CNC Knopfannähautomat
CNC Automat for Button Sewing

Bedienanleitung / Operating Instructions
Aufstellanleitung / Installation Instructions
Serviceanleitung / Service Instructions
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.
1 Product description

The Dürkopp Adler 531 is a CNC lockstitch button sewer. The existing button patterns are scalable and can be saved in this modified form. In addition it is possible to enter “free” stitch patterns (programming). The button sewer is fitted with an automatic sewing foot elevator, a thread cutter, a thread wiper, an electromagnetic thread tensioner and an integral DC direct drive.

Technical features:

- The sewing attachment is driven by an integral positioning drive. A DAC control unit controls not only the sewing drive but also two step motors for the X and Y movement to create the stitch geometry.
- The maximum size of the sewing area is 40 mm in the X direction and 20 mm in the Y direction.
- The thread is tensioned electromagnetically. It can be freely configured in specific areas of the stitch pattern.
- The wick is lubricated centrally for the top part and hook. Two separate oil reservoirs are available for this that are both supplied by the top container. There is only one refilling point.
- A maximum of 50 standard button patterns are available. These standard patterns can be modified temporarily (changing the overall length, width, speed). When the machine is switched off the modified values of the last used bar tack are retained when it is switched on again.
- 40 modified standard patterns can also be stored.
- There is also a maximum of 9 free stitch contours with a total of 3000 dynamically managed stitches available. Thus, for example, free button patterns can be sewn. The co-ordinates of the free stitch contours are entered on the operating panel. No other machine is required.
- 25 sewing pattern sequence programs each with up to 20 sewing patterns can be created and saved.
- The accuracy of the co-ordinate entry is 0.1 mm.
- It is possible to block special button and/or button sequence programs and/or modifications so that unauthorized use or modification can be stopped from the technician level.
- It is possible to perform an intermediate cut without raising the button clamp so that a connection thread can be avoided.
- The control unit can respond to external signals (input) and can also output signals itself (output).
- There is a hook thread counter and a daily piece counter.
- The arm shaft on the button sewer is driven directly by a brushless direct current motor.
- Speeds of 0 min \(^{-1}\) (manual operation with full functionality of the X and Y drives) up to 2700 min \(^{-1}\) can be reached in 100 min steps.
- Service and maintenance work is supported by extensive test programs with which the individual functions can be tested separately.
2  Intended Use

The Class 531 is a button sewer that can be used as intended to sew light to medium weight material. Such material is normally material made out of textile fibers or leather. Such sewing materials are used in the clothing, domestic upholstery and automobile upholstery industry.

In addition it is possible that even so-called technical seams can be done with this button sewer. However, here the operator (in co-operation with DÜRKOPP ADLER AG) must assess the possible risks because such applications are on the one hand comparatively rare and on the other hand there is an enormous variety. Depending on the results of this assessment suitable precautions may need to be taken.

Normally only dry material must be processed with this button sewer. The material must not be thicker than 9 mm if it is to be compressed through the lowered sewing feet. The material must not contain any hard objects. The button sewer must not be operated without an eye guard.

The seam is normally created with sewing threads made of textile fibers (cotton thread, synthetic thread or braided yarns) with the following dimensions:
Class 531-211  50/3 - 120/3 thread thickness
If you want to use other threads you must also the assess risks arising from this and if necessary take precautions.

This button sewer must only be installed and operated in dry, tidy premises. If the button sewer is used in other rooms that are not dry and tidy other measures will be required that will have to be agreed (see EN 60204-31: 1999).

As a manufacturer of industrial sewing machines we assume that at least skilled operating personnel work on our product so that all the normal conditions and if necessary their risks can be assumed to be known.

3  Subclasses

Cl. 531-211

Single needle lockstitch button sewer with automatic sewing foot elevation, thread cutter and thread wiper and electromagnetic thread tensioner.
Fitted with a special button clamp for:
- laundry = button sizes of Ø 7 - Ø 18 mm
- DOB & HAKA = button sizes of Ø 11 - Ø 40 mm together
  with optional button shank shaper unit.

The machine has a shank button rest.
4 Additional equipment

The following additional equipment is available for the button sewer 531:

<table>
<thead>
<tr>
<th>Order no.</th>
<th>Additional accessories</th>
</tr>
</thead>
<tbody>
<tr>
<td>9822 51 002 6</td>
<td>Sewing light</td>
</tr>
<tr>
<td>9822 51 002 7</td>
<td>Table clamp</td>
</tr>
<tr>
<td>9870 00 102 1</td>
<td>K lead (socket adapter set for sewing light)</td>
</tr>
<tr>
<td>0511 59 001 4</td>
<td>Laser marking (3 lights)</td>
</tr>
<tr>
<td>0510 59 003 4</td>
<td>Additional laser light</td>
</tr>
<tr>
<td>0511 59 003 4</td>
<td>Manual switch</td>
</tr>
<tr>
<td>0531 36 064 4</td>
<td>Button shank shaper unit inc. clamping feet</td>
</tr>
</tbody>
</table>

5 Frame

The following supporting frame is available for the button sewer 531.

MG55 40 029 4

Frame package
Table plate size 600 x 1060 mm
Frame height 1160 to 1,305 mm

6 Technical Data

Noises: \( L_c = 78 \text{ dB (A)} \)

Work place-related emission value in accordance with DIN 45635-48-A-1-KL-2

Speed: 2,700 min\(^1\)

Material: G1 DIN 23328 2 layers
6.1 Technical data for the sub classes

<table>
<thead>
<tr>
<th>Subclass:</th>
<th>211</th>
</tr>
</thead>
<tbody>
<tr>
<td>Sewing stitch type:</td>
<td>301</td>
</tr>
<tr>
<td>Hook type:</td>
<td>Oscillating hooks</td>
</tr>
<tr>
<td>Needle system:</td>
<td>DPx17 (135x17)</td>
</tr>
<tr>
<td>Needle thickness:</td>
<td>80 - 110 [Nm]</td>
</tr>
<tr>
<td>Needle thickness standard:</td>
<td>90 [Nm]</td>
</tr>
<tr>
<td>Thread thickness:</td>
<td>50/3 - 120/3</td>
</tr>
<tr>
<td>Stitch length:</td>
<td>Depending on seam construction [mm]</td>
</tr>
<tr>
<td>Max. speed:</td>
<td>2700 [min]</td>
</tr>
<tr>
<td>Clamp elevation:</td>
<td>9 [mm] On delivery maximum 13</td>
</tr>
<tr>
<td>Sewing area:</td>
<td>40 [mm] max. in X direction: 20 max. in Y direction:</td>
</tr>
<tr>
<td>Number of standard button patterns:</td>
<td>50</td>
</tr>
<tr>
<td>Number of patterns that can be saved and/or modified:</td>
<td>40</td>
</tr>
<tr>
<td>Number of sewing pattern sequence programs:</td>
<td>25</td>
</tr>
<tr>
<td>Number of sewing patterns per sewing pattern sequence program:</td>
<td>20</td>
</tr>
<tr>
<td>Number of free max. seam contours:</td>
<td>9</td>
</tr>
<tr>
<td>Soft start: can be switched on and off</td>
<td></td>
</tr>
<tr>
<td>Sewing drive:</td>
<td>DC motor</td>
</tr>
<tr>
<td>Rated voltage:</td>
<td>1 ~ 230V/50/60 Hz [V]</td>
</tr>
<tr>
<td>Power rating:</td>
<td>0.45 [kW]</td>
</tr>
</tbody>
</table>
7 Operation

7.1 Threading needle threads

Caution, danger of injury!
Switch the main switch off.
Only thread needle threads when the button sewer is switched off.

- Put reels of thread onto the thread stand and run the needle and hook threads through the feed arm.
The feed arm must be vertically above the thread reels.
- Thread needle threads as shown in the following illustration.
7.2 Adjusting needle thread tension

Pre-tensioning 3
When the main tensioner 2 is open a slight residual tension on the needle thread is required. The residual tension is created by the pre-tensioner 3.
At the same time the pre-tensioner 3 affects the length of the cut needle thread end (starting thread for the next seam).
- Shorter starting thread:  
  Turn the knurled nut 1 clockwise.
- Longer starting thread:  
  Turn the knurled nut 1 anti-clockwise.

Main tensioner 2
The main tensioner 2 must be set as low as possible.
The threads should intertwine in the middle of the material.
If the thread tensions are too great this could lead to unwanted crimping and thread tearing with thin material.
- Adjust the main tensioner 2 so that an even stitch pattern is achieved.
  To increase tension = turn the knurled nut clockwise
  To reduce tension = turn the knurled nut anti-clockwise

7.3 Opening needle thread tensioner

Automatic
The needle thread tension opens automatically when the thread is cut and when the material clamping feet are raised.
7.4 Adjusting thread regulator

Caution, danger of injury!
Switch the main switch off.
Only adjust the thread regulator when the button sewer is switched off.

The thread regulator 3 adjusts the amount of needle thread required to form the stitch.
Only a precisely adjusted thread regulator guarantees optimum sewing results.

If the adjustment is correct the needle thread loop must slide over the thickest part of the hook with slight tension.
- Undo screw 1.
- Change the position of the thread regulator 3.
  Thread regulator to the left = greater needle thread quantity
  Thread regulator to the right = smaller needle thread quantity.
- Screw up screw 1.

Adjustment note:
If the greatest amount of thread is required the thread take up spring 2 must be pulled down about 0.5 mm from its final upper position. This is the case if the needle thread loop passes the maximum hook diameter.
7.5  Winding hook threads

- Put the bobbin on the bobbin winder 4.
- Pull the thread through the guide 2 and round the tensioner 1.
- Wind the thread anti-clockwise about 5 times round the coil bobbin.
- Push the bobbin lever 3 onto the bobbin.
- Sew
  The bobbin lever ends the procedure as soon as the bobbin is full.
- After winding break the thread on the thread clamp 5.

**Note!**

Should the thread be wound without sewing
the thread winding mode can be switched to in the “Special functions” sub menu.

When the thread winding mode is switched on the sewing motor can be started with the pedal or the manual switch regardless of the sewing area drive (here unthread threads on the thread lever).

For settings see Section 8.5.1 “Thread winding mode”.
7.6 Changing hook thread bobbin

Caution, danger of injury!
Switch the main switch off.
Only change the hook thread bobbin when the button sewer is switched off.

Removing the empty bobbin
- Pull the hook cover 3 downwards.
- Lift up the bobbin case latch 1.
- Remove bobbin case 2 with bobbin 6.
- Take the empty bobbin out of the bobbin case 2.

To insert a full bobbin
- Insert a full bobbin into the bobbin case 2.
- Thread the hook thread through slit 5 under the tensioning spring 7 into the hole 4.
- Pull about 2.5 cm of hook thread out of the bobbin housing. The bobbin must turn in the direction of the arrow when the thread is being pulled out.
- Replace the bobbin case 2.
- Close the bobbin case latch 3.
7.7 Adjusting hook thread tension

Caution, danger of injury!
Switch the main switch off.
Only adjust the hook thread tension when the button sewer is switched off.

The required hook thread tension should be created by the tensioning spring 1. The bobbin case 3 should drop slowly under its own weight if the threaded hook thread is to be held fast.

Adjusting the tensioning spring
- Remove the bobbin case 3 and the bobbin.
- Change the tensioning spring 1 with the adjustment screw 2 until the required tension is reached.
- Replace the bobbin case.
7.8 Changing the needle

Caution, danger of injury!
Switch the main switch off.
Only change the needle when the button sewer is switched off.

- Undo screw 1.
- Push the new needle into the hole in the needle bar 2 until it can go no further.
  **CAUTION!**
  The hollow channel 3 on the needle must point towards the hook.
- Screw up screw 1.

**CAUTION!**
After changing to a different needle thickness the distance between the hook and the needle must be adjusted (see Service instructions).
7.9 Button shank shaper (optional)

The button clamp on the button sewer is fitted with a button shank shaper 1.

Setting the shank length
- To change the setting of the button shank shaper 2:
  
  downwards = shank becomes shorter
  upwards = shank becomes longer.
7.10 Adjusting the button clamp hook feet

Caution, danger of injury!
Take great care when adjusting the button clamp when the button sewer is switched on.

The button should be pushed as lightly as possible between the hook feet on the button clamp and can be aligned.
But the button must be securely clamped so that it cannot turn when it is inserted into the material.
Stop 4 adjusts the amount the hook feet open.
– Switch the button sewer on.
  The button clamp lifts up.
– Put the button to be sewn on between hook feet 1 and 2.
– Undo knurled nut 3.
– Move the stop towards the screw 5.
– Tighten knurled nut 3.
– Check whether the button can be inserted easily and aligned.
8 Operating the control unit 531

8.1 The operating terminal

An operating terminal with an LCD display and function buttons is used for entering and outputting data.

8.1.1 The buttons

<table>
<thead>
<tr>
<th>Function button</th>
<th>Function</th>
</tr>
</thead>
<tbody>
<tr>
<td>Cursor keys</td>
<td><strong>If no input field is selected:</strong> Press “⇔” to get back to a sub menu in the higher menu. <strong>If an input field is selected:</strong> Switch between the positions (not when selecting the sewing pattern or sequences). <strong>In sewing mode with sequence mode:</strong> Switch to the next or previous sewing pattern.</td>
</tr>
<tr>
<td>Function button</td>
<td>Function</td>
</tr>
<tr>
<td>-----------------</td>
<td>----------</td>
</tr>
</tbody>
</table>
| ![Function button](image) | **If no input box is selected:**  
Switch between the rows in the menus.  
The selected line is shown inversely.  
**If an input field is selected:**  
Increase or reduce the value of the relevant position by one or with functions with several alternative options switch between the parameters. |
| ![OK button] | **If no input field is selected:**  
Select the input field.  
The value can be changed with the “↑” and “↓” keys.  
**If an input field is selected:**  
The set value will be applied.  
**If the clamping foot has been lowered by pressing OK + F:**  
The test sequence starts. |
| ![ESC button] | **If the test functions have started (Multitest / 180° disc):**  
You go back to the selection menu.  
**If an input box has been selected:**  
An entry is cancelled.  
The previous value is retained.  
**At technician, programming level**  
The control unit switches to sewing mode.  
**In sewing mode**  
raise clamping foot and cancel sewing procedure. |
| ![P button] | The control unit switches from sewing mode to programming mode.  
In this mode changed stitch patterns can be saved under a new program number. |
| ![S button] | The control unit switches from sewing mode or sewing pattern programming mode to the sequence programming mode.  
In this mode new sequences can be created or existing ones modified. |
| ![F button] | The control unit switches from sewing mode to technician mode.  
This mode can only be selected by entering a code.  
In this operating mode basic machine parameters can be set and diagnosis and setting programs can be called up. |
8.2 User interface
8.2.1 Menu structure

Calling up the service menu

- Press F and hold it down.
- Turn the main switch on.
  The control unit is initialized.
  After a short time the window to enter the number code appears.
- Enter the number code (Code 1 see Section 8.6.4).
  The display changes to the service menu (see Section 8.6.4.3).
Calling up technician mode

- Switch the main switch on.
The control unit is initialized.
The sewing menu appears on the screen.
- Press “F”.
- Enter Code 1 (see Section 8.6.4).
- Press “OK”.
The display changes to technician mode.

8.3 Changing number and parameter values, alternative selection

8.3.1 Changing number values

- Select the required row by pressing “û” or “û”.
- “Press OK”.
The selected number value is indicated by a flashing cursor.
- Press “û” or “û” to toggle between the places.
Press “û” or “û” to increase or reduce the value of the selected position.
- “Press OK.”
The value currently set is applied
or
- “Press ESC.”
The original value is retained.

Note
All values can only be changed within the minimum and maximum values.
8.3.2 Selecting a parameter

With some parameters it is possible to select settings that cannot be modified.

- Select the required row with the parameters to be changed by pressing “ő” or “ő”.
- Press OK.
- Press “ő” or “ő” to switch between the specified options.
  Example: Sewing pattern number.

- Press OK.
  The parameter currently set is applied.

or

- “Press ESC.
  The original parameter is retained.

8.3.3 Alternative selection

Some menu items can be selected as an alternative to each other. The current selection is indicated by a tick (…√).

When selecting another alternative the mark on the current selection is cancelled and the new menu item is indicated.

Items that can be selected as an alternative are visually separated from the other menu items by a dividing line.
### 8.4 Sewing pattern

There are three different sewing pattern types available for the button sewer 531.

- **Fixed standard sewing pattern (type 1)** (See section 11)

  The length, width and sewing speed parameters can be changed in sewing mode. The laser marking lights can be switched on and off. The changes are saved.

  After selecting another sewing pattern the changes are lost, however.

  Sewing pattern numbers 1 - 50 are available for this sewing pattern that cannot be deleted or overwritten.

- **Programmable sewing pattern (type 2)**

  Fixed standard sewing patterns can be changed at programming level (length, width, sewing speed, laser light 1 - 8) and saved under a new program number.

  Sewing pattern numbers 51 - 90 are available for this sewing pattern that can be changed or overwritten.

- **Free seam contours (type 3)**

  Sewing pattern numbers 91 - 99 are available for these seam contours. How to create free seam contours is described in Section 8.6.5.4.

  The length, width and sewing speed parameters can be changed in sewing mode. The laser marking lights can be switched on and off. The changes are saved.

  When another sewing pattern is selected the changes are lost, however.

- **25 sewing pattern sequence programs each with up to 20 sewing patterns for each sewing pattern sequence program can be created and saved.**

### 8.5 Energy saving mode

The energy saving mode is selected after a time that can be set (1 - 60 minutes) or switched off completely (0 minutes) by using t5 in the *Machine configuration/times* menu.

When this is selected the clamping foot is lowered to save energy and thus reduce the amount of heat developed too.

The set time expires if no user entries are made via the control panel, pedal or manual switch.

Before selecting the energy saving mode the message flashes twice as an indication that the clamping foot will be lowered immediately.

Then the message stays on the screen.

Normal mode is enabled again. The clamping foot is raised and the message deleted if the user makes an entry using the control panel, pedal or manual switch.

The machine is now ready for operation immediately.
8.6 Main menu

8.6.1 Sewing pattern mode

The parameters for the individual sewing patterns are arranged in the main menu.
The sewing patterns can be changed with these parameters.

- Switch the main switch on.
  The control unit is initialized.
  The main menu appears.
- Select the required parameters by pressing “û” or “û”. The symbol for the selected parameters is shown inversely.
- Change the selected parameters as described in Section 8.3.

**Menu item**
The symbol at the top left of the screen describes the currently selected menu item.

**Button image**
The symbol at the bottom left of the screen shows the current button pattern.

**Sewing pattern**
The sewing pattern to be sewn is selected with these parameters.
Selection: 1..51 (52 - 99 if available)

**Speed**
The required speed is set with these parameters.
Enter: 0 - 2700 rpm
**Overstitch thread tension** (see Table 1)
The thread tension for overstitches is set with this menu item.

Enter: 0 ... 100  
0 = lowest thread tension  
100 = highest thread tension

The thread tension magnet sets the thread tension in accordance with the current value so that this can be checked.

If the fixing stitches are active (only with sewing pattern programs), the thread tension values in all other areas (see Table 1) of the sewing pattern is changed too depending on the difference from the previous value.

With standard sewing patterns (1 - 50) the thread tension in the different areas is not set separately. If this is necessary a sewing pattern program must be created.

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**Sewing pattern size/ sewing pattern offset sub menu**
Switch to this sub menu to set the sewing pattern size of the sewing pattern offset. The current sewing pattern size is shown in the X and Y direction.

**Sewing pattern width**
Setting the sewing pattern width
Enter: 0.1 ... 40 mm

**Sewing pattern length**
Setting the sewing pattern length
Enter: 0.1 ... 20 mm

**Sewing pattern offset in X direction**
To set the sewing pattern offset in the X direction
Enter: -20.0 ... +20.0 mm

**Sewing pattern offset in Y direction**
To set the sewing pattern offset in the Y direction
Enter: -10.0 ... +10.0 mm
**Sub-menu**

There is a sub menu behind this symbol.

**Number of stitches**

With standard sewing patterns this menu line displays the overstitch distribution with the standard sewing patterns and the total number of stitches with the free contours (cannot be changed).

Selecting the line by pressing “OK” takes you to the “Special functions” sub menu.

**Daily unit counter or capacity counter sub menu.**

Selecting the line by pressing “OK” takes you to the “Daily piece counter or the capacity counter” sub menu.

**Resetting the daily piece counter**

- Press “0” or “5” to switch to the menu item.
- Hold “OK” down for 3 seconds until the number displayed goes back to 0.

The daily piece counter can also be reset in this way if the capacity level is displayed. However, the value does not go back to 0.

or

**Capacity counter**

Selecting the line by pressing “OK” takes you to the “Daily piece counter or the capacity counter” sub menu.

**Special function and soft start status sub menu**

**Thread winding mode**

The hook thread winder can be operated separately.

The sewing motor can be started with the pedal or manual switch regardless of the step motors if ON is set.

Enter: ON / OFF
Winding hook thread bobbins:
With the pedal
- Move the pedal forwards (position 2).
  The sewing motor starts.
- Move the pedal back.
  The sewing motor stops.

Using the control panel
- Press “F”.
  The sewing motor starts.
- Press “ESC”.
  The sewing motor stops.

With manual switch (optional)
- Press switch 2.
  The sewing motor starts.
- Press switch 1.
  The sewing motor stops.

Soft start
The soft start can be switched on or off with this parameter.
Enter: ON / OFF

Laser marking lights sub menu (optional)
This menu item is only displayed if the laser light option is switched on in the Fittings menu (see Section).

Laser lights 1 ...3
Switching the laser marking lights 1 - 3 on or off
Enter: ON / OFF
Daily piece counter or capacity counter sub menu.

Alternative display of daily piece counter or capacity counter.
Both counters work in parallel.
The counter that is to be displayed in the main menu can be selected.

- The daily piece counter counts the number of sewing patterns sewn
  Display: 0 … 65000
- The hook thread counter works backwards.
  When the value 0 is reached and a sewing procedure starts a message appears.
  Display: 9999 … 0
  - “Press ESC .
  This switches back to the main menu.

If the daily piece counter is set the following appears:

Daily piece counter display in sewing mode
Enter: Select by pressing OK.

Capacity counter display in sewing mode
Enter: Select by pressing OK.

Capacity counter on/off
Enter: ON / OFF

Initial capacity counter value
Enter: 0 ... 9999
8.6.2 Programming mode

The parameters for programming sewing patterns are arranged under this menu item.
The shape, length, width and speed etc. of the sewing pattern are entered using the parameters.

- Switch the main switch on.
The control unit is initialized.
The main menu appears.
- When the main menu appears press P.
The display switches to the programming mode display.
- Select the required parameters by pressing “û” or “û”.
The symbol for the selected parameters is shown inversely.
- Change the selected parameters as described in Section 8.3.

Sewing pattern number
The sewing pattern number that is to be created or changed is selected using this parameter.
When creating a new program an asterisk (*) is displayed before the number.
Enter: 51 ... 90
- Select the required sewing pattern program by pressing “û” or “û”.
- “Press OK.
The program is selected.

Basic sewing pattern
A default sewing pattern can be selected with this parameter. The new sewing pattern is to be created based on this.
Enter: 1 ... 50 or
91 ... 99 if available.

Sewing speed
The required sewing speed is set with this parameter.
Enter: 0...2700 rpm
Thread tension sub menu
Switch to this sub menu to set the thread tension. The values displayed correspond to the thread tension in area 2 (overstitches).

Securing stitch sub menu
Switch to this sub menu to change the parameters for the securing stitches. The current values are displayed (number/ distance between the stitches).

Interloop stitch sub menu
Switch to this sub menu to change the parameters for the interloop stitches. The current values are displayed (number/ distance between the stitches).

Distance between button holes sub menu
Switch to this sub menu to set the distance between button holes in the X and Y direction (see Page 25).
Display: current distance between button holes X/Y

Sewing pattern offset sub menu
Switch to this sub menu to move the sewing pattern in the X and Y direction (see Page 25).
Display: current X offset/ Y offset

Stitch distribution/ number of stitches
Displays the overstitch distribution (with standard sewing patterns) or total number of stitches (with free contours).

Soft start
The soft start can be switched on or off with this parameter.
Enter: ON / OFF

Laser marking lights sub menu (optional)
This menu item is only displayed if the laser light option is switched on in the Fittings menu.

Laser lights 1 ...3
Switching the laser marking lights 1 - 3 on or off
Enter: ON / OFF
Thread tension sub menu

Thread tension for securing stitches
The thread tension for securing stitches is set with this menu item. This menu item is only displayed if 0 is not set for the number of securing stitches.

Overstitch thread tension
The thread tension for overstitches is set with this menu item.

Interlooped stitch thread tension
The thread tension for interlooped stitches is set with this menu item. This menu item is only displayed if 0 is not set for the number of interlooped stitches.

Thread tension area 2 ... 4
With sewing pattern programs with a free seam contour as the basic sewing pattern these menu items are displayed if they have been programmed as stitch operations in the free seam contour.

Enter: 0 ... 100 0 = lowest thread tension 100 = highest thread tension

Securing stitch sub menu
The number and distance between the securing stitches at the start of the seam can be set. The distance between the securing stitches remains at the set amount even if the sewing pattern is scaled.
### Number of securing stitches
The number of securing stitches at the start of the seam can be set here.
Enter: \( 0 \ldots 3 \) \((0 = \text{no securing stitches})\)

### Distance between securing stitches
The distance between the securing stitches in the X and Y direction can be set here.
Enter: \( 0 \ldots 1.0 \text{ mm} \)

When sewing a sewing pattern without securing stitches it is possible that, because of a very small number of stitches, the specified speed will not be reached particularly with sewing patterns with interim cutting. If necessary the soft start function can be switched off or the soft start speed adjusted to achieve an increase in speed.

### Interloop stitch sub menu
The number and distance between the interloop stitches at the start of the seam can be set. The distance between the interloop stitches remains at the set amount even if the sewing pattern is scaled.

#### Number of interloop stitches
The number of interloop stitches at the start of the seam can be set here.
Enter: \( 0 \ldots 3 \) \((0 = \text{no interloop stitches})\)

#### Distance between interloop stitches
The distance between interloop stitches at the end of the seam can be set here.
Enter: \( 0 \ldots 1.0 \text{ mm} \)

When sewing a sewing pattern without interloop stitches it is possible that, because of a very small number of stitches, the specified speed will not be reached particularly with sewing patterns with interim cutting. If necessary the soft start function can be switched off or the soft start speed adjusted to achieve an increase in speed.
8.6.3 Copying function for sewing pattern programs

Any number of sewing patterns can be copied at programming level:

- Press P to switch from the main screen to the sewing pattern programming mode.
- Press OK to select the sewing pattern program to be copied with the “↑” and “↓” cursor keys. Then confirm by pressing OK.
- Press P to start the copying process. A dialogue box appears to confirm:

```
BESTÄTIGUNG
Programm kopieren: 51 ?
<:Nein ➔:Ja
```

- Press “➔” (Yes) to start the copying procedure. A copy of the selected sewing pattern is attached to the existing ones and selected as the current one.
- Press “⇐” (No) to cancel the copying procedure.
8.6.4 Sewing pattern sequence (sequences)

8.6.4.1 Switching sewing pattern sequence operation on and off

Switching from sewing pattern mode to sewing pattern sequence mode
- With the main menu displayed press S to go to the sequence programming mode.

- Press OK to start editing the sequence numbers.
- Press ↑ to select any sequence (1-25)
- Press OK to confirm the selection. The sewing pattern sequence mode is switched on.
- Press ESC or “Φ”. The main menu for the sewing pattern sequence mode appears.

The sequence number and sequence menu items in the main menu are described at the end of this section.
Switching from sewing pattern sequence mode to sewing pattern mode

- With the main menu displayed press S to go to the sequence programming mode.

- Press OK to start editing the sequence numbers.
- Press “Ω” to select sequence number 0.
- Press OK to confirm the selection.
  The sewing pattern sequence mode is switched off.
- Press ESC or “θ”. The main menu for the sewing pattern mode appears.
Menu items in the main menu in sewing pattern mode

Sequence
Selecting the sewing pattern sequence.
Enter: 1 (2 - 25, if available)

Sequence
Displaying the sequence.
The current sewing pattern number is indicated with a bar (underlined).
The display scrolls if there are more than five numbers.

- More sewing patterns to the right: 01-02-51-91-

- More sewing patterns to the left: .51-91-01-02

- More sewing patterns to the left and right: ..02-51-91-01-...

Automatic mode
After sewing a sewing pattern the control unit automatically switches to the next sewing pattern.
After sewing the last sewing pattern the control unit switches back to the first sewing pattern in the sequence.
The current sewing pattern is indicated by a bar under the number.
The design of the selected sewing pattern is displayed in the left half of the display.

Manual operation
The control unit does not switch automatically between sewing patterns.
- Press “ paths” or “ paths” to display the next sewing pattern.
The design of the selected sewing pattern is displayed in the left half of the display.

Switching between automatic and manual mode
- Press “” or “” to select the second menu line (sequences).
- Press OK.
- Press “” or “” to select the operating mode.
An arrow will be displayed between the sewing patterns in automatic mode.
8.6.4.2 Sequence programming mode

This menu item combines the individual sewing patterns for the sewing pattern sequences that can be called up. There is a total of 25 independent sewing pattern sequences available. Each sewing pattern sequence can be made up of 20 sewing patterns in any order.

The sewing pattern sequence mode can also be switched on in this menu.

Switch the main switch on.
The control unit is initialized.
The main menu appears.

When the main menu appears press \textbf{S}. The display switches to the sequence programming mode.

Select the required menu item by pressing “\textbullet{}” or “\textbullet{}”.
The menu line shown inversely.

“Press \textbf{ESC} or \textlangle{}1\textrangle{}.
This switches back to the main menu.

Sequence number/ sewing pattern sequence mode

Selecting the sequence to be created or changed.
When creating a new program an asterisk (*) will be displayed before the number.
Enter: 0 … 25

Select the required sequence number by pressing “\textbullet{ }” or “\textbullet{ }”.
Should sewing pattern sequence mode be switched off select sequence number 0.
The sequence number is shown inversely.

“Press \textbf{OK}.
The program is selected.

Sewing pattern number (1 .. 20)

This menu item is used to select the sewing pattern number that is to be included in the current sequence.
Enter: 1 … 51 (52 - 99 if available)
The following menus are included in technician mode:

**Machine configuration**
Machine-specific settings are configured in this menu.

**User configurations**
Operation-specific settings are configured in this menu.

**Service functions**
Service functions enable a rapid check of all hardware components.

**Free contours**
Up to nine freely defined seam contours can be created and sewn with the button sewer 531. The co-ordinates are entered directly on the control panel.

**Memory dongle**
Data can be transferred from the machine to the dongle or loaded from there onto the machine using the memory dongle support.

**Cycle time**
Displays the cycle time of the last sewn sewing pattern. (Time from start to end of sewing).
Calling up technician mode
- Switch the main switch on.
  The control unit is initialized.
  The main menu appears.
- When the main menu appears press F.
  The display switches to the code query menu.

- Enter code number “25483” (Code 1).
  The display switches to technician mode when the right code number has been entered.
- Press “OK” to confirm.
  The following menu appears:

- Select the required sub menu by pressing “<” or “>”.
- Press “OK” to switch to the selected sub menu.
8.6.5.1 Machine configuration

**Parameters**
Various machine parameters can be set using this sub menu.

**Soft start**
The speeds for the soft start ramp can be set in this sub menu.

**Equipment**
The parameters for the sewing equipment and optional units can be set in this sub menu.

**Times**
The different times can be set in this sub menu.

**Machine cycles**
The total number of sewn cycles is displayed.
Machine parameters

- Select the required parameters by pressing “先进” or “后退”. The symbol for the selected parameters is shown inversely.
- Start the selected parameters by pressing OK or switch to the sub menu.

Cut off speed
Enter the sewing motor speed in the last three stitches.
Enter: 200 ... 300 [rpm]

Maximum sewing speed
Enter the maximum sewing speed that can be set
Enter: 200 ... 2700 [rpm]

Stop position
The positioning of the sewing motor or needle bar can be changed using the stop position.
Enter: 0 = Thread lever is at the upper dead center (needle bar is lower) -15 = Thread lever is 15° off the upper dead center (Needle bar is higher)

Feed position
Selecting the feed position for the material.
Enter: A = Seam starting point B = Machine zero point

Note
The following advantages or disadvantages arise depending on the feed position:
Feed point A = low cycle time
Feed point B = easier feed for larger sewing patterns, longer cycle time.
Referencing
The behavior for referencing the step motors after a sewing procedure can be configured using this menu item.
Enter: 
- 0 = no referencing
- 1 = reference each time
- 2 – 10 = after every 2nd - 10th sewing procedure.

Raising the clamping foot
Setting whether the clamping foot is to be raised after referencing the step motors.
Enter: 
- A = the clamping foot is raised before referencing.
- B = the clamping foot is raised after referencing.

Sewing motor reverse rotation angle
After the end of the sewing procedure it is possible to rotate the sewing motor backwards so that the needle can reach a higher position. Before the next sewing procedure the needle position is moved once more to the sewing motor stop position. The angle that the sewing motor is to be back rotated can be set.
Enter: 
- 0 … 70° (0° = back rotation switched off)
- (70° = highest needle position)

Opening the thread tension angle
Setting the angle to open the thread tension in the last stitch.
Enter: 
- 200° … 355°

The thread tension is opened before reaching the thread cut off position. Thus only the mechanical pre-tensioning works in the cutting procedure.
All angles are given from the sewing motor reference position.
**Soft start**

The speed parameters for the soft start can be set in this sub menu.

### Speed of 1st stitch

Enter the speed for the first stitch.

Enter: 400...900 [rpm]

### Speed of 2nd stitch

Enter the speed for the second stitch.

Enter: 400 ... 2700 [rpm]

### Speed of 3rd stitch

Enter the speed for the third stitch.

Enter: 400 ... 2700 [rpm]

### Speed of 4th stitch

Enter the speed for the fourth stitch.

Enter: 400 ... 2700 [rpm]

### Speed of 5th stitch

Enter the speed for the fifth stitch.

Enter: 400 ... 2700 [rpm]
Equipment
The parameters for the sewing equipment can be set in this sub menu.

Note
Entering the clamping foot number automatically checks whether the sewing pattern currently to be sewn is in the material support plate opening.
If there are no specified clamping feet free dimensions can also be defined.

Clamping foot
Selecting a fixed clamping foot as a device.
Enter: Alternative:

Free dimensions
Selecting a clamping foot with free sewing field dimensions.
Enter: Alternative:

Number
Selecting a DA clamping foot number.
Enter: 1

<table>
<thead>
<tr>
<th>Clamping foot number</th>
<th>Material support plate opening dimensions X x Y (mm)</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>10 x 10</td>
<td>button clamps</td>
</tr>
</tbody>
</table>

For technical reasons and to provide a safety margin the sewing field is smaller than the material support plate opening.
Length
Entering a freely selectable sewing field length. Entry only possible if “free clamping measurement” has been selected. Otherwise the length/width of the selected clamps are displayed (cannot be changed).
Enter: 0.5 … 20.0

Width
Entering a freely selectable sewing field width. Entry only possible if “free clamping measurement” has been selected. Otherwise the length/width of the selected clamps are displayed (cannot be changed).
Enter: 0.5 … 40.0

Equipment
Optional units can be activated using this sub menu.
Fittings sub menu

Manual switch
Activating the optional manual switch. If this option has been selected a menu item to select the operating mode appears in the “User configuration” menu.
Enter: ON / OFF

Electrical thread wiper
Switching the electrical thread wiper on/off.
Enter: ON/OFF

Laser lights
Activating the 3 optional laser lights.
Enter: ON / OFF

Assigning the inputs
This menu item gives an overview of the assignment of the inputs with (optional) units.

Assigning the 24V outputs
This menu item gives an overview of the assignment of the 24v outputs with (optional) units.
Times sub menu

<p>| | |</p>
<table>
<thead>
<tr>
<th></th>
<th></th>
</tr>
</thead>
<tbody>
<tr>
<td>t1:</td>
<td>100</td>
</tr>
<tr>
<td>t2:</td>
<td>120</td>
</tr>
<tr>
<td>t3:</td>
<td>50</td>
</tr>
<tr>
<td>t4:</td>
<td>70</td>
</tr>
<tr>
<td>t5:</td>
<td>15</td>
</tr>
</tbody>
</table>

Waiting time between pedal position 1 (lower clamping foot) and start of sewing (t1).
Time only relevant with rapid start using the pedal or the hand switch (optional).
Enter: 50 ... 300 ms
Default value: 150 ms

Switch on time for thread wiper magnet (t2)
This menu item is only displayed if the electrical thread wiper option is switched on in the Fittings menu.
Enter: 30 ... 100 ms
Default value: 40 ms

Time when thread wiper magnet off - clamping foot magnet on (t3)
Waiting time between the thread wiper magnets being switched off and the clamping foot magnets being switched on.
This menu item is only displayed if the electrical thread wiper option is switched on in the Fittings menu.
Enter: 0 ... 300 ms
Default value: 50 ms

Waiting time between clamping foot magnet coming on and the reference run (t4).
Waiting time between the clamping foot magnets being switched on and the step motors being referenced.
Enter: 0 ... 300 ms
Default value: 70 ms

Time for activating energy saving mode (t5)
Waiting time between any operating component being operated (control panel, pedal, manual switch) until energy saving mode is activated.
Enter: 0 ... 60 min
0 = energy saving mode switched off
Operation-specific settings are configured in this menu.

- Select the required parameters/sub menu by pressing “<” or “>”. The selected parameters/sub menu are shown inversely.
- Start the selected parameters by pressing OK or switch to the sub menu.

**Language**

The language can be selected in this sub menu.

- Selects German for the technician level.
- Selects English for the technician level.
- Selects the numbering of the menu items for technician level.
Manul switch operating mode (optional)
Selecting the manual switch mode.
This menu item is only available if the “manual switch” option is activated in the Fittings menu.
Enter: A = Rapid start
       B = Normal

In the “NORMAL” manual switch mode the switches have the following functions:
Switch 1: Raising and lowering the clamping foot.
        Stopping the sewing procedure.
        Cancelling the sewing procedure when it has been stopped.
Switch 2: Start sewing when the clamping foot is lowered.
        Stopping the sewing procedure.
        Continuing the sewing procedure when it has been stopped.

In the “RAPID START” manual switch mode the switches have the following functions:
Switch 1: Raising and lowering the clamping foot.
        Stopping the sewing procedure.
        Cancelling the sewing procedure when it has been stopped.
Switch 2: Start sewing.
        If the clamping foot is not lowered it is lowered.
        Stopping the sewing procedure.
        Continuing the sewing procedure when it has been stopped.

Parameter blocking
Switching the ability of parameters to be changed on or off in sewing and programming modes.
Enter: ON / OFF

Note
If the parameter block is switched on no parameter changes are possible any more in sewing and programming modes.
Blocking sewing patterns

Individual sewing patterns can be released for selection or blocked in this sub menu.

The following restrictions normally apply:

1. Sewing pattern mode
   - The sewing pattern currently selected in sewing mode cannot be blocked.
   - Blocked sewing patterns cannot be selected from the selection list in sewing mode.
     Blocked sewing patterns are indicated by “#”.

2. Sewing pattern sequence mode
   - A blocked sewing pattern can be selected in a sequence. At the start of the sewing sequence (when the clamping foot is lowered, an error message appears, however. The sewing sequence cannot be started.
   - The last selected sewing pattern in sewing mode cannot be blocked.

Block all
All sewing patterns are blocked with the aforementioned restrictions. The status of the sewing pattern numbers displayed switches to “OFF”.

Activate all
All sewing patterns are activated. The status of the sewing pattern numbers displayed switches to “ON”.

Blocking/ activating individual sewing patterns
Enter: ON / OFF
Blocking sequences
Individual sequences can be released for selection or blocked in this sub menu.

The following restrictions normally apply:

1. **Sewing pattern mode:**
   - The last selected sequence in sequence mode cannot be blocked.

2. **Sewing pattern sequence mode:**
   - The sequence currently selected in sewing mode cannot be blocked.
   - Blocked sequences cannot be selected from the selection list in sewing mode.
   - Blocked sequences are indicated by “#”.

**Block all**
All sequences are blocked with the aforementioned restrictions. The status of the sequence numbers displayed switches to “OFF”.

**Activate all**
All sequences are activated. The status of the sequence numbers displayed switches to “ON”.

**Blocking/ activating individual sequences**
Enter: ON / OFF
8.6.5.3 Service functions

Service functions enable a rapid check of all hardware components.

**Note**
The service menu can be reached directly when switching the machine on (see Section 8.2.1).

**Multi-test**
All hardware components can be checked in the Multi-test menu.

**180° disc**
This menu item makes a function available to set the referencing of the sewing motor (180° disc) correctly (see Service instructions).

**Events**

**Initialization**
Using this menu the events memory and the permanent data can be reset to factory settings.
Multi-test
Selecting the Multi-test sub menu

Caution, danger of injury!
Do not put your hands into the running machine during the function check of the output components.

Risk of breaking!
When testing individual output components first of all check whether collisions may occur when the machine moves.
**Output test**
The function of the output components is checked with this test function.

- Start the test function by pressing OK.
- Select the required output component by pressing “ hely” or “ hely”.
- Switch the selected output component on or off by pressing OK.

---

**Caution, danger of injury!**
Do not put your hands into the running machine during the function check of the output components.

---

<table>
<thead>
<tr>
<th>Output component</th>
<th>Function</th>
</tr>
</thead>
<tbody>
<tr>
<td>Y1</td>
<td>Thread wiper magnet</td>
</tr>
<tr>
<td>Y4</td>
<td>Thread tension magnet</td>
</tr>
<tr>
<td>Y21</td>
<td>Laser marking light 1, if option is activated</td>
</tr>
<tr>
<td>Y22</td>
<td>Laser marking light 2, if option is activated</td>
</tr>
<tr>
<td>Y23</td>
<td>Laser marking light 3, if option is activated</td>
</tr>
</tbody>
</table>

Cf. also paragraph 8.7 Distributor circuit board
**PWM output test**

The function of the magnets is checked with this test function.

- Start the test function by pressing **OK**.
- Select the required output component by pressing “” or “”.
- Switch the selected output component on or off by pressing **OK**.

---

**Caution, danger of injury!**

Do not put your hands into the running machine during the function check of the output components.

---

<table>
<thead>
<tr>
<th>Output component</th>
<th>Function</th>
</tr>
</thead>
<tbody>
<tr>
<td>Y31</td>
<td>Clamping foot magnet</td>
</tr>
</tbody>
</table>

Cf. also paragraph 8.7 Distributor circuit board
**Input test**
The input components to be tested are selected with this test function.

---

**CAUTION!**
The input components are set carefully at the factor. Configuring and correcting them must only be done by trained service personnel.

- Start the test function by pressing **OK**.
- Select the required input component by pressing “+” or “-”. The switching status of the input component is displayed.

- To exit the test function press **ESC**. The Multi-test menu appears.

---

<table>
<thead>
<tr>
<th>Input component</th>
<th>Function</th>
</tr>
</thead>
<tbody>
<tr>
<td>S1</td>
<td>Manual switch 1, if the option is activated</td>
</tr>
<tr>
<td>S2</td>
<td>Manual switch 2, if the option is activated</td>
</tr>
<tr>
<td>S14</td>
<td>Pedal A</td>
</tr>
<tr>
<td>S15</td>
<td>Pedal B</td>
</tr>
<tr>
<td>S16.</td>
<td>Pedal C</td>
</tr>
<tr>
<td>S17</td>
<td>Pedal D</td>
</tr>
<tr>
<td>N ref.</td>
<td>Sewing motor reference switch</td>
</tr>
<tr>
<td>X ref.</td>
<td>X reference switch</td>
</tr>
<tr>
<td>Y ref.</td>
<td>Y reference switch</td>
</tr>
</tbody>
</table>

The current assignment of the inputs is specified in the Fittings menu in the “Assignment of inputs” sub menu.

Cf. also paragraph 8.7 Distributor circuit board
Auto input test

The function of the input components is checked with this test function.

- Start the test function by pressing **OK**.
- Operate the required input component. The switching status and number of the input component operated are displayed.

```
              Auto-Eing-Test

              Eingang  S14: -
```

- To exit the test function press **ESC**. The Multi-test menu appears.

To assign input components see the Input test table.
Sewing motor test
The sewing motor can be checked with this test function.

– Start the test function by pressing OK.
– Start the motor by pressing .
– Change the speed by pressing “” or “”.
  The speed is displayed.

Press ESC.
The test finishes and the motor stops.
The sewing motor control unit performs a reference run and the clamping foot is raised.
The Multi-test menu appears on the display.
**Step motor test**
The step motors and the associated reference switches can be checked with this test function.

**CAUTION Risk of breaking!**
Move the needle upwards with the hand wheel before the test.

- Start the test function by pressing **OK**.
- Check the step motor for transverse movement (X axis).
  Move the step motor by pressing “←” or “→”.
  The number of steps moved is shown by the arrow on the left.
  The status of the reference switch is modified by the reference setting.
- Check the step motor for lengthwise movement (Y axis).
  Move the step motor by pressing “↑” or “↓”.
  The number of steps traveled is shown above the arrow.
  The status of the reference switch is modified by the reference setting.
- Press **ESC**.
  The test finishes.
  The Multi-test menu appears on the display.
**RAM test**

The memory (SRAM and program data memory) is checked with this test function.

- Start the test function by pressing **OK**.
  The test results are displayed.

```
RAM-Test

SRAM  : ✓
NVSRAM: ✓
```

<table>
<thead>
<tr>
<th>Display</th>
<th>Explanation</th>
</tr>
</thead>
<tbody>
<tr>
<td>SRAM OK</td>
<td>The memory is working properly</td>
</tr>
<tr>
<td>SRAM ERROR</td>
<td>Error in the memory</td>
</tr>
<tr>
<td>NV-RAM OK</td>
<td>Program data memory is OK</td>
</tr>
<tr>
<td>NV-RAM ERROR</td>
<td>Error in program data memory</td>
</tr>
</tbody>
</table>

- Press **ESC**.
  The test finishes.
  The Multi-test menu appears on the display.
EEPROM test
This test function checks the microprocessor’s programmable read-only memory (ROM).

- Start the test function by pressing OK. The display shows the following rest results:
  - ROM size
  - Machine class
  - Software version
  - Software date
  - checksum and status

<table>
<thead>
<tr>
<th>EEPROM Test</th>
</tr>
</thead>
<tbody>
<tr>
<td>ROM-Gr.: 675k</td>
</tr>
<tr>
<td>Klasse: 531</td>
</tr>
<tr>
<td>Version: A01.0</td>
</tr>
<tr>
<td>Datum: 30.09.09</td>
</tr>
<tr>
<td>Checks.: 0x1234 Ok</td>
</tr>
</tbody>
</table>

Note:
The details change depending on the software version.

- Press ESC.
The test finishes.
The Multi-test menu appears on the display.
Events
In the event of a malfunction the menu can give important information on the cause of the malfunction.

Event memory

<table>
<thead>
<tr>
<th>Ereignisspeicher</th>
</tr>
</thead>
<tbody>
<tr>
<td>E4304 3 x</td>
</tr>
<tr>
<td>E8254 1 x</td>
</tr>
</tbody>
</table>

(Example)
All events that have occurred are displayed in this menu item.
- Exit the menu item by pressing ESC.
- Display again by pressing °.

Latest events

<table>
<thead>
<tr>
<th>Letzte Ereignisse</th>
</tr>
</thead>
<tbody>
<tr>
<td>1 E4304 Z 1154889</td>
</tr>
<tr>
<td>S 263</td>
</tr>
<tr>
<td>2 E4304 Z 1152558</td>
</tr>
<tr>
<td>S 263</td>
</tr>
<tr>
<td>3 E8254 Z 1150034</td>
</tr>
<tr>
<td>S 263</td>
</tr>
</tbody>
</table>

(Example)
The latest events that have occurred are displayed in this menu item.
Z = milliseconds after switching the machine on
S = Machine unit counter
E = Event/ error number
- Exit the menu item by pressing ESC.
- Display again by pressing °.
Initializing (Init)
Selecting the sub menu to initialize the event memory and permanent data.

Event memory
The event memory can be reset using this menu item.

Sewing pattern programs (variations) and sequences
Sewing pattern programs and sequences can be deleted using this menu item.

Machine parameters
Machine parameters, soft start speeds, times, user configuration, hook thread counter data and options can be reset to factory settings using this menu item.

Free seam contours
All free seam contours can be reset (deleted) using this menu item.

Note
By resetting sewing pattern programs and sequences are also deleted and the numbers of subsequent programs and sequences modified.

Whole machine
All permanent data can be reset using this menu item. After resetting the machine is restarted automatically.

Note
After the machine has been restarted the clamp number and fittings must be selected again (see installation instructions Section 9).
8.6.5.4 Free contours

Up to nine freely defined seam contours can be created and sewn with the button sewer 531. The co-ordinates of the seam contour are entered on the control panel.

Create
A new seam contour can be created with this menu item.

Note
The seam contour number is allocated automatically.

Modify
After selecting the seam contour to be modified you go to the sub menu for changing the seam contour.

Delete
A selected seam contour can be deleted with this menu item.

Copy
Any basic sewing pattern number of free seam contour can be copied and modified. After selecting the sewing pattern number you go to the “Change seam contour” sub menu.
- Select the required standard sewing pattern by pressing “û” or “û’”.
- Select the standard sewing pattern by pressing OK.

Note
The seam contour number is allocated automatically.

Number of available stitches:
The number of stitches still available is displayed (max. 3000).

Number of available contours:
The number of contours still available is displayed (max. 9).
Determining contour co-ordinates

When creating a seam contour each individual stitch with details of the position on the co-ordinate cross (S and Y axis) must be entered into the control unit. The individual co-ordinate points must therefore be determined in advance.

The co-ordinate points can be determined using millimeter paper.

Note

The seam contour should be created so that the machine zero point is in the middle of the contour as far as possible.

- Draw the maximum sewing field size on the millimeter paper (X = max. 40 mm, Y = max. 20 mm).
- Put the co-ordinate cross in the middle of the sewing area.
- Plot the seam contour.
- Determine the X and Y co-ordinates for each required stitch.
- Enter the X and Y co-ordinates into the control unit (see next page).
Creating the contour

The X and Y co-ordinates for each individual stitch are entered in this menu.

<table>
<thead>
<tr>
<th>X1: 0.0</th>
</tr>
</thead>
<tbody>
<tr>
<td>Y1: 0.0</td>
</tr>
<tr>
<td>X2: 0.0</td>
</tr>
<tr>
<td>Y2: 0.0</td>
</tr>
<tr>
<td>X3: 0.0</td>
</tr>
<tr>
<td>Y3: 0.0</td>
</tr>
</tbody>
</table>

**Note:**

To enter stitch operations (e.g. interim cutting) first of all complete the contour (enter co-ordinates) and then insert into the Change contour menu by editing the stitch operation.

**X1**

Entering the X co-ordinates for stitch 1

Enter: -20.0 ... +20.0

**Y1**

Entering the Y co-ordinates for stitch 1

Enter: -10.0 ... +10.0

**Note:**

The value X1 can be changed as shown in Section 8.3.1.

After confirming the value of X1 by pressing OK select menu item Y1 by pressing “OK”.

The values for Y1, X2, Y2, X3 and Y3 can be changed as described for value X1.

After confirming the entry of Y3 by pressing OK select “Add stitch” by pressing “OK”.

After selecting this line by pressing OK the next co-ordinates Xn+1 and Yn+1 are specified in the top two menu lines (here: X4 and Y4).

The selection bar switches automatically to the line Xn+1 (here: X4).

The values Xn+1 and Yn+1 can be changed if necessary as described above. This procedure can be repeated until all the stitch co-ordinates have been entered.

Adding a stitch

Function to add a stitch.

The co-ordinates for the first three stitches (here: X1/Y1, X2/Y2 and X3/Y3) are moved upwards and Xn+1/Yn+1 (here: X4/Y4) appears on the display.
Parameter sub menu
Selecting the sub menu to enter the contour parameters

<table>
<thead>
<tr>
<th>Default speed:</th>
</tr>
</thead>
<tbody>
<tr>
<td>Default speed</td>
</tr>
<tr>
<td>Enter: 100...2700 rpm</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Distance X:</th>
</tr>
</thead>
<tbody>
<tr>
<td>Distance from the hole in the X direction</td>
</tr>
<tr>
<td>Enter: 0...40.0 mm</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Distance Y:</th>
</tr>
</thead>
<tbody>
<tr>
<td>Distance from the hole in the Y direction</td>
</tr>
<tr>
<td>Enter: 0...20.0 mm</td>
</tr>
</tbody>
</table>

Default values = external stitches in X and Y direction
Values must be changed depending on the distance between the button and the hole (refers to correct scaling in the main menu).

If the free seam contour is currently selected in the main display and if one or both of the X/Y distances have been changed, the value for the length or width or both must be changed accordingly in the main menu.
Change contour

Stitch co-ordinates
Selecting the sub menu to change the stitch co-ordinates.

Removing a stitch:
Delete stitch.
Enter: stitch number to be deleted

Inserting a stitch:
Insert stitch.
Enter: Stitch number before which a stitch is to be inserted.
The sub menu to change the stitch co-ordinates appears.

Adding a stitch (at the end)
The sub menu to change the stitch co-ordinates appears.

Parameters
Selecting the sub menu to change the contour parameters

Stitch co-ordinates sub menu
The sub menu appears immediately if the contour to be changed has 99 stitches or fewer.
The following menu appears if the contour to be changed has more than 99 stitches:

- Select the required stitch area by pressing “<” or “>”.
- Select the stitch area by pressing OK.
The “Stitch co-ordinates” sub menu appears.
Select the required stitch by pressing “_” or “_”.

Select the stitch by pressing **OK**.

The sub menu to change a stitch co-ordinate appears.

If a stitch operation is allocated to a stitch this will be marked by an asterisk (*) instead of a forward slash (/).

### Changing the stitch co-ordinates sub menu

This sub menu appears when selecting a stitch co-ordinate from the “Stitch co-ordinates” menu after inserting or changing a stitch.

#### Example:

<table>
<thead>
<tr>
<th>F1</th>
<th>X10:</th>
<th>1.70</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>Y10:</td>
<td>1.70</td>
</tr>
</tbody>
</table>

#### Op 1

Changing the traveling operation of stitch 10.

Enter: see Table on page 70

#### Op 2

Changing the thread tensioning operation of stitch 10.

Enter: see Table on page 70

#### Op 3

Changing the speed operation of stitch 10.

Enter: see Table on page 70

**Note:**

The stitch operation entered is performed **after** the stitch.
<table>
<thead>
<tr>
<th>Type of operation</th>
<th>Operation</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>Traveling operation (Op 1)</td>
<td>Intermediate cutting</td>
<td>Intermediate cutting can be programmed in a contour up to 10 times. There must be at least 3 stitches between 2 intermediate cutting procedures.</td>
</tr>
<tr>
<td>Thread tension operation (Op 2)</td>
<td>Thread tension 1</td>
<td>Thread tension area 1</td>
</tr>
<tr>
<td></td>
<td>Thread tension 2</td>
<td>Thread tension area 2</td>
</tr>
<tr>
<td></td>
<td>Thread tension 3</td>
<td>Thread tension area 3</td>
</tr>
<tr>
<td></td>
<td>Thread tension 4</td>
<td>Thread tension area 4</td>
</tr>
<tr>
<td></td>
<td>Thread tension 5</td>
<td>Thread tension area 5</td>
</tr>
<tr>
<td>Speed operation (Op 3)</td>
<td>Speed 200</td>
<td>Speed reduction to 200 1/min</td>
</tr>
<tr>
<td></td>
<td>Speed 400</td>
<td>Speed reduction to 400 1/min</td>
</tr>
<tr>
<td></td>
<td>Speed 600</td>
<td>Speed reduction to 600 1/min</td>
</tr>
<tr>
<td></td>
<td>Speed 800</td>
<td>Speed reduction to 800 1/min</td>
</tr>
<tr>
<td></td>
<td>Speed 1000</td>
<td>Speed reduction to 1000 1/min</td>
</tr>
<tr>
<td></td>
<td>Speed 1200</td>
<td>Speed reduction to 1200 1/min</td>
</tr>
<tr>
<td></td>
<td>Speed 1400</td>
<td>Speed reduction to 1400 1/min</td>
</tr>
<tr>
<td></td>
<td>Speed 1600</td>
<td>Speed reduction to 1600 1/min</td>
</tr>
<tr>
<td></td>
<td>Speed 1800</td>
<td>Speed reduction to 1800 1/min</td>
</tr>
<tr>
<td></td>
<td>Speed 2000</td>
<td>Speed reduction to 2000 1/min</td>
</tr>
<tr>
<td></td>
<td>Speed 2200</td>
<td>Speed reduction to 2200 1/min</td>
</tr>
<tr>
<td></td>
<td>Speed 2400</td>
<td>Speed reduction to 2400 1/min</td>
</tr>
<tr>
<td></td>
<td>Speed 2600</td>
<td>Speed reduction to 2600 1/min</td>
</tr>
<tr>
<td></td>
<td>Default speed</td>
<td>Set to default speed</td>
</tr>
</tbody>
</table>

If “No operation” is selected the corresponding stitch operation is switched off.
Deleting a contour

- Select **Delete** by pressing † or ¥.
- “Press **OK**.
- Select the required contour number by pressing “])), or “)),
- Confirm the selection by pressing **OK**.
  The contour is deleted.

**CAUTION!**

By deleting a free seam contour the numbering of sewing pattern programs and/or sequences may change as these may be deleted too.
Copying a contour

- Select **Copy** by pressing « or ».  
- „Press OK.  
- Select the required sewing pattern number (1-50,91-99) by pressing “,” or “,”.  
- Confirm the selection by pressing **OK**. 

The contour is copied and the “Change contour” menu is displayed.

The contour is changed by following the “Change contour” section on Page 68.
8.6.5.5 Memory dongle

Using the functions of this sub menu data from the machine can be saved on a dongle or data from a dongle can be loaded onto the machine.

**Dongle content**

Using this menu item the content of a memory dongle inserted into the control unit can be displayed.

**Load**

Using this menu item program data (sewing pattern programs and sequences) and machine parameters as well as free seam contours can be uploaded from the dongle to the machine.

**Save**

Using this menu item program data (sewing pattern programs and sequences) and machine parameters as well as free seam contours can be saved on a data dongle.

**Format**

A dongle must be formatted as a data dongle to save data.

The dongle must be inserted into the control unit in the pin connection marked Dongle (X110).
Display dongle content

Boot dongle
If a boot dongle is inserted information about the machine program is output.

![Boot Dongle Information](image)

(Example)
A boot dongle with a machine program for any machine class can be inserted in order to display the dongle information.

Data dongle
If a data dongle is inserted that has been formatted for machine class 531 the saved sewing pattern programs or free seam contours are displayed.

Reading out the saved sewing pattern programs

![Data Dongle Information](image)

(Example)
Press ⇒ to switch between the saved sewing pattern programs display and the free seam contours display.
Reading out the saved free seam contours

Data from a different machine class dongle
The following display appears if a dongle for a different machine class is inserted.

Loading data from the dongle to the machine
Using this menu item program data (sewing pattern programs and sequences) and machine parameters or all free seam contours can be loaded from the dongle to the machine.
Content
Using this menu item the content of a memory dongle inserted into the control unit can be displayed.
Before loading the following four data areas a window appears for each of them to confirm the selection.

- Press Ø (No) to cancel the procedure or Ø (Yes) to perform the procedure.

The time required to load the data depends on the number of sewing pattern programs and free seam contours.

Free seam contours
This menu item starts loading all free seam contours.

All free seam contours on the machine are deleted when loading the dongle.

Sewing pattern programs and sequences
This menu item starts loading all sewing pattern programs and sequences.

All sewing machine programs and sequences on the machine are overwritten when loading the memory dongle.
If sewing machine programs or sequences relate to free seam contours that are not available these are deleted again after loading. In this case the free seam contours should be loaded first or the whole machine.

Machine parameters
This menu item starts loading the machine parameters.
The following data is loaded from the memory dongle:
Cutting speed, number of referencing procedures, feed position, maximum sewing speed, stop position, the current sewing pattern number and standard sewing pattern data if the equipment matches.

The machine parameters on the machine are overwritten when loading the memory dongle.

Whole machine
This menu item starts loading all the aforementioned data areas.

The data on the machine is deleted when loading the memory dongle.
Saving data on the dongle
Here program data (sewing pattern programs and sequences) and machine parameters or all free seam contours from the machine can be saved on the dongle.

Content
Using this menu item the content of a memory dongle inserted into the control unit can be displayed.

Before saving the following four data areas a window appears for each of them to confirm the selection.
- Press \( \text{c63} \) (No) to cancel the procedure or \( \text{c63} \) (Yes) to perform the procedure.

The time required to save the data depends on the number of free seam contours on the machine.

**All free seam contours**
This menu item starts saving all free seam contours.

All free seam contours on the dongle are deleted during the save procedure.

**Sewing pattern programs and sequences**
This menu item starts saving all sewing pattern programs and sequences.

All sewing pattern programs and sequences on the memory dongle are overwritten during the save procedure.
A window to confirm the selection appears.
- Press 🆕 (No) to cancel the procedure or 🆕 (Yes) to perform the procedure.

The program data and machine parameters on the dongle are deleted during the save procedure.

**Note**
The time required to save the data depends on the number of sewing pattern programs on the machine.

**Formatting the dongle**
Before a dongle can be used to save data it must be formatted as a data dongle.

- To start press P.
  A window appears to confirm the selection.
- Press 🆕 (No) to cancel the procedure or 🆕 (Yes) to perform the procedure.

When the dongle is formatted any data stored on it is lost.
## Error messages

<table>
<thead>
<tr>
<th>Pictogram</th>
<th>Designation</th>
<th>Possible cause</th>
<th>Elimination</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>Dongle missing</td>
<td>no dongle inserted</td>
<td>Insert dongle into the control unit</td>
</tr>
<tr>
<td></td>
<td>Dongle empty</td>
<td>no data stored on the dongle</td>
<td>save data on the dongle</td>
</tr>
<tr>
<td></td>
<td>wrong type of dongle</td>
<td>Dongle has the wrong format for the required function.</td>
<td>• use another dongle</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td>• Format the dongle</td>
</tr>
<tr>
<td></td>
<td>wrong machine class</td>
<td>Data dongle is not formatted for Class 531.</td>
<td>• use another dongle</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td>• Format the dongle</td>
</tr>
<tr>
<td></td>
<td>Format ID error</td>
<td>• Dongle not correctly formatted</td>
<td>• Format the dongle again</td>
</tr>
<tr>
<td></td>
<td></td>
<td>• Dongle defective</td>
<td>• use another dongle</td>
</tr>
<tr>
<td></td>
<td>unknown dongle type</td>
<td>• Dongle not correctly formatted</td>
<td>• Format the dongle again</td>
</tr>
<tr>
<td></td>
<td></td>
<td>• Dongle faulty</td>
<td>• Use another dongle</td>
</tr>
</tbody>
</table>
### Description of the outputs

<table>
<thead>
<tr>
<th>Output number</th>
<th>Output Assignment</th>
<th>Assignment</th>
</tr>
</thead>
<tbody>
<tr>
<td>Y1 (FW)</td>
<td>24V / 4 A</td>
<td>Thread wiper magnet</td>
</tr>
<tr>
<td>Y2</td>
<td>24V / 0.5 A</td>
<td>-</td>
</tr>
<tr>
<td>Y3</td>
<td>24V / 3 A</td>
<td>-</td>
</tr>
<tr>
<td>Y4 (FS)</td>
<td>24V / 4 A*</td>
<td>Thread tension magnet</td>
</tr>
<tr>
<td>Y5</td>
<td>24V / 0.5 A</td>
<td>-</td>
</tr>
<tr>
<td>Y13 (FA)</td>
<td>24V / 3 A*</td>
<td>thread cutter magnet</td>
</tr>
<tr>
<td>Y14 - Y17</td>
<td>24V / 0.5 A</td>
<td>-</td>
</tr>
<tr>
<td>Y18 - Y19</td>
<td>24V / 6.5 A*</td>
<td>-</td>
</tr>
<tr>
<td>Y21 - Y23</td>
<td>24V / 0.2A</td>
<td>Option: Laser marking lights 1 - 3</td>
</tr>
<tr>
<td>Y24 - Y28</td>
<td>24V / 0.2A</td>
<td>-</td>
</tr>
<tr>
<td>Y31(X11/ X12: FL)</td>
<td>60V / 8A(2A)</td>
<td>Clamping foot magnet</td>
</tr>
</tbody>
</table>

*: Output is PWM-enabled

Magnets and magnetic valves are connected between +24V (X9) and the corresponding output (X8, X10).
## Description of inputs

<table>
<thead>
<tr>
<th>Input number</th>
<th>Input</th>
<th>Assignment</th>
</tr>
</thead>
<tbody>
<tr>
<td>S1</td>
<td>24V</td>
<td>Option: Manual switch 1</td>
</tr>
<tr>
<td>S2</td>
<td>24V</td>
<td>Option: Manual switch 2</td>
</tr>
<tr>
<td>S3 - S10</td>
<td>24V</td>
<td>-</td>
</tr>
<tr>
<td>S12 (N ref.)</td>
<td>24V</td>
<td>Sewing motor reference switch</td>
</tr>
<tr>
<td>S14</td>
<td>24V</td>
<td>Pedal A</td>
</tr>
<tr>
<td>S15</td>
<td>24V</td>
<td>Pedal B</td>
</tr>
<tr>
<td>S16</td>
<td>24V</td>
<td>Pedal C</td>
</tr>
<tr>
<td>S17</td>
<td>24V</td>
<td>Pedal D</td>
</tr>
<tr>
<td>S21 - S24</td>
<td>24V</td>
<td>-</td>
</tr>
<tr>
<td>S25 (X ref.)</td>
<td>TTL</td>
<td>Step motor X axis reference switch</td>
</tr>
<tr>
<td>S26 (Y ref.)</td>
<td>TTL</td>
<td>Step motor Y axis reference switch</td>
</tr>
<tr>
<td>S27 - S28</td>
<td>TTL</td>
<td>-</td>
</tr>
</tbody>
</table>

S1 - S17: The bottom switching threshold is 7.2V, the top one 16.8 V
S21 - S24 The switching threshold is 1.5V.
8.8 Error messages

If an error occurs in the control system or in the sewing pattern program the display shows a corresponding symbol and an error number.

Using the following table the cause of the error can be determined and help obtained.

8.8.1 Error categories

<table>
<thead>
<tr>
<th>No.</th>
<th>Pictogram</th>
<th>Name</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td><img src="Stop.png" alt="Stop" /></td>
<td>Serious error</td>
<td>The emergency stop switch is activated. The locking unit must be switched off and on again.</td>
</tr>
<tr>
<td>2</td>
<td><img src="Error.png" alt="Error" /></td>
<td>Error</td>
<td>Work can only continue after the user has acknowledged the error.</td>
</tr>
<tr>
<td>3</td>
<td><img src="Warning.png" alt="Warning" /></td>
<td>Warning</td>
<td>Work can only continue after the user has acknowledged the warning.</td>
</tr>
</tbody>
</table>
### 8.8.2 Application messages

<table>
<thead>
<tr>
<th>Pictogram</th>
<th>Description</th>
<th>Category</th>
<th>Reaction/ troubleshooting</th>
</tr>
</thead>
</table>
|           | Capacity counter is zero                             | Note     | · Clamping foot can only be lowered after pressing OK  
· The message disappears when it has been confirmed.  
· When the message has been confirmed the capacity counter is reset to its initial value. |
|           | Hand wheel turned manually                           | Warning  | After the sewing procedure is interrupted:  
· no further sewing is possible  
· Cancel the sewing procedure by moving the pedal backwards, confirm with manual switch 1 (clamps) or press ESC on the control panel. |
|           | Contour exceeds the internal clamping foot frame in the -X or +X direction. | Warning  | · no further sewing is possible  
· select another clamping foot  
· select another sewing pattern  
· Reduce the X offset in the appropriate direction |
|           | Contour exceeds the internal clamping foot frame in the -X or +X and Y direction. | Warning  | · no further sewing is possible  
· select another clamping foot  
· select another sewing pattern  
· Reduce the X offset in the appropriate direction.  
Reduce the sewing pattern in the Y direction. |
|           | Contour exceeds the internal clamping foot frame in the -X and -Y and +Y direction. | Warning  | · no further sewing is possible  
· select another clamping foot  
· select another sewing pattern  
· Reduce X offset  
· Reduce the X offset in the appropriate direction. |
|           | Contour exceeds the internal clamping foot frame in the +X and -Y or +Y direction. | Warning  | · no further sewing is possible  
· select another clamping foot  
· select another sewing pattern  
· Reduce X offset  
· Reduce the Y offset in the appropriate direction. |
|           | Contour exceeds the internal clamping foot frame in the X and -Y or +Y direction. | Warning  | · no further sewing is possible  
· select another clamping foot  
· select another sewing pattern  
· Reduce the sewing pattern in the X direction  
· Reduce the Y offset in the appropriate direction. |
|           | Contour exceeds the internal clamping foot frame in the -Y or +Y direction. | Warning  | · no further sewing is possible  
· select another clamping foot  
· select another sewing pattern  
· Reduce the Y offset in the appropriate direction. |
<table>
<thead>
<tr>
<th>Pictogram</th>
<th>Description</th>
<th>Category</th>
<th>Reaction/ troubleshooting</th>
</tr>
</thead>
</table>
| ![image](42x716) | Contour exceeds the clamping foot material support opening in the X direction | Warning    | · Sewing cannot start  
                      · select another clamping foot  
                      · select another sewing pattern  
                      · Reduce the sewing pattern in the X direction. |
| ![image](41x646) | Contour exceeds the clamping foot material support opening in the Y direction | Warning    | · Sewing cannot start  
                      · select another clamping foot  
                      · select another sewing pattern  
                      · Reduce the sewing pattern in the Y direction. |
| ![image](42x575) | Contour exceeds the clamping foot material support opening in the X and Y direction | Warning    | · Sewing cannot start  
                      · select another clamping foot  
                      · select another sewing pattern  
                      · Reduce the sewing pattern in the X and Y direction. |
| ![image](42x514) | Sewing pattern blocked                                                       | Note       | · Sewing cannot start  
                      · select another sewing pattern  
                      · Activate sewing pattern |
<p>| <img src="42x456" alt="image" /> | Excessive thread tension magnet temperature                                 | Warning    | · Flow adjuster (thread tension) is switched off |
| <img src="42x399" alt="image" /> | Time expired without operating input                                         |            | · Clamping foot is lowered |</p>
<table>
<thead>
<tr>
<th>Error code</th>
<th>Description</th>
<th>Possible cause</th>
<th>Troubleshooting</th>
</tr>
</thead>
<tbody>
<tr>
<td>1051</td>
<td>Sewing motor time out</td>
<td>- Cable to sewing motor reference switch faulty</td>
<td>- Check cable</td>
</tr>
<tr>
<td></td>
<td></td>
<td>- Sewing motor faulty</td>
<td>- Check reference switch</td>
</tr>
<tr>
<td></td>
<td></td>
<td>- Machinery not running smoothly</td>
<td>- Check sewing motor</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td>- Check mechanics</td>
</tr>
<tr>
<td>1055</td>
<td>Sewing motor overload</td>
<td>- Sewing motor blocked</td>
<td>- Eliminate the blockage/ stiffness</td>
</tr>
<tr>
<td></td>
<td></td>
<td>/not running smoothly</td>
<td>- Check sewing motor</td>
</tr>
<tr>
<td></td>
<td></td>
<td>- Sewing motor faulty</td>
<td>- Check control unit</td>
</tr>
<tr>
<td></td>
<td></td>
<td>- Control unit faulty</td>
<td>- Connect or check sewing motor cable</td>
</tr>
<tr>
<td></td>
<td></td>
<td>- Cable for sewing motor not plugged in or faulty</td>
<td>- Connect or check incremental encoder cable</td>
</tr>
<tr>
<td></td>
<td></td>
<td>- Cable for incremental encoder not plugged in/ faulty.</td>
<td></td>
</tr>
<tr>
<td>1342</td>
<td>Sewing motor error</td>
<td>Internal error</td>
<td>- Switch machine off and on again</td>
</tr>
<tr>
<td>1343</td>
<td></td>
<td></td>
<td>- Update software</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td>- Inform DA service</td>
</tr>
<tr>
<td>2101</td>
<td>X axis step motor time out referencing</td>
<td>- Reference switch cable faulty</td>
<td>- Check cable</td>
</tr>
<tr>
<td></td>
<td></td>
<td>- Reference switch faulty</td>
<td>- Check reference switch</td>
</tr>
<tr>
<td></td>
<td></td>
<td>- Step motor faulty</td>
<td>- Check step motor</td>
</tr>
<tr>
<td></td>
<td></td>
<td>- Machinery not running smoothly</td>
<td>- Check mechanics</td>
</tr>
<tr>
<td>2103</td>
<td>Step loss test: Step losses on X axis</td>
<td>Stitch length in the contour in the X direction too great</td>
<td>- Reduce speed</td>
</tr>
<tr>
<td></td>
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<td>- Scale contour smaller in X direction</td>
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<td>- Reduce stitch length in the contour in the X direction</td>
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<td>Step motor data - X axis</td>
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<td>- Machinery not running smoothly</td>
<td>- Check mechanics</td>
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<td>Step loss test: Step losses on Y axis</td>
<td>Stitch length in the contour in the Y direction too great</td>
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<td>Machine control voltage</td>
<td>Temporary power failure</td>
<td>Check mains voltage</td>
</tr>
<tr>
<td>3101</td>
<td>Machine power voltage</td>
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<td>Check mains voltage</td>
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<td>Error code</td>
<td>Description</td>
<td>Possible cause</td>
<td>Troubleshooting</td>
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<td>------------</td>
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</tbody>
</table>
| 3104       | 24V switching power supply: overload | - Overload 24V output  
- Short circuit on the distributor circuit board outputs  
- Cable connection to distributor circuit board damaged | - Check output component and if necessary switch to another output  
- Check connections, eliminate short circuit  
- Check cable connections |
| 3301 3320 - 3322 3330 - 3332 3340 3350 - 3351 3353 3360 3341 3350 - 3358 | Error procedure control / Test procedure/ Step motor test procedure/ Switch on procedure/ sewing procedure/ winding procedure/ adjustment aid procedure | Internal error | - Switch the machine off and on again  
- Update software  
- Contact DA Service |
| 3358 | Sewing procedure: Hand wheel turned while machine stopped | Hand wheel turned while machine stopped | Cancel sewing procedure: Push pedal back |
| 3500 - 3506 3520 - 3530 3540 3721 | Command interpreter/ motor synchronisation error | Internal error | - Switch the machine off and on again.  
- Update software  
- Contact DA Service |
| 3830 | Additional circuit board program: Update error | - Malfunction  
- Additional circuit board faulty | - Switch the machine off and on again.  
- Change control unit |
| 3840 | Additional circuit board does not respond after update attempt | - Malfunction  
- Additional circuit board faulty | - Switch the machine off and on again.  
- Change control unit |
| 4301 | Dongle missing | No dongle inserted | Insert dongle into the control unit |
| 4302 | Dongle empty | - No data stored on the dongle | - Save data on the dongle |
| 4304 | Wrong type of dongle | Dongle has the wrong format for the required function. | - Use another dongle  
- Format the dongle |
| 4307 | Wrong machine class | Data dongle is not formatted for Class 531. | - use another dongle  
- Format the dongle |
| 4311 | Format ID error | - Dongle not correctly formatted  
- Dongle faulty | - Format the dongle again  
- Use another dongle |
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<tr>
<th>Error code</th>
<th>Description</th>
<th>Possible cause</th>
<th>Troubleshooting</th>
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<td></td>
<td>- Dongle faulty</td>
<td>- Use another dongle</td>
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<td>4530 - 4537 4900</td>
<td>Menu system error/ user error message</td>
<td>Internal error</td>
<td>- Switch machine off and on again</td>
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<td>- Inform DA service</td>
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<td>5101</td>
<td>NV RAM empty</td>
<td>Control unit is new. No data available</td>
<td>Data is reset to factory settings</td>
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<td>Control unit for a different machine class, data</td>
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<td>incompatible</td>
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<td>5104</td>
<td>NV RAM checksum error</td>
<td>NV SRAM faulty Malfunction</td>
<td>- Check with Multi-test, check control unit</td>
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<td>- Switch the machine off and on again</td>
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<td>- Data is reset to factory settings</td>
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<td>5804</td>
<td>Free contours: Checksum incorrect</td>
<td>- NV SRAM faulty Malfunction</td>
<td>- Check with Multi-test, check control unit</td>
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<td>- Switch machine off and on again</td>
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<td>5808</td>
<td>Error - free seam contour stitch number cannot be determined</td>
<td>Internal error</td>
<td>- Switch the machine off and on again</td>
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<td></td>
<td>- Contact DA Service</td>
</tr>
<tr>
<td>5809</td>
<td>Free contours: Maximum number of partial contours</td>
<td>Maximum number of partial contours (interim cutting) exceeded</td>
<td>Delete the interim cutting operations in the free contours</td>
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<td>5810</td>
<td>Free contours: Minimum number of stitches per partial contour</td>
<td>Minimum number of stitches per partial contour not adhered to</td>
<td>Move interim cutting operations in the free seam contours.</td>
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<td>5900</td>
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<td>Internal error</td>
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<td>- Contact DA Service</td>
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<tr>
<td>6152 - 6154 6204</td>
<td>Input/ output error</td>
<td>Internal error</td>
<td>- Switch the machine off and on again</td>
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<td>- Contact DA Service</td>
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<tr>
<td>6351 - 6354</td>
<td>Error I2C</td>
<td>Control unit faulty</td>
<td>Check control unit</td>
</tr>
<tr>
<td>6551 - 6554 6651 6751 - 6759</td>
<td>Upper part position error/ AD converter/ processor error/ step motor driver</td>
<td>Internal error</td>
<td>- Switch the machine off and on again</td>
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<td></td>
<td></td>
<td>- Update software</td>
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<tr>
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<td></td>
<td></td>
<td>- Contact DA Service</td>
</tr>
<tr>
<td>7460</td>
<td>Test interface communication</td>
<td>- Cable fault</td>
<td>- Switch off source of interference</td>
</tr>
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<td></td>
<td></td>
<td>- Test interface cable faulty</td>
<td>- Check cable</td>
</tr>
<tr>
<td></td>
<td></td>
<td>- Internal error</td>
<td>- Switch the machine off and on again</td>
</tr>
<tr>
<td>Error code</td>
<td>Description</td>
<td>Possible cause</td>
<td>Troubleshooting</td>
</tr>
<tr>
<td>-------------</td>
<td>-------------------------------------------------------------------------------</td>
<td>---------------------------------------</td>
<td>--------------------------------------------------------------------------------</td>
</tr>
</tbody>
</table>
| 7551 - 7559 | Operating panel interface communication                                      | Internal error                        | - Switch the machine off and on again  
- Update software  
- Contact DA Service |
| 7556 7557   | Operating panel interface communication                                      | - Cable fault  
- Operating panel interface cable faulty | - Switch off source of interference  
- Check cable   |
| 7700        | Protocol: Max. number of repeats                                             | - Cable fault  
- Test interface cable faulty         | - Switch off source of interference  
- Check cable   |
| 7701        | Error log                                                                     | Internal error                        | - Switch the machine off and on again  
- Update software  
- Contact DA Service |
| 8351 8700 8702 8800 - 8806 8890 8891 | Test pin error/ key simulation/ signal/ event processing/ memory wrapper/ function list | Internal error                        | - Switch the machine off and on again  
- Update software  
- Contact DA Service |
| 9100 - 9105 9200 9201 9900 9902 9903 9905 | Sewing pattern management error/ Sewing pattern program/ Sewing pattern activation/ Setting up/ Pressing keys/ Memory message output | Internal error                        | - Switch the machine off and on again  
- Update software  
- Contact DA Service  
If error 9110 occurs repeatedly. Reset the sewing pattern programs and sequences using the Initialization menu (see Page 60). |

If an error occurs the corresponding unit can be checked to ensure it is working properly using the Service/ Multi-test menu (see Page 49). The Service menu can be accessed at technician level and when switching the machine on by pressing F when the DA logo appears (Enter code 25483).
## 9. Sewing

### Operating and function sequence when sewing:

<table>
<thead>
<tr>
<th>Sewing procedure</th>
<th>Operation/ Explanation</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Before starting sewing</strong></td>
<td></td>
</tr>
<tr>
<td>Initial position</td>
<td>- Pedal idle</td>
</tr>
<tr>
<td></td>
<td>- Locking unit idle</td>
</tr>
<tr>
<td></td>
<td>- Needle up, material clamps up.</td>
</tr>
<tr>
<td>Insert material</td>
<td></td>
</tr>
<tr>
<td><strong>Sewing</strong></td>
<td>- Push pedal forward to position 1. The clamps come down.</td>
</tr>
<tr>
<td></td>
<td>- Release pedal.</td>
</tr>
<tr>
<td></td>
<td>- The clamps go up again.</td>
</tr>
<tr>
<td></td>
<td>- The material can be repositioned.</td>
</tr>
<tr>
<td><strong>In the sewing cycle</strong></td>
<td>- Push pedal completely forward. The locking unit sews at the set speed.</td>
</tr>
<tr>
<td>Stop sewing procedure-</td>
<td></td>
</tr>
<tr>
<td>To continue the sewing procedure</td>
<td>- Push the pedal all the way forward.</td>
</tr>
</tbody>
</table>
10 Maintenance

10.1 Cleaning and checking

**Caution, danger of injury!**
Switch the main switch off.
The locking unit must only be maintained when it is switched off.

Maintenance work must be done no later than the maintenance intervals specified in the tables (see “Operating hours” column).
When dealing with very fluffy materials shorter maintenance intervals may be necessary.
A clean locking unit protects against malfunctions.

<table>
<thead>
<tr>
<th>Maintenance work to be carried out</th>
<th>Explanation</th>
<th>Operating hours</th>
</tr>
</thead>
</table>
| **Top of machine**                | - Remove sewing dust and loose threads. (e.g. with compressed air gun)  
- Places to be cleaned particularly:  
  - Underside of stitch plate  
  - Area under the hook 1  
  - Bobbin housing  
  - Thread cutter  
  - Area under the needle 2 | 8 |
| **Control box**                   | - Keep ventilation filters clear | 8 |
10.2 Oil lubrication

**Caution, danger of injury!**
Oil can cause skin rashes. Avoid excessive contact with the skin. Wash thoroughly after contact.

**CAUTION!**
Handling and disposing of mineral oils is subject to statutory regulations. Take used oil to an authorised receiving center. Protect the environment. Ensure that you do not spill any oil.

Only use lubrication oil DA 10 or a similar oil with the following specifications to lubricate the locking unit:
- Viscosity at 40°C: 10 mm²/s
- Flash point: 150°C

**DA 10** can be obtained from DÜRKOPP ADLER AG sales centers under the following part numbers:
- 20 ml container: 9047 000011
- 1 litre container: 9047 000012
- 2 litre container: 9047 000013
- 5 litre container: 9047 000014

<table>
<thead>
<tr>
<th>Maintenance work to be carried out</th>
<th>Explanation</th>
<th>Operating hours</th>
</tr>
</thead>
</table>
| Lubricating the button sewing attachment | The button sewer is fitted with a central oil wick lubrication system. The bearing points are supplied from oil reservoirs 2 and 3.  
- The oil level must not go below the red line on the two oil reservoirs  
- Top up with oil through hole 1 up to the red line. | 8 |
## 11. Standard sewing patterns

<table>
<thead>
<tr>
<th>No.</th>
<th>Stitch pattern</th>
<th>Stitch distribution</th>
<th>number of Connecting threads</th>
<th>standard size x direction (mm)</th>
<th>Standard size Y direction (mm)</th>
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<td>standard size x direction (mm)</td>
<td>standard size Y direction (mm)</td>
<td>Standard size</td>
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12. Clamping feet

<table>
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<th>Clamping foot number</th>
<th>Dimensions X x Y [mm]</th>
<th>Material support plate opening</th>
<th>Rectangular inner frame</th>
<th>Standard sewing pattern parameter</th>
<th>Permissible standard sewing patterns</th>
<th>Description</th>
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<tr>
<td>1</td>
<td>10 x 10</td>
<td>yes</td>
<td>1</td>
<td>all</td>
<td>button clamps</td>
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</tbody>
</table>

- For technical reasons and to provide a safety margin the sewing field is smaller than the material support plate opening.
When the machine is damaged or parts are worn please contact:

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