

910

**CNC-Nähanlage für freie Nahtkonturen
CNC sewing unit for free seam contours**

Bedienanleitung / [Operating Instructions](#)

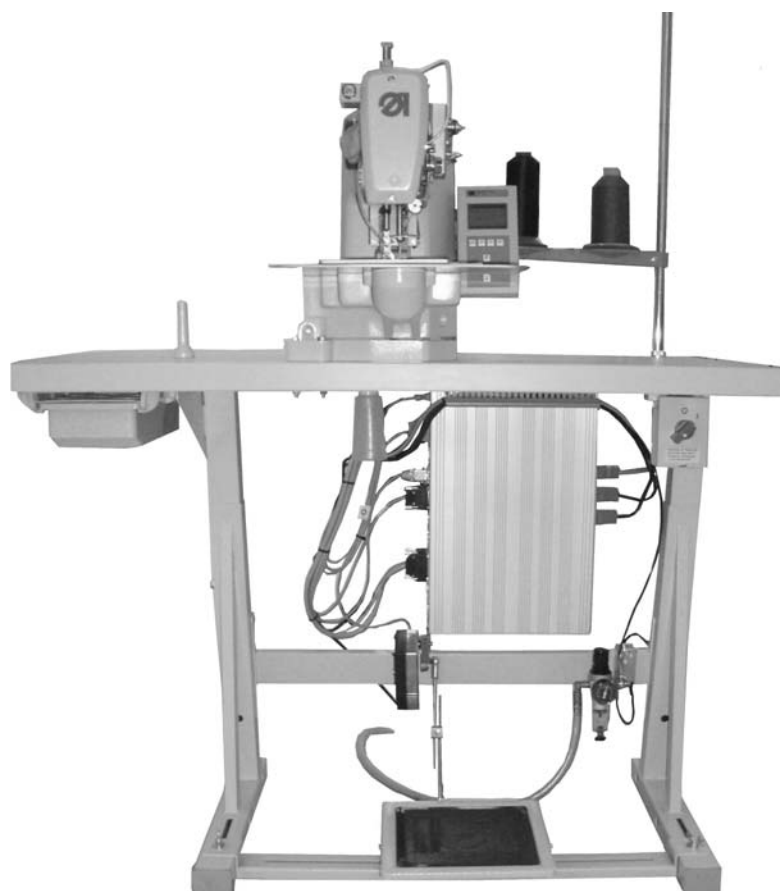
Aufstellanleitung / Installation Instructions

Serviceanleitung / Service Instructions

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Foreword

This instruction manual is intended to help the user to become familiar with the machine and take advantage of its application possibilities in accordance with the recommendations.

The instruction manual contains important information on how to operate the machine securely, properly and economically. Observation of the instructions eliminates danger, reduces costs for repair and down-times, and increases the reliability and life of the machine.

The instruction manual is intended to complement existing national accident prevention and environment protection regulations.

The instruction manual must always be available at the machine/sewing unit.

The instruction manual must be read and applied by any person that is authorized to work on the machine/sewing unit. This means:

- Operation, including equipping, troubleshooting during the work cycle, removing of fabric waste,
- Service (maintenance, inspection, repair) and/or
- Transport.

The user also has to assure that only authorized personnel work on the machine.

The user is obliged to check the machine at least once per shift for apparent damages and to immediately report any changes (including the performance in service), which impair the safety.

The user company must ensure that the machine is only operated in perfect working order.

Never remove or disable any safety devices.

If safety devices need to be removed for equipping, repairing or maintaining, the safety devices must be remounted directly after completion of the maintenance and repair work.

Unauthorized modification of the machine rules out liability of the manufacturer for damage resulting from this.

Observe all safety and danger recommendations on the machine/unit! The yellow-and-black striped surfaces designate permanent danger areas, eg danger of squashing, cutting, shearing or collision.

Besides the recommendations in this instruction manual also observe the general safety and accident prevention regulations!

General safety instructions

The non-observance of the following safety instructions can cause bodily injuries or damages to the machine.

1. The machine must only be commissioned in full knowledge of the instruction book and operated by persons with appropriate training.
2. Before putting into service also read the safety rules and instructions of the motor supplier.
3. The machine must be used only for the purpose intended. Use of the machine without the safety devices is not permitted. Observe all the relevant safety regulations.
4. When gauge parts are exchanged (e.g. needle, presser foot, needle plate, feed dog and bobbin) when threading, when the workplace is left, and during service work, the machine must be disconnected from the mains by switching off the master switch or disconnecting the mains plug.
5. Daily servicing work must be carried out only by appropriately trained persons.
6. Repairs, conversion and special maintenance work must only be carried out by technicians or persons with appropriate training.
7. For service or repair work on pneumatic systems, disconnect the machine from the compressed air supply system (max. 7-10 bar). Before disconnecting, reduce the pressure of the maintenance unit. Exceptions to this are only adjustments and functions checks made by appropriately trained technicians.
8. Work on the electrical equipment must be carried out only by electricians or appropriately trained persons.
9. Work on parts and systems under electric current is not permitted, except as specified in regulations DIN VDE 0105.
10. Conversion or changes to the machine must be authorized by us and made only in adherence to all safety regulations.
11. For repairs, only replacement parts approved by us must be used.
12. Commissioning of the sewing head is prohibited until such time as the entire sewing unit is found to comply with EC directives.
13. The line cord should be equipped with a country-specific mains plug. This work must be carried out by appropriately trained technicians (see paragraph 8).



It is absolutely necessary to respect the safety instructions marked by these signs.

Danger of bodily injuries !

Please note also the general safety instructions.



Preface and general safety hints

Part 1: Operating instructions cl. 910

(Edition 04/2007)

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1. Description of product

The **Dürkopp Adler 910** is a CNC sewing unit for free seam contours. The seam contours can be programmed directly at the control panel without any further devices.

Technical features

- DAC control with control panel.
The following functions are available:
 - 4 free seam contours with a total of 2800 available stitches can be stored.
The coordinates are entered at the control panel.
No further devices are required.
 - 4 sewing sample sequence programs with up to 4 sewing samples per sewing sample sequence program can be created and memorized.
 - The coordinates (teach-in) are entered with a precision of 0.5 or 1 mm respectively.
 - Counter of capacity and daily number of pieces.
 - The speed can be changed from 0 rpm (manual operation with full operability of the x-y drive) up to 2500 rpm in steps of 100 rpm.
- Fabric drive via two step motors.
- Drive of the sewing unit directly at the arm shaft via brushless direct current motor.
- Maximum sewing field size 120 x 60 mm.
- Thread monitor and thread pulling device.
- Oil wick lubrication of arm shaft and driving shaft by means of two oil reservoirs.
- Service and maintenance work is supported by comprehensive test programs.

2. Use in accordance with the requirements

Class **910** is a sewing unit determined for processing light to medium-weight material, i.e. fabrics made of textile fibres or leather. Such sewing materials are used in the clothing industry and for the production of home and car upholstery.

Furthermore, this sewing unit can also sew so-called technical seams. However, in this case the user has to estimate the possible risks (preferably in cooperation with **DÜRKOPP ADLER AG**) because on the one hand such fields of application are comparatively rare and on the other hand there is an immense variety of possibilities. According to the result of this estimation suitable safety measures may have to be taken.

Generally only dry fabrics must be processed on this sewing unit. The material must not be thicker than 10 mm when compressed by the lowered fabric clamp. It must not include any hard objects.

In general the seam is produced with sewing threads made of textile fibres (cotton threads, synthetic threads or core threads) with the following dimensions:

Class 910 threads of the dimension 15/3 - 120/3

If other threads are to be used, it is indispensable also in this case to consider the possible risks and to take corresponding safety measures, if necessary.

This sewing unit must only be installed and operated in dry and well-kept rooms. In case it is operated in other rooms which are not dry and well-kept further measures can become necessary which have to be agreed upon (see EN 60204-31: 1999).

We as manufacturers of industrial sewing machines take it for granted that at least semi-skilled operators are working with our products so that we can assume that all usual operations and their risks are known to them.

3. Subclass

Cl. 910

Single needle lockstitch sewing unit with thread trimmer and thread pulling device.
Equipped with two sewing feet for general seam contours.

4. Optional equipment

The following optional equipment is available for the sewing unit 910:

Order number	Optional equipment
0910 590044	Laser marking (pc.)
9822 510026	Sewing lamp
9822 510027	Table clamp
	Needle cooling

Please contact our application centre (APC) for further optional equipment.

5. Stands

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The following stand is available for the sewing unit 910:

MG55 400294	Stand package
	Table top size 600 x 1060 mm
	Stand height 1160 to 1305 mm

6. Technical data

Stitch type:	301
Hook type:	oscillating large capacity hook
Needle system:	DPx17 (135x17)
Needle size:	90 - 140 [Nm]
Standard needle size:	120 [Nm]
Thread size:	20/3 - 120/3
Stitch length:	dependent on seam pattern up to 12.7 mm
Max. speed	2500 [min ⁻¹]
Max. clamping stroke:	18 [mm]
Sewing field size	
max. in X-direction:	120 [mm]
max. in Y-direction:	60 [mm]
Number of sewing sample sequence programs (sequences)	4
Number of sewing samples per sewing sample sequence program	4
Sewing drive:	DC motor
Rated voltage:	1 ~ 230V/ 50/60 Hz
Rated load:	0.45 kw

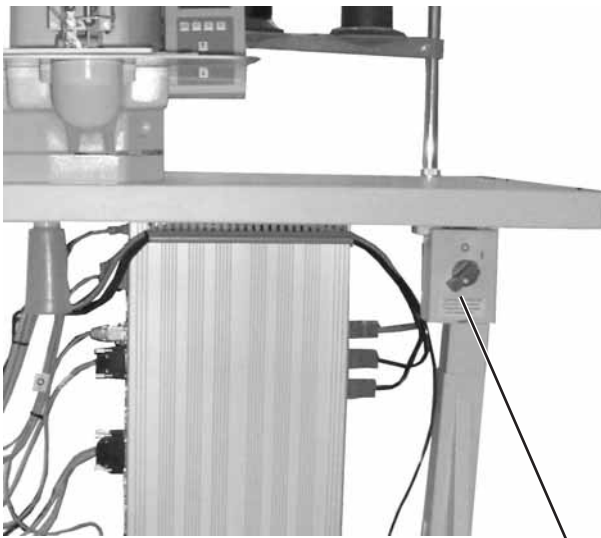
Noise: **Lc = dB (A)**

Emission value per work place according to DIN 45635-48-A-1-KL-2

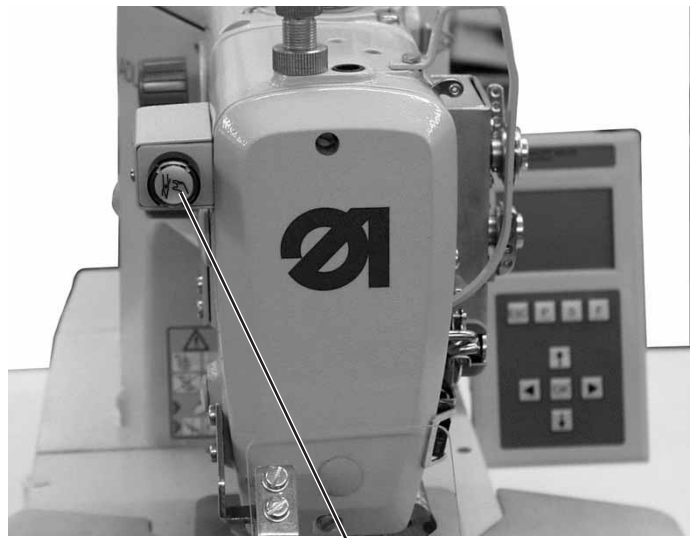
Sewing length:	___ mm
Stitches:	___
Speed:	_____ min ⁻¹
Fabric:	G1 DIN 23328 2 plies
Sewing cycle:	1.3 sec. On and 1.0 sec. Off

7. Operating

7.1 Switching on - Switching off - Safe stop



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7.1.1 Switching on

- Switch on the main switch 1.
- Step the pedal back to reach the initial position of the sewing unit. The main menu appears in the display.

7.1.2 Switching off

- Switch off the main switch 1.
All drives and the control are immediately separated from the mains.

7.1.3 Safe stop

The sewing unit has to be switched off or switched to “safe stop” before carrying out any work on it.

Switching on “safe stop”

- Press key 2.
The key must snap in!
The sewing unit is in “safe stop” condition.
The lamp in the key is shining.

Switching off “safe stop”

- Press key 2 again.
The key must be released.
- Step the pedal back to reach the initial position of the sewing unit.

7.2 Threading in the needle thread

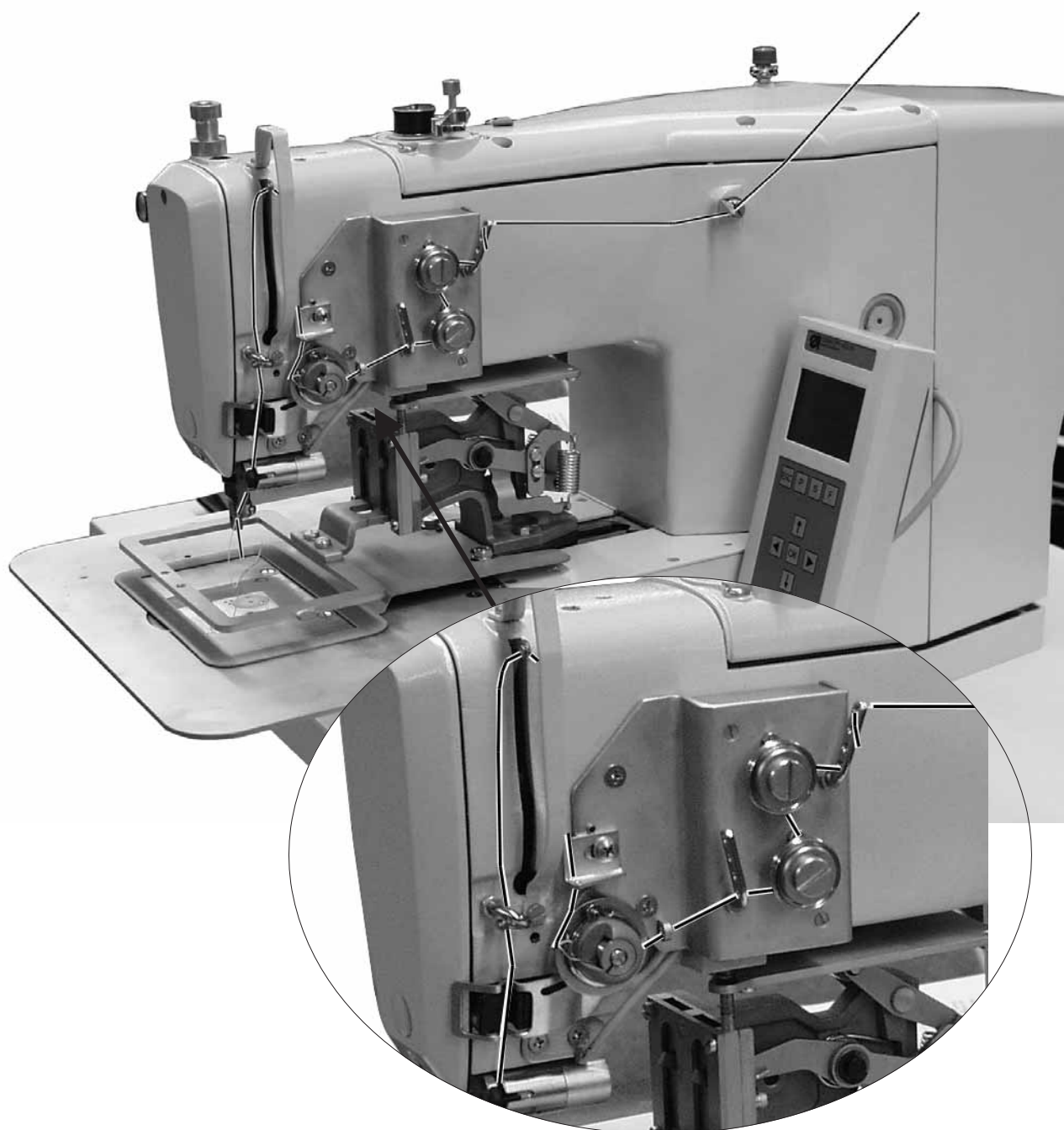


Caution: Risk of injury!

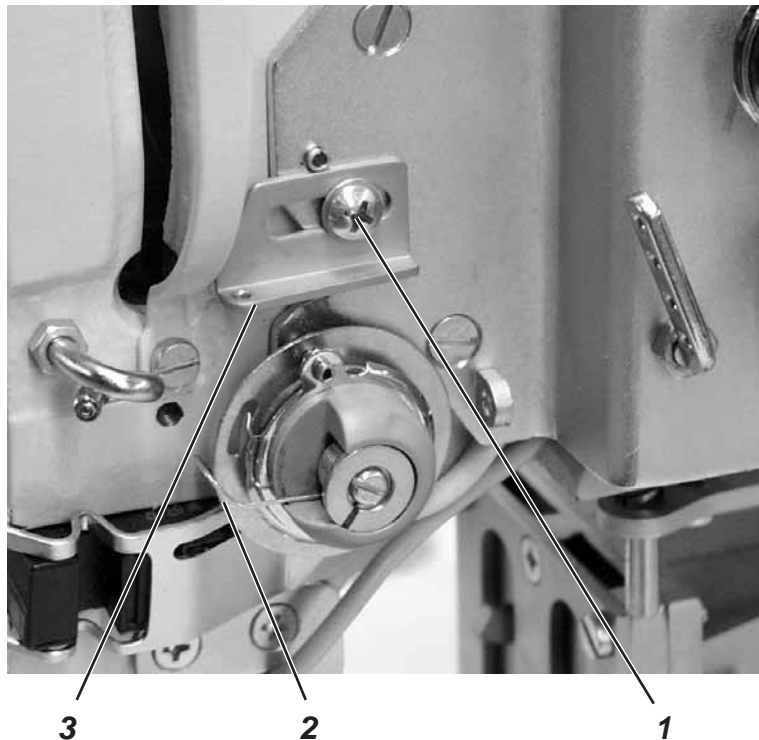
Switch the main switch off!

Thread in the needle thread only with the sewing unit switched off.

- Stick the thread reels on the thread reel holder and guide the needle thread and the bobbin thread through the unwinding arm. The unwinding arm must be positioned vertically above the thread reels.
- Thread in the needle thread as shown in the illustration below.



7.3 Adjusting the thread regulator



1



Caution: Risk of injury !

Switch the main switch off.

Adjust the thread regulator only with the sewing unit switched off.

With the thread regulator 3 the needle thread quantity required for the stitch formation is regulated.
Only a precisely adjusted thread regulator guarantees an optimum sewing result.

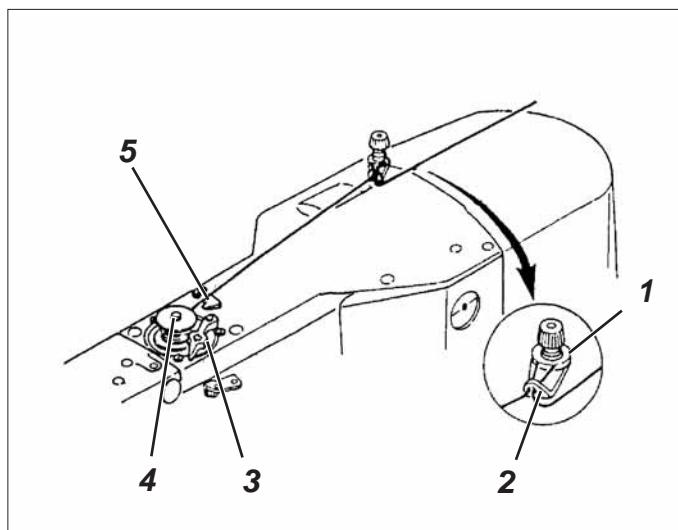
When the thread regulator is adjusted correctly, the needle thread loop must slide over the thickest spot of the hook with low tension.

- Loosen screw 1.
- Change the position of the thread regulator 3.
Thread regulator to the left = larger needle thread quantity
Thread regulator to the right = minor needle thread quantity
- Tighten screw 1.

Adjustment hint:

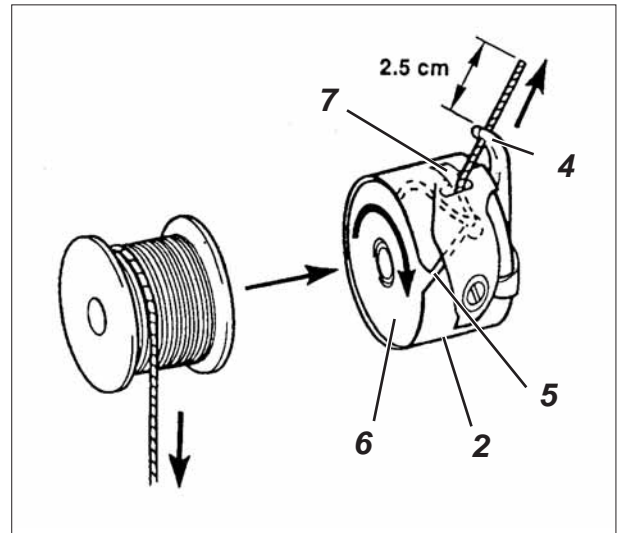
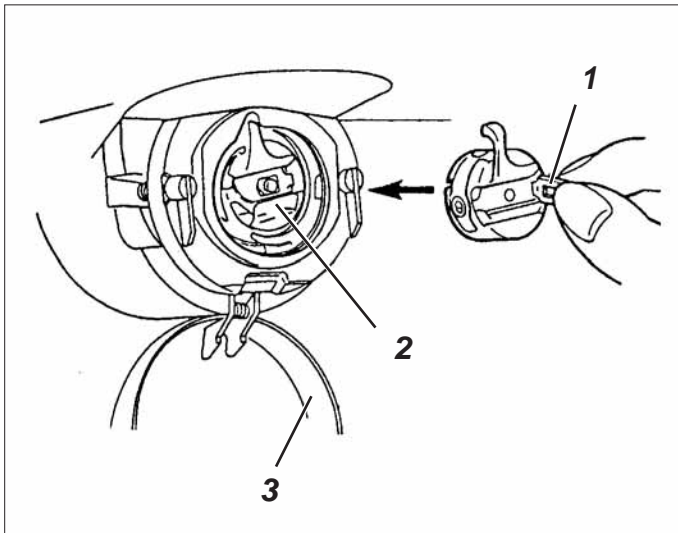
If the largest thread quantity is required, the thread controller spring 2 must be pulled up by approx. 0.5 mm from its lower end position. This is the case when the needle thread loop passes the maximum hook diameter.

7.4 Winding up the bobbin thread



- Put the bobbin on the bobbin winder 4.
- Pull the thread through the guide 2 and around the tension 1.
- Wind the thread counter-clockwise around the core of the bobbin (approx. 5 times).
- Press the winder lever 3 into the bobbin.
- Sewing
The winder lever stops the winding process as soon as the bobbin is full.
- Tear off the thread at the thread clamp 5 after winding up.

7.5 Changing the hook thread bobbin



Caution: Risk of injury !

Switch the main switch off.

Change the hook thread bobbin only with the sewing unit switched off.

1

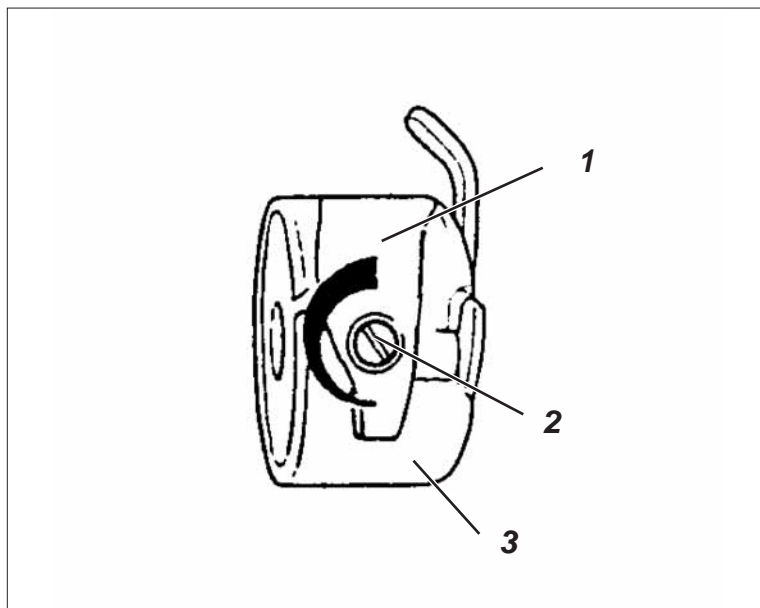
Taking the empty bobbin off

- Pull the hook cover 3 down.
- Lift the bobbin case cover 1.
- Take off the top of bobbin case 2 with bobbin 6.
- Remove the empty bobbin from the top of bobbin case 2.

Inserting the full bobbin

- Place the full bobbin in the top of bobbin case 2.
- Thread the bobbin thread through the slot 5 below the tension spring 7 in the drill-hole 4.
- Pull the bobbin thread out of the bobbin case 2 for a length of approx. 2.5 cm.
When winding off the thread the bobbin must turn in the direction of the arrow.
- Reinsert the bobbin case 2.
- Close the bobbin case cover 3.

7.6 Adjusting the bobbin thread tension



Caution: Risk of injury !

Switch the main switch off.

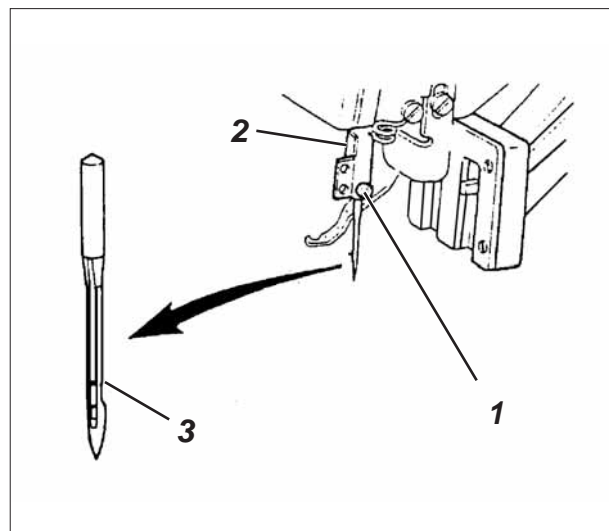
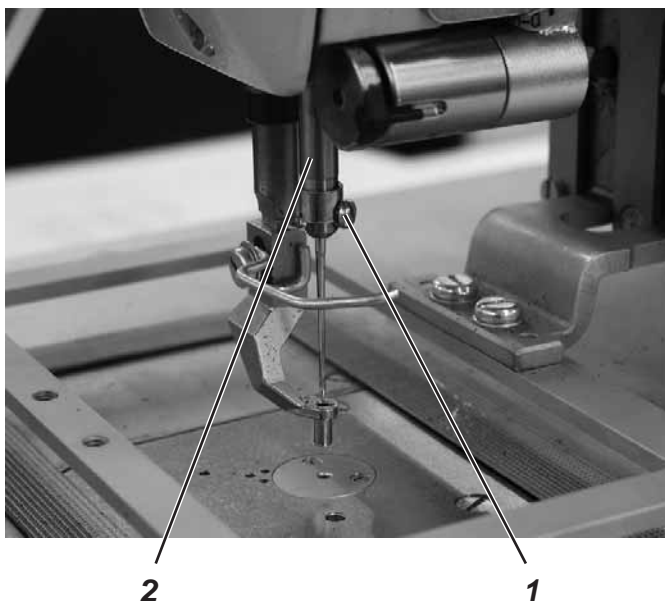
Adjust the bobbin thread tension only with the sewing unit switched off.

The required bobbin thread tension is to be produced by the tension spring 1. The top of bobbin case 3 should drop slowly due to its own weight when being held at the threaded-in bobbin thread.

Adjusting the tension spring

- Take off the top of bobbin case 3 with the bobbin.
- Adjust the tension spring 1 at the regulating screw 2 until the required tension value is reached.
- Reinsert the top of the bobbin case.

7.7 Changing the needle



Caution: Danger of injury !

Switch the main switch off.

Change the needle only with the sewing unit switched off.

- Loosen the screw 1.
- Push the new needle into the drill-hole of needle bar 2 as far as it will go.

ATTENTION !

The hollow groove 3 of the needle must point to the hook.

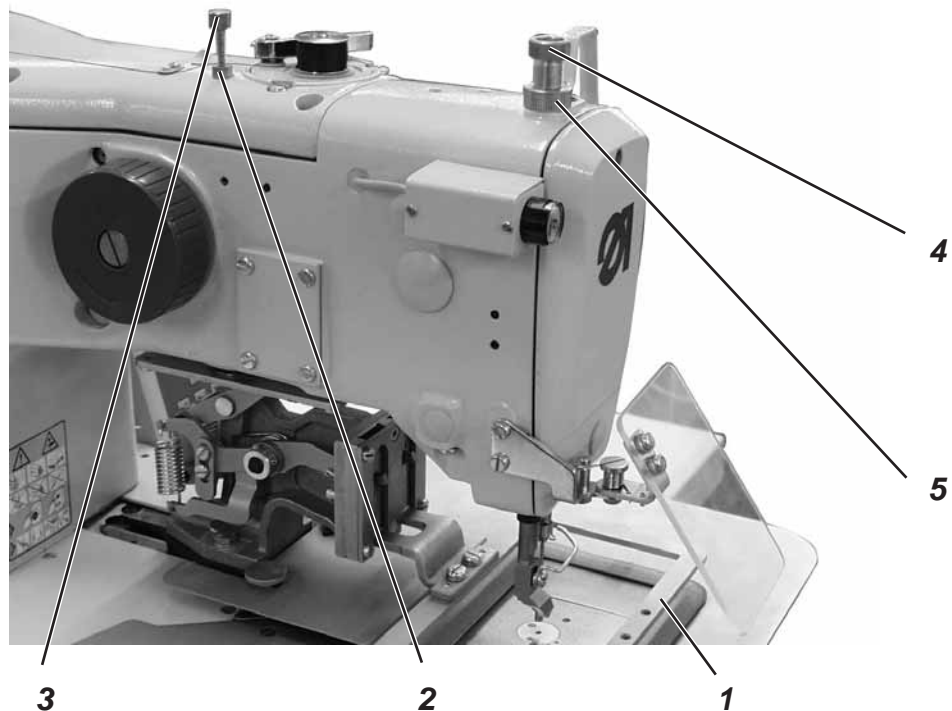
- Tighten the screw 1.



ATTENTION !

After the changeover to another needle size the distance between hook and needle has to be corrected (see service instructions).

7.8 Adjusting the lifting movement of the clamping plate



The height of the opened clamping plate 1 can be adjusted via the knurled-head screw 3.

- Loosen the counter nut 2.
- Turn the knurled-head screw 3.
turn to the right = clamping plate 1 opens a little
turn to the left = clamping plate 1 opens wider.
- Tighten the counter nut 2.

7.9 Sewing foot pressure

The desired sewing foot pressure is adjusted by means of the knurled-head screw 4.

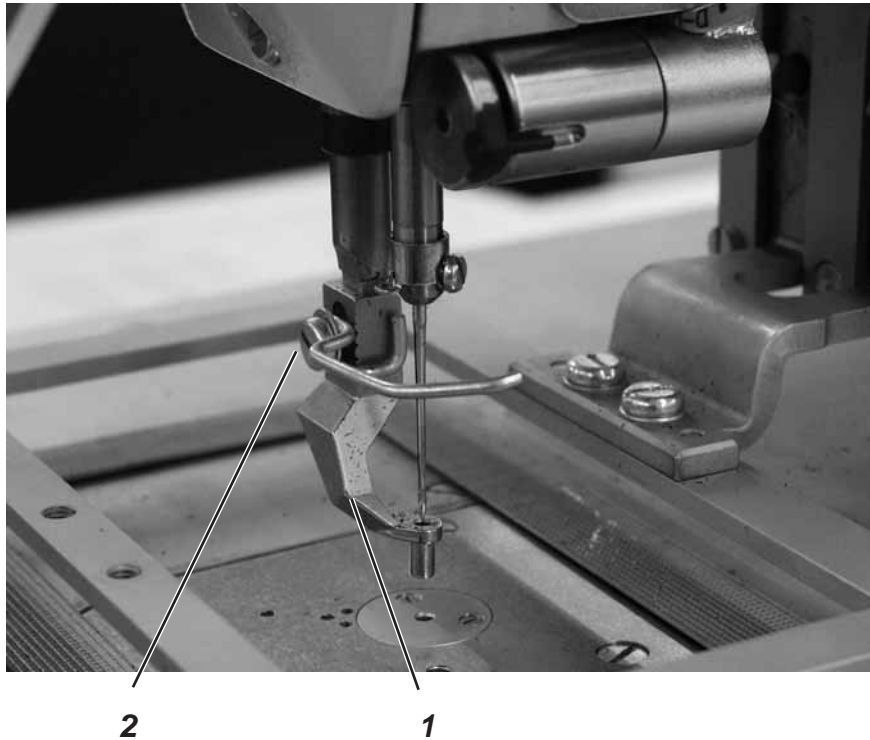


ATTENTION !

The material must not be lifted by the needle movement.
The pressure should not be set too high.

- Loosen the counter nut 5.
- Higher sewing foot pressure = turn the knurled-head screw 4 in clockwise direction.
- Lower sewing foot pressure = turn the knurled-head screw 4 counter-clockwise.
- Tighten the counter nut 5.

7.10 Sewing foot height



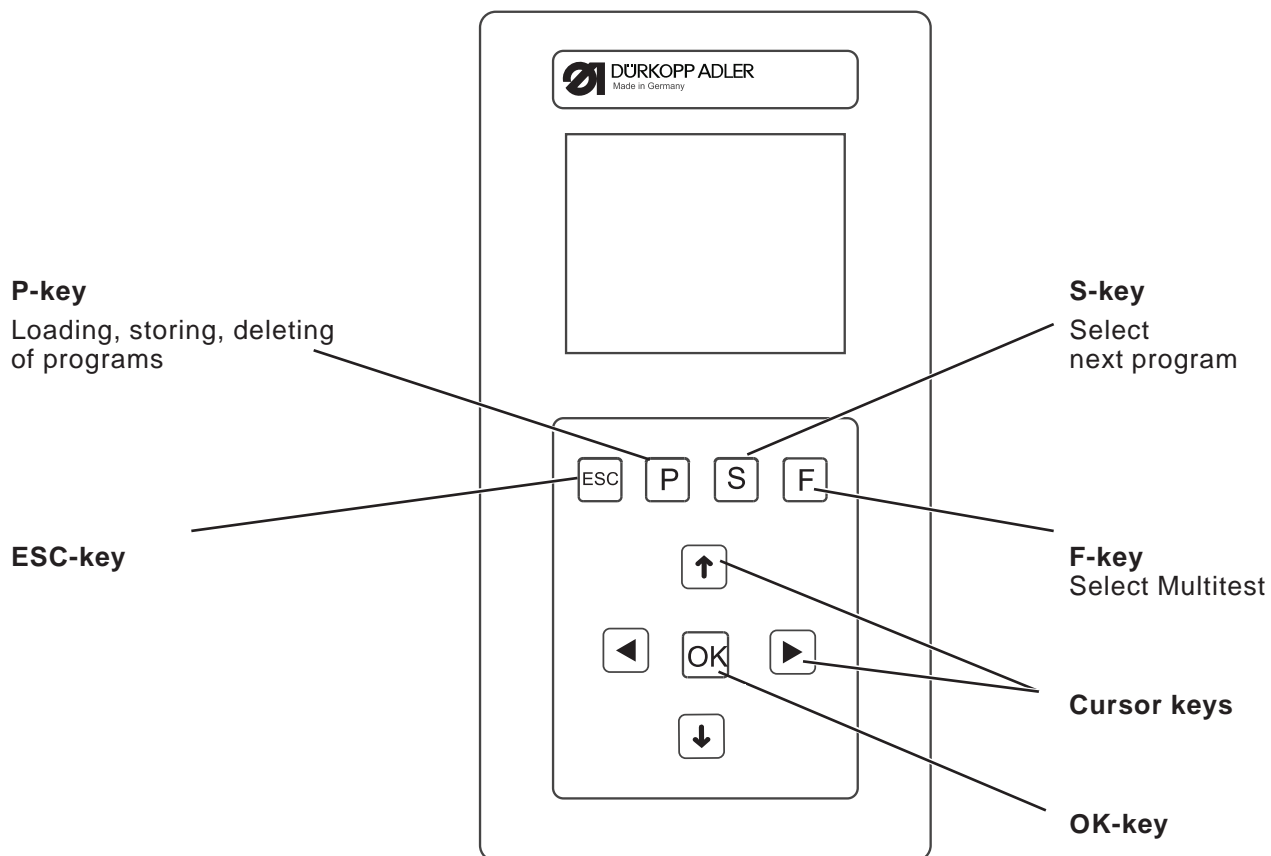
The sewing foot height is set by shifting the sewing foot 1.

- Remove needle and thread.
- Feed the material.
- Switch the thread monitor on.
- Start the sewing process and wait until the sewing unit stops automatically.
- Press “safe stop”.
- Turn the handwheel until the sewing foot 1 is at its bottom position.
- Loosen screw 2.
- Set the height of sewing foot 1.
- Retighten screw 2.
- Release “safe stop”.










8. Operating the control of cl. 910

8.1 The operator terminal

For the input and output of data an operator terminal with an LCD display and function keys is used.

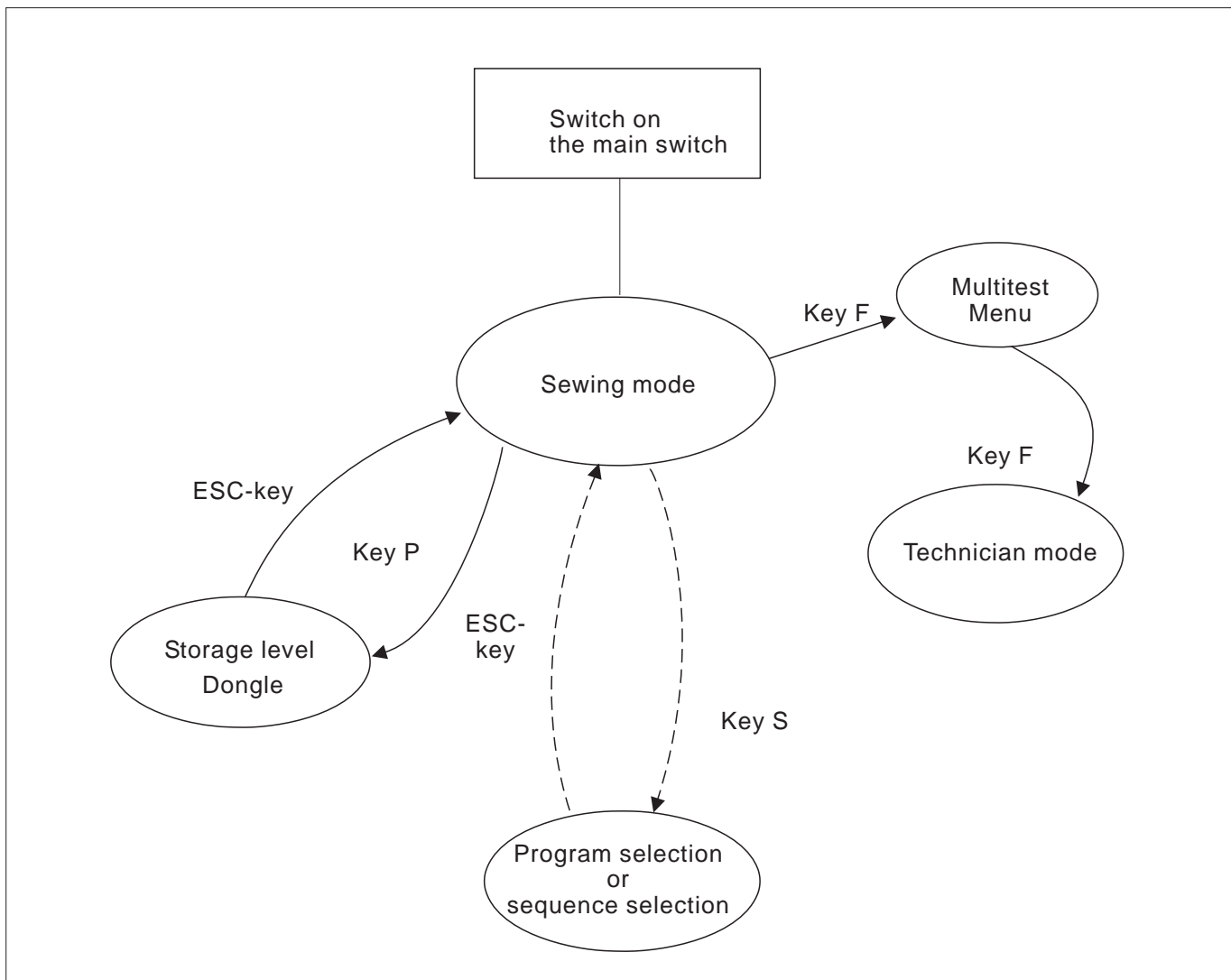


8.1.1 The keys

Function key	Function
Cursor keys  	<p>In the sewing mode or sequence mode: Shift the cursor to the left or to the right.</p> <p>In the sewing mode in case of sequence operation: Change to the next or to the preceding sewing sample.</p>
 	<p>If not input field is activated: Change between the lines of the menus. The selected line is displayed inversely.</p> <p>If an input field is activated: Increase or reduce the value of the respective point by one or change between the parameters in case of functions with several choices.</p>
OK-key 	<p>If no input field is activated: Activate the input field. The value can be altered with the keys “↑ ” and “↓ ”.</p> <p>If an input field is activated: The set value is taken over.</p>
ESC-key 	<p>If test functions are activated: You return to the selection menu.</p> <p>If an input field is activated: An input is aborted. The preceding value is maintained.</p> <p>In the technician and programming level: The control changes over to the preceding level.</p>
P-key 	<p>Loading, saving and deleting of programs.</p>
S-key 	<p>Select the next program.</p> <p>In the sequence mode: Change sequences.</p>
F-key 	<p>Call up Multitest and switch over to the technician level.</p>

8.2 User interface

8.2.1 Structure of menu



Calling up the service menu


- Switch the main switch on.
The control is initialized.
- Step the pedal back to reach the initial position of the sewing unit.
- Press the function key “F”.
The display changes over to the Multitest menu.

Calling up the technician mode

- Switch the main switch on.
The control is initialized.
- Step the pedal back to reach the initial position of the sewing unit.
- Press key “F” .
The display changes over to the Multitest menu.
- Press key “F” .
- Enter **Code 1** (see chapter 9).
- Press the “OK” key.
The display changes over to the technician mode.

8.3 Altering numerical values, parameter values, selection of alternatives

8.3.1 Altering numerical values

 max.	P: Riegel	
	UPM:	1500
	Sequenzen	
	Zähler	62
	Service-Menue	
	FS-Abgl.	25
	Vorspg.	5

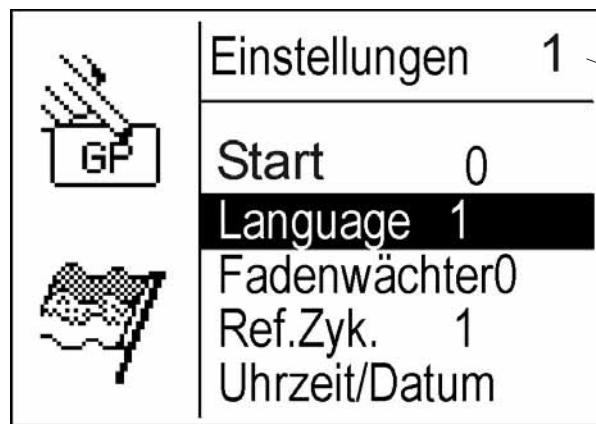
- Select the desired line with the keys “↑” or “↓”.
 - Press the “OK” key.
The selected numerical value is marked by a flashing cursor.
 - Change between the points with the keys “←” or “→”.
Increase or reduce the value of the selected point by one with the keys “↑” or “↓”.
 - Press the “OK” key.
The currently set value is taken over.
- or
- Press the “ESC” key.
The original value is maintained.

Note

All values can only be altered within the minimum and maximum values.

8.3.2 Selection of a parameter

Some parameters offer a selection of non-modifiable adjustments.



The figure "1" after the setting means that more than one page is available!

- Select the desired line with the parameter to be altered with the keys "↑" or "↓".
 - Press the "OK" key.
 - Change between the given possibilities with the keys "↑" or "↓".
Example:
Language
 - Press the "OK" key.
The currently set parameter is taken over.
- Or
- Press the "ESC" key.
The original parameter is maintained.

8.4 Main menu

Prog.	P: Riegel	
	UPM:	1500
	Sequenzen	
	Zähler	62
	Service-Menue	
	FS-Abgl.	25
	Vorspg.	5

- Switch the main switch on.
The control is initialized.
The main menu appears.
- Select the desired parameter with the keys “↑” or “↓”.
The symbol of the selected parameter is displayed inversely.
- Alter the selected parameter as described in chapter 8.3.

1

Prog.

Program name

Call the program list (max. 99 programs) using the “S” key and select one program using the cursor keys (see 8.3.1).

After confirming by pressing the “OK” key, the selected sewing program will be displayed.



Speed (RPM)

Via this parameter the desired speed is set.

Input: 0 to 2500 R/min

Note

The speed is defined in the seam programs. Via this menu item the speed in the program can **only** be reduced. A higher speed is indicated, but not executed.



Sequences

Selection of the sewing sample sequence (see submenu “Sequences”, page 25).

Input: 1 (2 .. 8, if available)



Counter

Switches over to the submenu “Counter” (see submenu “Counter”, page 26).



Service menu

Switches over to the service menu (see “Service menu”, page 28).



Adjustment of thread tension

Via this menu item the thread tension is adapted.

Input: 0 .. 250

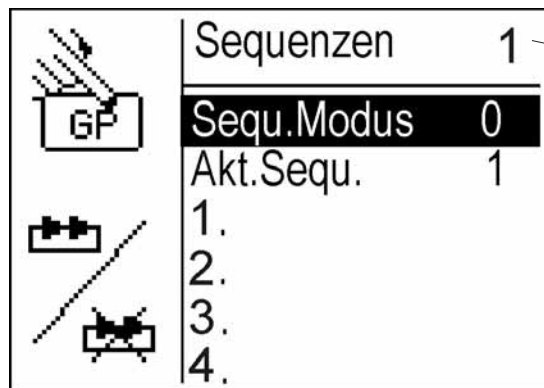


Pretension

Via this menu item the pretension is set.

Input: 0 .. 100

8.5.1 Submenu Sequences



The figure "1" after the sequence means that more than one page is available!



Sequence mode

Via this menu item the sequence mode is switched on or off.

Input: 0 = OFF
1 = ON

Condition: At least one program must be available in 1./2./3... 8.

Current sequence

Here the currently set sequence is displayed.
A maximum of 8 sequences can be assigned.

1./ 2./ 3.... 8.

Under these sequences existing programs from the control can be memorized.

Procedure:

Use the cursor key to move to the next free storage location.

Press the "OK" key (display of all sewing programs in alphabetical order).

Select the sewing program using the cursor key and confirm your choice by pressing the "OK" key.


Note:

Up to 8 sewing programs can be assigned to each of the 8 possible sequences.

When the sequence mode is active, the first line in the main menu will change.

If the "S" key is pressed, the cursor will flash and the desired sequence (1....8) can be selected by pressing the keys "↑" or "↓".

In the selected sequence (e.g. 1), the next sewing program can be selected using the keys "←" or "→".

 1- 8	S1/1:Riegel	
	UPM:	1500
	Sequenzen	
	Zähler	62
	Service-Menue	
	FS-Abgl.	25
	Vorspg.	5

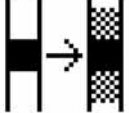
Change/Delete sequence

Select the storage location using the cursor key and confirm your choice by pressing the "OK" key.

The following possibilities are available:

- Replacing a program
Press the "OK" key and select a new program from the memory.
- Deleting a program
Press the "ESC" key (you will then exit the menu and all available programs will move up).

8.5.2 Submenu Counter

	Zähler-Menue	
	Spule gewech.	
	Sp.max.	0
	Sp.akt.	7730
	Teile löschen	
	Teile	62

The number of stitches which can be sewn with the thread quantity of a full bobbin mainly depends on the following factors:

- Stitch length
- Thread size
- Fabric thickness
- Thread tension when winding up

The control monitors the sewn stitches and the approximate thread quantity used.

When the bobbin thread quantity is nearly used up, the following message appears:

Hinweis:	
Die Spule wird leer	
Bitte die Spule	
austauschen !	
Sp.akt.	147
Sp.max.	20
Weiter mit ESC	



Bobbin changed

This menu item resets the counter to "0".



Bobbin max.

Initial value of the bobbin capacity counter

Input: 0 ... 99990

If the value is set to "0", the stitch counter is switched off.

Determining the bobbin capacity

- Set **Bobbin max.** to "0".
- Confirm "bobbin changed".
Current bobbin is set to "0".
- Press the "**ESC**" key.
- Insert full bobbin.
- Sew until the bobbin is empty.
- Call up the "counter menu".
- Read off **Current bobbin**.
- Enter a value less a reserve in the field **Bobbin max..**
Example: - 50 stitches per seam pattern.

Note

Confirm "bobbin changed" after every bobbin change.

1

Current bobbin

Current bobbin capacity.



Deleting parts

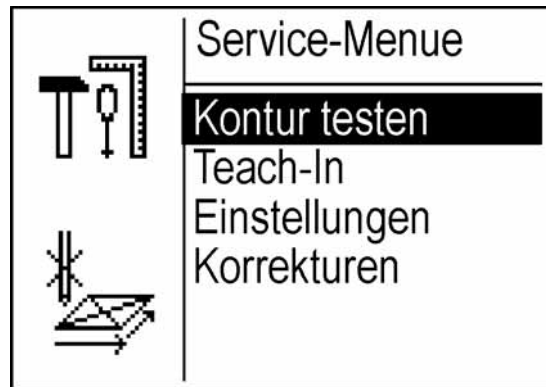
Reset the parts counter

- Press the "**OK**" key.
The parts counter is reset to "0".

Parts

Display of the sewn parts.

8.5.3 Submenu Service menu



Checking the contour

Via this menu item a programmed contour can be checked.

- Actuate the pedal.
The sewing unit runs along the contour.



Teach-In

Via this menu item a new seam contour can be created.
(see Teach-In, page 29)



Settings

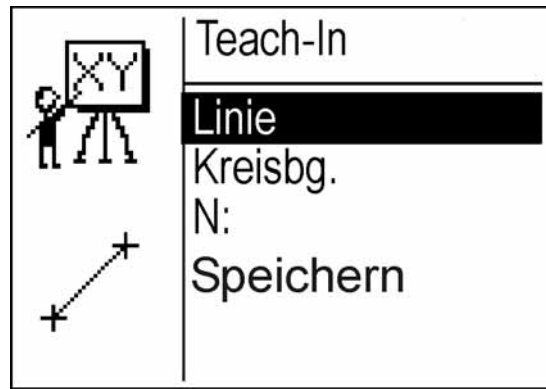
Via this menu item the clamping mode, the language, the thread monitor, the reference cycle as well as date and time can be set.



Corrections

Via this menu item a seam program can be shifted or scaled.

Submenu Teach-In



With the sewing unit 910 up to 4 freely defined seam contours can be created and saved in the control. The coordinates are entered at the control panel.



Line

Via this menu item a line can be defined.



Circular arc

Via this menu item a circular arc can be defined.



N: (Name)

Via this menu item a program name can be entered.



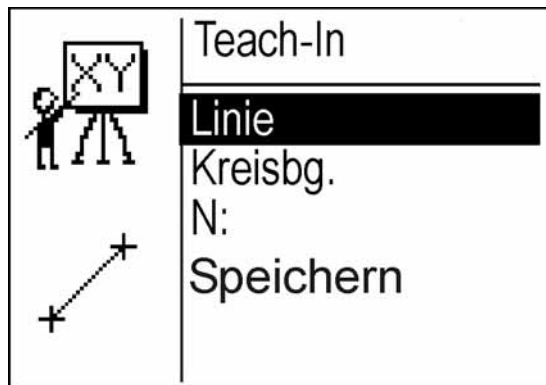
Save

Via this menu item the created seam contour is saved.

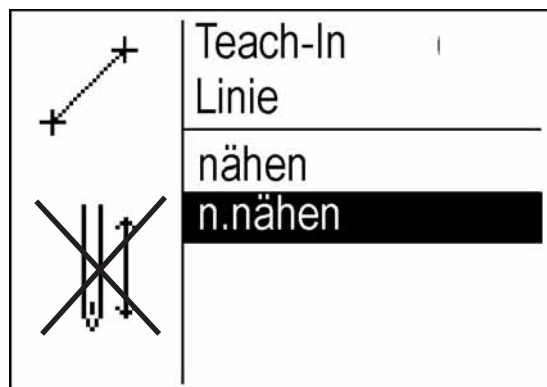
Entering the contour

1) Entering lines (not sewing)

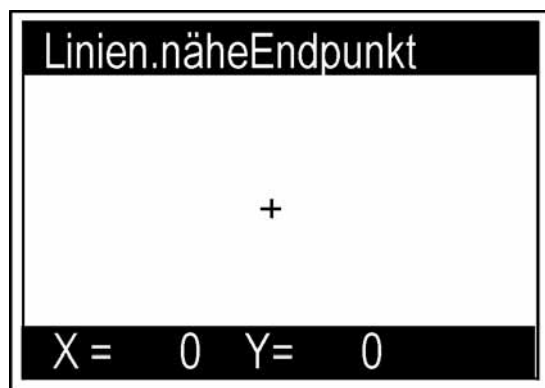
(Example: program location 4)



- Select the menu item "Line" with the keys "↑" or "↓".
- Press the "OK" key.
The following screen appears.



- Select the option "**not sewing**" with the key "↓".
The seam course to be entered is not sewn.
- Press the "OK" key.
The following screen appears.



With the keys "←", "→", "↑" and "↓" the individual sections of the seam contour are fixed in steps of 0.5 mm.

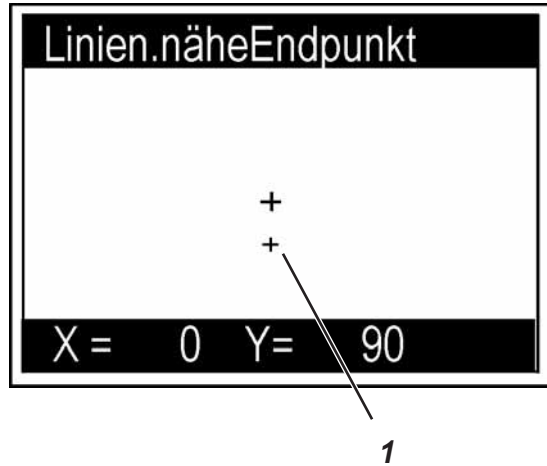
By stepping the pedal forward and with the keys "←", "→", "↑" and "↓" the individual seam sections can be fixed in steps of 1.0 mm.

- Move to the first coordinate point 1 with the keys “←”, “→”, “↑”, “↓” or by stepping the pedal forward and with the keys “←”, “→”, “↑” and “↓”.

Note

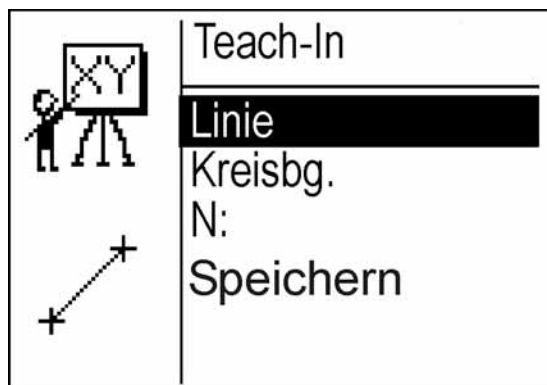
Short pressing of the key = execute one step

Continuous pressing of the key = execute several steps

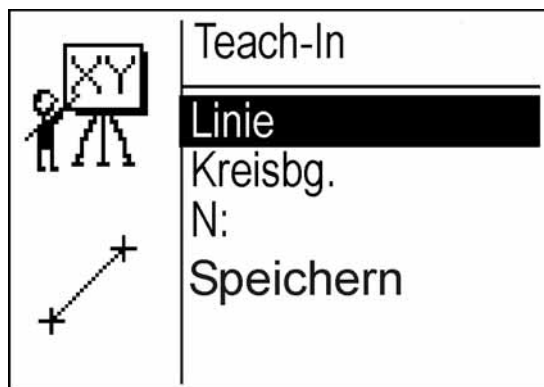


1

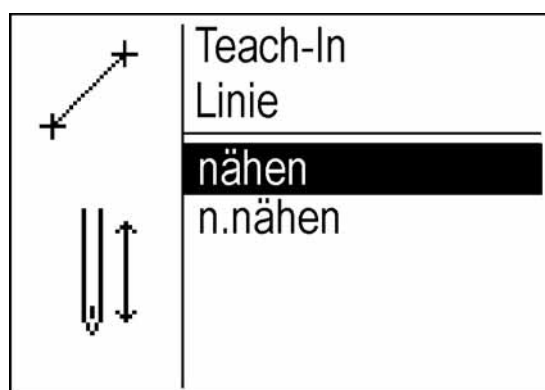
- Press the “OK” key.
The coordinate point is taken over.
The following screen appears:



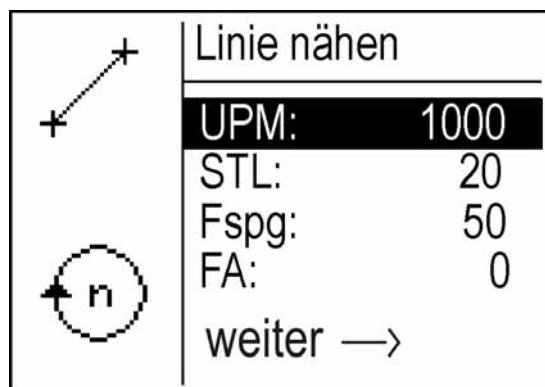
2) Entering lines (sewing)



- Select the menu item “Line” with the keys “↑” or “↓”.
- Press the “OK” key.
The following screen appears.



- Select the option “**sewing**” with the key “↑”.
- Press the “OK” key.
The following screen appears.



- Enter the values for the seam course to be sewn.

RPM: (Speed)

Input of the sewing speed.

Input: 0 ... 2500

STL: (Stitch length)

Stitch length within the seam course.

Input: 0 ... 127

Example: 20 = 2.0 mm

Fspg. (Thread tension)

Input: 0 ... 100 (standard = 50)

Total tension = approx. 1000g

Setting 50 = approx. 500g

FA: (Thread trimming)

Cut the thread after the end of the seam course or not.

Input: 0 = no cutting

1 = cutting

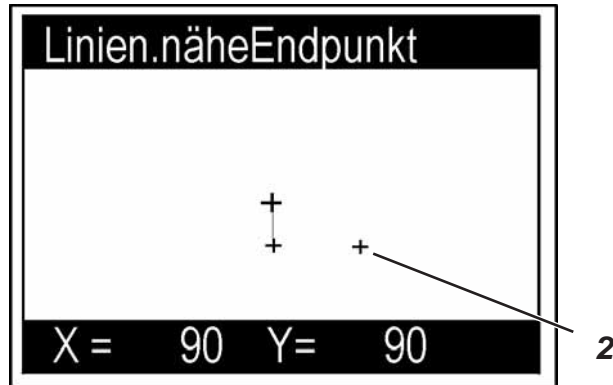
2 = Thread burning

- Switch to the display of coordinates with the key “⇐”.

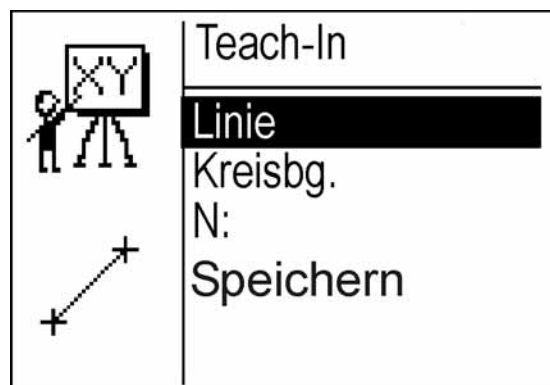
With the keys “⇐”, “⇒”, “↑” and “↓” the individual sections of the seam contour are fixed in steps of 0.5 mm.

By stepping the pedal forward and with the keys “⇐”, “⇒”, “↑” and “↓” the individual seam sections can be fixed in steps of 1.0 mm.

- Move to the second coordinate point 2 with the keys “⇐”, “⇒”, “↑”, “↓” or by stepping the pedal forward and with the keys “⇐”, “⇒”, “↑” and “↓”.



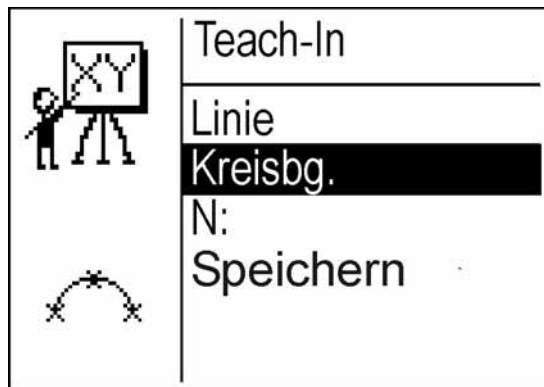
- Press the “OK” key.
The coordinate point is taken over.
The following screen appears again:



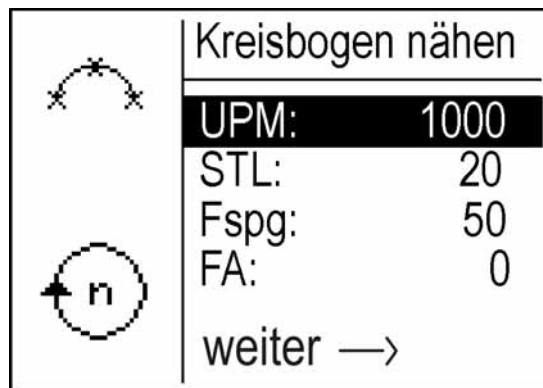
3) Entering the circular arc (sewing)

The circular arc is created with three stitches.

(Note: A circular arc is generally executed by sewing).



- Select the menu item “Circular arc” with the keys “↑” or “↓”.
- Press the “OK” key.
The following screen appears.



- Enter the values for the seam course to be sewn.

RPM: (Speed)

Input of the sewing speed.

Input: 0 ... 2500

STL: (Stitch length)

Stitch length within the seam course.

Input: 0 ...

Fspg. (Thread tension)

Input: 0 ... 100 (standard = 50)

FA: (Thread trimming)

Cut the thread after the end of the seam course or not.

Input: 0 = no cutting
1 = cutting

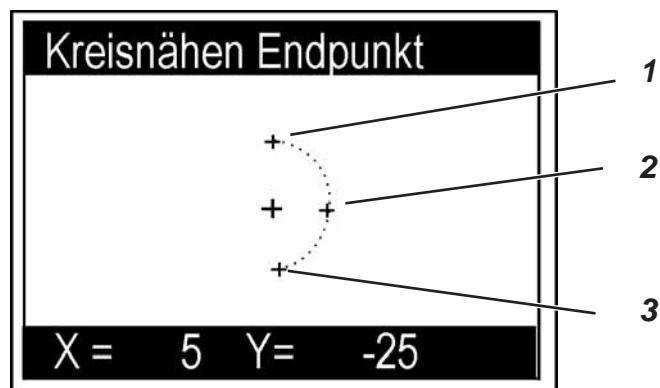
- Switch to the display of coordinates with the key “⇐”.

With the keys “⇐”, “⇒”, “↑” and “↓” the circular arcs of the seam contour are fixed in steps of 0.5 mm.

By stepping the pedal forward and with the keys “⇐”, “⇒”, “↑” and “↓” the individual seam sections can be fixed in steps of 1.0 mm.

- Move to the first coordinate point 1 with the keys “⇐”, “⇒”, “↑”, “↓” or by stepping the pedal forward and with the keys “⇐”, “⇒”, “↑” and “↓” and determine this as non-sewing line.

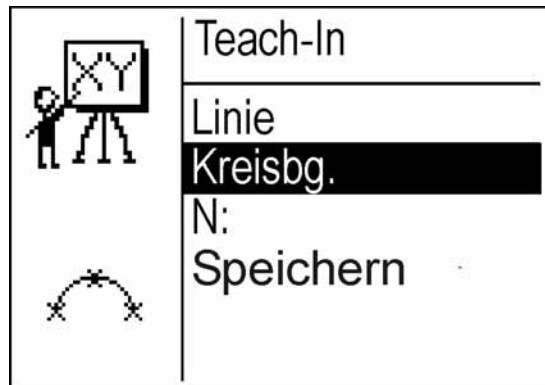
1

**Note**


Point 1 is the last point of the prior seam course.

- Press the “OK” key.
- Move to the second coordinate point 2 with the keys “⇐”, “⇒”, “↑”, “↓” or by stepping the pedal forward and with the keys “⇐”, “⇒”, “↑” and “↓”.
- Press the “OK” key.

- Move to the third coordinate point 3 with the keys “←”, “→”, “↑”, “↓” or by stepping the pedal forward and with the keys “←”, “→”, “↑” and “↓”.
- Press the “OK” key.
The coordinate point is taken over.
The following screen appears:

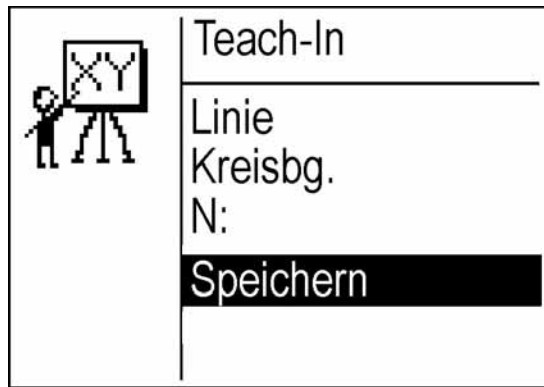


4) Entering N: (Name)

	Teach-In
	Linie
	Kreisbg.
	N: <input type="text"/>
	Speichern

- Change between the digits with the keys “←” and “→”.
- Select the letter with the keys “↑” and “↓”.
- Press the “OK” key.
The name is taken over.

5) Saving



- Press the “OK” key.
The following screen appears.



- Press the “OK” key.
The seam contour will be saved under its name and sorted alphabetically.
- Press the “ESC” key.
The seam contour is cancelled.

Submenu Settings



The figure "1" after the setting means that more than one page is available!

Note: The submenu "Settings" has two pages.



Start

0 = One clamp

Sewing process

- Step the pedal = the clamp lowers.
- Step the pedal = start of the sewing process

1 = One clamp (quick start)

Sewing process

- Step the pedal = the clamp lowers, the sewing process starts.

2 = Continuous operation

- Step the pedal continuously = continuous cycle.



Language

Via this menu item the language in the control panel is set.

Input: 0 = English
1 = German



Thread monitor

Via this menu item the thread monitor is switched on or off.

Input: 0 = off
1 = on



Needle cooling

With this menu item the needle cooling is switched on or off.

Input: 0 = off
1 = on



Reference cycle

Via this menu item the reference cycle time of the sewing unit is set.

Input: 1 ... 10



Date/Time

Via this menu item the date and the time are set.



Additional functions

Via this menu item the operational additional functions can be set.

Input: 1 ... 99



Pedal

Input:

0 = Foot switch

1 = Push button

Submenu Corrections

Note

The corresponding seam program has to be selected in the main menu first.

	Korrekturen	
	Versch.X	0
	Versch.Y	0
	Faktor X	100
	Faktor Y	100
	Laser/Ausg.	
	Klammer	0



Shifting X

Via this menu item the seam contour is shifted in the X-direction.

Input: +/- 0 to 5 mm



Shifting Y

Via this menu item the seam contour is shifted in the Y-direction.

Input: +/- 0 to 5 mm



Factor X

Via this menu item the seam contour is enlarged or scaled down in the X-direction.

Input: +/- 0 to 20 %



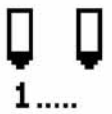
Factor Y

Via this menu item the seam contour is enlarged or scaled down in the Y-direction.

Input: +/- 0 to 20 %

Laser/Outputs

Via this menu item the outputs are switched.
Example for program location 4.

	Laser/Ausg.	
	1.Ausgang	0
	2.Ausgang	0
	3.Ausgang	0
	4.Ausgang	0
	5.Ausgang	0
	6.Ausgang	0
	7.Ausgang	0



First output = laser lamp

Input: 0 = OFF
 1 = ON



Clamp

Via this menu item the operation of the clamp
for the corresponding sewing program can be set.

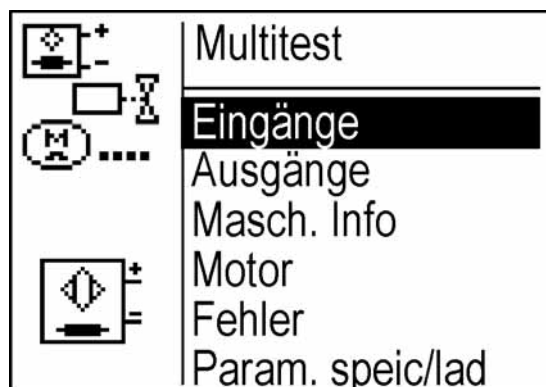
- 0 = **One clamp**

Double clamps (not yet available)

- 1 = lower the right clamp first, then the left one
- 2 = lower the left clamp first, then the right one
- 3 = lower both clamps simultaneously

8.6 Calling up Multitest

- Switch the main switch on.
The control is initialized.
- Step the pedal back to reach the initial position of the sewing unit.
- When the main menu is displayed, press the function key “F”.
The following menu appears.



- Select the desired test function with the keys “↑” and “↓”.
The selected test function is displayed inversely.
- Select the chosen test function with the “OK” key.



Inputs

With this test function the input element to be tested is selected.



ATTENTION !

The input elements have been carefully set in the factory.
Setting and correcting must only be done by trained service staff.



Caution: Risk of injury!

Do not reach into the machine when starting and finishing the input test.

- Start the test function with the “**OK**” key.
- Select the desired input element with the keys “**↑**” or “**↓**”.
The switching status of the input element is indicated.

	Eingänge	
	Eingang	01
	Zustand	1
	Geändert	09
	Zustand	1

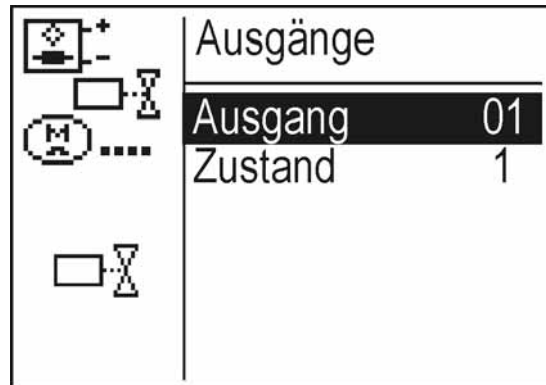
- Press the function key “**ESC**” for quitting the test function.
The menu Multitest is displayed.

Input element	Function
9	Needle thread monitor
25	Reference switch sewing motor
26	Reference switch X-motor
27	Reference switch Y-motor



Outputs

With this test function the function of the output elements is checked.



- Start the test function with the **“OK”** key.
- Select the desired output element with the keys **“↑ ”** or **“↓ ”**.
- Confirm the selected output element with the **“OK”** key.
- Switch the output element with the keys **“←”** or **“→”**.
- Press the function key **“ESC”** for quitting the test function.



Caution: Risk of injury !

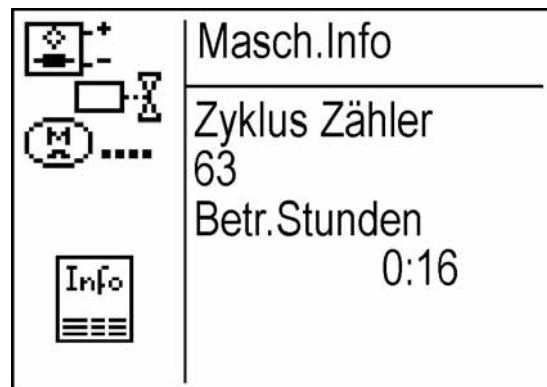
Do not reach into the running machine during the function test of the output elements.

Output element	Function
5	Needle cooling
6	Clamp 2 open/ closed
7	Clamp 1 open/ closed
8	Lift/ lower the foot
9	Lamp “Safe stop”
10 to 16	Laser lamps
17	Lower / Lift the thread burner
18	Retract the upper thread burner
19	Thread wiper
20	Retract the lower thread burner
21	Thread burner heater on



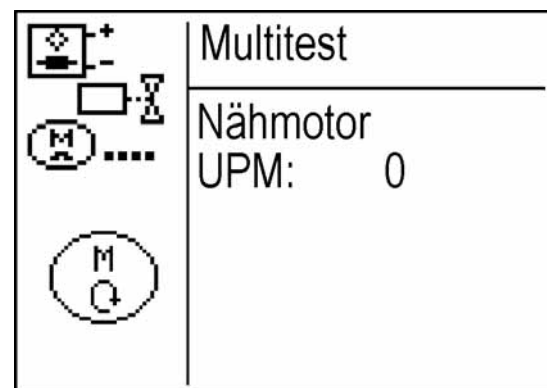
Machine information

This menu item provides information concerning the operating hours and the number of contours sewn.



Motor

Via this menu item the motor is tested.



Entering the test speed

- Select "RPM:" with the keys "↑" or "↓".
- Set the speed with the keys "↑" or "↓".
Input in steps of 100.
"↑" = Increase the speed
"↓" = Reduce the speed

The sewing motor works with the selected speed.

X-motor test

Via this menu item the X-motor is tested.

- Remove needle and sewing foot.

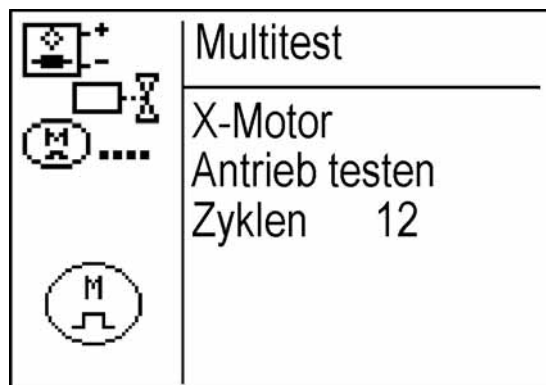


Caution: Risk of injury !

The function test is started with the “OK” key.

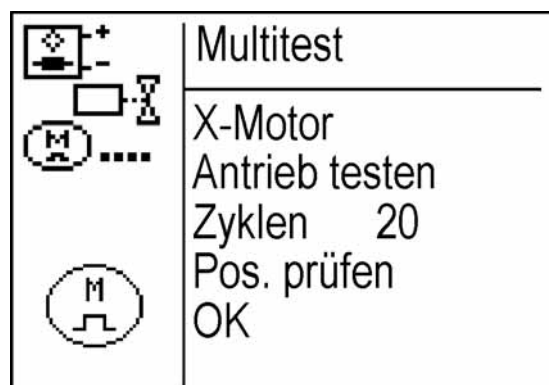
Do not reach into the machine during the function test of the motor.

- Press the “OK” key.
The following screen appears:



The motor check is done automatically.

After the end of the test the following message is displayed:



- Switch the sewing unit off and on again.

Y-motor test

Via this menu item the Y-motor is tested.

- Remove needle and sewing foot.

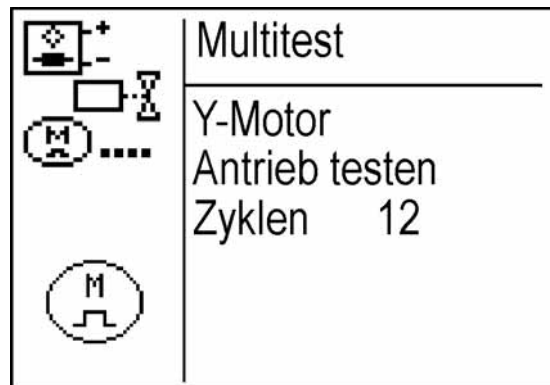


Caution: Risk of injury !

The function test is started with the “OK” key.

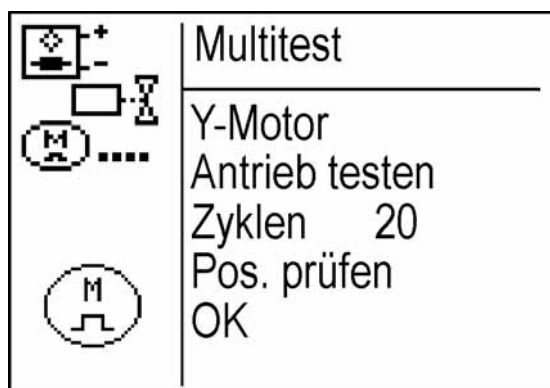
Do not reach into the machine during the function test of the motor.

- Press the “OK” key.
The following screen appears:



The motor check is done automatically.

After the end of the test the following message is displayed:

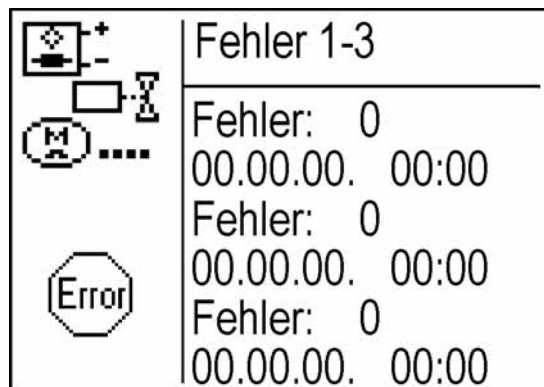


- Switch the sewing unit off and on again.



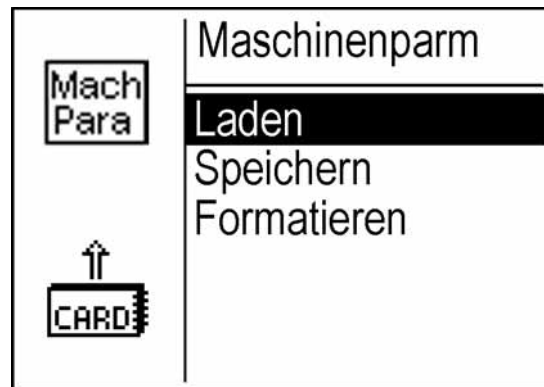
Errors

Via this menu items errors and the down time are indicated.



Saving/ loading parameters

Via this menu item machine parameters are loaded or saved.



Loading

Via this menu item machine parameters can be transferred from the dongle to the machine.



Saving

Via this menu item machine parameters can be saved on a data dongle.



Formatting

For saving of data on a dongle this has to be formatted as data dongle.

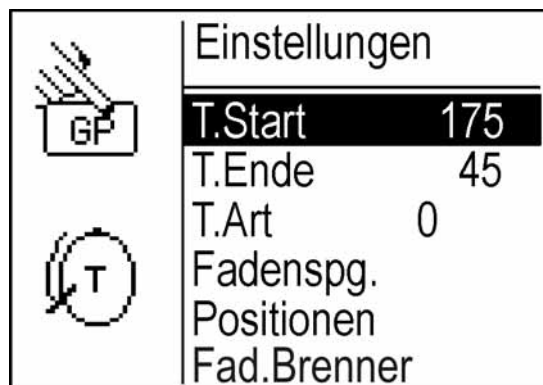
The dongle has to be put on the pin connection with the designation "Dongle" (X110) at the control.

8.7 Technician mode

- Switch the main switch on.
The control is initialized.
- Step the pedal back to reach the initial position of the sewing unit.
- When the main menu is displayed, press the function key “F”.
The Multitest menu appears.
- When the Multitest menu is displayed, press the function key “F”.
The following screen appears:



- Enter the code number “25483” and confirm with “OK”.
After entering the correct code number the display changes over to the menu “Technician mode”.
- Press the “OK” key.
The menu “Technician mode” appears:



- Select the desired submenu with the keys “↑” or “↓”.
- Switch to the selected submenu with the “OK” key.

Note

T.Start and T.Stop are interdependent.

The transport bracket must not be $< 180^\circ$.

**T.Start (Feeding start)**

Position of the needle bar at the feeding start.

Input: 0 ... 359

**T.End (Feeding Stop)**


Position of the needle bar at the feeding stop.

Input: 0 ... 359

**T.Art (Feed type)**

0 = intermittent feed

1 = continuous feed

	Fadenspg.	
	Kali.1	130
	Kali.2	400
	Kali3.	750
	100%-Wert	1000
	FS-Test	0

Via this menu item the thread tensions are calibrated.



Kali.1 (calibration)

Setting of the thread tension with closed thread tension discs.

Factory setting = 120



Kali.2 (calibration)

Setting of the thread tension with closed thread tension discs.

Factory setting = 400



Kali.3 (calibration)

Setting of the thread tension with closed thread tension discs.

Factory setting = 700



100% value

For reducing the thread tension when the value in the main menu is at the lowest end already.

Example:

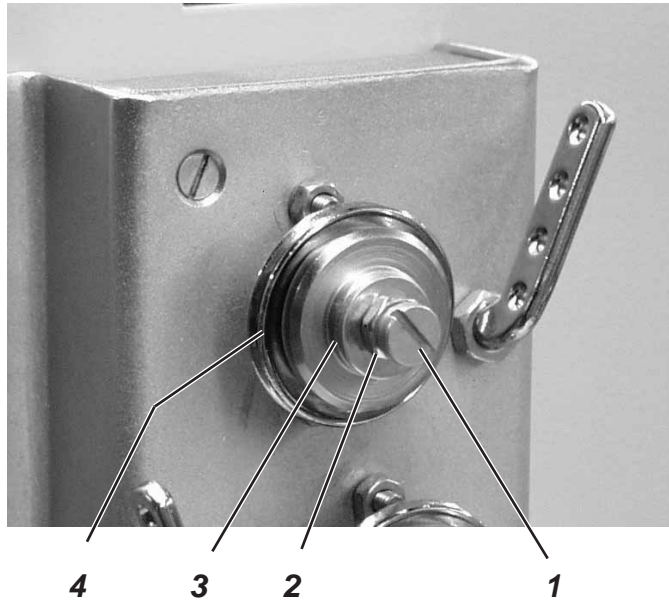
Set the value to 50 % = the thread tension is reduced by half in the whole setting range.



FS test

Thread tension test for measuring the thread tension.

8.7.2 Mechanical adjustment of thread tensions



- Loosen counter nut 2.
- Select "**Kali.3**" in the submenu "Thread tension".
- Turn the disc 3 until the tension discs are positioned one in front of the other.
- Counter the nut 2 slightly.
- Deactivate "**Kali.3**".
- Screw the screw 1 in until the tension discs open.
(When selecting "**Kali.1**" the tension must tighten again).
- Open the thread tension with the "OK" key.
The thread tension must open with slight pressure so that the thickest thread to be processed can be pulled between the tension discs unhindered.
- Close the thread tension again with the "OK" key and check whether the thread tension is completely closed again.



- Thread in sewing threads 40/3 up to the thread lever.
- Select “**Kali.1**” in the submenu “Thread tension”. With the “OK” key the thread tension is closed.
- Measure the tension with a thread scale.
- Enter the value in the control.
- Measure and enter the inputs for calibration 2 and calibration 3 as described.



1



ATTENTION !

The calibration has to be checked in regular intervals!

8.7.4 Submenu Positions

 Pos	Positionen	
	Pos.FK.auf	200
	Pos.FK.zu	340
	Pos.FS.red	120
	FA-Drehzahl	260
	Pos.FK.zu	90

Via this menu item the thread clamp and the trimming speed are set.



Pos.FK auf (Position thread clamp open)

Time when the thread clamp opens.

Input: 0 ... 359



Pos.FK zu (Position thread clamp closed)

Time when the thread clamp closes.

Input: 0 ... 359



Pos.FS red (Position thread tension reduced)

Time when the thread tension is reduced.

Input: 0 ... 359



FA-Drehzahl (Thread cutting speed)

Input of the sewing motor speed when trimming the thread.

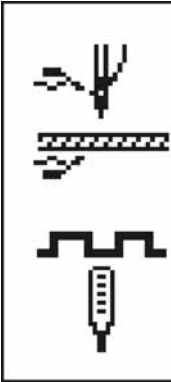
Input: 100 ... 400 [R/min]



Pos.FK zu (Position thread clamp closed)

Time when the thread clamp closes after sewing. (in conjunction with the thread pulling device).

Input: 0 ... 359

	Fad.Brenner	
	Vorwaerm	0
	Vorheiz.	50
	Auf/Ab	200
	Wischer	200
	Br.Oben	200
	Br. Unten	200
	Verweil.	200

Via this menu item the thread burner is set.



Vorwarm. (Pre-warming)

Pre-warm the burner to a certain temperature and thus making possible the reduction of the pre-warming time.
Input: 0 ... 99% of the burning temperature



Vorheiz. (Pre-heating)

Heating the burner to the burning temperature.
Input: 0 ... 99 (= 0 ... 9,9 sec)



Auf/Ab (Pre-heating)

Duration, until the next action of the burner.
Input: 0 ... 999 ms



Wischer

Pull the remaining thread for the burning process.
Input: 0 ... 999 ms



Br.Oben (Upper Burner)

Time until the upper burner is activated.
Input: 0 ... 999 ms



Br.Unten (Lower Burner)

Time until the lower burner is activated.

Input: 0 ... 999 ms



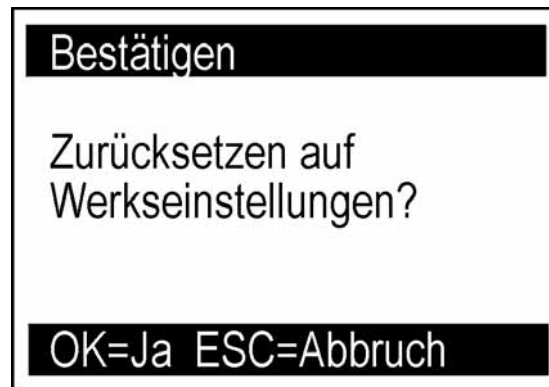
Verweil (Delay)

Thread burning time.

Input: 0 ... 999 ms

8.7 Loading the factory settings

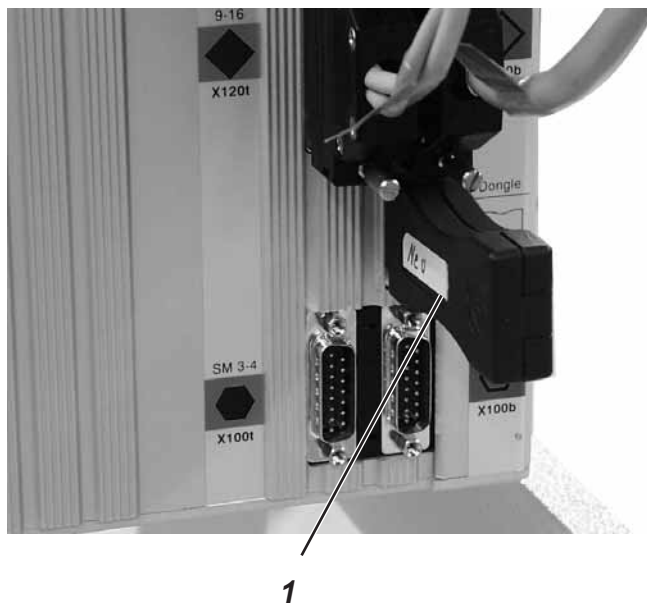
- When the menu “Settings” is displayed, press the function key “**S**”. The following screen appears:



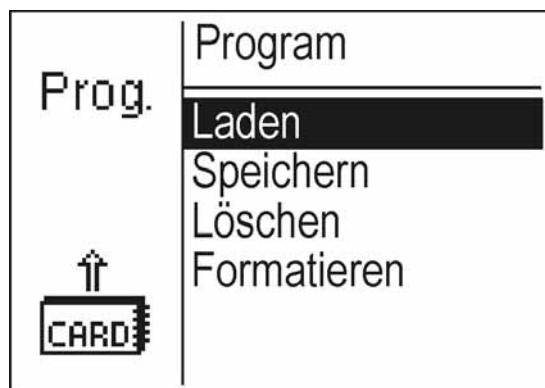
- Confirm with the “**OK**” key.
or
- Abort with the “**ESC**” key.

8.8 Saving and loading of programs

8.8.1 Loading programs into the control



- Switch the sewing unit off.
 - Plug the dongle 1 in the control.
 - Switch the sewing unit on again.
 - Press key “P”.
- The following display appears:

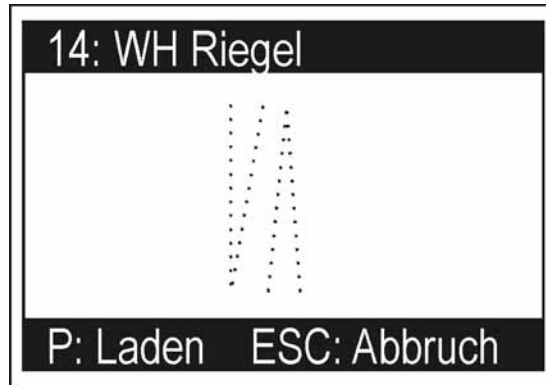


- Select **Load** with the keys “↑ ” or “↓ ”.
 - Press the “OK ” key.
- The programs saved on the dongle are indicated.



The figure “1” after the loading program means that more than one page is available!

- Select the program location (1-4) with the key “**S**”.
- Select the desired program with the keys “**↑**” or “**↓**”.
- Press the “**OK**” key.
The selected program is indicated.

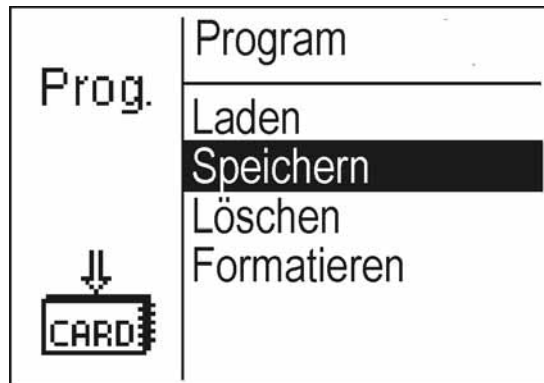


- Press key “**P**”.
The program will be loaded in alphabetical order.

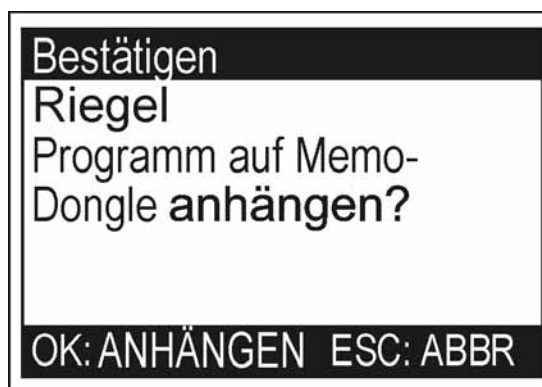
1

8.8.2 Saving programs on the dongle

- Press key “**P**”.
The following display appears:



- Select **Save** with the keys “**↑**” or “**↓**”.
- Press the “**OK**” key.



Press the "**OK**" key to confirm or "**ESC**" to go back.

Note:

The present sewing program will be saved on the dongle.

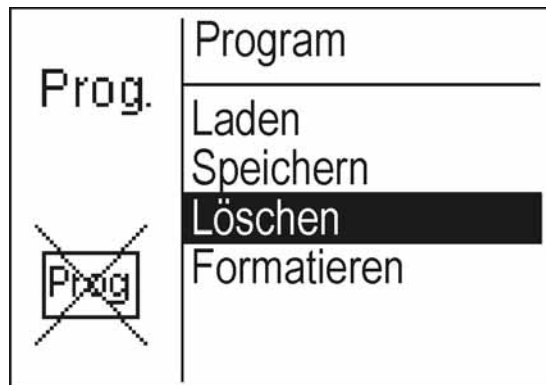


8.8.3 Deleting data from the dongle

Note:

Only the present sewing program will be deleted.

- Press key “P”.
The following display appears:



- Select **Delete** with the keys “↑” or “↓”.
- Press the “OK” key.
The following screen appears:



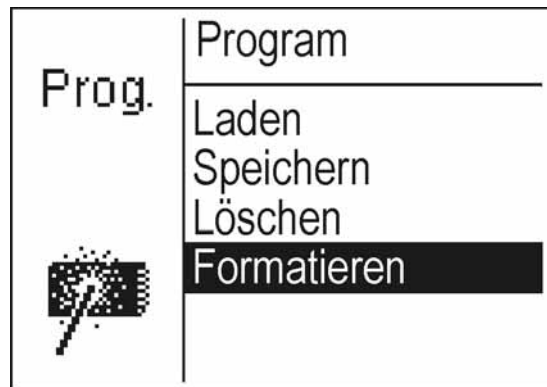
- Press the “OK” key.
The program is deleted.

Note:

If the program you want to delete is part of a sequence, the complete sequence will also be deleted and the sequence mode is deactivated.

8.8.4 Formatting the dongle

- Press key “**P**”.
The following display appears:



- Select **Format** with the keys “**↑**” or “**↓**”.
- Press the “**OK**” key.
The following screen appears:



- Press the “**OK**” key.
The dongle is formatted.

8.9 Machine faults

Error-code	Description	Possible cause	Troubleshooting
1051	Sewing motor timeout	<ul style="list-style-type: none"> - Cable to sewing motor - Reference switch faulty - Sewing motor faulty - Mechanical parts rough-running 	<ul style="list-style-type: none"> - Check cable - Check reference switch - Check sewing motor - Check the mechanical parts
1052	Sewing motor overcurrent	<ul style="list-style-type: none"> - Sewing motor cable faulty - Sewing motor faulty - Control faulty - Software not compatible to the control unit version (A/Bxx.x) 	<ul style="list-style-type: none"> - Check sewing motor cable - Check sewing motor - Check control - Check the serial number of the DAC III control unit¹, if necessary load the correct software version.
1053	Sewing motor overvoltage	Mains voltage too high	Check the mains voltage
1055	Sewing motor overload	<ul style="list-style-type: none"> - Sewing motor blocked /rough-running - Sewing motor faulty - Control faulty 	<ul style="list-style-type: none"> - Eliminate blocking/rough-running - Check sewing motor - Check control
1056	Sewing motor overheat	<ul style="list-style-type: none"> - Sewing motor rough-running - Sewing motor faulty - Control faulty 	<ul style="list-style-type: none"> - Eliminate rough-running - Check sewing motor - Check control
1058 1059	Sewing motor speed (inverted)	Sewing motor faulty	Check sewing motor
1062	Sewing motor IDMA Autoincrement	Failure	Switch the sewing machine off and on again
1205	Sewing motor not in the position thread lever high	<ul style="list-style-type: none"> - Sewing motor blocked/rough-running - Sewing motor faulty - Control faulty 	<ul style="list-style-type: none"> - Eliminate blocking/rough-running - Check sewing motor - Check control
1301	Sewing motor Referencing error	<ul style="list-style-type: none"> - Cable to sewing motor - Reference switch faulty - Sewing motor faulty - Mechanical parts rough-running 	<ul style="list-style-type: none"> - Check cable - Check reference switch - Check sewing motor - Check the mechanical parts
1302	Sewing motor power source error	<ul style="list-style-type: none"> - Plug for sewing motor not plugged in - Plug for incremental sensor not plugged in 	<ul style="list-style-type: none"> - Connect the plug for the sewing motor - Connect the plug for the incremental sensor
1342 — 1344	Sewing motor failure	Internal error	<ul style="list-style-type: none"> - Switch the sewing machine off and on again - Software update - Contact the DA-Service staff
2101	Step motor X-Axis Timeout Referencing	<ul style="list-style-type: none"> - Cable to reference switch faulty - Reference switch faulty - Step motor faulty - Mechanical part rough-running 	<ul style="list-style-type: none"> - Check cable - Check reference switch - Check step motor - Check the mechanical parts
2152	Step motor X-Axis overcurrent	<ul style="list-style-type: none"> - Step motor X-Axis faulty - Control faulty 	<ul style="list-style-type: none"> - Check step motor X-Axis - Check control
2153	Step motor X-Axis overvoltage	Mains voltage too high	Check the mains voltage

Error-code	Description	Possible cause	Troubleshooting
2156	Step motor X-Axis overheat	- Step motor X-Axis rough-running - Step motor X-Axis faulty - Control faulty	- Eliminate rough-running - Check step motor X-Axis - Check control
2162	Step motor X-Axis IDMA Autoincrement	Failure	Switch the sewing machine off and on again
2201	Step motor Y-Axis Timeout Referencing	- Cable to reference switch faulty - Reference switch faulty - Step motor faulty - Mechanical part rough-running	- Check cable - Check reference switch Check step motor - Check the mechanical part
2252	Step motor Y-Axis overcurrent	- Step motor Y-Axis faulty - Control faulty	- Check step motor Y-Axis - Check control
2253	Step motor Y-Axis overvoltage	Mains voltage too high	Check the mains voltage
2256	Step motor Y-Axis overheat	- Step motor Y-Axis rough-running - Step motor Y-Axis faulty - Control faulty	- Eliminate rough-running - Check Step motor Y-Axis - Check control
2262	Step motor Y-Axis IDMA Autoincrement	Failure	Switch the sewing machine off and on again
2911 2914	Step motor error	Internal error	- Switch the sewing machine off and on again - Software update - Contact the DA-Service staff
3100	Machine control voltage	Temporary mains voltage drop Fuse F403 faulty	Check the mains voltage Replace fuse F403
3101	Machine power voltage	Temporary mains voltage drop Fuse F402 faulty	Check the mains voltage Replace fuse F402
3102	Machine voltage intermediate circuit sewing motor	Temporary mains voltage drop Fuses F400/F404 faulty (ext.)*	Check the mains voltage Replace fuses F400/F404 (ext.)
3103	Machine voltage intermediate circuit step motors	Temporary mains voltage drop Fuse F401 faulty	Check the mains voltage Replace fuse F401
3107	Machine temperature	- Vent holes closed - Ventilation grid dirty	- Check the vent holes - Clean the ventilation grid
3210	Needle thread breakage	Thread breakage	see Operating instructions Chapter 9.1

Error-code	Description	Possible cause	Troubleshooting
3301 3320 - 3322 3330 - 3332 3340 3341 3350 - 3351 3353 3360 3361 3400 3401 3403	Error control procedure / Test procedure / Step motor test procedure / Starting procedure / Sewing procedure / Winding procedure / Adjusting aids	Internal error	- Switch the sewing machine off and on again - Software update - Contact the DA-Service staff
4301	Dongle missing	No dongle plugged in	Connect the dongle to the control
4302	Dongle empty	No data saved on the dongle	Save the data on the dongle
4304	Wrong dongle type	The dongle has not the proper format for the wished function	- Use other dongle type - Format dongle
4307	Wrong machine class	The dongle data is not formatted for the cl. 910	- Use other dongle type - Format dongle
4311	Error Format-ID	- Dongle not formatted properly Dongle faulty	- Format the dongle anew - Use a new dongle
4312	Unknown dongle type	- Dongle not formatted properly - Dongle faulty	- Format the dongle anew - Use a new dongle
5101	NV-RAM empty	Control is brand new, no data found Control is for another class, incompatible data	Data will be reset to factory setting.
5104	Error NV-RAM checksum	NV-SRAM faulty Failure	- Check via Multitest, if necessary replace the control Switch the sewing machine off and on again Data will be reset to factory setting.
5301 5302 5303 5305 5306 5340	Data contour administration	Internal error	Switch the sewing machine off and on again Eventually the sewing prog. is not ok: Reset the sewing prog. again. Load the sewing prog. from the dongle again.
5900	Error sequences – Invalid sequence number	Internal error	- Switch the sewing machine off and on again - Software update - Contact the DA-Service staff
6151 - 6154	Error input/output	Internal error	Switch the sewing machine off and on again
6351 - 6354	Error I ² C	Control faulty	- Check control - Software update - Contact the DA-Service staff

Error-code	Description	Possible cause	Troubleshooting
6551 - 6554 6651 - 6653 6751 - 6761 6952	Error Machine head position / AD-Converter / Processor error / Step motor driver	Internal error	- Switch the sewing machine off and on again - Software update - Contact the DA-Service staff
7451 7453 7454	Communication Test Interface	Internal error	Switch the sewing machine off and on again
7452 7455	Communication Test Interface	- Transmission failure - Cable Test interface faulty - Internal error	- Switch off the source of interference - Check cable - Switch the sewing machine off and on again
7551 - 7555 7558 7559	Communication Terminal interface	Internal error	- Switch the sewing machine off and on again - Software update - Contact the DA-Service staff
7556 7557	Communication Terminal interface	- Transmission failure - Cable Terminal interface faulty	- Switch off the source of interference - Check cable
7700	Protocol: Max number of repetition	- Transmission failure - Cable Test interface faulty	- Switch off the source of interference - Check cable
7701	Error Protocol	Internal error	- Switch the sewing machine off and on again - Software update - Contact the DA-Service staff
8151 8156 - 8159	Error IDMA	- Failure - Control faulty	- Switch the sewing machine off and on again - Replace control
8152 - 8154 8251 8255	Error IDMA / Booting ADSP / Booting	Internal error	- Switch the sewing machine off and on again - Software update - Contact the DA-Service staff
8252 8257 8258 / 8253 8256 8254	Booting ADSP / Booting XILINX / Booting	Failure	- Switch the sewing machine off and on again
8351	Error Testpins	Internal error	- Switch the sewing machine off and on again - Software update - Contact the DA-Service staff

Should an error occurs, the corresponding component can be checked over the menu service/multi-test for its correct function.

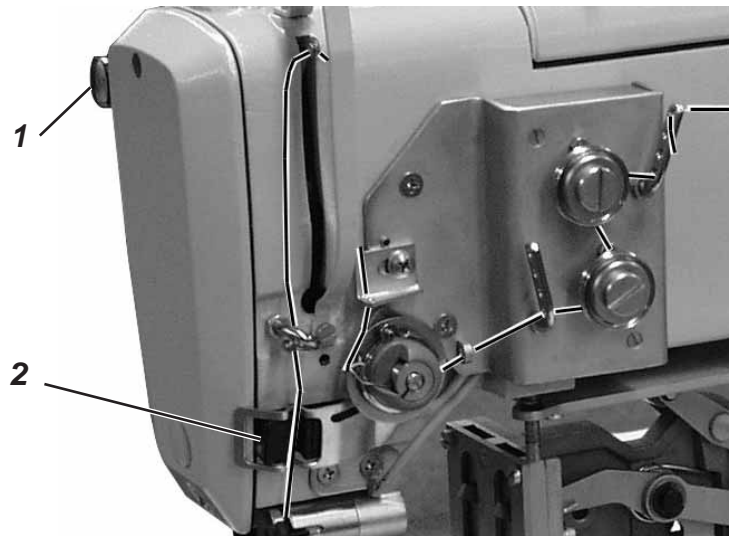
9. Sewing

Operating and function sequence when sewing:

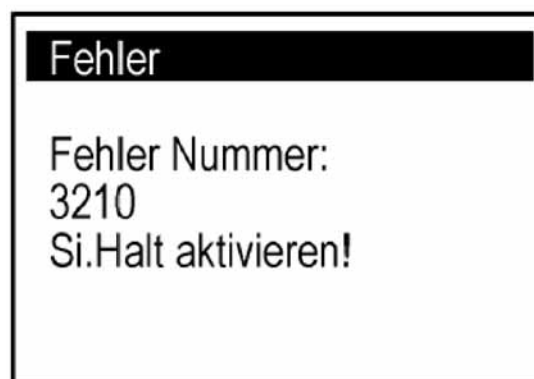
Sewing operation	Operation/ Explanation
Before the sewing start Starting position	<ul style="list-style-type: none">- Pedal in resting position Sewing unit stands idle Needle and fabric clamp in position "up".- Feed material
Sewing	<ul style="list-style-type: none">- Step the pedal forward. The sewing unit works with the set speed.
During the sewing cycle Interrupt the sewing operation Continue the sewing operation Finish the sewing operation	<ul style="list-style-type: none">- Step the pedal back. The sewing unit stops. The clamps remain in position "down".- Step the pedal forward again.- Step the pedal back again.

9.1 Thread breakage mode

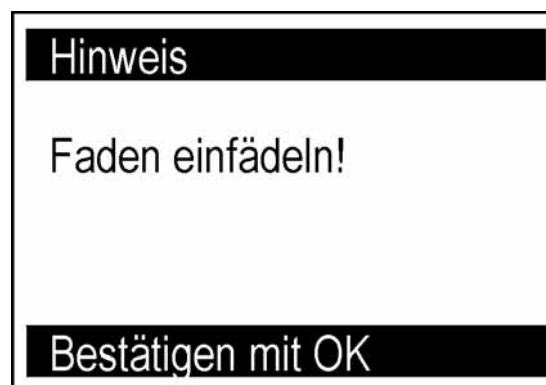
If the needle thread breaks during the sewing process, this is recognized by the thread monitor 2 and the sewing unit switches into the thread breakage mode.



After the thread monitor has responded, the following screen appears:

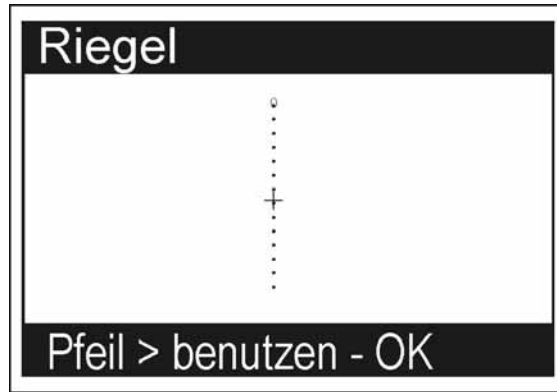


- Press switch 1 “Safe stop”.
The following screen appears:

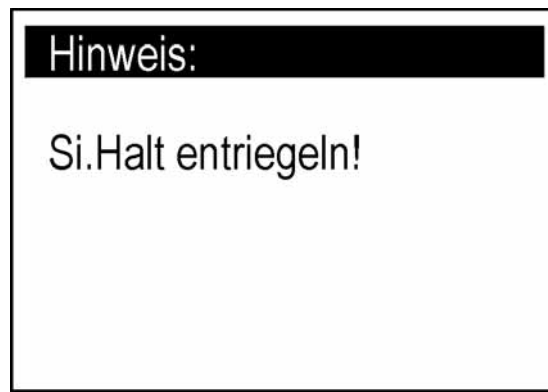


- Thread in the thread.
- Press the “OK” key.

The following display appears:



- Move along the seam contour up to the point of thread breakage with the key “⇔”.
- Press the “OK” key.
The following screen appears:




- Press switch 1 “Safe stop”.
The following screen appears:



- Step the pedal forward.
The seam is finished.

10. Maintenance

10.1 Cleaning and checking



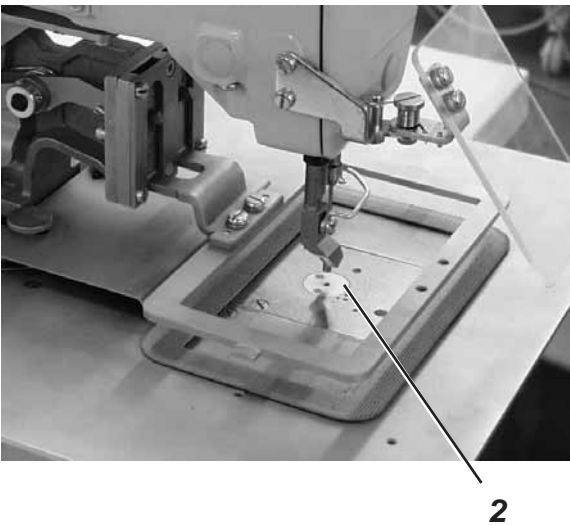
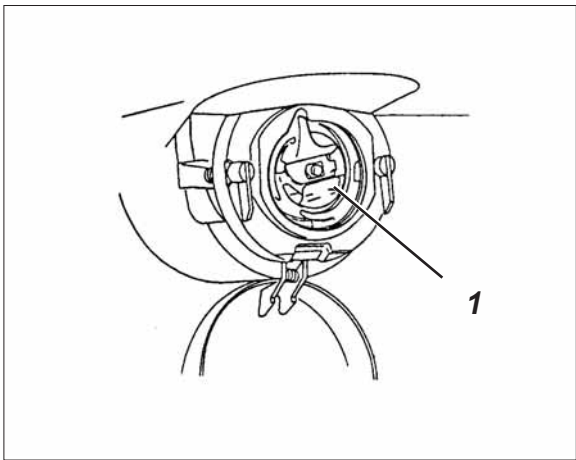
Caution: Risk of injury !

Switch the main switch off.
The maintenance of the sewing unit must only be carried out when the machine is switched off.

Maintenance work has to be done after the intervals indicated in the tables at the latest (see column “Operating hours”).

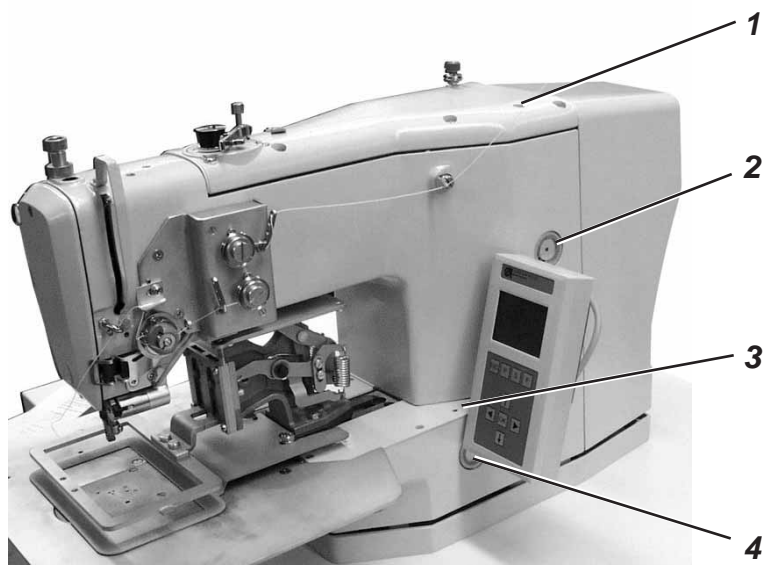
The processing of fluffy material may require shorter maintenance intervals.

A clean sewing unit protects from disturbances.



Maintenance work to be done	Explanation	Operating-hours
Machine head		8
- Remove sewing dust and thread remainders. (e.g. with compressed air pistol)	Spots to be cleaned especially carefully: - Underside of the throat plate - Zone around hook 1 - Bobbin case - Thread trimmer - Zone around needle 2	
Control box	- Keep the ventilation grilles clean	8

10.2 Oil lubrication



Caution: Danger of injury !

Oil can cause skin eruption.
Avoid a longer contact with the skin.
Wash yourself thoroughly after a contact.



ATTENTION !

The handling and disposal of mineral oils is subject to legal regulations.
Deliver used oil to an authorized collecting station.
Protect your environment.
Be careful not to spill any oil.

Oil the sewing unit exclusively with lubricating oil **DA-10** or an equivalent oil with the following specification:

- Viscosity at 40° C: 10 mm²/s
- Ignition point: 150° C

DA-10 can be bought at the sales points of **DÜRKOPP-ADLER AG** under the following parts numbers:

250 ml-Container:	9047 000011
1-Litre-Container:	9047 000012
2-Litre-Container:	9047 000013
5-Litre-Container:	9047 000014

Maintenance work to be done	Explanation	Operating hours
Lubrication of the sewing unit	<p>The sewing unit is equipped with a central oil wick lubrication. The bearings are provided by the oil reservoirs 2 and 4.</p> <p>- The oil level must always be visible in the inspection glass of the two reservoirs. - Fill up oil up to the red marking through the drill-holes 1 and 3.</p>	8

Note: