ATS-2400

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Translation of the original user manual

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1. INTRODUCTION

The purpose of this manual is to explain the operation and use of the ATS-2400 Automatic Pocket Stitching machine. It is recommended to carefully read this manual, especially chapter 2 is essential to guarantee the user's safety.
To understand the manual correctly and to operate the machine safely, we recommend a special machine training by Eisenkolb or an experienced user. Always observe the safety requirements.
It is expected from personnel working with the ATS-2400 to have sufficiently mastered the operating instructions and to be aware of possible hazards and risks.
The user must immediately report any failures in the machine to the supplier.

1.1 PURPOSE OF THE MACHINE

The ATS-2400 automatic pocket stitching machine is designed to automatically fold and stitch one or more pocket panels in curtain fabric. Furthermore, it is (optionally) possible to apply additional UV-markings on the fabric for making pockets or inserting grommets (eyelets), or for finishing the lower seam at a later stage.
In most cases the sizes and working range of the machine are geared to the size of the workshop.
The operator must insert the top of the fabric into an insertion beam. The machine can be started as soon as a selection from the available basic shapes on the control screen has been made and the required dimensions have been entered.
The curtain will automatically be lifted to the correct height, after which the upper pocket is shaped. The sewing machine will stitch the pocket along the entire fabric width.
After the machine has returned, the next pocket will be shaped and stitched.
As soon as all pockets are completed, the curtain can be removed. Next the curtain must be cut to size and hemmed (externally).
If required, various curtains can be processed alongside each other. This is not only convenient for increasing production capacity, but also for stitching all pockets at exactly the same height while the curtains are placed side by side.

The machine features menu-controlled operation and is therefore very user-friendly. Upon delivery Eisenkolb has already pre-programmed at least one basic shape. This shape contains a graphical representation of the standard pocket curtain procedure for the user.
Several basic shapes are available upon request. They can be purchased and implemented at a later stage.

In addition to additional basic shapes, various other options are available for the pocket stitching machine. These options are explicitly described in section § 4.4.

Figure 1 ATS-2400 Automatic pocket stitching machine

1.2 DOCUMENTS

This manual is based on the latest product information available at the time of publication. Eisenkolb reserves the right to make changes in their documentation at any time with no obligation to modify previous publications.
Keep this manual in a safe place for future use.

1.3 TEXTUAL CONVENTIONS

The following expressions are used to emphasize certain parts of the text:

TIP

Suggestions and recommendations to facilitate certain tasks.

ATTENTION

This comment points out possible problems to the user.

CAUTION

Failure to carefully follow the procedures may result in damage to the equipment.

WARNING

Failure to carefully follow the procedures may result in the operator injuring himself or others or seriously damaging the equipment.

1.4 USE OF SIGNS

Listings of various possibilities are indicated as follows in this manual:

- Possibility-1
- Possibility-2
- ...

Activities to be carried out are indicated as follows in this manual:

- Step 1
- Step 2
- ...

2. SAFETY

The ATS-2400 was developed for easy and efficient use. However, read this manual carefully and act accordingly.
Everybody working on or in the immediate vicinity of the equipment must be acquainted with these instructions.
In addition to the instructions in this manual, always observe the applicable safety requirements and provisions.

2.1 PICTOGRAMS AND GENERAL SAFETY INSTRUCTIONS

The pictograms and safety requirements below are important for using the ATS-2400.

When using the marking liquid: consult the supplier's safety instructions regarding the use of personal protection.

Electrical voltage!

General warning symbol.

Watch out for moving parts (danger of entrapment)!

Watch out for moving parts (pinching danger)!

Attention: heavy load at height.

Never operate the machine without finger protectors and safety devices. Turn off the main switch for threading, changing bobbins, cleaning, etc.

Respect the environment:
Discard marking fluid, oils and redundant machine parts in accordance with local regulations.

Also observe the following points:

- Make sure that the work area is clean and well-lit.
- Keep the control boxes closed during normal use.
- Only use original parts.
- Carry out quality maintenance work regularly. Consult the instructions in chapter 7.

2.2 PERSONAL PROTECTION

WARNING

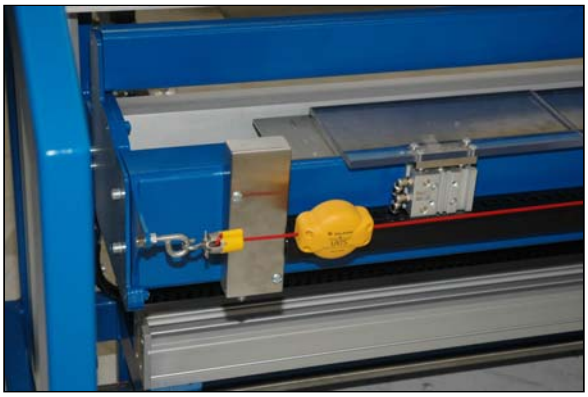
Do not wear long hair down.

2.3 EQUIPMENT SAFETY DEVICES

The ATS-2400 is equipped with safety devices, as shown in the close-ups below:

- Emergency stop button on the control box. If this button is pressed, all motor-driven movements will be stopped immediately.
  Fabric and pocket clamps will remain in their current position.
  The red lamp on the control box will be illuminated.

- Emergency stop cord along the entire front part of the machine. By pulling this cord aside in any direction, all motor-driven movements will be stopped immediately.
  Fabric and pocket clamps will remain in their current position.
  The red lamp (Reset) on the control box will be illuminated.



- Fixed plating around the sewing machine's moving parts.

- Fully closed drive systems for sewing machine's longitudinal movement and insertion beam's vertical movement.

2.4 SAFETY LABELS

In the table below the location of the various labels is shown (also see section 2.1):

WARNING

Replace the labels in case of damage or loss.

Position:

- On the insertion beam.
- On the cross carriage for the sewing machine's cross movement.

Position:

- On the sliding plate.

Position:

- On all electric motors.

2.5 SPECIAL POINTS OF INTEREST AND RESIDUAL RISKS

WARNING

To avoid starting the machine accidentally when touching one of the buttons on the touchscreen, switch off the machine under the following circumstances:

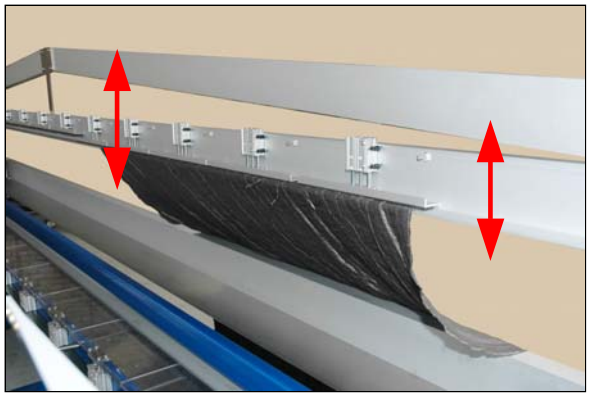
- If the machine is not used.
- If the machine is left unattended.
- If a malfunction occurs.
- If strange noises or smells are detected.

WARNING

Never grab inside the machine if it is already started.
Never try to rectify or insert a curtain correctly between operations!
Movements can be activated automatically and unexpectedly due to the automatic operation of the machine!

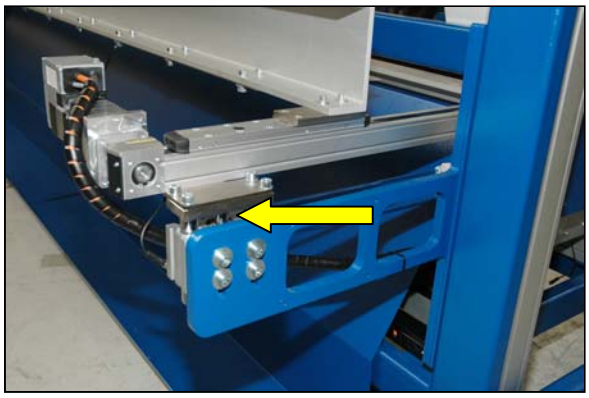
It is intrinsic to the functionality of the pocket stitching machine and the required accessibility for operators that some points imply a user risk. These points are:

- Entrapment and impact hazards against vertically moving insertion beam.
  During the production of the pockets the insertion beam automatically moves to a different height, without the operator having to enter a command.



- Entrapment and impact hazards of horizontally moving sewing machine.
  During production the sewing machine will automatically move back and forth (at low speed) along the machine to stitch the pocket. The small clearances will create entrapment hazards around the sewing machine.

- Entrapment hazard near the sliding plate lift movement (see photo); it goes up and down to move the sliding plate in and out the pocket clamps.
- In addition, watch out for entrapment hazards at the place where the sliding plate itself moves into the pocket clamps.



If this option is present:

- Risk of marking fluid coming into contact with the eyes when removing the hose before the pressure is switched off.

2.6 SPECIFIC USE OF THE MACHINE

- The ATS-2400 is developed for automatically shaping and stitching pockets in curtain fabric. For other applications, please contact Eisenkolb.
- Only switch on the machine if all safety devices are in place and OK, as described in section 2.3 and 2.4.
- Carry out quality maintenance regularly, as described in chapter 7.
- Only qualified personnel are allowed to carry out maintenance and repair work on the control section.
- Keep the machine free from contamination such as fabric remnants, needles, scissors etc.
- Never insert curtain fabric in the machine if needles or pins are still present in the fabric. Folding and stitching may cause them to break or fly off. Furthermore, it may damage the sewing machine.
- If the control box must be opened for repairs, first always remove the connector from the socket and then wait at least 5 minutes!
- The system components should only be applied in the combination described in this manual.

2.7 DISSUASIONS

- Do not use the machine for activities other than those described in this manual. The linked movements can cause dangerous situations.
- Do not use bent or blunt needles.
- When the machine is in use, persons other than the operator should stay out of the immediate vicinity of the moving parts, because of the entrapment hazard.
- Do not place unnecessary obstacles or tools on the machine.
- Never grab in the operating machine!
- Do not cover the motors or control box; covering the ventilation slots may lead to overheating!
- Mechanical operations on the system, such as drilling holes or welding components, may cause damage to the equipment.
- Never by-pass safety devices such as emergency stop buttons, cord and fuses. In addition, do not replace fuses with fuse types with different specifications.
- The machine is grounded. Do not remove this ground connection!
- Do not use the machine in the immediate vicinity of volatile or highly inflammable materials such as petrol or solvents, sprays, pure oxygen etc.
- Do not use the machine in the immediate vicinity of high-frequency welding equipment or other interference sources.

2.8 SOUND LEVEL

The following noise measurements were carried out for this machine:

- Distance : 0.5 m.
- Height : approx. 1 m 50 from the floor.
- Equipment : Brüel & Kjaer, type 2219
- Controls : Sewing mode with regular curtain fabric.
- Sound level : xxx dB(A).

2.9 CE MARKING

The ATS-2400 complies with the EC directive for machine safety. The CE declaration is shown in Figure 2.

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Verklaring van overeenstemming	Eisenkolb B.V. verklaart hierbij dat de ATS-2400 geconstrueerd, geproduceerd en getest werd in overeenstemming met onderstaande normen en daarom voldoet aan de CE-norm die is vastgelegd in de Machinerichtlijn 2006/42/EG.
Manufacturer's declaration	Eisenkolb B.V. hereby declares that the ATS-2400 was constructed, produced and tested in accordance with the standards below and therefore complies with the CE standard established in the Machinery Directive 2006/42/EC.
Übereinstimmungserklärung	Eisenkolb B.V. erklärt hiermit, dass der ATS-2400 in Übereinstimmung mit den unten stehenden Normen konstruiert, hergestellt und getestet wurde und daher der in der Maschinenrichtlinie 2006/42/EG festgelegten CE-Norm entspricht.
Certificat de conformité	Eisenkolb B.V. affirme par la présente que l'ATS-2400 a été construite, produite et testée conformément les normes ci-dessous et qu'elle répond ainsi à la norme CE définie dans la Directive pour Machines 2006/42/CE.
Certificado de conformidad	Eisenkolb B.V. declara por la presente que la máquina ATS-2400 fue construida, producida y verificada en conformidad con las siguientes normas y por eso cumple con la norma CE establecida en la Directiva de Máquinas 2006/42/CE.
Dichiarazione di accordo	Eisenkolb B.V. dichiara che l'ATS-2400 è stata progettata, prodotta e collaudata in conformità con le norme qui presenti e dunque risponde alla normativa CE prevista dalla Direttiva Macchine 2006/42/EG.

EN 894-1, EN 953, EN 954-1, EN 983, EN 1037, EN-ISO 11111, EN-ISO 12100-1 & -2, EN 13850, EN 13857, EN-ISO 14121-1, EN-IEC 60204-1, EN 60304, EN-IEC 61000-6-2, EN-IEC 61000-6-4.

G.J. Eisenkolb. Managing Director of Eisenkolb B.V.

Bladel, 25-05-2010

Figure 2 CE declaration

3. TECHNICAL SPECIFICATIONS

The ATS-2400 has the following technical specifications:

ASPECT	SPECIFICATION
Machine width	5,820 mm
Machine depth	1,320 mm (when control box door is closed)
Machine height	Customer-specific
Weight	Depending on construction size
Electrical connection	230 V, 50 Hz (1 phase) + neutral + PE Power consumption approx. 4 kW
Sewing machine	Dürkopp Adler, 4180i-5xx-100
Fabric type to be processed	According to sales contract
Stitch type	Lockstitch
Stitch length	3.2 mm
Sewing speed	Variable, max. 1,700 stitches/minute
Needle system	134R-80 / 134R-90
Pocket depth	10 – 40 mm (set in basic pocket shape)
Working width	4,500 mm
Pocket and fabric clamps	Pneumatic
Production capacity	Up to 80 curtains per 8 hours, depending on the number of pockets and work experience of the operator.
Compressed air connection	Operating pressure: 6 Bar (0.6 MPa) Min. supply pressure: 7 Bar (condition: according to ISO 8573, category 2)
Control panel	15" touchscreen
Lubricating oil to be used	Esso SP-NK 10, DA 10 or equivalent. Viscosity 10 mm^2/s at 40°C, flash point 150°C.

4. SYSTEM DESCRIPTION

4.1 OVERVIEW

The ATS-2400 automatic pocket stitching machine is a modular available system that is geared to the available space in the workshop in terms of dimensions and working range.

Figure 3 shows the main components of the ATS-2400.

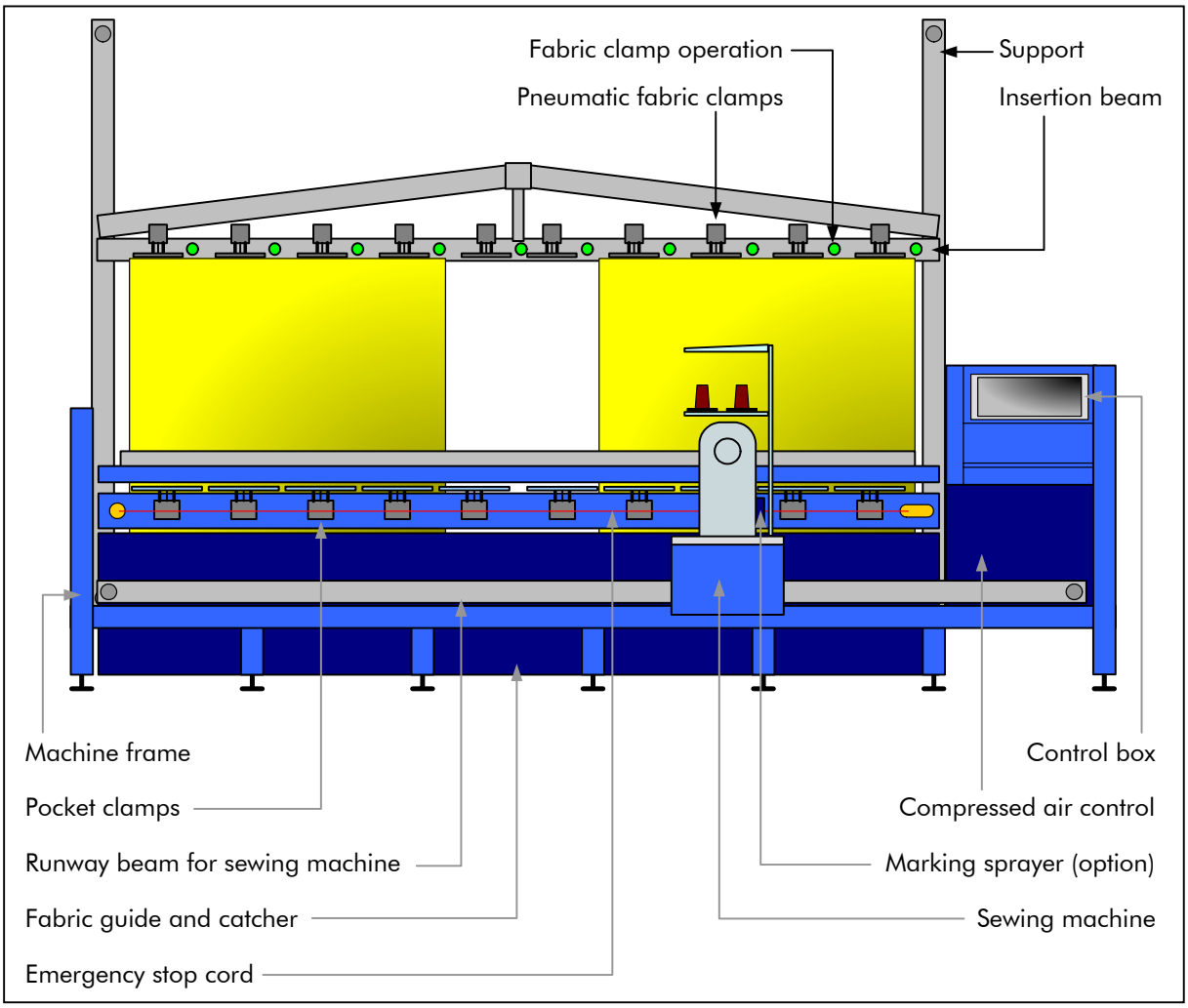


Figure 3 ATS-2400 main components

4.2 MECHANICAL STRUCTURE AND OPERATION

The ATS-2400 is constructed around a frame that is mounted to the ground in the workshop permanently (in general).

A horizontal insertion beam is mounted inside the frame. On this insertion beam a number of pneumatic clamps has been mounted (Figure 4) in which the curtain fabric can be fixed manually. The clamps each have their own manually operated switch.

Figure 4 Spring-loaded fabric clamps

The insertion beam is connected to the vertical supports by two slides. These slides are interconnected mechanically and are driven by a shared electric motor which lifts the insertion beam to a proper height for a correct pocket position and distance.

The framework lower section contains a mechanism which shapes the pockets. It globally consists of the following main components (Figure 5):

Figure 5 Pocket shaping

- Fabric guide tubes and plates which ensure the correct position and place of the curtain. The sliding plate moves in between them to shape the pocket.
- Horizontally moving sliding plate which pushes the curtain in the groove-shaped opening in the frame, shaping the pocket. This movement determines the final pocket depth. This dimension is set by the operating system and can be adapted by the operator in most cases.
  The sliding plate also makes a small vertical movement so it can freely slide in and out.
- Large number of transparent pocket clamps. The clamps fix the pocket in the machine frame after the pocket has been pre-shaped by the sliding plate. Then the sliding plate returns to its stop position. The fabric remains fixed underneath the pocket clamps.

The machine is built on a cross slide around the pocket section and can move along the entire curtain width to stitch the shaped pocket. The operating system ensures that this sewing movement is only possible when the pocket clamps are closed.
An integrated sensor monitors the curtain fabric. As soon as it detects no more fabric over a certain distance, the machine will return immediately to its stop position so the next pocket can be shaped.

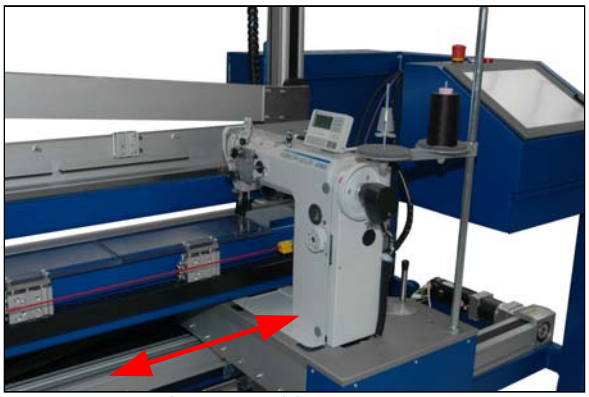


Figure 6 Sewing machine on cross slide

4.3 OPERATING SYSTEM AND CONTROLS

4.3.1 GENERAL

Based on a pre-defined basic shape the operator determines the exact pocket specifications of the curtain.
The ATS-2400 operating system will then automatically determine the required height control of the insertion beam and the depth movement of the sliding plate to produce correct pockets.

4.3.2 CONTROL BOX

All components for controlling and operating the ATS-2400 are contained in a control box at the right-hand side of the machine, see Figure 7.

Figure 7 Control box

The functions of the controls are described in the table below.

A touchscreen has been mounted onto the control box for entering pocket data and operating the machine. By softly touching the area of the required control with your finger, this control will be activated and will appear on the next window or a value will be selected.
The exact operating controls are explained in the operating instructions, see chapter 6.
The main switch is located at the back of the control box, see Figure 8.

Figure 8 Main switch

CONTROL	DESCRIPTION
Main switch	Use this switch to turn on or off the complete installation.
Emergency stop button	Operate the emergency stop button in case of danger. • All electrically driven movements are stopped (vertical movement of insertion beam, as well as drive and movement of the sewing machine). • Fabric and pocket clamps will remain in their current position.
Reset button	Press this button after unlocking the emergency stop button or after restoring the cord switch. The set curtain data will be maintained, but the machine will have to be restarted. Also after switching on the main switch, the reset button must be operated.
Touchscreen	This panel is used for setting and operating the machine.

4.3.3 OPERATING PROGRAM

The operating program for the ATS-2400 is shown permanently on the touchscreen. The main structure is shown in Figure 9.

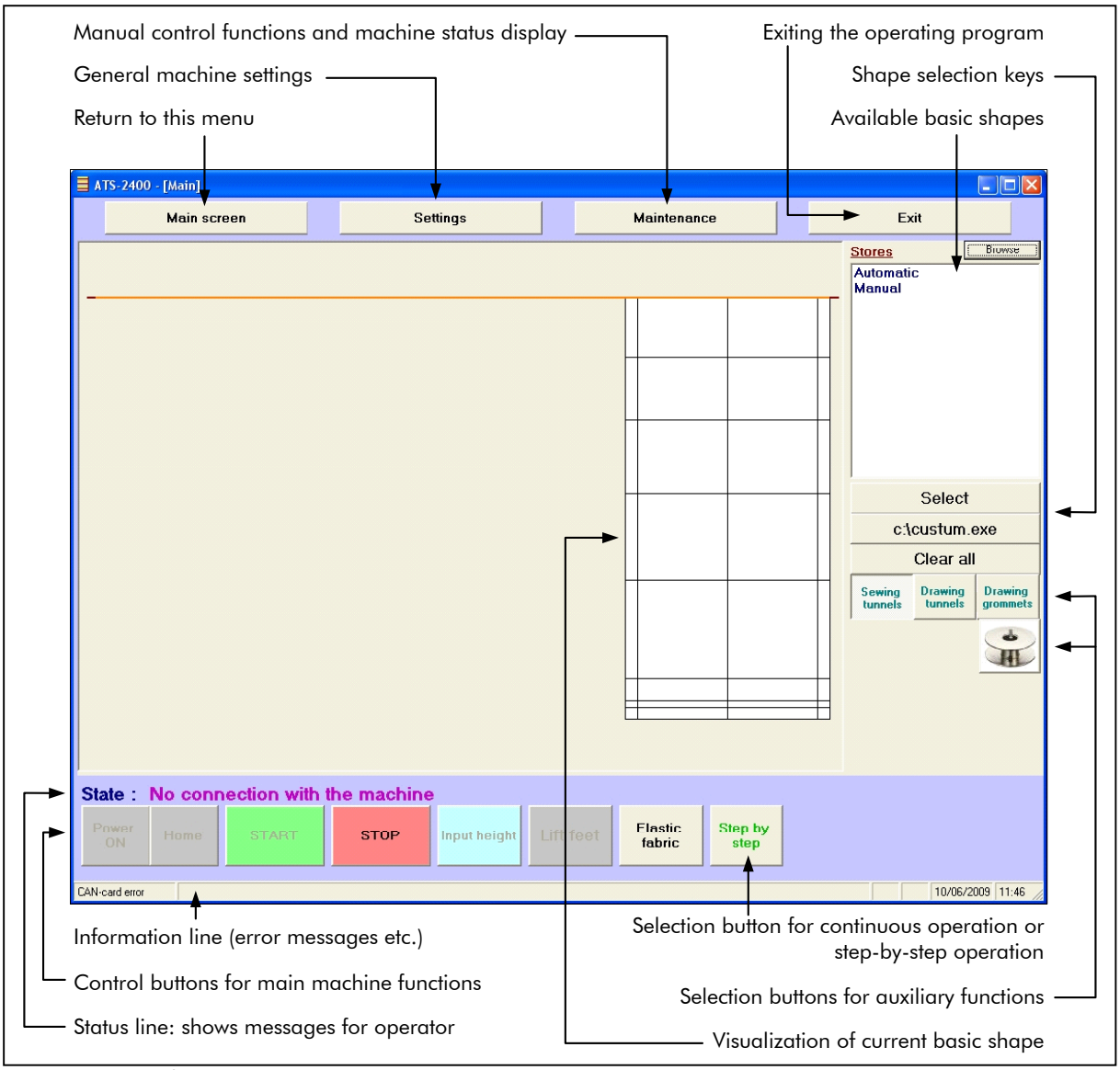


Figure 9 ATS-2400 work menu

4.3.4 PANEL FOR SEWING MACHINE CONTROLS

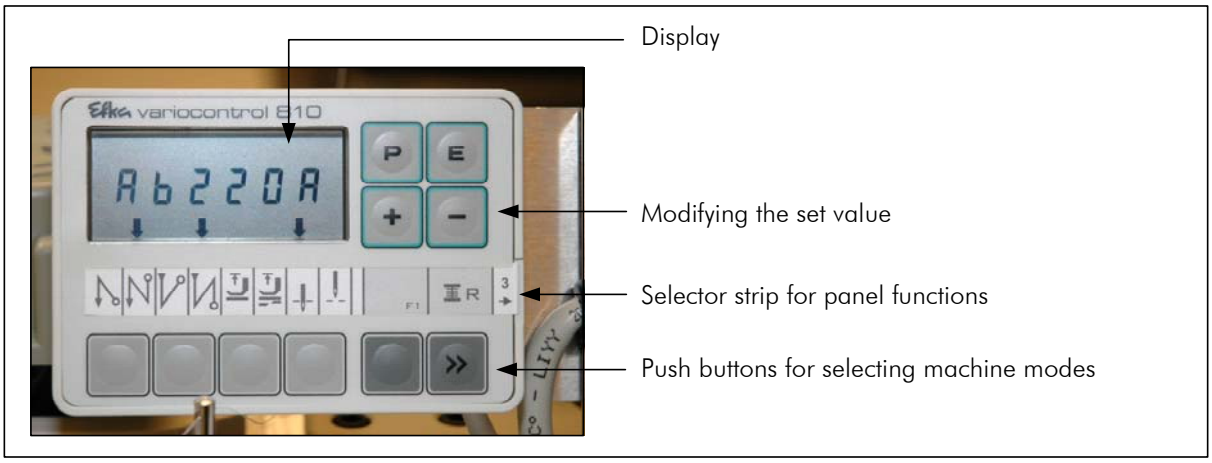
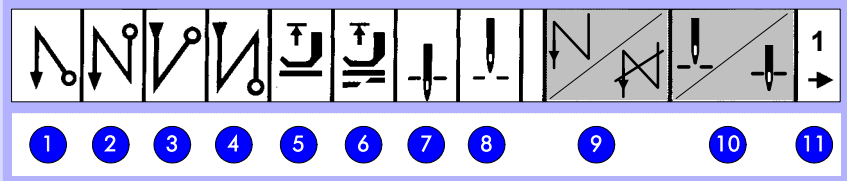
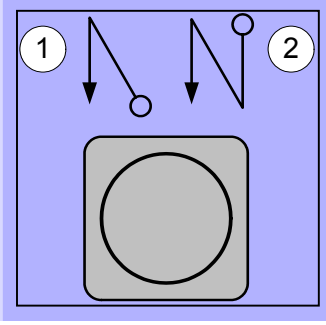


Figure 10 Panel for sewing machine controls (V810)

The controls are described below (Figure 10):

CONTROLS	DESCRIPTION
Display	This indicates the current value of the selected mode. Example: When the **[Initial stitch – single]** mode is selected, the display will for approx. 2 seconds indicate how many stitches will be stitched back at the beginning of the seam, before the fabric is transported.
[+ / -]	These buttons are used to modify the value of the mode currently selected with the push buttons. Example: When the **[Initial stitch – single]** mode is selected, the display will for approx. 2 seconds indicate how many stitches will be stitched back at the beginning of the seam, before the fabric is transported. Within these 2 seconds press **[+]** to increase the number of stitches or **[-]** to decrease this number.
Selector strip for stitching modes	The machine is equipped with this basic strip:  It activates the following modes: 1 = Initial stitch – single 2 = Initial stitch – double 3 = End stitch – single 4 = End stitch – double 5 = Presser foot always up 6 = Presser foot up after cutting 7 = Needle always low 8 = Needle always high 9 = xxx 10 = xxx 11 = Strip type

CONTROLS	DESCRIPTION
Push buttons for selecting machine modes	Operate the buttons to switch the corresponding machine modes (see previous line) on and off (always 1 button per 2 machine modes). Example:  • Press button once: modes 1 and 2 are switched off. • Press button twice: mode 1 is activated. • Press button three times: mode 1 is switched off, mode 2 is activated. After activating a certain mode, the LED above the symbol will be illuminated.

4.3.5 COMPRESSED AIR SUPPLY

The compressed air supply unit is located at the bottom of the control box and generates two supply pressures:

- Low pressure (2,5 Bar / 0.25 MPa) for closing the pocket clamps (with sliding plate in between clamps);
- High pressure (approx. 7 Bar / 0.7 MPa) for all other pneumatic controls.

Figure 11 shows this unit.

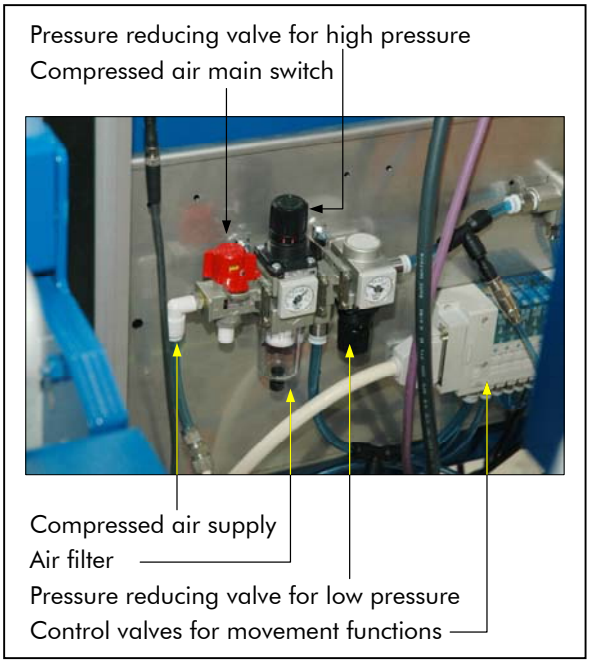


Figure 11 Compressed air supply unit

4.4 OPTIONS

The following options are available for the ATS-2400:

4.4.1 MARKING SPRAYER

The marking sprayer (Figure 12) is used for marking lines on the curtain fabric, for example for:

- The **Drawing grommets** mode: for each pocket one or more marking points are drawn on the curtain so it can be equipped with cords at a later stage.
- The **Drawing tunnels** mode: the shaped pocket is not actually stitched, but a line is marked onto the fabric.
- **Final curtain length** or **Lower seam**.

For this purpose, a UV-liquid is used which is only visible in special light.

Figure 12 Marking sprayer head

The **Drawing grommets** marking mode can only be used for basic shapes which are prepared for this purpose. In this case, the basic shape in the touchscreen must have vertical lines, as shown in the example of Figure 13.

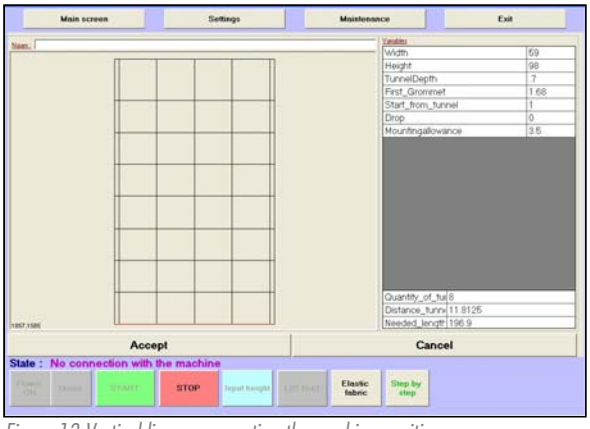


Figure 13 Vertical lines representing the marking positions

The reservoir can be filled up manually by using a squeeze-bottle.

4.4.2 ADDITIONAL BASIC SHAPES FOR POCKET SPECIFICATIONS

Basic shapes have been developed by Eisenkolb based on customer requirements. These shapes contain the standard pocket curtain procedure and include the following characteristics.

- The way in which pockets are indicated;
- The references used for curtain and pocket specifications;
- The names being used.

Naturally, each basic shape can be used to produce various pocket curtain types and sizes.
If other aspects are required for a curtain specification, a special new basic shape can be designed and supplied. This shape is supplied in the form of a software file which can be added to the operating system by the user. Figure 14 shows an example of several basic shapes.

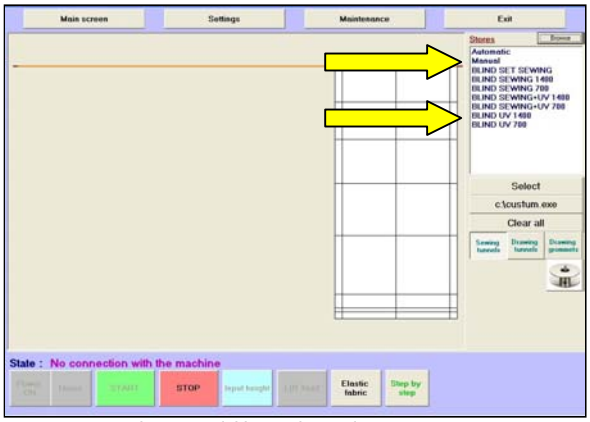


Figure 14 Basic shapes available in selection list

5. INSTALLATION AND COMMISSIONING

The supplier will install and commission the ATS-2400. Therefore, these activities are not described in this manual.

6. OPERATION

6.1 INFORMATION ABOUT THIS MANUAL

The instructions in this chapter are based on the fact that the machine is equipped with a marking sprayer and various basic shapes.
If the machine is not equipped with these options, part of the explanations no longer applies.

6.2 PREPARATIONS AFTER MACHINE IS SWITCHED OFF

WARNING

Avoid risks caused by sudden start-up.
Carry out all activities described in this section with the machine switched off and motor stopped.

6.2.1 INSTALLING THE STITCHING NEEDLE

CAUTION

Only use stitching needles in accordance with the specifications listed in chapter 3. Different needle types may produce bad stitching results or even cause damage to the machine.

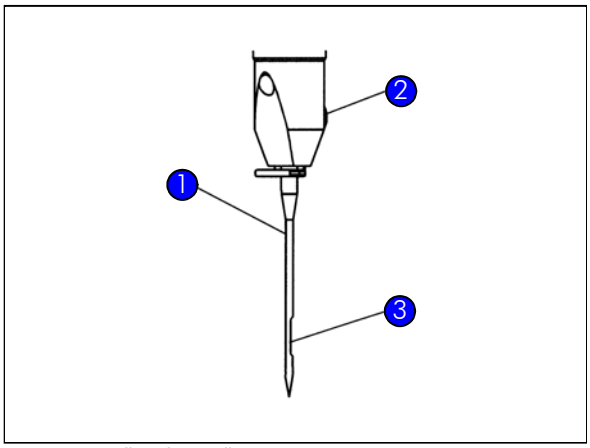


Figure 15 Installing the needle

- Lift the needle in the highest position by using the hand wheel.
- Loosen bolt ❷ (Figure 15) and remove the old needle.
- Push the new needle ❶ as far upwards inside the needle bar as possible.
- Ensure that the groove ❸ (above the eye) is placed in the same direction as the gripper.
- Tighten bolt ❷.

6.2.2 THREADING THE UPPER THREAD

- Thread the upper thread as shown in Figure 16.
- Let the thread stick approx. 40 mm out of the needle.

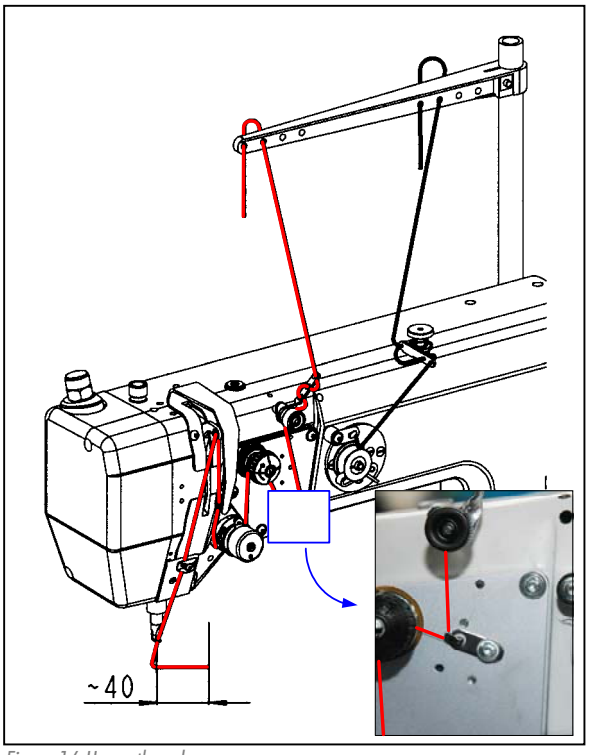


Figure 16 Upper thread

CAUTION

A different threading method may produce bad stitching results or even cause damage to the machine.

6.2.3 CHANGING THE BOBBIN HOUSING AND THREADING THE LOWER THREAD

ATTENTION

It is only possible to change the bobbin housing if the machine is in its starting position. If not, switch on the machine and press **[Home]** on the touchscreen.

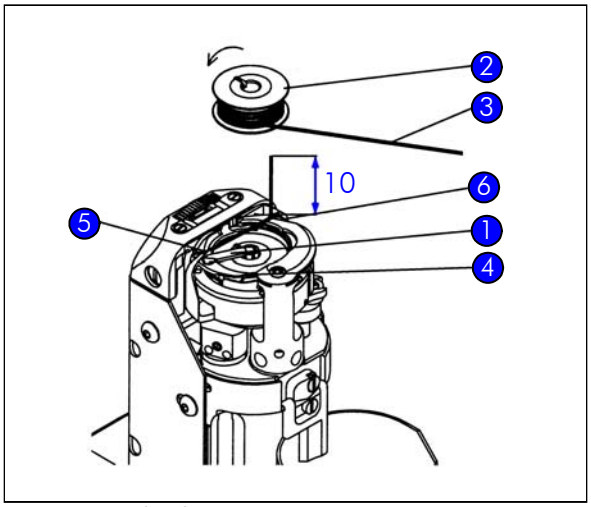
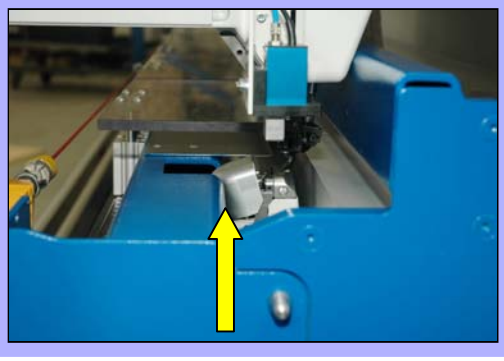


Figure 17 Lower thread

- Lift the locking pin ❶.
- Install the bobbin ❷ and keep the thread end ❸ in the direction as shown in Figure 17.
- Guide the thread through the notch ❹ and opening ❺ and insert the thread under the spring ❻.
- Cut the thread according to the instruction in Figure 17.

CAUTION

Do not forget to close the cover above the lower section. If it remains open, it will get stuck against the machine frame!



6.3 SWITCHING ON AND STARTING THE MACHINE

- Switch on the entire machine by using the switch at the back of the control box (see Figure 18).

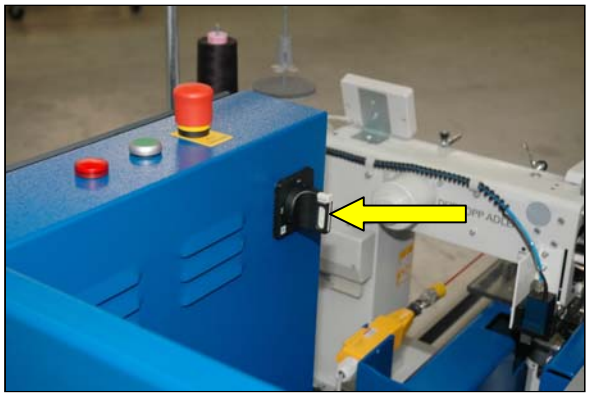


Figure 18 Main switch

- Check if the compressed air supply system is switched on. If required, open the main tap (see Figure 19).
- If required: unlock the emergency stop button and/or restore the cord switch (see section 9.2).
- Press **[Reset]** and the red lamp will extinguish.

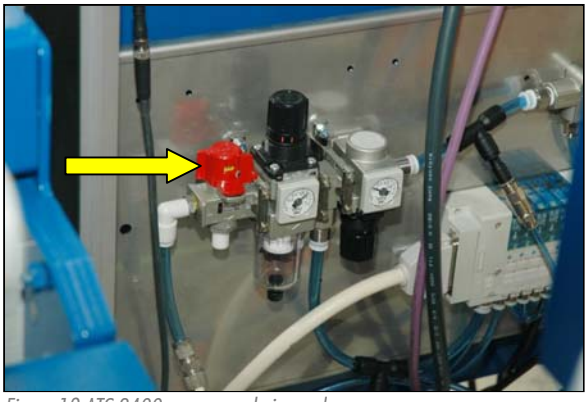


Figure 19 ATS-2400 compressed air supply

After the machine is switched on, the touchscreen will be illuminated. After a while the Windows logo appears.

- Double-click the ATS-2400 logo.
- The main screen appears: The status line shows the text ***Motors are not energized. Press Motors ON.***
- Press the **[Power ON]** key.

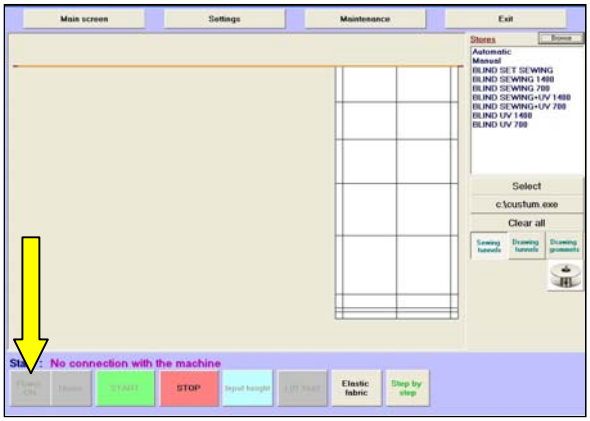


Figure 20 Main screen

- The status line now shows: ***Motors are switched on, press Calibrate.***
  Press the **[Home]** key.
  Now the status line ***Machine is ready to be started*** will follow.

6.4 FURTHER MACHINE PREPARATIONS

6.4.1 WINDING THE LOWER THREAD

WARNING

For the following activities the machine must be switched on.
Watch out for moving parts: touching them may result in injuries or damage tot the machine!

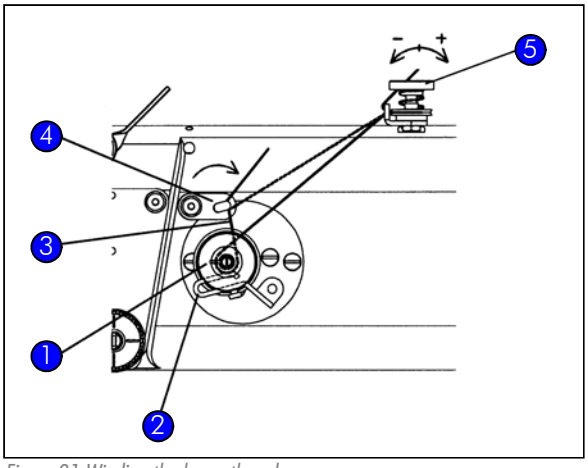


Figure 21 Winding the lower thread

- Place the bobbin ❶ on the carrier.
- Thread the lower thread through the tension controller ❺ and thread guide, as shown in Figure 21.
- If required, set the winding tension by using controller ❺:
  - Turning clockwise will result in a higher thread tension; if the setting is too high, the thread will slip over the bobbin;
  - Turning counterclockwise will result in a lower tension.
- Manually wind the thread ❸ counterclockwise onto the bobbin, at least 6 turns.
- Cut the thread end by using the thread cutter ❹.
- Fasten the lever ❷.
- Press the bobbin symbol on the touchscreen (Figure 22).
  Now the bobbin is wound automatically; drive system will stop automatically when the bobbin is full.
- Remove the bobbin and cut the thread by using thread cutter ❹.

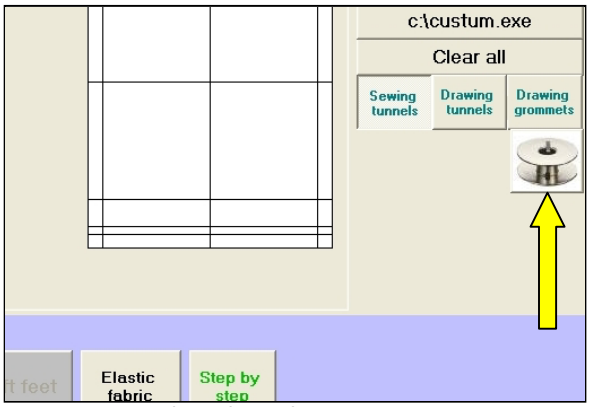


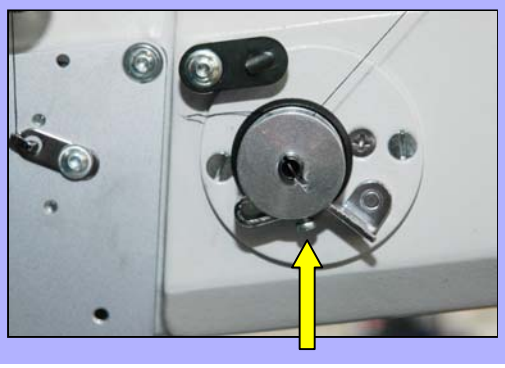
Figure 22 Activating the winding mode

TIP-1

We recommend winding some addition bobbins during productions so full bobbins are always available.
Wind the bobbins as described in this section. When the sewing machine is running, this will be done automatically, without having to press the bobbin logo.

TIP-2

The amount of thread on the bobbin can be rectified, if required. Turn the adjusting bolt shown on the photo.



6.4.2 SETTING THE THREAD TENSION

The instructions below for controlling the thread tension are based on a normal stitched seam. When stitching decorative seams, the upper tension can be set slightly lower.

The thread tension to be used depends on thread size and material type. The table below shows the nominal values.

CATEGORY	UPPER THREAD TENSION (N)	MAX. LOWER THREAD TENSION (N)
1	3	1
2	4.5	1.5
3	8	2
4	12	2

Upper thread tension (Figure 23):

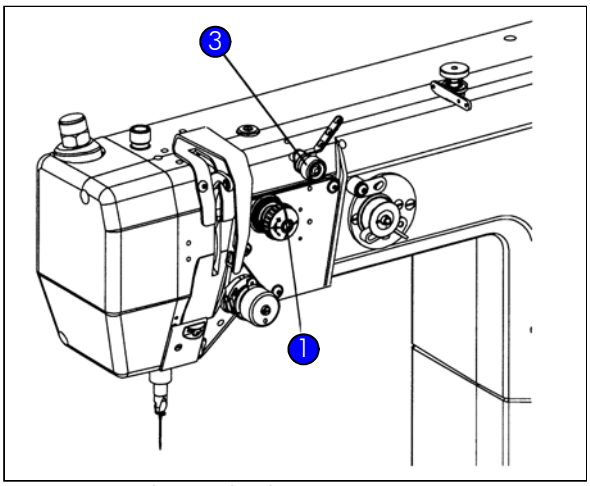


Figure 23 Setting the upper thread tension

- Turn the tension controller ❶ to set the thread tension:
  - Counterclockwise: lower tension,
  - Clockwise: higher tension.
- Set the additional controller ❸ as low as possible, but still high enough that the thread will not run out of the controller after it has been cut.

ATTENTION

The upper thread tension will be released automatically, as soon as the thread is cut and the upper roller is lifted. Then the thread tension can no longer be measured.

Lower thread tension (Figure 24):

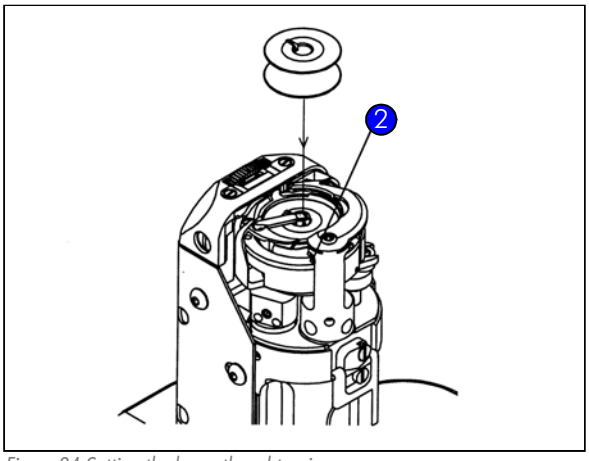


Figure 24 Setting the lower thread tension

WARNING

Avoid risks caused by sudden start-up.
Only carry out activities when the machine is switched off and the motor is stopped.

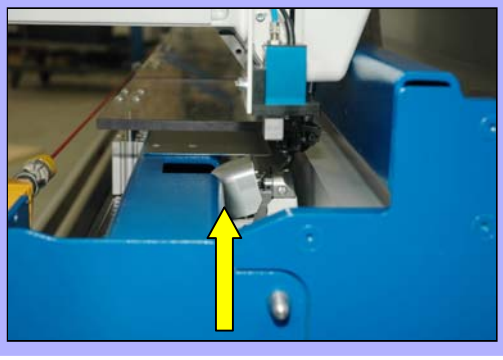
- Turn bolt ❷ to set the required tension value:
  - Counterclockwise: lower tension,
  - Clockwise: higher tension.

ATTENTION

An exceeded tension may cause problems during stitching.

CAUTION

Do not forget to close the cover above the lower section. If it remains open, it will get stuck against the machine frame!



6.5 SELECTING AND SETTING A BASIC SHAPE

- Select the required line from the available basic shapes under **Stores**. Double-click it.

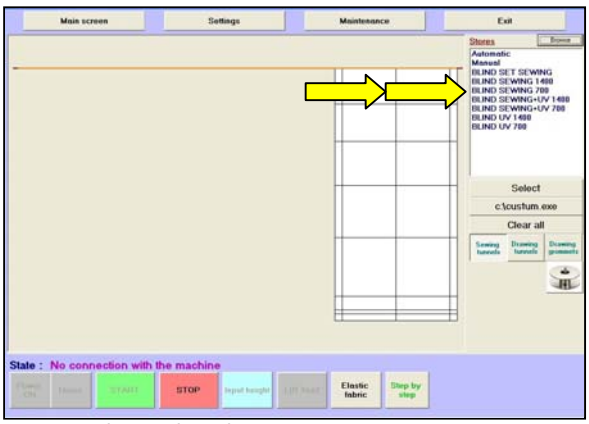


Figure 25 Selecting a basic shape

- The touchscreen will shown the main data of this basic shape, see example in Figure 26.

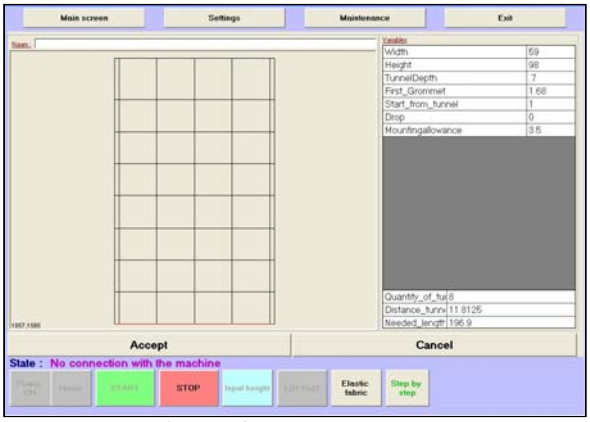


Figure 26 Screen with curtain data

The big box shows a graphical representation of the curtain structure. In the example shown 3 pockets will be stitched.
The operator must check all lines in the specification field and correct them, if necessary. Use the internal production job for this check.
The specification lines may differ for each machine. They are established in consultation with the customer. Therefore, they cannot be explained separately in this manual.

- Double-click the relevant line.
- Enter the proper value by using the virtual keyboard (Figure 27).
- Confirm this value with [✓].

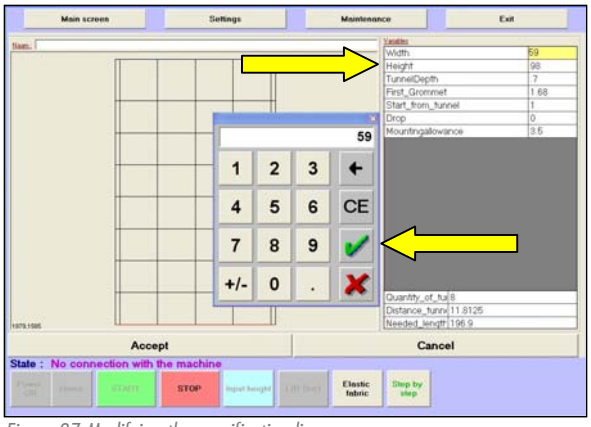


Figure 27 Modifying the specification lines

TIP

The auxiliary keys on the virtual keyboard have the following functions:

- [⬅] deletes the last character;
- [CE] resets the value to 0;
- [✓] accepts the new value and closes the keyboard;
- [✕] ignores the new value and closes the keyboard.

ATTENTION

All values are in **[mm]**.

- Press **[Accept]** after all data have been entered.
  The touchscreen now shows the **Main screen**.
  This screen now shows the updated visualization of the specified curtain.

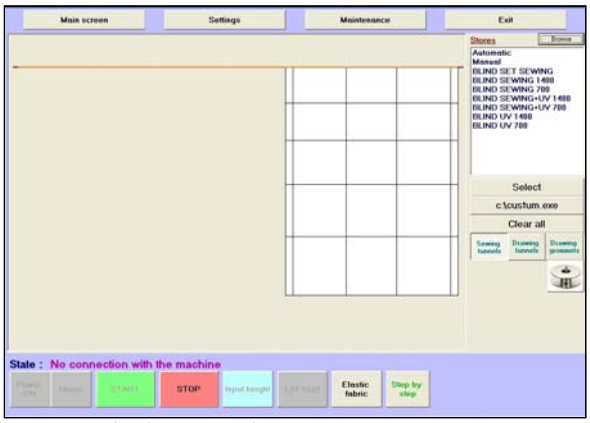


Figure 28 Updated curtain visualization

6.6 INSERTING AND PROCESSING CURTAINS

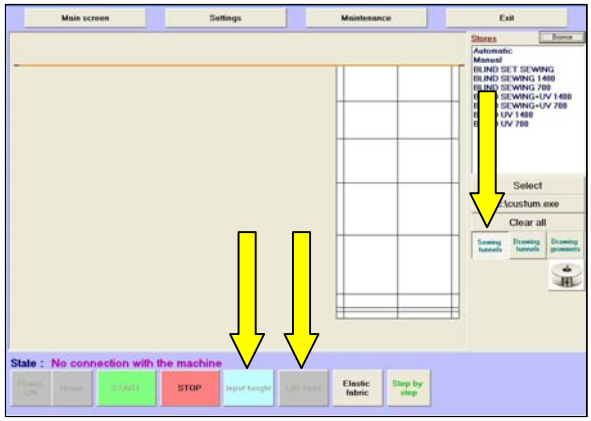
Follow the procedure below for processing single curtains:

STEP-1

- Turn the machine hand wheel in the direction shown to lift the needle.
  The indicator should be between **70** and **80**.

STEP-2

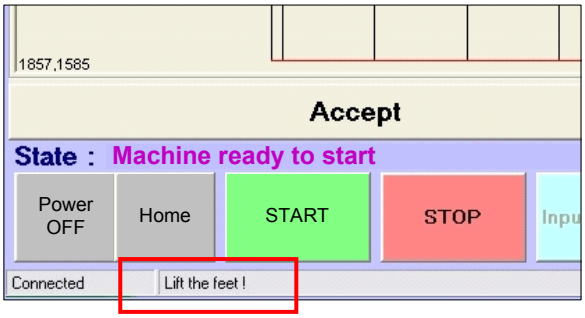
- Check if the **[Sewing tunnels]** function key on the **Main screen** is active.
- Press **[Reset feet]** to lift the fabric clamp.
- Press **[Inputheight]**. The machine will assume its starting position and the pocket clamps and insertion beam will be raised to operating height.



ATTENTION

If one of the specified conditions is not met, the machine will not go to its rest position and will not lift the insertion beam.
Remember that the fabric clamp will be lowered after a while (to protect the lifting magnet).

In this case, the information line will show which action to take (see adjacent example).

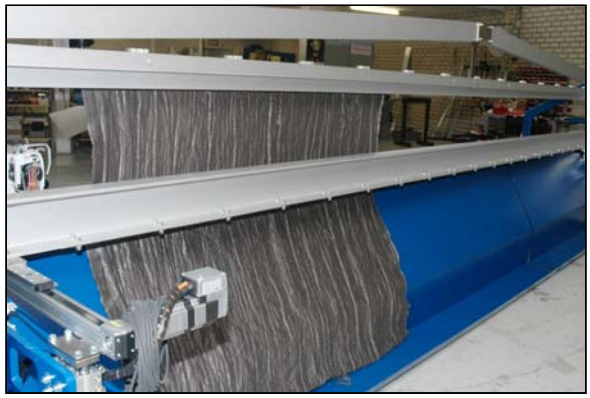


STEP-3

- Insert the curtain into the insertion beam and keep the right-hand side of the curtain equal with the right-hand clamp.
- Operate the switch for each fabric clamp to activate the clamp.

STEP-4

- Hang the curtain straight down for both grey beams (this photo was taken from the back of the machine).
- Guide the fabric over the fabric guide at the back and let it rest in the fabric catcher.
- Make sure that the fabric is not pleated or caught on any obstacle.

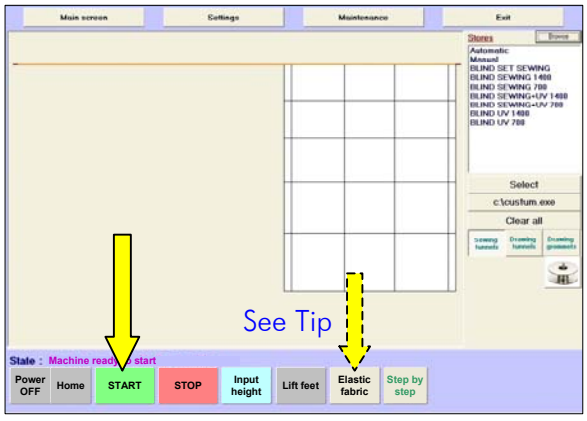


STEP-5

- Press **[Start]**.

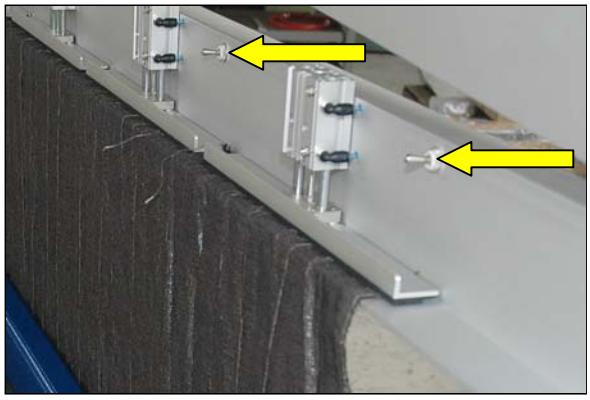
The following will happen:

- The insertion beam will take the curtain to the proper height for the first pocket.
- The sliding plate will shape the pocket and the pocket clamps will close.
- The sliding plate will pull back.
- The sewing machine will find the front of the fabric and the presser foot will be lowered.
- The pocket will be stitched (sewing machine's cross movement) and the machine will return to the beginning of the curtain.
- All subsequent pockets will be made in the same way.



STEP-6

- Press **[Input height]** as soon as the curtain is finished and the insertion beam will be lowered to operating height.
- Open the fabric clamps and remove the curtain.



TIP

When processing elastic curtain fabric, it may stretch temporarily while shaping the pockets. In this case the final pocket distance will be smaller than intended.

To prevent this, press the **[Elastic fabric]** function key before pressing **[Start]**. The insertion beam will then be lowered slightly when sliding in the sliding plate.

6.7 PRODUCING MULTIPLE CURTAINS

6.7.1 GENERAL

The basic shape may include a line for producing various curtains at the same time, for example **Number of roman blinds**.
If this line is used, all curtain hanging side by side in the insertion beam will be provided with pockets at the same time. Naturally, these pockets will all be stitched at the same height, see Figure 29.

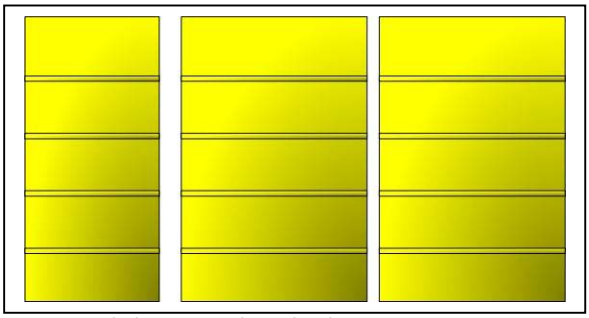


Figure 29 Multiple curtains with equal pockets

During the sewing machine's cross movement a built-in sensor will detect where one curtain ends and the next curtain starts. It will automatically fasten off and on these points.

- Make sure that the curtains are inserted at intervals of at least 75 mm. The max. interval is 150 mm.

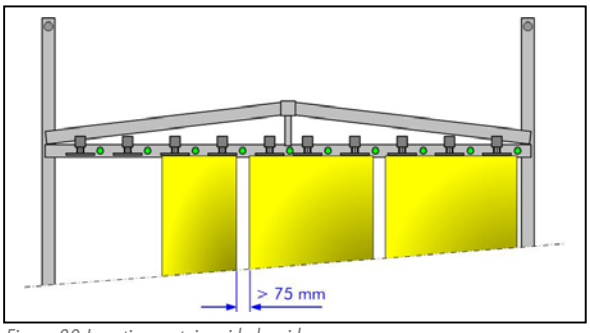


Figure 30 Inserting curtains side by side

- Follow the normal operating procedure, as described in section 6.6.

6.7.2 UNEQUAL CURTAIN LENGTHS

When processing sets with unequal lengths (for example for 2 windows and 1 door), proceed as follows:

- Insert the longest curtain on the far right.
- Insert all subsequent curtain lengths in descending order.
  Due to the automatic end-of-fabric detection the machine will automatically return to its starting position if no curtain is detected over a distance of approx. 150 mm.
  Figure 31 shows a simplified representation, with the insertion beam in the highest position. The red lines show the sewing machine's cross movement for each pocket.

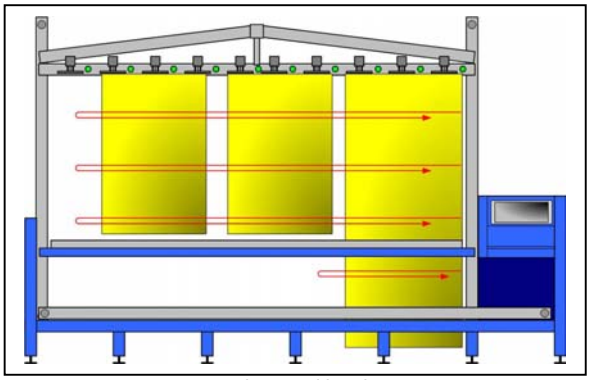


Figure 31 Inserting curtains with unequal lengths

The visualization on the touchscreen is always based on the longest curtain and will only show equal lengths (see Figure 32).
Nevertheless, in most cases (see section 6.7.3) the machine will not attempt to stitch unnecessary pockets underneath the shorter curtains.

Figure 32 Visualization of multiple curtains

- Follow the normal operating procedure, as described in section 6.6.

6.7.3 CRITICAL CURTAIN LENGTHS

Figure 31 shows that the sewing machine no longer considers the shorter curtains while stitching the bottom pocket in the right-hand curtain.
Due to the connection between curtain lengths and pocket positions, a critical situation may arise, as shown in Figure 33. When the machine returns from the 4th pocket, it will come into contact with the free fabric of the remaining curtains. The machine will not detect a end-of-fabric and will also stitch the shorter curtains. Obviously, this is not supposed to happen.

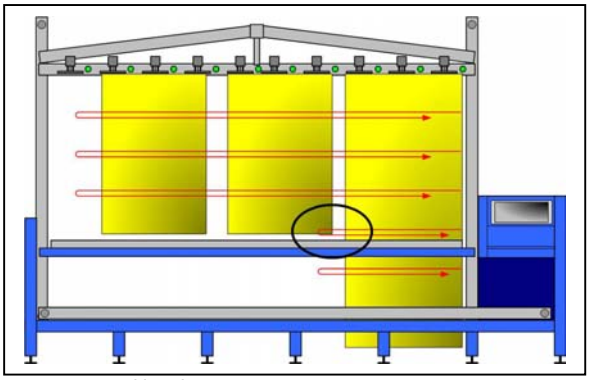


Figure 33 Critical length ratios

Proceed as follows to prevent this situation:

- Stitch the pockets which have to be applied in all curtains according to the normal procedure (see section 6.7.1).
- Press the **[Step by step]** key while the machine returns from the last completed pocket (in this example: the 3rd pocket).
  The touchscreen will now show an additional key: **[Next step]** (see Figure 34).

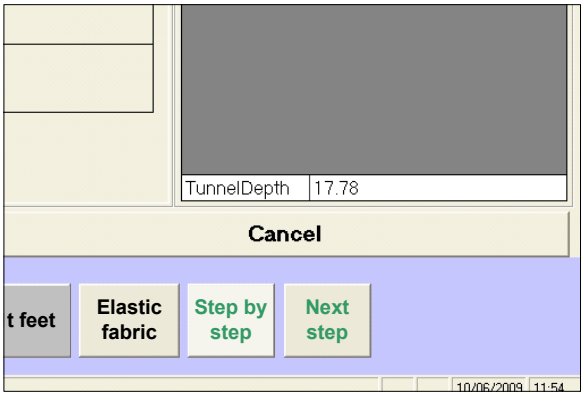


Figure 34 Step-by-step operation

- Keep pressing **[Next step]** until the fabric clamps are opened.
- Now remove the short curtains from the machine.
  Only the longest curtain will remain inside the machine. This curtain can be finished according to the normal procedure.
- Press **[Step-by-step]** to cancel this function.
- Press **[Start]**. The remaining curtain will now be finished in one go.

6.8 AUXILIARY FUNCTIONS

6.8.1 RECTIFYING BROKEN THREADS AND/OR ERRORS

If the machine detects that one of the yarns has run out or if another error occurs during stitching, the production must be stopped. Rectify the error (for example, replace the bobbin) and restart the machine. However, a restart always takes place at the beginning of a pocket, from the right-hand side of the machine, and has the following consequences:

- If part of a pocket was already stitched, the stitching must be removed.
- If multiple curtains are inserted and some curtains already have more pockets than others, these curtains must be temporarily removed.

Proceed as follows:

- Press **[Stop]**. The sewing machine will stop in its current position.
- Press **[Input height]**. The thread is fastened off and cut.
  The fabric clamp will open, the sewing machine will return to its starting position, the pocket clamps will open and the insertion beam will be moved to insertion height.
- Remove the curtain with the unfinished pocket.
- Remove the stitching of the unfinished pocket.
- Reinsert the curtain in the insertion beam.
- Double-click the illustration on the touchscreen (Figure 35).

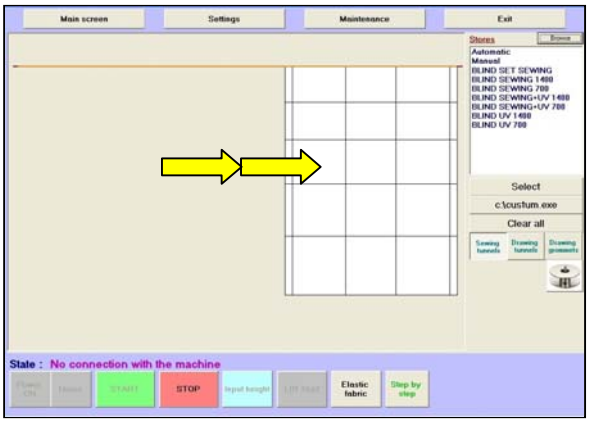


Figure 35 Main screen

CAUTION

Do not click the selection list (Stores). This will immediately cancel all curtain settings!

The main data of the current basic shape will appear again.

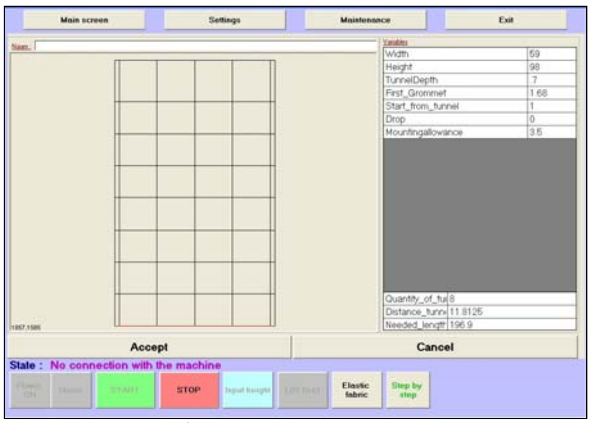


Figure 36 Curtain specifications

- Activate the line **Start from tunnel …**
- Enter the number of the pocket to be (re)stitched.
- Press **[Accept]**.
  The illustration in the **Main screen** will now show by means of diagonal lines which pockets have to be stitched.
- To produce the current and subsequent pockets in all curtains:
  - Press **[Start]**.
- To (re)produce the current pocket in single curtains only:
  - Place the curtains with finished pocket over the sliding beam (Figure 37).

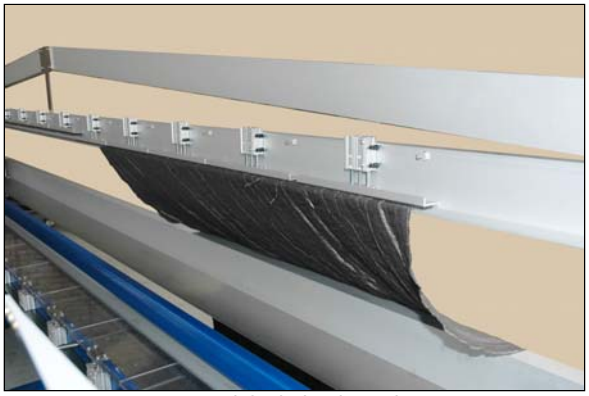


Figure 37 Putting curtains with finished pocket aside

  - Activate **[Step by step]**.
  - Keep pressing **[Next step]** until this pocket is finished.
  - Insert all curtains in a normal way into the machine.
  - Deactivate the **[Step by step]** function.
  - Press **[Start]**. All subsequent pockets will now be finished according to the normal procedure.

6.8.2 WINDING LOWER THREAD DURING PRODUCTION

The sewing machine has a winding device which can automatically produce full bobbins during a production.
The procedure is described in section 6.4.1.

6.8.3 LIFTING THE UPPER ROLLER

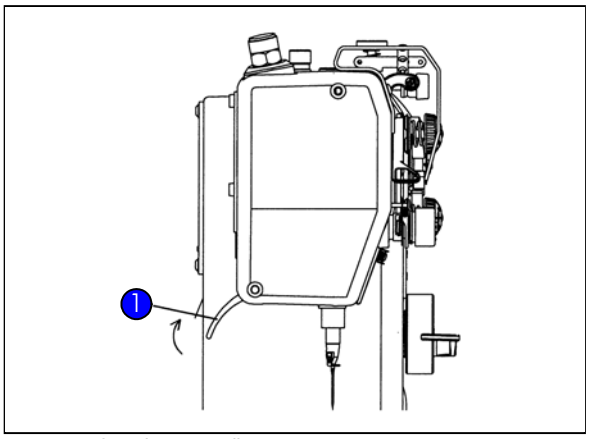


Figure 38 Lifting the upper roller

- The presser roller can be lifted manually, if required. Push lever ❶ upwards.

6.9 OPTIONAL OPERATIONS

6.9.1 DRAWING TUNNELS

If pockets do not have to be stitched, but only have to be marked onto the curtain fabric, activate the **Drawing tunnels** function (Figure 39). The operating system will then consider the required fabric length for each pocket while lifting the curtain.
Two lines are drawn for each pocket.

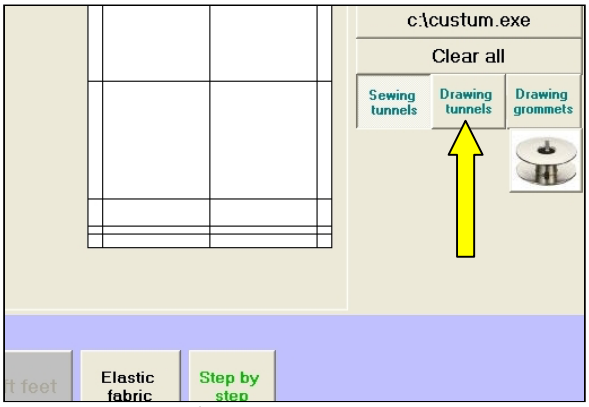


Figure 39 Drawing tunnels

6.9.2 DRAWING GROMMETS

If a curtain needs additional lift cords at a later stage, it is convenient to apply markings at the required points.
Activate the **Drawing grommets** function on the touchscreen (Figure 40).

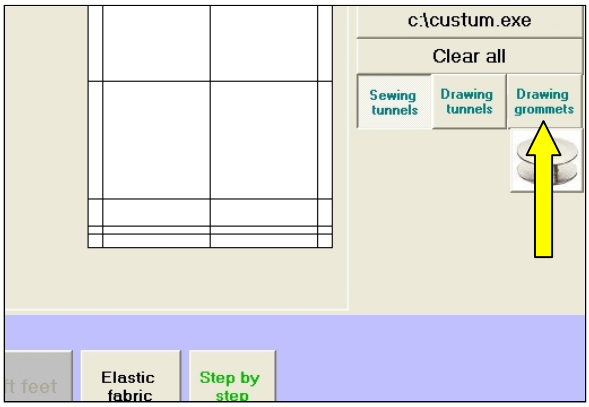


Figure 40 Drawing grommets

In this case, the basic shape should have vertical lines. A marking is applied to each intersection. Figure 41 shows the markings for the top pocket.
Within the basic shape the number of marking points can be set manually.

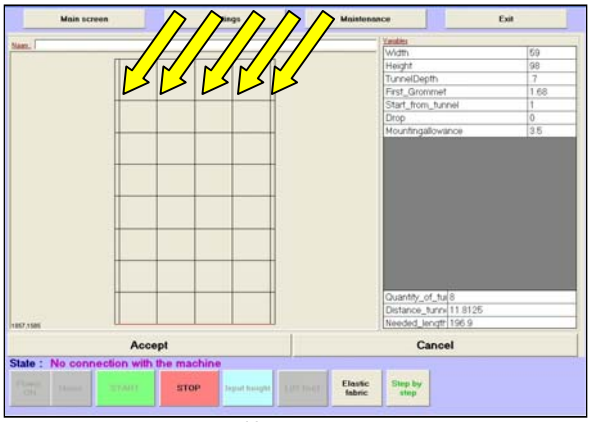


Figure 41 Grommets on vertical lines

6.10 SWITCHING THE MACHINE OFF

Follow the procedure below to switch off the ATS-2400:

- Wait until the curtain is finished and then remove it from the machine.
- If required, put the machine in its starting position by pressing the **[Home]** key.
- Press the **[Power OFF]** key.
- Press the **[Exit]** key.
- Exit Windows.
- Switch the main switch at the back of the control box off.
- Close the compressed air supply (see Figure 19).

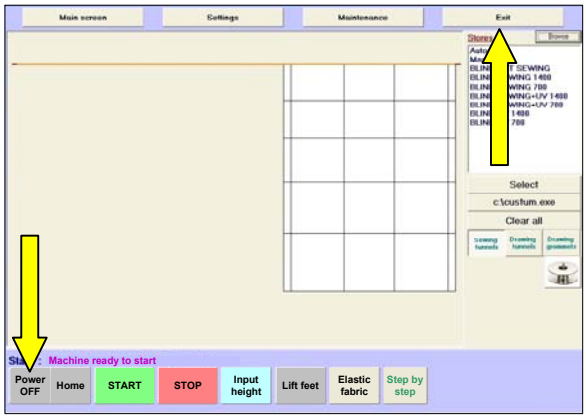


Figure 42 Switching off the ATS-2400

- Wait at least 20 seconds after switching off the machine, before it can be restarted.

7. MAINTENANCE AND MACHINE SETTINGS

This chapter describes the normal maintenance of the ATS-2400.

WARNING

All maintenance work should be carried out by qualified personnel with the machine shut down completely (unless required otherwise)! The compressed air supply must also be switched off!

7.1 DAILY MAINTENANCE

- Remove the stitch plate.
- Clean the round conveyor, the gripper and the clearances around them. Remove all fabric and thread remnants.
- Use a long-haired brush.

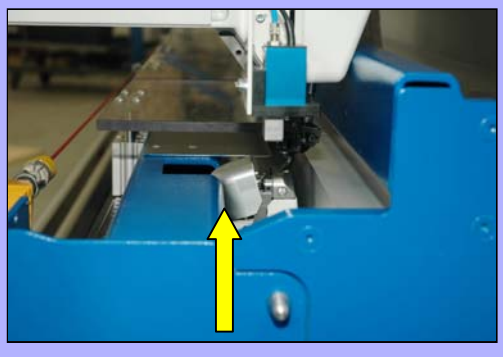
ATTENTION

When using a blowing gun for cleaning, always wear safety glasses to avoid eye injuries caused by flying parts!

- Lubricate the gripper with a drop of oil (see section 3).

CAUTION

Do not forget to close the cover above the lower section. If it remains open, it will get stuck against the machine frame!



7.2 WEEKLY MAINTENANCE

- Check the oil level ❸ of the gripper lubrication in the sewing machine's lower section, see Figure 43.
- If necessary, fill until the upper edge through opening ❹. Only use oil in accordance to the specifications listed in section 3.
- Do not forget to close the cover above the lower section. If it remains open, it will get stuck against the machine frame (see photo in section 7.1)!

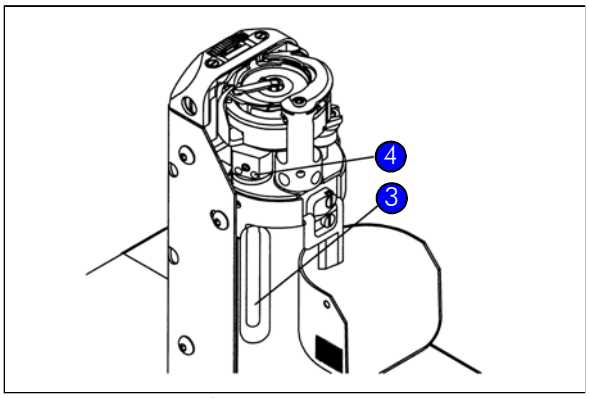


Figure 43 Lower section oil reservoir

7.3 MONTHLY MAINTENANCE

- Check the oil level ❶ of the central lubrication in the sewing machine's upper section, see Figure 44.
- If required, fill the oil reservoir until the **MAX** ❷ mark. Only use oil in accordance with the specifications listed in chapter 3.

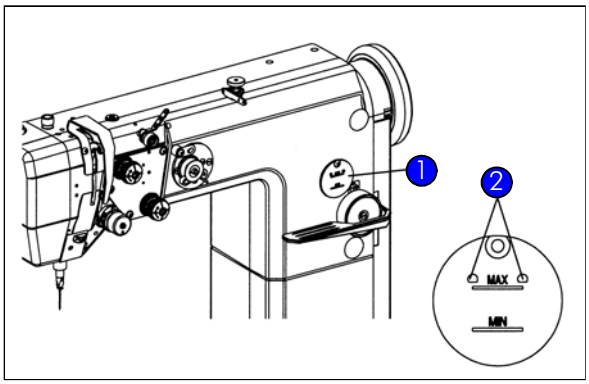


Figure 44 Upper section oil reservoir

7.4 SETTING THE UPPER ROLLER PRESSURE

The upper roller pressure should be as low as possible, but still high enough to prevent the fabric from moving after the needle is lifted from the stitchery.

- Turn the control button to set the required pressure value:
  - Counterclockwise: reduce roller pressure;
  - Clockwise: increase roller pressure.

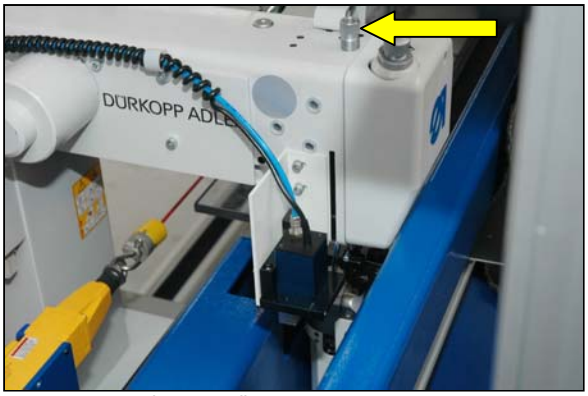


Figure 45 Setting the upper roller pressure

7.5 FILLING THE MARKING SPRAYER RESERVOIR

Fill the reservoir as follows:

- Turn the pressure reducing valve back to 0 Bar. Check this value by using the manometer! The fluid reservoir is now depressurized.
- Open the reservoir and fill it up with ink.
- Close the reservoir carefully.
- Check whether the two hoses are connected properly.
- Turn the pressure reducing valve to 0.5 Bar.

8. SERVICE FUNCTIONS

8.1 ACCESS TO HIGHER LOG-IN LEVEL

All activities on the ATS-2400 control screen which are described in the previous chapters, can be carried out by all users. No access code is required.
However, the functions described in chapter 8 require a higher log-in level. In most cases the operating system will inform the operator by displaying a virtual keyboard, as shown in Figure 46.

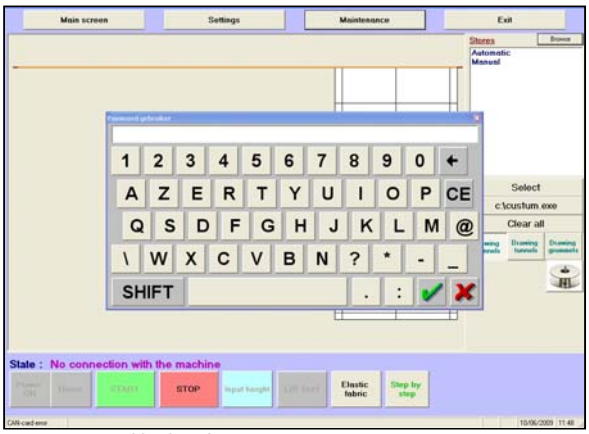


Figure 46 Virtual keyboard

- Enter your access code by using the alphanumeric keys.
  Auxiliary keys:
  - [⬅] = deletes the last character;
  - [CE] = deletes the entire line;
- Confirm the code with [✓].

8.2 MACHINE STATUS AND MANUAL OPERATION

The touchscreen shows the machine functions which are currently active. It can also be used to manually switch certain functions on or off.

- Press the **[Maintenance]** key in the **Main screen**.
- Select **[Inputs / Outputs]**, as shown in Figure 47.

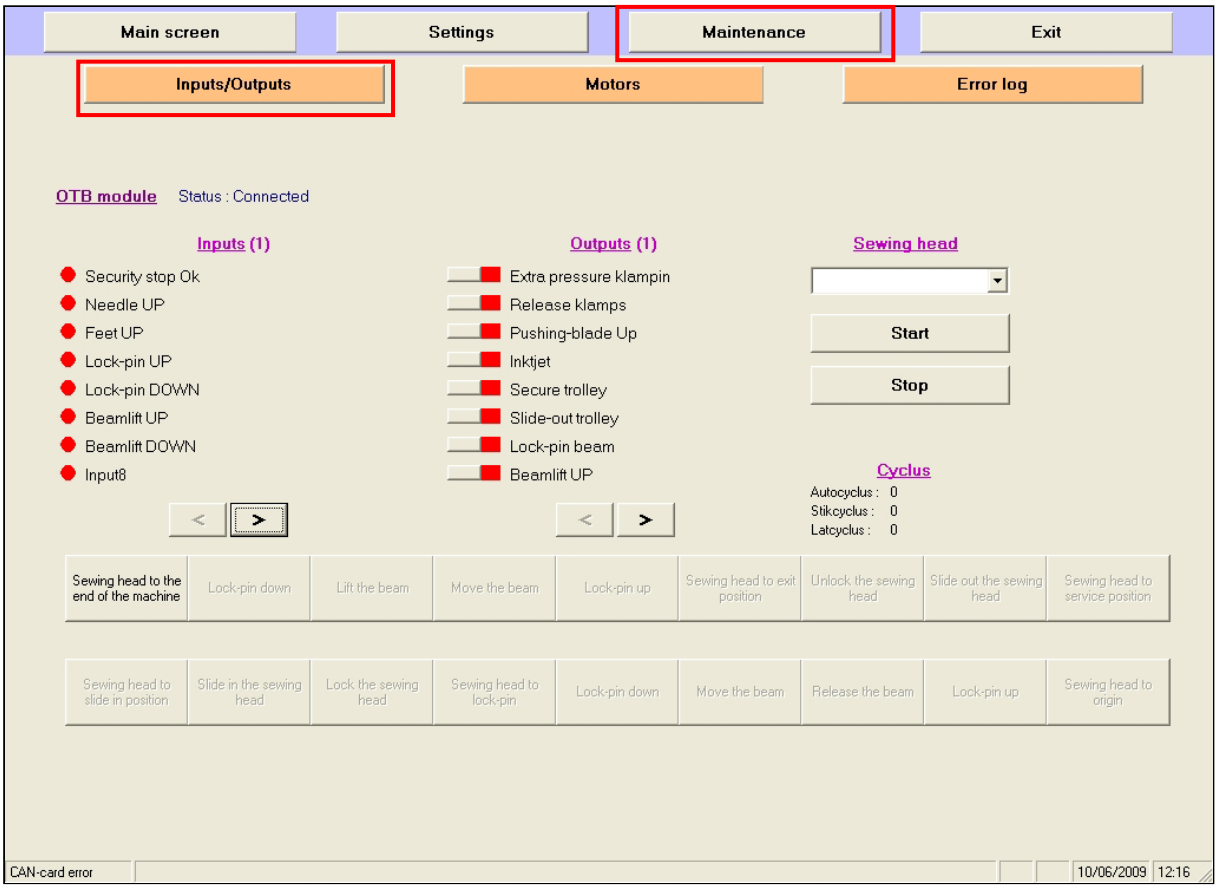


Figure 47 Maintenance menu

Inputs:

- Green LED: sensor is active;
- Red LED: sensor is inactive;
- Use [<] and [>] to scroll to other parts of the list.

Outputs:

- Press the virtual key to switch the corresponding function on or off.

CAUTION

Only use the manual functions if you are sure what is going to happen. Wrong actions can lead to damage to the machine!

TIP

As soon as you exit the menu, the machine will return to its original status.

Sewing head:
By activating this field, a function list will appear which refers to the operation of the sewing machine itself.

- After a function has been selected, it can be activated by pressing **[Start]**.
- Deactivate a function by pressing **[Stop]**.
- A few machine counters are shown under **Cycle**.

9. MALFUNCTIONS AND QUALITY PROBLEMS

9.1 GENERAL

WARNING

Only qualified personnel are allowed to work on the electric equipment!
Wait at least 5 minutes after switching off before opening the control box!

CAUTION

If malfunctions occur which are not trivial or which cannot be solved according to the method described, consult your supplier.
Do not perform any activities on this machine other than those described in this manual.

9.2 EMERGENCY STOP SITUATIONS

When a dangerous situation occurs, the machine can be stopped immediately by pressing the emergency stop button or pulling the cord.

- All motor-driven movements will be stopped immediately.
- Fabric and pocket clamps will remain in their current position.

Restore the situation as follows:

- If the emergency button was pushed, pull it out again (Figure 48).
- Press **[Reset]** on the control box.

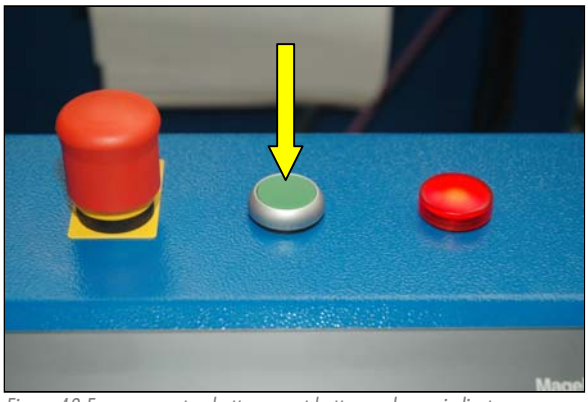


Figure 48 Emergency stop button, reset button and error indicator

- If the emergency stop cord was activated, you will see that the blue tensioner button on the cord switch is (largely) turned upwards (Figure 49).
- Turn the tensioner button back to its horizontal position.
- Press **[Reset]** on the control box.

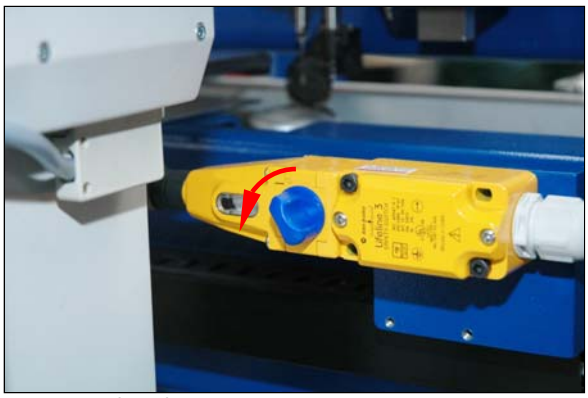


Figure 49 Cord switch

Now the curtain must be inserted and processed further, starting from the last completed pocket. This is described in section 6.8.1.

9.3 RESTORING THE SAFETY COUPLING

The sewing machine's lower section is equipped with a safety coupling which switches off the drive unit as soon as the gripper is blocked. Reactivate the coupling as follows (Figure 50):

ATTENTION

The coupling is only accessible if the machine is in its starting position. If not, press **[Home]** on the touchscreen.

WARNING

Avoid risks caused by sudden start-up. Therefore, first switch off the machine completely and wait until the motor is fully stopped.

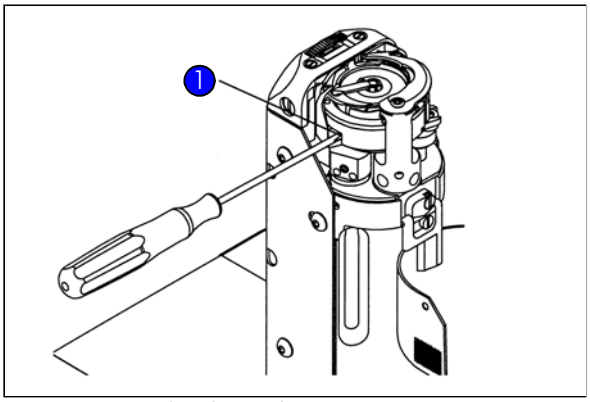
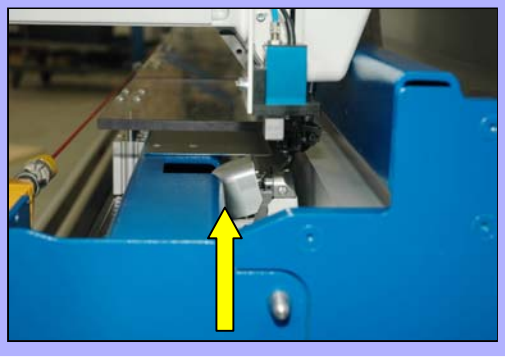


Figure 50 Restoring the safety coupling

- Open the cover above the lower section.
- Turn the machine hand wheel until opening ❶ is accessible.
- Insert a screw driver in the opening.
- Turn the machine hand wheel further (in the direction of the arrow on the machine housing) until the coupling noticeably clicks.
- Close the cover.

CAUTION

Do not forget to close the cover above the lower section. If it remains open, it will get stuck against the machine frame!



9.4 QUALITY PROBLEMS

While stitching the pockets, malfunctions may occur which are not related to the programming and contents of the basic shape.
To solve these problems, follow the instructions below.

PROBLEM	CAUSE	ACTION
Upper thread breaks.	• Upper thread has been threaded incorrectly.	▸ Rethread the thread, as indicated in section 6.2.2.
	• Upper thread tension is too high.	▸ Set the tension correctly (see section 6.4.2).
	• Needle not installed properly or damaged.	▸ Correctly install a new needle. Watch the direction of the groove (see section 6.2.1).
	• Needle thickness does not correspond with thread and curtain fabric used.	▸ Use the proper needle/thread combination.
	• Gripper point touches the thread.	▸ Contact the Eisenkolb service department.
	• Lower thread is too elastic.	▸ Use a different type of lower thread or contact the Eisenkolb service department.
	• Bad quality of upper thread.	▸ Replace the thread.
	• Needle thickness is not suitable for stitch plate.	▸ Replace the stitch plate insert.
	• Stitch plate is damaged.	▸ Replace the stitch plate insert.
	• Wrong setting of the bobbin function.	▸ Contact the Eisenkolb service department.
Lower thread breaks.	• Thread has been threaded incorrectly.	▸ Rethread the thread, as indicated in section 6.2.3.
	• Bobbin is damaged.	▸ Replace the bobbin.
Stitches are skipped at the beginning of the stitched seam (after cutting the thread)	• Remaining thread in needle was too short after cutting (thread tension during cutting too high).	▸ Thread the upper thread correctly (see section 6.2.2). ▸ Reduce the tension in the pre-tension switch (number ❸ in section 6.4.2). ▸ Contact the Eisenkolb service department if the problem is not solved.
	• Upper thread tension is too high.	▸ Set the tension correctly (see section 6.4.2).
	• Needle is too thick for thread and curtain fabric used.	▸ Use a thinner needle.
	• Other technical machine settings incorrect.	▸ Contact the Eisenkolb service department.

PROBLEM	CAUSE	ACTION
Stitches are skipped	• Needle not installed properly or damaged.	▸ Correctly install a new needle. Watch the direction of the groove (see section 6.2.1).
	• Clearance between needle and gripper point is too big.	▸ Contact the Eisenkolb service department.
	• Timing between needle and gripper incorrect or needle height incorrect.	▸ Contact the Eisenkolb service department.
	• Curtain fabric or thread is too elastic. Timing and needle bush height must be modified.	▸ Contact the Eisenkolb service department.
	• Gripper point is damaged.	▸ Replace the gripper.
Incorrect stitch; thread is entangled in the stitching at the top of the fabric.	• Lower thread tension is incorrect.	▸ Rectify the tension (see section 6.4.2).
	• Upper thread has not been threaded properly or tension is incorrect.	▸ Thread the upper thread correctly (see section 6.2.2). ▸ Rectify the tension (see section 6.4.2).
Incorrect stitch; thread is entangled in the stitching at the bottom of the fabric. Problem is not solved by increasing the upper thread tension.	• Upper thread has run out of the control discs.	▸ Thread the upper thread correctly (see section 6.2.2).
	• Bobbin lifter is not opened sufficiently	▸ Contact the Eisenkolb service department.
	• Conveyor is set too low.	▸ Contact the Eisenkolb service department.
	• Upper thread tension is too low when thread passes the gripper.	▸ The thread limiter must be set slightly higher. Contact the Eisenkolb service department.
Stitches are too loose and irregular. Thread is frayed.	• Upper and lower thread tension are too low.	▸ Rectify the tension (see section 6.4.2).
	• Upper thread tension is too low when thread passes the gripper.	▸ The thread limiter must be set slightly higher. Contact the Eisenkolb service department.
	• Needle is too thin for the thread used.	▸ Install a thicker needle.
Fabric is irregular near stitched seam.	• Thread tension is too high for the fabric used.	▸ Rectify the tension (see section 6.4.2).
Curtain fabric is not transported or is transported very slowly.	• Safety coupling is active.	▸ Restore the coupling, see section 9.3.

PROBLEM	CAUSE	ACTION
Difficult or irregular supply.	• Conveyor is set too low (especially for soft or heavy fabrics).	▸ Contact the Eisenkolb service department to rectify this setting.
	• Conveyor teeth are too fine for the fabric used.	▸ Contact the Eisenkolb service department for more robust teeth.
	• Conveyor drive chain tension is too high, causing it to block.	▸ Contact the Eisenkolb service department.
Gripper is blocked.	• Lower thread not threaded properly when installing the bobbin. Gripper has run behind the thread.	▸ Rethread the thread and install the bobbin, as indicated in section 6.2.3.
	• Upper thread has run out the control discs and was grabbed twice by the gripper point.	▸ Rethread the upper thread (see section 6.2.2).
	• Space between needle and stitch plate is too small.	▸ Contact the Eisenkolb service department.
Upper thread is not cut off.	• Upper thread has been threaded incorrectly.	▸ Rethread the upper thread (see section 6.2.2).
	• Upper thread is pulled too hard when needle is lifted (thick elastic material, low conveyor setting).	▸ The needle used is too thin. Use a thicker needle. ▸ Modify the lower thread tension. ▸ If required, ask the Eisenkolb service department to modify the conveyor height.
	• Problem with the thread cutting function.	▸ Contact the Eisenkolb service department.
	• While cutting the thread, the safety coupling is activated.	▸ Increase the safety coupling spring load. Contact the Eisenkolb service department.
Lower thread is not cut.	• Problem with the thread cutting function.	▸ Contact the Eisenkolb service department.
After the thread was cut, the 2nd and 3rd stitch were not finished properly.	• Retaining spring for lower section thread is not set properly.	▸ Contact the Eisenkolb service department.

10. SPARE PARTS

See appendix for recommended spare parts.

11. DISMANTLING

When the ATS-2400 is no longer used and has to be dismantled, follow the steps below in the correct order:

- Make sure that the control console is switched off.
- Remove the electric main connection and detach the connector from the cable.
- Remove the compressed air connection.
- Empty the marking head reservoir and discard the liquid in accordance with local regulations.
- Disassemble the electric engines and discard the oil in accordance with local regulations.
- Keep the possible instability of the upright frame into account when disassembling. Therefore, keep the machine anchored to the floor as long as possible.
- All components have to be discarded in accordance with local regulations, preferably by a company that will recycle the materials.

ATTENTION

These steps only refer to parts supplied by Eisenkolb and described in this manual.