

**D669
M-TYPE DELTA**

Operating Instructions

IMPORTANT
READ CAREFULLY BEFORE USE
KEEP FOR FUTURE REFERENCE

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1 About these instructions



These instructions have been prepared with utmost care. They contain information and notes intended to ensure long-term and reliable operation.

Should you notice any discrepancies or if you have improvement requests, then we would be glad to receive your feedback through **Customer Service** ( p. 177).


Consider these instructions as part of the product and keep it easily accessible.

1.1 For whom are these instructions intended?

These instructions are intended for:

- **Operators:**
This group is familiar with the machine and has access to the instructions. Specifically, chapter **Operation** ( p. 19) is important for the operators.
- **Specialists:**
This group has the appropriate technical training for performing maintenance or repairing malfunctions. Specifically, the chapter **Setup** ( p. 141) is important for specialists.

Service Instructions are supplied separately.

With regard to minimum qualification and other requirements to be met by personnel, please also follow the chapter **Safety** ( p. 9).

1.2 Representation conventions – symbols and characters

Various information in these instructions is represented or highlighted by the following characters in order to facilitate easy and quick understanding:



Proper setting

Specifies proper setting.



Disturbances

Specifies the disturbances that can occur from an incorrect adjustment.



Cover

Specifies which covers must be disassembled in order to access the components to be set.



Steps to be performed when operating the machine (sewing and equipping)



Steps to be performed for service, maintenance, and installation



Steps to be performed via the software control panel

The individual steps are numbered:

1. First step
 2. Second step
 - ...
- The steps must always be followed in the specified order.
- Lists are marked by bullet points.



Result of performing an operation

Change to the machine or on the display/control panel.



Important

Special attention must be paid to this point when performing a step.



Information

Additional information, e.g. on alternative operating options.



Order


Specifies the work to be performed before or after an adjustment.

References



Reference to another section in these instructions.

Safety

Important warnings for the user of the machine are specifically marked. Since safety is of particular importance, hazard symbols, levels of danger and their signal words are described separately in the chapter **Safety** ( p. 9).

Location information

If no other clear location information is used in a figure, indications of **right** or **left** are always from the user's point of view.

1.3 Other documents

The machine includes components from other manufacturers. Each manufacturer has performed a hazard assessment for these purchased parts and confirmed their design compliance with applicable European and national regulations. The proper use of the built-in components is described in the corresponding manufacturer's instructions.

1.4 Liability

All information and notes in these instructions have been compiled in accordance with the latest technology and the applicable standards and regulations.

Dürkopp Adler cannot be held liable for any damage resulting from:

- Breakage and transport damages
- Failure to observe these instructions
- Improper use
- Unauthorized modifications to the machine
- Use of untrained personnel
- Use of unapproved parts

Transport

Dürkopp Adler cannot be held liable for breakage and transport damages. Inspect the delivery immediately upon receiving it. Report any damage to the last transport manager. This also applies if the packaging is not damaged.

Leave machines, equipment and packaging material in the condition in which they were found when the damage was discovered. This will ensure any claims against the transport company.

Report all other complaints to Dürkopp Adler immediately after receiving the product.

2 Safety

This chapter contains basic information for your safety. Read the instructions carefully before setting up or operating the machine. Failure to do so can result in serious injury and property damage.



2.1 Basic safety instructions

The machine may only be used as described in these instructions. The instructions should be available at the machine's location at all times.

Work on live components and equipment is prohibited. Exceptions are defined in the DIN VDE 0105.

For the following work, switch off the machine at the main switch or disconnect the power plug:

- Replacing the needle or other sewing tools
- Leaving the workstation
- Performing maintenance work and repairs
- Threading

Missing or faulty parts could impair safety and damage the machine. Only use original parts from the manufacturer.

Transport Use a lifting carriage or stacker to transport the machine. Raise the machine max. 20 mm and secure it to prevent it from slipping off.

Setup The connecting cable must have a power plug approved in the relevant country. The power plug may only be assembled to the power cable by qualified specialists.

Obligations of the operator Follow the country-specific safety and accident prevention regulations and the legal regulations concerning industrial safety and the protection of the environment.

All the warnings and safety signs on the machine must always be in legible condition. Do not remove!

Missing or damaged warnings and safety signs must be replaced immediately.

Requirements to be met by the personnel

Only qualified specialists may be used for:

- Setting up the machine
- Performing maintenance work and repairs
- Performing work on electrical equipment

Only authorized persons may work on the machine and must first have understood these instructions.

Operation

Check the machine during operating for any externally visible damage. Stop working if you notice any changes to the machine. Report any changes to your supervisor. Do not use a damaged machine any further.

Safety equipment

Safety equipment should not be disassembled or deactivated. If it is essential to disassemble or deactivate safety equipment for a repair operation, it must be assembled and put back into operation immediately afterward.

2.2 Signal words and symbols used in warnings






Warnings in the text are distinguished by color bars. The color scheme is based on the severity of the danger. Signal words indicate the severity of the danger.

Signal words Signal words and the hazard they describe:

| Signal word | Meaning |
|----------------|---|
| DANGER | (with hazard symbol) If ignored, fatal or serious injury will result |
| WARNING | (with hazard symbol) If ignored, fatal or serious injury can result |

| | |
|----------------|---|
| CAUTION | (with hazard symbol) If ignored, moderate or minor injury can result |
| CAUTION | (with hazard symbol) If ignored, environmental damage can result |
| NOTICE | (without hazard symbol) If ignored, property damage can result |

Symbols The following symbols indicate the type of danger to personnel:

| Symbol | Type of danger |
|--|----------------------|
|  | General |
|  | Electric shock |
|  | Puncture |
|  | Crushing |
|  | Environmental damage |

Examples Examples of the layout of warnings in the text:

DANGER



Type and source of danger!

Consequences of non-compliance.

Measures for avoiding the danger.

☞ This is what a warning looks like for a hazard that will result in serious injury or even death if ignored.

WARNING



Type and source of danger!

Consequences of non-compliance.

Measures for avoiding the danger.

☞ This is what a warning looks like for a hazard that could result in serious or even fatal injury if ignored.

CAUTION



Type and source of danger!

Consequences of non-compliance.

Measures for avoiding the danger.

☞ This is what a warning looks like for a hazard that could result in moderate or minor injury if the warning is ignored.

NOTICE

Type and source of danger!

Consequences of non-compliance.

Measures for avoiding the danger.

- ↙ This is what a warning looks like for a hazard that could result in property damage if ignored.

CAUTION



Type and source of danger!

Consequences of non-compliance.

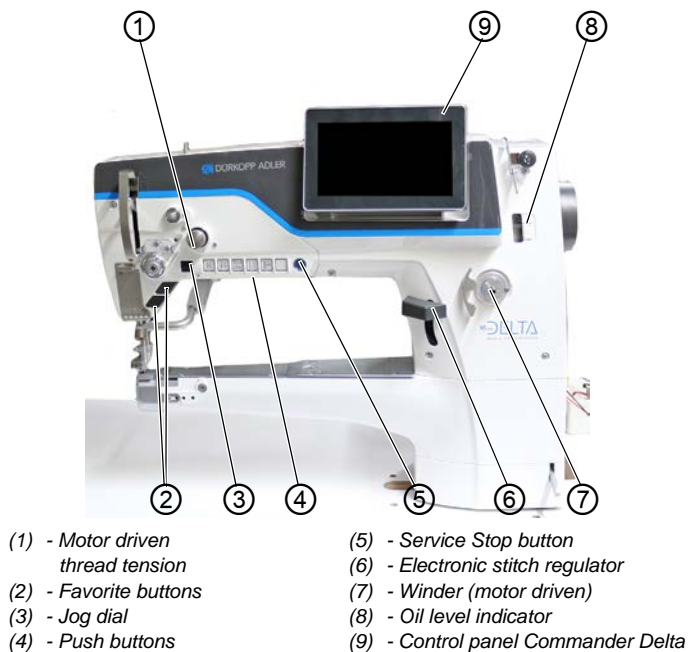
Measures for avoiding the danger.

- ↙ This is what a warning looks like for a hazard that could result in environmental damage if ignored.

3 Machine description

3.1 Components of the machine

Fig. 1: Components of the machine



3.2 Proper use

WARNING



Risk of injury from live, moving and cutting parts as well as from sharp parts!

Improper use can result in electric shock, crushing, cutting and punctures.

Follow all instructions provided.

NOTICE


Non-observance will lead to property damage!

Improper use can result in material damage at the machine.

Follow all instructions provided.

The machine may only be used with sewing material that satisfies the requirements of the specific application at hand.

The machine is intended only for use with dry sewing material. The sewing material must not contain any hard objects.

The needle thicknesses permissible for the machine are listed in the **Technical data** ( p. 201) chapter.

The seam must be completed with a thread that satisfies the requirements of the specific application at hand.

The machine is intended for industrial use.

The machine may only be set up and operated in dry conditions on well-maintained premises. If the machine is operated on premises that are not dry and well-maintained, then further measures may be required which must be compatible with DIN EN 60204-31.

Only authorized persons may work on the machine.

Dürkopp Adler cannot be held liable for damages resulting from improper use.

3.3 Declaration of Conformity

The machine complies with European regulations ensuring health, safety, and environmental protection as specified in the declaration of conformity or in the declaration of incorporation.



4 Operation

The operating sequence consists of several different steps. Fault-free operation is necessary in order to achieve a good sewing result.

4.1 Preparing the machine for operation

WARNING



Risk of injury from moving, cutting and sharp parts!

Crushing, cutting and punctures are possible.

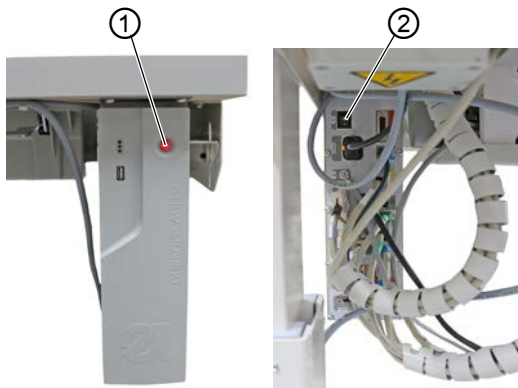
If possible, make preparations only when the machine is switched off.

Complete the following steps in preparation of sewing before starting to work:

- Inserting or changing the needle
- Threading the needle thread
- Threading or winding the hook thread
- Adjusting the thread tensions

4.2 Switching on and off the machine

Fig. 2: Switching on and off the machine






(1) - Button

(2) - Switch

Switching on the machine





To switch on the machine:

1. Press the switch (2) on the rear of the control to position **I**.
 The button (1) on the front of the control illuminates red.
2. Press the button (1) on the front of the control.
 The control and the control panel of the machine start up.
3. Press the pedal backwards when prompted to do so on the display.
 The machine performs a reference run and is afterwards ready for sewing.

Switching off the machine



To switch off the machine:

1. Press the button (1) on the front of the machine.
 Control and control panel shut down and are set to standby; the button (1) illuminates red.
2. If necessary, press the switch (2) on the rear of the control to position **O**.
 The machine is no longer set to standby.

4.3 Switching on and off the sewing lights

The machine comes with a classic sewing light (1) in the area of the needle and machine head lighting (2) in the area of the arm.

Fig. 3: Switching on and off the sewing light (1)



(1) - Sewing light

(2) - Machine head lighting

Dimming the sewing lights

You can adjust the brightness of the sewing lights via software at the control panel (*Burger menu - Settings - User Configuration - Machine*).

Switching on and off the sewing lights

By default, there is no simple way to switch the sewing lights on or off. Enabling this option requires that you assign the function to switch the lights on and off to the buttons on the push button panel.

You can assign functions to the buttons via software at the control panel (*Burger menu - Settings - User Configuration - Smart keys configuration*).

4.4 Inserting or changing the needle

CAUTION



Risk of injury from sharp parts!

Puncture possible.

Switch off the machine before you insert or change the needle.

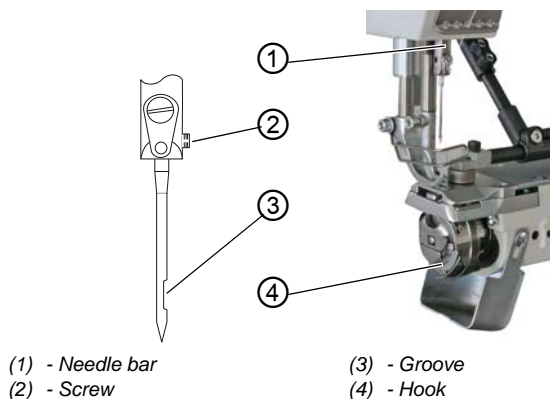
NOTICE

Property damage may occur!

There is a risk of machine damage, needle breakage or thread breakage if the distance between needle and hook tip is incorrect.

Set the distance to the hook tip after inserting a needle with a different strength.

Fig. 4: Inserting or changing the needle



To change the needle:

1. Turn the handwheel until the needle bar (1) reaches the upper end position.
2. Loosen the screw (2).
3. Pull the needle out towards the bottom.


4. Insert the new needle into the hole in the needle bar (1) until it reaches the end stop.

**Important**

Align the needle in such a way that the groove (3) faces the hook (4).

5. Tighten the screw (2).

**Order**

Always adjust the clearance between the hook and the needle after changing to a different needle strength ( *Service Instructions*).

**Disturbance**

An incorrect hook clearance can cause the following disturbances:

- Changing to a thinner needle:
 - Skip stitches
 - Thread damage
- Changing to a thicker needle:
 - Damage to the hook tip
 - Damage to the needle

4.5 Threading the needle thread

WARNING



Risk of injury from needle tip and moving parts!

Puncture, cutting and crushing possible.


Turn off the machine before threading the thread.




Information

You will find a video with instructions regarding this chapter on the Commander Delta control panel of the machine.

To start the instructional video:

1. Switch on the machine.
2. Click on the tile  on the control panel.
 A window opens named *Threading: one needle*.
The instructional video starts automatically.

3. Click on the tile  in the left menu bar.

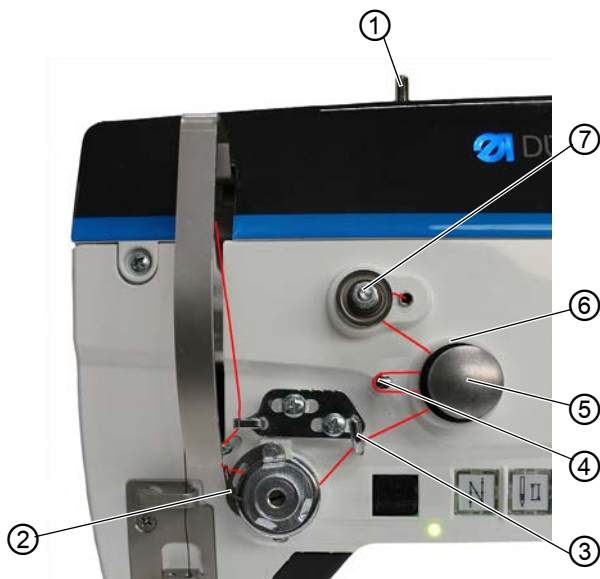
The instructional video *Threading: two needles* starts automatically.



To thread the needle thread:

1. Fit the thread reel on the reel stand.
The unwinding bracket must stand directly above the thread reel.
2. Feed the thread from the rear to the front through the thread guide on the unwinding bracket.

Fig. 5: Threading the needle thread (1)

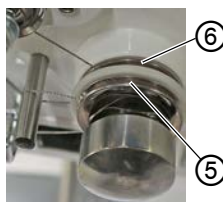


- | | |
|--------------------------------|-----------------------|
| (1) - Tube | (5) - Front tensioner |
| (2) - Thread tensioning spring | (6) - Rear tensioner |
| (3) - Hook | (7) - Pretension |
| (4) - Pin | |



3. Insert the thread from the top and guide it through the tube (1).
4. Feed the thread counterclockwise from the tube (1) around the pretension (7).
5. Feed the thread clockwise through the rear tensioner (6).
6. Feed the thread clockwise around the pin (4) and keep feeding it clockwise through the front tensioner (5).

Fig. 6: Threading the needle thread (2)

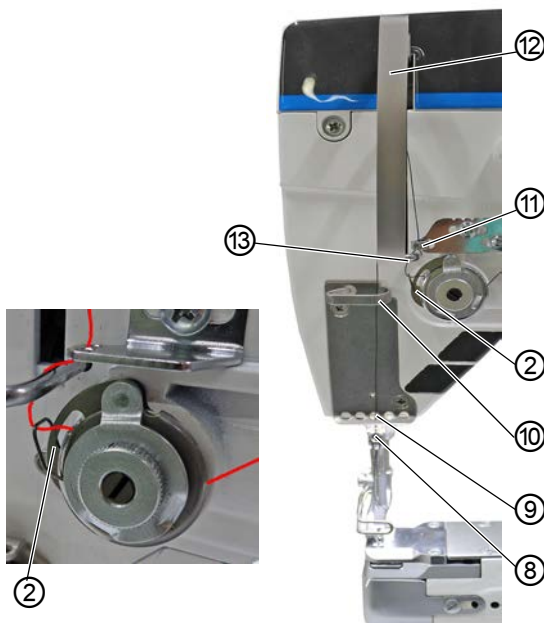


- | | |
|-----------------------|----------------------|
| (5) - Front tensioner | (6) - Rear tensioner |
|-----------------------|----------------------|



7. Feed the thread over the hook (3) before feeding it clockwise through the thread tensioning spring (2) from below.

Fig. 7: Threading the needle thread (3)



- (2) - Thread tensioning spring
(8) - Thread guide
(9) - Lower thread guide
(10) - Upper thread guide

- (11) - Needle thread regulator
(12) - Thread lever (covered)
(13) - Pin



8. Feed the thread around the pin (13) from left to right and then from top to bottom through the rear hole of the needle thread regulator (11).
9. Insert the thread from the right to the left through the lower guide of the thread lever (12).
10. Insert the thread through the upper thread guide (10).
11. Insert the thread through a hole in the lower thread guide (9).

**For machines with thread clamp (optional)**

12. Insert the thread through the right hole of the guide above the thread clamp.
13. Insert the thread through the right hole of the guide below the thread clamp.

Fig. 8: Thread clamp



14. Insert the thread into the thread clamp from the right so that the thread is held in place inside the hook of the clamp.

The thread is supposed to run through the clamp almost without touching it and in such a way that it only makes contact with the guides above and below the thread clamp.



15. Insert the thread through the thread guide (8) on the needle bar block.
16. Insert the thread through the needle eye (towards the groove) in such a way that the loose thread end faces the hook.
17. Pull the thread through the needle eye until the loose thread end has a length of approx. 4 cm with the thread lever (12) at the highest position.

**Important**

Check the thread length.

If the loose thread end is too long, the thread may be caught by the hook and cause a disturbance. If the loose thread end is too short, the machine cannot start sewing.

4.6 Winding the hook thread

WARNING



Risk of injury from needle tip and moving parts!

Puncture, cutting and crushing possible.

Turn off the machine before threading the thread.

The hook thread can be wound on without sewing.



Important

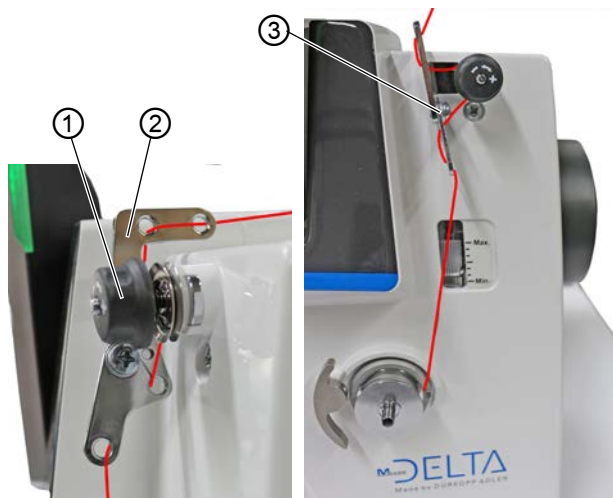
Never use the winder without a bobbin. If using it without a bobbin, you run the risk of the thread winding itself around the bobbin shaft, which may cause damage to the winder.



To wind the hook thread:

1. Fit the thread reel on the reel stand.
The unwinding bracket must stand directly above the thread reel.
2. Feed the thread from the rear to the front through the thread guide on the unwinding bracket.

Fig. 9: Winding the hook thread (1)



- (1) - Pretension
(2) - Thread guide

- (3) - Thread guide



3. Insert the thread in a wavelike manner through the first 2 holes of the thread guide (2): from left to right through the first hole and from right to left through the second hole.
4. Feed the thread through the third hole of the thread guide (2) from left to right before feeding it clockwise around the pretension (1).
5. Feed the thread to the left through the thread guide (3).
6. Feed the thread from the left to the right through the bottom-most hole of the thread guide (3).

Fig. 10: Winding the hook thread (2)



(4) - Winder lever
(5) - Bobbin shaft

(6) - Knife
(7) - Winder



7. Guide the thread to the winder (7).
8. Clamp the thread behind the knife (6) and tear off the loose end behind it.
9. Fit the bobbin on the bobbin shaft (5).
10. Turn the bobbin on the bobbin shaft (5) until the drive dog spring audibly clicks into place in the slot of the bobbin.
11. Pull the winder lever (4) up.
- ↗ The winding process starts and ends automatically when the bobbin is full. The winder lever (4) returns to its lower position.



Information

The hook thread is normally wound on when sewing is in progress. However, you can also wind on the hook thread without sewing, e. g. if you require a full bobbin in order to start sewing. For this purpose, use Bobbin Wind mode in Manual mode (📖 p. 43).



12. Pull off the full bobbin.
13. Tear off the thread behind the knife (6).
14. Insert the full bobbin into the hook (📖 p. 31).

4.7 Changing the bobbin

WARNING



Risk of injury from needle tip and moving parts!

Puncture, cutting and crushing possible.

Turn off the machine before changing the bobbin.

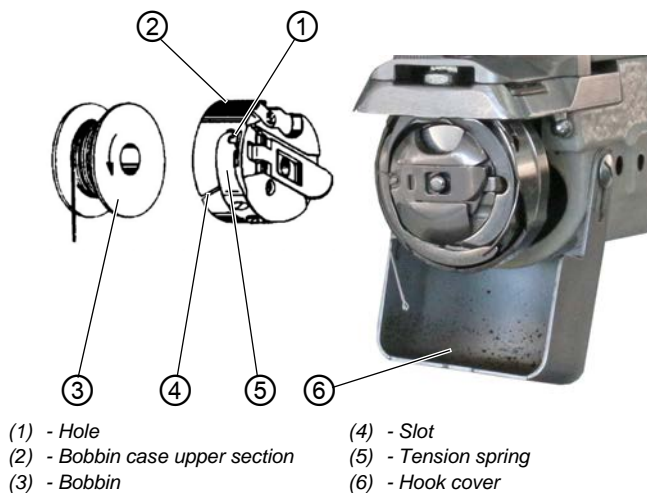
NOTICE

Property damage may occur!

The surface of the bobbin may become damaged, causing the bobbin rotation monitor to stop working correctly.

Do NOT use sharp parts to remove the bobbin!

Fig. 11: Changing the bobbin




To change the bobbin:

Removing an empty bobbin

1. Move the needle to the top dead center.

2. Pull off the hook cover (6) and fold it down.
3. Remove the bobbin case upper section (2) with the empty bobbin.
4. Remove the empty bobbin.

Inserting a full bobbin

5. Insert a full bobbin (3) into the bobbin case upper section (2).
6. Feed the hook thread through the slot (4) under the tension spring (5) into the hole (1).
7. Pull the hook thread approx. 5 cm out of the bobbin case upper section (2).
-  The bobbin must rotate in the direction of the arrow when pulling out the thread.
8. Insert the bobbin case upper section (2) again.
9. Close the hook cover (6).

4.8 Thread tension

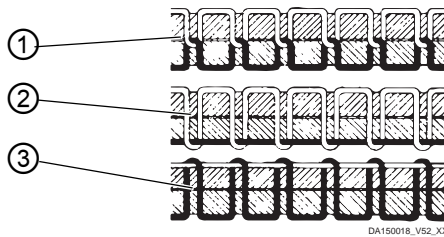
Together with the hook thread tension, the needle thread tension influences the final seam pattern. With thin sewing material, excessive thread tension can lead to undesired ruffing and thread breaking.



Proper setting


If the tension of needle thread and hook thread is identical, the thread interlace lies in the middle of the sewing material. Adjust the needle thread tension so that the desired seam pattern is achieved with the lowest possible tension.

Fig. 12: Thread tension



- (1) - Identical needle thread and hook thread tension
- (2) - Hook thread tension higher than needle thread tension
- (3) - Needle thread tension higher than hook thread tension

4.8.1 Adjusting the needle thread tension

The needle thread tension can only be adjusted via software; for detailed information, refer to the chapter Programming ( p. 43).

4.8.2 Adjusting the hook thread tension

WARNING

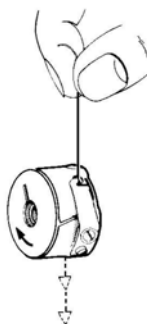


Risk of injury from needle tip and moving parts!

Puncture, cutting and crushing possible.

Switch off the machine before adjusting the hook thread tension.

Fig. 13: Adjusting the hook thread tension (1)



Proper setting

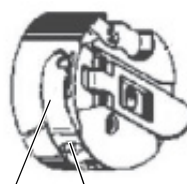
The hook thread tension must be set so that the resulting seam pattern is uniform.

The basic setting for the tension spring is performed as follows:

- When the bobbin case contains a full bobbin it must sink slowly under its own weight.

The braking spring (1) prevents the bobbin running on when the thread has been cut.

Fig. 14: Adjusting the hook thread tension (2)



- (1) - Braking spring
(2) - Tension spring

- (3) - Adjusting wheel



To adjust the hook thread tension:

1. Set the tension spring (2) using the adjusting wheel (3).
 - **To increase the tension:** Turn the adjusting wheel (3) clockwise
 - **To reduce the tension:** Turn the adjusting wheel (3) counterclockwise

4.9 Adjusting the needle thread regulator

WARNING



Risk of injury from needle tip and moving parts!

Puncture, cutting and crushing possible.

Switch off the machine before adjusting the needle thread regulator.

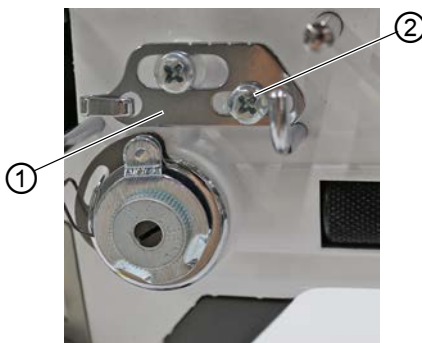
The needle thread regulator determines the tension applied to guide the needle thread around the hook.



Proper setting

The loop of the needle thread slides at low tension over the thickest point of the hook.

Fig. 15: Adjusting the needle thread regulator



(1) - Needle thread regulator

(2) - Screw

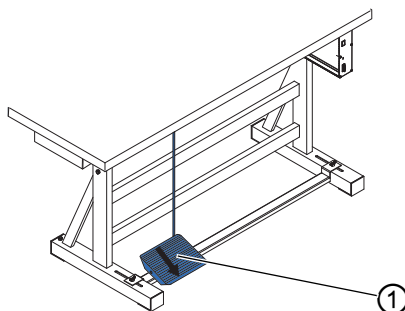


To adjust the needle thread regulator:

1. Loosen the screw (2).
 - **To increase the tension:** Slide the needle thread regulator (1) to the right
 - **To reduce the tension:** Slide the needle thread regulator (1) to the left
2. Tighten the screw (2).

4.10 Lifting the sewing feet

Fig. 16: Lifting the sewing feet



(1) - Pedal



To lift the sewing feet:

1. Press the pedal (1) halfway back.
 - ↳ The machine stops and lifts the sewing feet.
The sewing feet remain up as long as the pedal is pressed halfway back.

OR



1. Press the pedal (1) fully back.
 - ↳ Thread cutting is activated, and the sewing feet are raised.

4.11 Sewing backwards with the stitch regulator (optional)

The electronic stitch regulator on the machine arm reduces the stitch length down to sewing backwards in the lower end position.

Fig. 17: Sewing backwards with the stitch regulator



(1) - Stitch regulator



1. Slowly push the stitch regulator (1) down.



The stitch length becomes smaller.
In the lower end position, the machine sews backwards with the set stitch length.

4.12 Setting quick stroke adjustment (optional)

On machines equipped with a knee button, the knee button can be used to switch on the increased sewing foot stroke.

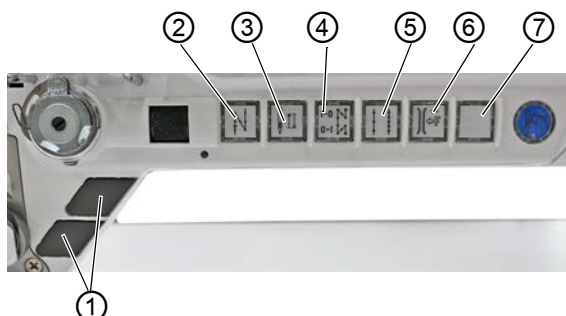
You can assign functions to the knee button in the software using the control panel of the machine.

4.13 Quick functions on the push button panel

The machine has push buttons on the machine arm which can be used to activate specific functions while sewing. You can define the settings in the software (📖 p. 43).

4.13.1 Activating function keys

Fig. 18: Activating function keys



- | | |
|---------------------------|----------------------------------|
| (1) - Favorite buttons | (5) - Stitch length preselection |
| (2) - Sewing backwards | (6) - Additional value |
| (3) - Needle position | Needle thread tension |
| (4) - Bartack suppression | (7) - fully customizable button |

Activating a function



To activate a function key:

1. Press the desired button.
- 👉 Function is activated. The button lights up.








Deactivating a function



To activate/deactivate a function key:

1. Press the desired button again.
- ↪ Function is deactivated. The button turns off.

Functions of the buttons

| Button | Function |
|---|--|
|  | Sewing backwards When this button is activated, the machine sews in reverse. |
|  | Needle position When this button is activated, the needle moves to a specific position. This position is determined individually via the parameter settings. For more information, read the  <i>Service Instructions</i> . The machine comes configured so that selecting the button will bring the needle up to the top dead center. |
|  | Bartack suppression This button cancels the general setting for sewing start and end bartacks. If bartacks are on, pressing the button skips the next bartack. If bartacks are off, pressing the button sews the next bartack. |
|  | Stitch length When this button is selected, the machine sews with the greater stitch length that was programmed for this stitch length on the control panel. |
|  | Additional value needle thread tension When this button is selected, the machine sews with the programmed additional thread tension. |
|  | Fully customizable The button is fully customizable. The machine comes configured so that a press of the button will switch on the underarm lighting. |

4.13.2 Assigning a function to the favorite buttons

You can transfer the button functions from the push button panel to the favorite buttons. Select a function that you frequently use so that you can switch it on faster while sewing.

Fig. 19: Assigning a function to the favorite buttons



(1) - Favorite buttons



You can assign any functions you require to the favorite buttons. You can define the settings in the software (📖 p. 43).

4.14 Sewing

WARNING

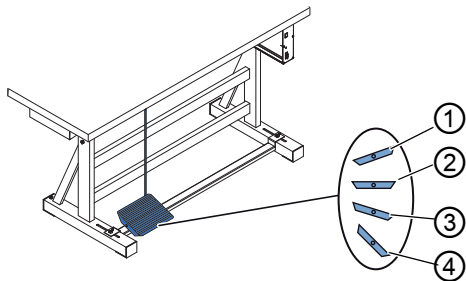


Risk of injury from the needle if sewing is started unintentionally!

Puncture possible.

Do not press the pedal when you fingers are in the area of the needle tip.

Fig. 20: Sewing








(1) - Position +1
(2) - Position 0

(3) - Position -1
(4) - Position -2

The pedal starts and controls the sewing process.

| Condition | Processes |
|---------------------------------|---|
| Before starting sewing | |
| Initial situation | <ul style="list-style-type: none">• Pedal in rest position (position 0)↳ Machine is at a standstill↳ Needle up. Sewing feet down. |
| Positioning the sewing material | <ul style="list-style-type: none">• Press the pedal halfway back (position -1)↳ The sewing feet are lifted.• Position the sewing material.• Release the pedal.↳ Sewing feet are lowered onto the sewing material. |

| Condition | Processes |
|---|---|
| At seam beginning | |
| Start bartack and sew | <ul style="list-style-type: none"> • Press the pedal forwards (position +1) and keep it there. ↳ Machine sews a start bartack (if specified). ↳ Afterwards, the machine continues to sew - with increasing speed the further forward the pedal is pressed. |
| In the middle of the seam | |
| Stop sewing | <ul style="list-style-type: none"> • Release the pedal (position 0). ↳ Machine stops. Depending on the setting, sewing feet and needle are up / down. |
| Continue the sewing process (after releasing the pedal) | <ul style="list-style-type: none"> • Press the pedal forwards (position +1) ↳ Machine continues to sew - with increasing speed the further forward the pedal is pressed. |
| Sew over thicker parts of the material | <ul style="list-style-type: none"> • Switch on the elevated sewing foot stroke with the knee button ( p. 38). |
| Change the stitch length | <ul style="list-style-type: none"> • Activate the 2nd stitch length using the button on the push button panel ( p. 38). |
| Increase the thread tension | <ul style="list-style-type: none"> • Activate additional thread tension using the button on the push button panel ( p. 38). |
| Sew an intermediate bartack | <ul style="list-style-type: none"> • Sew backwards with stitch regulator ( p. 37) or activate backwards sewing using the button on the push button panel ( p. 38). |
| At seam end | |
| Finish the seam and remove the sewing material | <ul style="list-style-type: none"> • Press the pedal fully back (position -2) and keep it there. ↳ End bartack is sewn, and thread is cut (if set). ↳ Machine stops. ↳ Needle up, sewing feet down. • Remove the sewing material. |

5 Programming

5.1 Control panel Commander DELTA

Fig. 21: Control panel Commander DELTA



All settings in the software are performed using the Commander DELTA control panel.



Information

If a value is entered that is not within the specified value range, the software will automatically adopt the limit value which is closest to your entry from the value range.

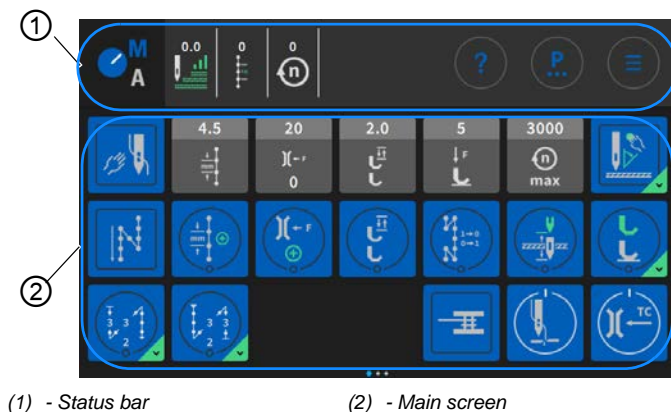
5.2 Navigating the Commander DELTA control panel

You navigate the control panel by tapping the screen with your fingers. There is no need for an input device.

You can open menus by pressing the corresponding button with your finger. You switch between the different pages of the start screen by swiping with one finger.

You can modify the information displayed in the status bar (1). You can also adjust the tiles shown on the three pages of the main screen (2). You customize the information using the control panel settings, [p. 69](#).

Fig. 22: Navigating the Commander DELTA control panel














(1) - Status bar

(2) - Main screen



5.2.1 Symbols and tiles

Explanation of recurring symbols:

| Icon | Meaning |
|---|---|
|  | <p>The letter shown in blue is active. A = Automatic mode M = Manual mode Press the symbol to toggle between the two modes.</p> |
|  | <p>Programming mode (access via the burger menu), see  p. 100.</p> |
|  | <p>Parameters you can set in manual mode.</p> |
|  | <p>Burger menu A window opens that lets you select Automatic mode, Manual mode, Programming mode or Settings.</p> |
|  | <p>Context-sensitive help Start by pressing the gray question mark before pressing the area for which you need help - this brings up a pop-up window containing a Help text. Press anywhere to make the window disappear.</p> |
|  | <p>Gray tiles Parameters for which you can/must enter a numerical value. Values can be input by pressing.</p> |
|  | <p>Blue tiles (stored) You can active or deactivate dark tiles encircled by a white line by tapping. You cannot set any values.</p> |

| Icon | Meaning |
|---|---|
|  | Blue tiles (multifunction) You can active or deactivate dark tiles encircled by a white line and showing a blue triangle in the corner by pressing. A long press opens a menu that lets you input values. |
|  | Blue tiles (not stored) You cannot enter any values for dark tiles surrounded by a square white line. The function assigned to the tile is only active for as long as you press the tile. |
|  | Grayed-out tiles Grayed-out tiles merely provide information. You can neither enter values nor active or deactivate these tiles. |

5.2.2 Entering values

You can input values using the buttons  or  or by typing on the integrated on-screen keyboard.

Values highlighted in red are invalid as they are not within the specified value range. If you enter invalid values, the software will automatically set the limit value of the value range.

5.2.3 Navigating the burger menu


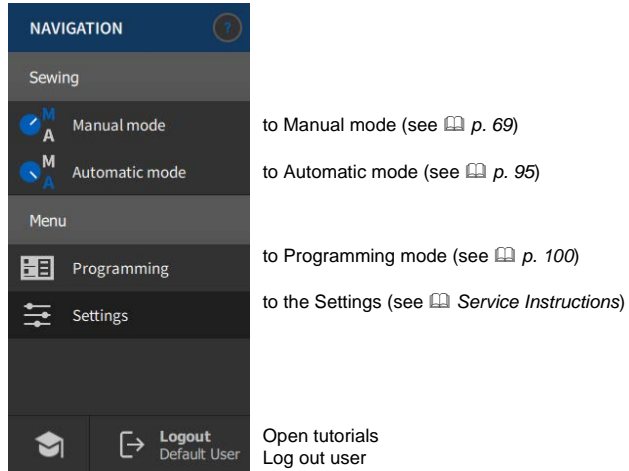
You can open the burger menu with a press of the symbol .



Fig. 23: Navigating the burger menu



5.2.4 Navigation during the start of the control panel

You can access the languages and settings without having to wait for the control panel to finish starting up.

You can select these options as soon as their icons are displayed on the control panel. After entering your user login, you will be taken to the language options or the settings - depending on which option you selected.

| Symbol | Explanation |
|---|--------------------|
|  | Language selection |
|  | Settings |


5.3 User Configuration



The User Configuration allows the currently logged-in user to customize the software interface to their specific needs.

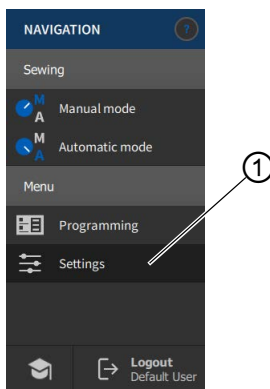


To access the User Configuration:

1. Press the symbol  to bring up the navigation pane.

↳ This opens the navigation interface.

Fig. 24: User Configuration (1)



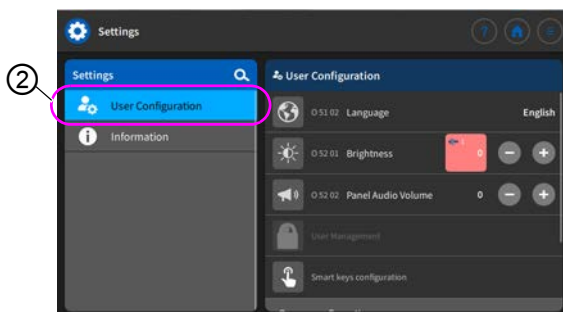
(1) - Settings



2. Press *Settings* (1).


↳ This opens the Settings interface.

Fig. 25: User Configuration (2)



(2) - User Configuration



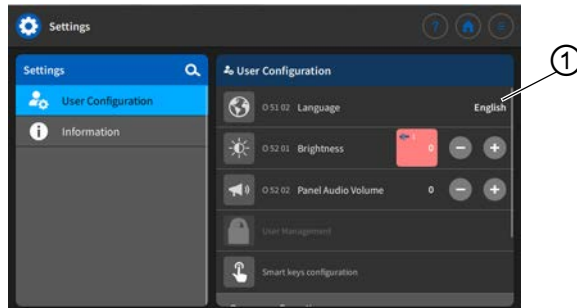
3. Press the item *User Configuration* (2) on the left.
 You are in the User Configuration.

5.3.1 Setting the language



Here, you can set the language of the software.

Fig. 26: Setting the language (1)



(1) - Language indicator



To set the language:


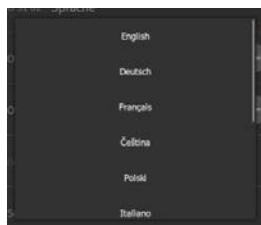

1. Press on the language indicator (1).
 A list holding the language selection opens:

Fig. 27: Setting the language (2)



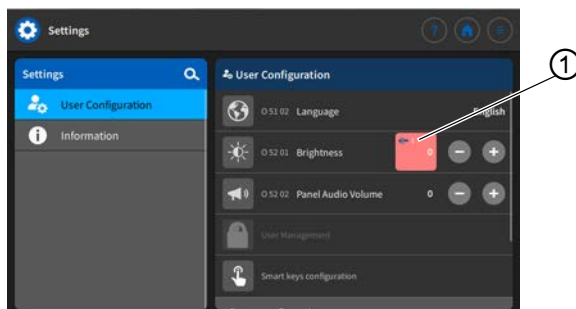
2. Press on the desired language.
 The language of the control panel is changed immediately.

5.3.2 Setting the brightness



Here, you can adjust the brightness of the control panel.



Fig. 28: Adjusting the brightness (1)



(1) - Brightness indicator



To set the brightness:

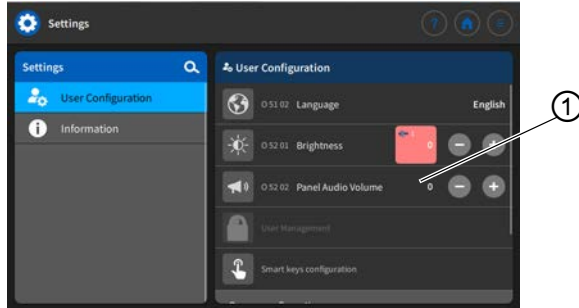
1. Press on the brightness indicator (1).
 2. Enter the desired value using the keyboard or the buttons  or .
- 👉 The brightness of the control panel is adjusted.

5.3.3 Setting the volume



Here, you can adjust the volume of the audio output.



Fig. 29: Setting the audio volume (1)



(1) - Audio volume indicator




To set the audio volume:

1. Press on the audio volume indicator (1).
 2. Enter the desired value using the keyboard or the buttons  or .
- 👉 The volume of the control panel is adjusted.

5.3.4 User Management administration



This section is locked if you are logged in as the *Default User*. Settings in User Management cannot be adjusted without extended authorizations.

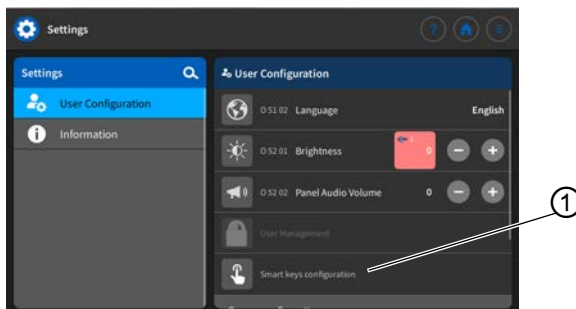
User Management administration is explained in a separate chapter ( p. 54).

5.3.5 Setting the smart keys configuration



Here, you can assign the functions of the push button panel and of the favorite buttons.

Fig. 30: Setting the smart keys configuration (1)



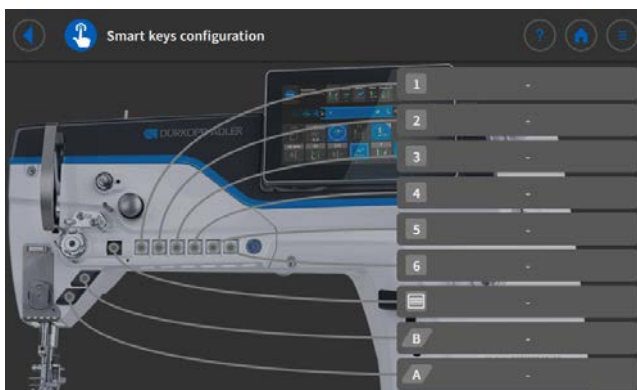
(1) - Audio volume indicator



To set the smart keys configuration:

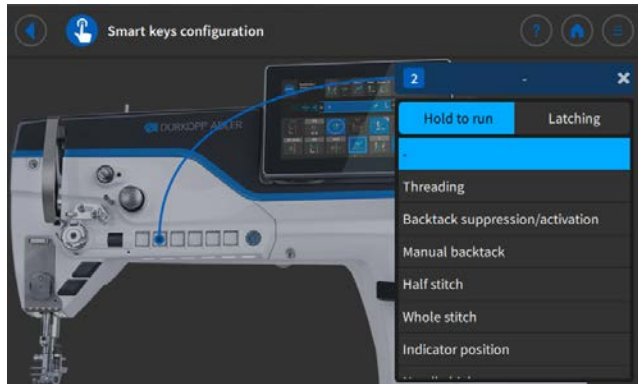
1. Press on the sub-item *Smart keys configuration* (1).
 ↳ This opens the interface of the fast menu key configuration:

Fig. 31: Setting the smart keys configuration (2)



2. Press on the bar of the button to which you wish to assign a function.
 ↳ This opens the selection of the functions that can assigned to this button.


Fig. 32: Setting the smart keys configuration (3)



3. Press on the function you wish to assign to the button.
 4. Press to select the option *Not stored* or *Stored*.
 5. Press outside the selection to exit the selection.
- ↩ The adjusted settings are stored.

5.3.6 Setting the screen configuration

The screen configuration is used for the display of the tiles in Manual mode.

The setting is explained at the appropriate place in the chapter on Manual mode ( p. 69).

5.4 User Management



The User Management section allows you to create users and roles with different authorizations.

The setting is such that the *Default User* will automatically be logged in when the machine starts. You can change this setting at the Technician level as needed.

The following is an explanation of the user *Default Technician*, who is set up as the default user. You can set up any number of users and roles that meet your individual requirements.

Requirement for User Management administration: You have to be logged in as the Default Technician.



To log in as the *Default Technician*:



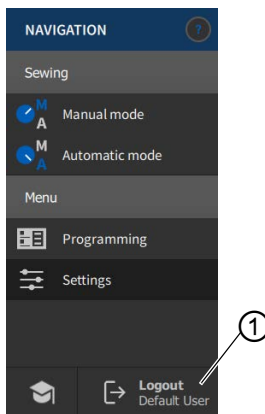
1. Press the symbol  to bring up the navigation pane.
 This opens the navigation interface.



Fig. 33: User Management (1)



(1) - Logout

2. Press *Logout* (1).
- ↳ This opens the Login interface.



-  3. Enter *technician* and *25483* for username and password.
4. Press .
- ↳ The user is logged in.

 To access User Management:


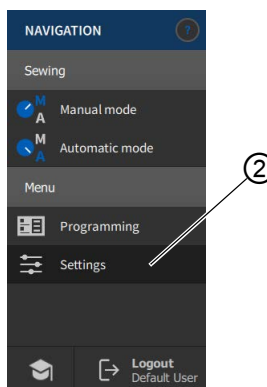
1. Press the symbol  to bring up the navigation pane.
- ↳ This opens the navigation interface.

Fig. 34: User Management (2)



(2) - Settings

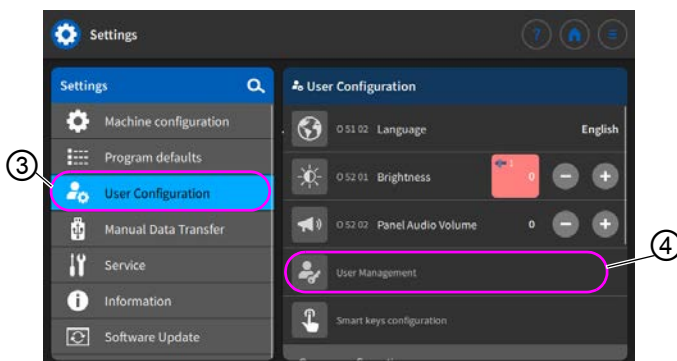


2. Press *Settings* (2).



This opens the Settings interface.

Fig. 35: User Management (3)



(3) - User Configuration

(4) - User Management



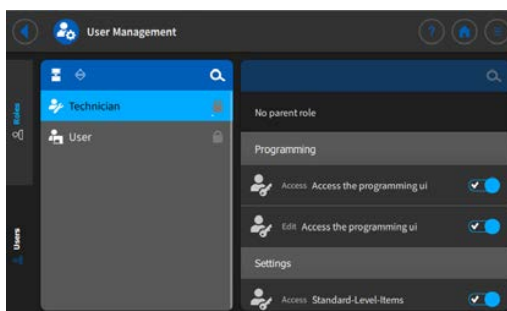
3. Press the item *User Configuration* (3) on the left.

4. Press the item *User Management* (4) on the right.



The user management interface opens - which may look different depending on the user.

Fig. 36: User Management (4)



5. Define the desired settings (for explanations, see p. 57).

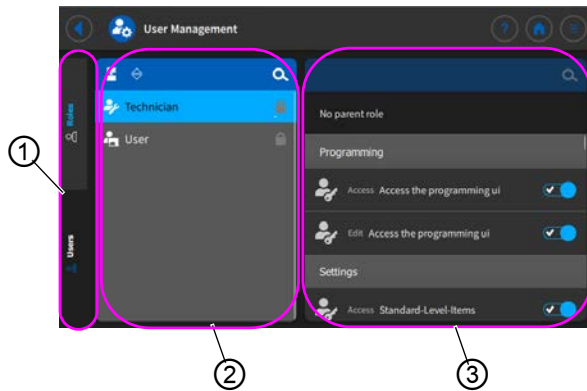
6. Press to return to Settings or to return to Manual mode.

5.4.1 Authorizations as *Default Technician*



The factory setting for the *Default Technician* requires that the technician enter their username and password (*technician*, 25483) to log in. If selecting User Management as a *Default Technician* (📖 p. 54), you will be presented with the following interface:

Fig. 37: Authorizations as *Default Technician*



(1) - Tab for roles and users
(2) - List of roles/users

(3) - Settings for
roles/users

On the left-hand side, you can select between the tabs (1) reserved for roles (📖 p. 58) and users (📖 p. 62). Detailed explanations are provided further below. To the right of the tabs you will find the list (2) of created roles / users - varying with the tab (1) you selected. On the far right, you will find the settings (3) associated with the role/user you selected.

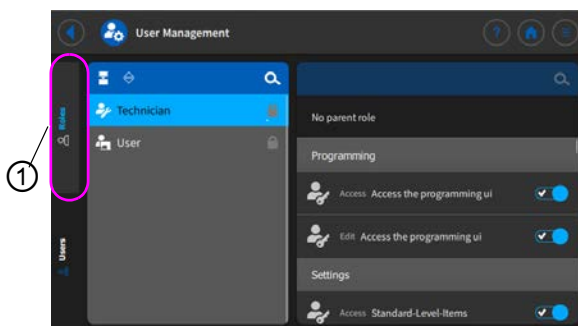
Explanation of role and user

| Role | User |
|--|---|
| A role defines which authorizations are permitted or forbidden. It is possible to assign more than one role to a single user. You need to be a user to log in; you cannot log in using a role. | You can log in as a user. A user can be assigned one or several roles - this is how they receive their authorizations. |

5.4.1.1 Managing roles

If selecting User Management as a *Default Technician* (p. 48), you will be presented with the following interface:

Fig. 38: Managing roles




(1) - Tab for roles

Press the tab (1) reserved for the *Roles* on the left-hand side.

Deleting a role




To delete a role:

1. Press the desired role.
↳ The role is highlighted in blue.
2. Press .
- ↳ The role disappears from the list; it has been deleted.




Information

Roles with a  symbol behind their names have been created at the factory. They cannot be deleted.

Creating/deriving a new role



To create a new role:

1. Press  (only a role with fewer or equal authorizations than your own).
- ↳ The list shows a new role.
2. Define the settings for the role (see table below).



Information

When logged in as a *Default Technician*, you can only select role derivations up to the role of *Technician*. You can adjust this setting in the authorizations of the roles (table below).

Settings of the roles

| Read/Edit/Access | Menu item |
|--------------------|---------------------------|
| Programming | |
| Access | Access the programming ui |
| Edit | Access the programming ui |
| Settings | |
| Access | Standard level |
| Access | Technician level |
| Manual mode | |
| Edit | Status bar |
| Edit | Main screen |
| Access | Role Main Screen |
| Access | Role Status Bar |
| Edit | Sewing parameters |
| Access | Switch to automatic mode |
| Access | Parameter View |

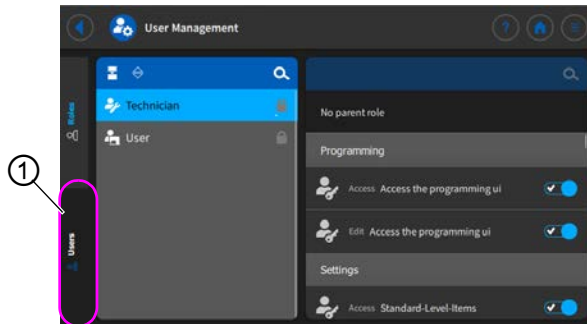
| Read/Edit/Access | Menu item |
|-------------------------|-------------------------------------|
| Edit | Manual bartack |
| Edit | Sewing foot lifted |
| Edit | Needle stop position |
| Edit | Bobbin Wind Mode |
| Edit | Segment abort |
| Edit | Edge trimmer |
| Edit | 2 nd Edge Guide Position |
| Edit | 2 nd Edge Guide Height |
| Edit | Edge Guide reference position |
| Edit | Stitch length |
| Edit | Switch Stitch Length |
| Edit | Needle thread tension |
| Edit | Switch Thread Tension |
| Edit | Sewing foot pressure |
| Edit | Sewing foot stroke |
| Edit | Switch Foot Stroke Alternation |
| Edit | Bartack Toggle |
| Edit | Max. Speed |
| Edit | Bartack at seam begin |
| Edit | Bartack at seam end |
| Edit | Needle Half Stitch |
| Edit | Enabled Thread Trim |
| Edit | Needle thread clamp |
| Edit | Threading Mode |
| Edit | Light barrier |
| Edit | Reset Bobbin Counter |

| Read/Edit/Access | Menu item |
|------------------------|---|
| Edit | Seam Center Guide |
| Automatic mode | |
| Access | Program selection |
| Edit | Program |
| Edit | Stitch length correction factor |
| Edit | Needle thread tension correction factor |
| Sewing | |
| Access | Start bartack submenu |
| Access | End bartack submenu |
| Access | Foot lifting submenu |
| Access | Thread clamp submenu |
| Access | Pointing position submenu |
| Access | 2 nd Edge guide position submenu |
| Access | Reset bobbin counter submenu |
| Access | Reset daily pieces submenu |
| Access | Seam center guide enabled |
| User Management | |
| Edit | Current user |
| Edit | Roles up to technician |
| Edit | Users up to technician |
| Edit | Auto Login editable |

5.4.1.2 Managing users

If selecting User Management as a *Default Technician* (p. 48), you will be presented with the following interface:

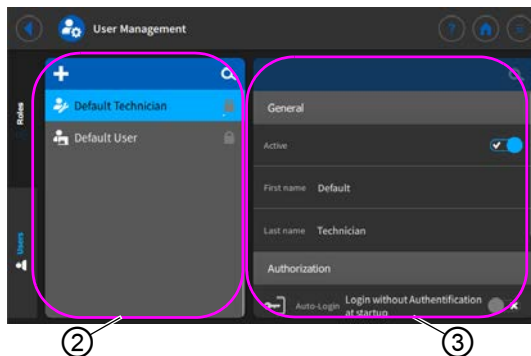
Fig. 39: Managing users (1)



(1) - Tab for users

Press the tab (1) reserved for the *Users* on the left-hand side. This interface appears:

Fig. 40: Managing users (2)



(2) - List of users




(3) - Settings of the user

The left-hand side holds a list of all users (2) that have been created. When pressing a user in this section, you will see on the right-hand side which settings (3) have been defined for the selected user.

Deleting a user




To delete a user:

1. Press the desired user.
 The user is highlighted in blue.
2. Press .
-  The user disappears from the list; it has been deleted.





Information

Users with a  symbol behind their names have been created at the factory. They cannot be deleted.

Creating a new user










To create a new user:

1. Press .
-  The list shows a new user.
2. Define the settings for the user (see table below).

Settings of the user

| Icon | Setting | Explanation |
|----------------|-------------------|---|
| General | | |
| | <i>First name</i> | Name of the user, NOT to be confused with the data used for logging in! |
| | <i>Name</i> | |

| Icon | Setting | Explanation |
|--|--|--|
| Authorization | | |
|  | <i>Login with username and password</i> | On/Off |
| | | <i>Username</i> Name for logging in |
| | | <i>Password</i> Password for logging in |
|  | <i>Login with NFC token</i> | Login by NFC chip allowed or not allowed |
|  | <i>Login with USB key</i> | Login by USB key allowed or not allowed |
|  | <i>Automatic login during system start</i> | Automatic login when machine starts; no login required |
| Roles ( p. 58) | | |
|  | <i>Technician</i> | Slider control active/inactive; for assigning the role |
|  | <i>User</i> | Slider control active/inactive; for assigning the role |

5.4.2 User login

The factory setting of the software is such that the *Default User* will be logged in automatically when the machine is switched on. This does not require any type of authorization. The following explains how you can switch users.



To access User Management:



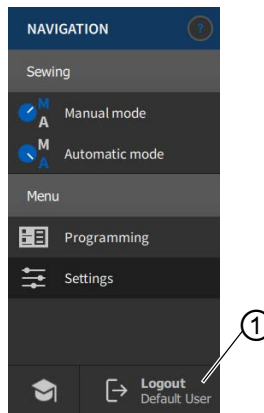

1. Press the symbol  to bring up the navigation pane.
 This opens the navigation interface.

Fig. 41: User login (1)



(1) - Logout



2. Press *Logout* (1).
 This opens the Login interface.




There are three ways to log in. The three options - including the necessary settings in the software - are described below.

5.4.2.1 Logging in with username and password

Assigning a username and password




To assign a username and password:

1. Create a new user in *User Management* and assign this user a username and password ( p. 62).
- ↳ The user can log in immediately with this login information.

Logging in with username and password



To log in with username and password:


1. Enter *username* and *password*.
2. Press .
- ↳ If the login information is correct, the user will be logged in.

5.4.2.2 Logging in with a USB key

Assigning a USB key to a user



To assign a USB key to a user:

1. Select a user in *User Management* or create a new user ( p. 62).
2. Press the item *Login with USB-Stick*.
- ↳ A new window opens.
3. Plug the USB key into one of the ports on the control panel.
4. Select the USB key you wish to assign to the user for login purposes.

5. To assign the USB key, press *Pair*.
 - ↳ The window disappears, and the function *Login using USB* is active.

Logging in with USB key



To log in with a USB key:


1. Plug the assigned USB key into the control panel.
 - ↳ If the USB key has been assigned correctly, the user will be logged in.

5.4.2.3 Logging in with NFC chip

Assigning an NFC chip to a user



To assign an NFC chip to a user:

1. Select a user in *User Management* or create a new user ( p. 62).
2. Press the item *Login with NFC chip*.
 - ↳ A new window opens.
3. To assign the NFC chip, hold the chip up to the control panel on the left-hand side.
 - ↳ The window disappears, and the function *Login with NFC chip* is active.

Logging in with NFC chip



To log in with an NFC chip:

1. Hold the assigned NFC chip up to the control panel on the left-hand side.
 - ↳ If the NFC chip has been assigned correctly, the user will be logged in.

5.5 Software operating modes

The software of the control panel offers various operating modes:

- **Manual mode**

Manual mode is the simplest operating mode. There are no programs/seam programs and no inputs for individual seam sections.

Changes to the sewing foot pressure, stroke height, stitch length, needle thread tension and, also, the activation of other functions are always implemented immediately.

All the major sewing parameters can be changed manually during the sewing process.

- **Automatic mode**

Automatic mode allows for the execution of setups (seam program comprised of only one seam section) or complex seam programs (comprising 2 or more seam sections).

Seam programs are divided into individual seam sections. Each section is assigned its own individual stitch length, needle thread tension, etc.

- **Programming**

Programming mode makes it possible to create, adjust or delete a seam program in a quick and easy manner.

The individual modes and their uses are explained in detail later on.

5.6 Using Manual mode

In manual mode, no programs have been saved, allowing you to use all parameters in a variable manner.



To access the Manual mode:



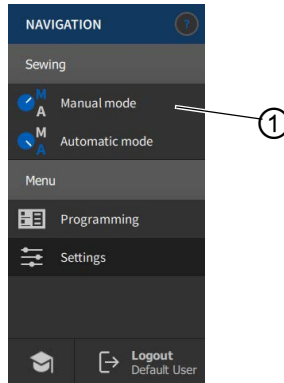

1. Press the symbol  to bring up the navigation pane.
 This opens the navigation interface.

Fig. 42: Using Manual mode



(1) - Manual mode



2. Press *Manual mode* (1).
 The interface of Manual mode opens.

5.6.1 Setting up the user interface

You can customize the arrangement of the tiles and the appearance of the status bar in Manual mode.

Arranging the tiles on the main screen

The main screen consists of three pages, which you can customize to your individual needs.



To adjust the tiles on the main screen:



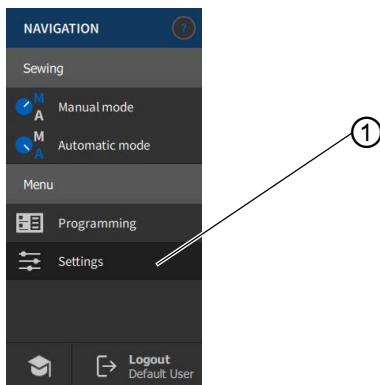
1. Press the symbol  to bring up the navigation pane.
 This opens the navigation interface.

Fig. 43: Setting up the user interface (1)



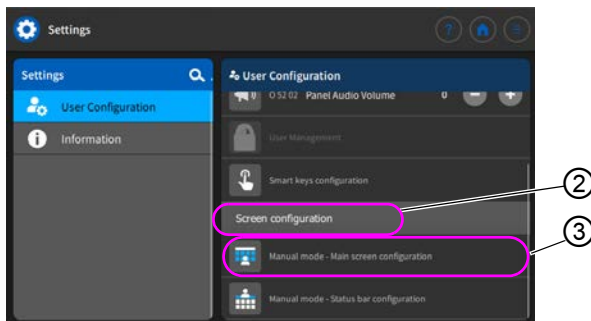
(1) - Settings



2. Press *Settings* (1).

↳ This opens the Settings interface.

Fig. 44: Setting up the user interface (2)



(2) - Screen configuration

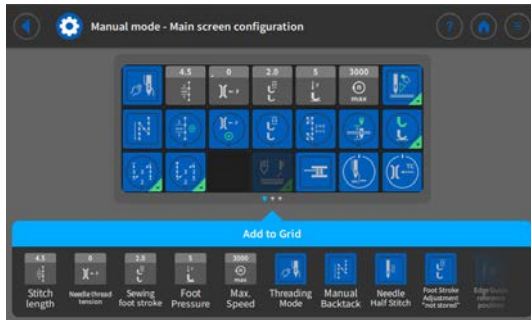
(3) - Main screen configuration





3. Go to *Screen configuration* (2) and press on *Manual mode - Main screen configuration* (3).

↳ The interface used for configuring the main screen opens.

Fig. 45: Setting up the user interface (3)



4. Press and hold the desired tile and drag it to move it into or out of the grid.
5. Press  to return to Settings or  to return to Manual mode.

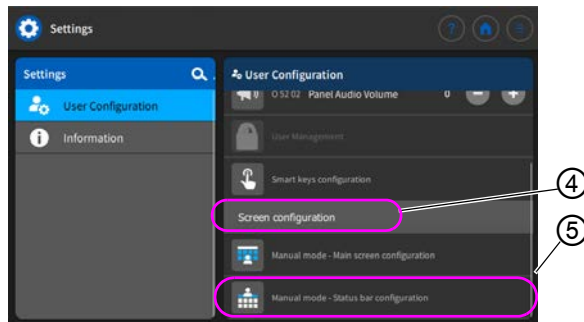
Adjusting the information displayed in the status bar

To adjust the appearance of the status bar:



1. Go to *Settings* (see above).

Fig. 46: Setting up the user interface (4)



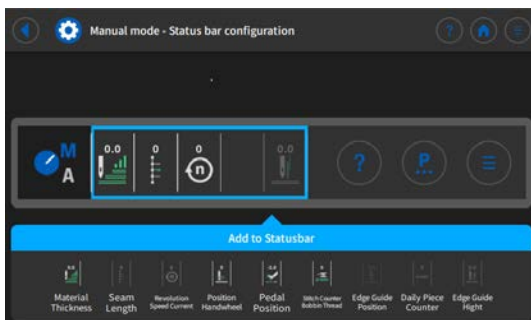
(4) - Screen configuration



(5) - Status bar configuration



2. Go to *Screen configuration* (4) and press on *Manual mode - Status bar configuration* (5).
- ↳ The interface used for configuring the status bar opens.

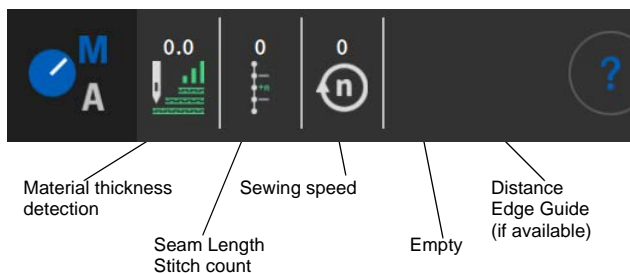
Fig. 47: Setting up the user interface (5)



3. Press and hold the desired symbol and drag it to move it into or out of the status bar.
4. Press  to return to Settings or  to return to Manual mode.

Default status bar settings

Fig. 48: Default status bar



5.6.2 Setting the parameters



In Manual mode, you can set a variety of parameters. The functions and how they affect the parameters are described further below.



To access the parameter settings:


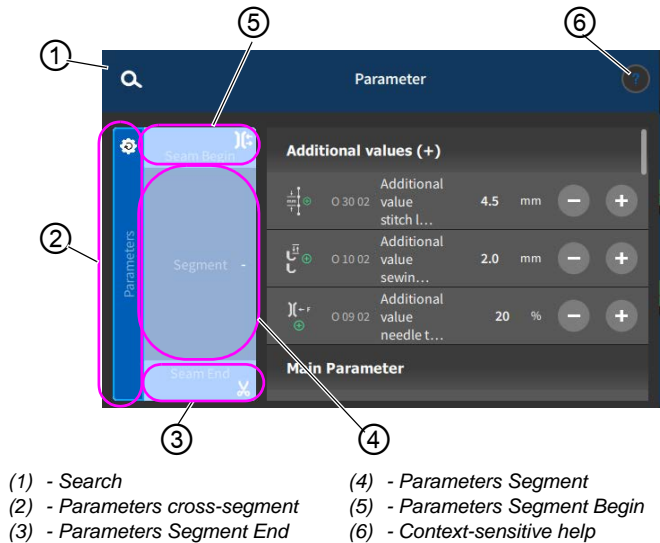
1. Press the symbol  to bring up the parameter pane.
- ↳ This opens the parameter settings interface.

Fig. 49: Setting the parameters



















- | | |
|--------------------------------|--------------------------------|
| (1) - Search | (4) - Parameters Segment |
| (2) - Parameters cross-segment | (5) - Parameters Segment Begin |
| (3) - Parameters Segment End | (6) - Context-sensitive help |







5.6.3 Setting cross-segment *parameters*

There are various options for setting the cross-segment parameters. The following table lists all possible options.

Settings that are more complex and therefore require further explanation are described in more detail after the table.

| Icon | Parameter | Setting |
|---|--|---|
| Additional values (+) | | |
|  | <i>Additional value stitch length (+)</i> The 2 nd value for the stitch length can be switched on using a button on the push button panel or the tile on the control panel. | Value range 00.0 - 12.0 (depending on sewing equipment and subclass) |
|  | <i>Additional value sewing foot stroke (+)</i> The 2 nd value for the sewing foot stroke can be switched on using a button on the push button panel, the knee button or the tile on the control panel. | Value range 05.0 - 09.0 [mm] |
|  | <i>Additional value needle thread tension (+)</i> The 2 nd value for the needle thread tension can be switched on using a button on the push button panel or the tile on the control panel. | Value range 01 - 99 |
|  | <i>Gap (2nd value)</i> The 2 nd value for the gap between the motor driven edge guide and the needle (factoring in the defined safety distance to the sewing feet). | Value range 1.0 - 45.0 (depends on the sewing equipment) |
| Main Parameter | | |
|  | <i>Bobbin monitor mode</i> | (see  p. 77) |




| Icon | Parameter | Setting |
|---|---|--|
|  | <i>Point position</i> The distance of the needle from the material can be adjusted to allow precise positioning of the sewing material when starting sewing. The value entered here corresponds to the degree number on the handwheel. | Value range 000 – 359 [°] |
|  | <i>Gap</i> Value for the gap between the motor driven edge guide and the needle (factoring in the defined safety distance to the sewing feet). | Value range 1.0 - 45.0 (depends on the sewing equipment) |
| Correction speed effect | | |
|  | <i>Correction speed effect</i> | Value range On/Off (see  p. 79) |
|  | <i>Stitch length</i> | The stitch length changes slightly depending on the speed. For this reason, the stitch length can be adjusted at different speeds by the software. |
|  | <i>Needle thread tension</i> | Depending on the speed, the needle thread tension can be adjusted at different speeds by the software. |
|  | <i>Sewing foot pressure</i> | Depending on the speed, the sewing foot pressure can be adjusted at different speeds by the software. |
| Material thickness detection | | |
|  | <i>Material thickness detection</i> | Value range On/Off (see  p. 83) |
|  | <i>Sewing foot stroke</i> | The sewing foot stroke can be adjusted to different material thicknesses by the software. |






| Icon | Parameter | Setting |
|---|------------------------------|---|
|  | <i>Stitch length</i> | The stitch length changes slightly depending on the material thickness. For this reason, the stitch length can be adjusted to different material thicknesses by the software. |
|  | <i>Needle thread tension</i> | Depending on the material thickness, the needle thread tension can be adjusted to different material thicknesses by the software. |
|  | <i>Sewing foot pressure</i> | The sewing foot pressure can be adjusted to different material thicknesses by the software. |
|  | <i>Max. sewing speed</i> | The maximum sewing speed can be adjusted to different material thicknesses by the software. |
| Output | | |
|  | <i>Output 1-16</i> | (see  p. 87) |

5.6.3.1 Setting the *Bobbin monitor mode* parameters



The amount of remaining thread on the bobbin can be monitored optically or by software using this setting.

| Menu item | Setting option 1 | Setting option 2 |
|--|---|---------------------------------|
| <i>Off</i> | | |
| Monitor Monitor mode can only be used if the additional equipment of the remaining thread monitor is present on the machine. Monitor mode allows for optical monitoring of the bobbin. | <i>Sewing stop</i>  Sewing stops and a notice is shown on the display when the bobbin is detected to be nearly empty. If the parameter is not activated, only the LEDs on the machine arm give a warning if the bobbin is empty. | Value range On/Off |
| | <i>Sewing foot lower position</i>  | Value range On/Off |
| | <i>t Clean</i>  Duration for which the lens is blown clear with compressed air. The process takes place as the thread is cut. | Value range 0000 – 5000 [ms] |

| Menu item | Setting option 1 | Setting option 2 |
|---|---|------------------------------|
| <i>Software / Stitch Counter</i> In Software mode, the bobbin is monitored by the software based on the number of stitches sewn. | <i>Counter Type</i>  A-D Σ 4 different counters can be applied. The following 3 sub-items can be set for each of the counters. | Value range A/B/C/D |
| | <i>Counter value</i>  Σ:0000 Bobbin supply capacity in stitches. This is a very variable value, which depends on the size of the bobbin and the thickness of the thread. | Value range 00000 - 99999 |
| | <i>Sewing stop</i>  Sewing stops and a notice is shown on the display when the bobbin is detected to be nearly empty. If the parameter is not activated, only the LEDs on the machine arm give a warning if the bobbin is empty. | Value range On/Off |
| | <i>Sewing foot lower position</i>  (The icon also includes a green horizontal line with a small vertical tick at the end.) | Value range On/Off |
| | <i>Reset necessary</i>  It is only possible to resume sewing after changing the bobbin and confirming the message on the control panel. | Value range On/Off |

5.6.3.2 Setting the *Correction speed effect* parameters



Some parameters are affected by high speeds because of the resulting physical effects. To counteract these effects and to achieve consistent results, even at high speeds, adjustment factors can be set depending on the speed.

Overview of settings modes

The correction of the effects of high speeds can be identified in various modes and responded to depending on the setting. This general explanation can be applied to the following specific parameters.

| Setting mode | Description |
|------------------|---|
| <i>linear</i> | In the linear setting, the size of the parameter increases or decreases steadily as the speed increases. The increase/decrease of the parameter depends on the limits set for the minimum and maximum speed. |
| <i>2 . OnOff</i> | If a certain speed is exceeded, the 2 nd value of the parameter is activated. If the speed then falls below this level again, it switches to the base value for the parameter. |
| <i>2 . On</i> | If a certain speed is exceeded, the 2 nd value of the parameter is activated. If the speed then falls below this level again, it does NOT switch to the base value for the parameter. Only after finishing the seam by cutting the thread is the base value for the parameter set again. |



Setting options *Stitch length*

| Menu item | Setting 1 | Setting 2 |
|----------------------------|---|---|
| <i>linear</i> | <i>Stitch length</i> Value range -50 – 50 [%] | Maximum stitch length variation reached at the upper speed limit. |
| | <i>Min. Sewing speed</i> Value range 0000 – 4000 [rpm] (depending on subclass) | Speed at which the increase/reduction of stitch length should start. |
| | <i>Max. Sewing speed</i> Value range 0000 – 4000 [rpm] (depending on subclass) | Speed up to which the increase/reduction of stitch length should occur. |
| <i>2. Value On/Off</i> | <i>Min. Sewing speed</i> Value range 0000 – 4000 [rpm] (depending on subclass) | Speed from which the 2 nd stitch length should be used. |
| <i>2. Value On</i> | <i>Min. Sewing speed</i> Value range 0000 – 4000 [rpm] (depending on subclass) | Speed from which the 2 nd stitch length should be used. |



Setting options *Needle thread tension*

| Menu item | Setting 1 | Setting 2 |
|----------------------------|---|--|
| <i>linear</i> | <i>Needle thread tension</i> Value range 00 – 99 | Maximum needle thread tension reached at the upper speed limit. |
| | <i>Min. Sewing speed</i> Value range 0000 – 4000 [rpm] (depending on subclass) | Speed at which the increase in needle thread tension should start. |
| | <i>Max. Sewing speed</i> Value range 0000 – 4000 [rpm] (depending on subclass) | Speed up to which the increase in needle thread tension should occur. |
| <i>2. Value On/Off</i> | <i>Min. Sewing speed</i> Value range 0000 – 4000 [rpm] (depending on subclass) | Speed from which the 2 nd needle thread tension should be used. |
| <i>2. Value On</i> | <i>Min. Sewing speed</i> Value range 0000 – 4000 [rpm] (depending on subclass) | Speed from which the 2 nd needle thread tension should be used. |


Setting options *Sewing foot pressure*

| Menu item | Setting 1 | Setting 2 |
|---------------|---|--|
| <i>linear</i> | <i>Sewing foot pressure</i> Value range 00 – 20 | Maximum sewing foot pressure reached at the upper speed limit. |
| | <i>Min. Sewing speed</i> Value range 0000 – 4000 [rpm] (depending on subclass) | Speed at which the increase in sewing foot pressure should start. |
| | <i>Max. Sewing speed</i> Value range 0000 – 4000 [rpm] (depending on subclass) | Speed up to which the increase in sewing foot pressure should occur. |

5.6.3.3 Setting the *Material thickness detection* parameters



To achieve consistently good sewing results for different material thicknesses, some parameters can be adjusted specifically to the material thickness.

Overview of settings modes

The material thickness can be identified in various modes and responded to depending on the setting. This general explanation can be applied to the following specific parameters.

| Setting mode | Description |
|------------------|---|
| <i>linear</i> | In the linear setting, the size of the parameter increases or decreases steadily as the material thickness increases. The increase/decrease of the parameter depends on the limits set for the minimum and the maximum material thickness. |
| <i>2 . OnOff</i> | If a certain material thickness is exceeded, the 2 nd value of the parameter is activated. If the material thickness then falls below this level again, it switches to the base value for the parameter. |
| <i>2 . On</i> | If a certain material thickness is exceeded, the 2 nd value of the parameter is activated. If the material thickness then falls below this level again, it does NOT switch to the base value for the parameter. Only after finishing the seam by cutting the thread is the base value for the parameter set again. |


Setting options *Sewing foot stroke*

| Menu item | Setting 1 | Setting 2 |
|----------------|--|--|
| <i>linear</i> | <i>Sewing foot stroke</i> Value range 00 – 09 [mm] | Maximum sewing foot stroke reached at the upper material thickness limit. |
| | <i>Min. Material thickness</i> Value range 00.0 – 10.0 [mm] | Material thickness at which the increase in sewing foot stroke should start. |
| | <i>Max. Material thickness</i> Value range 00.0 – 10.0 [mm] | Material thickness up to which the increase in sewing foot stroke should occur. |
| <i>2.OnOff</i> | <i>Min. Material thickness</i> Value range 00.0 – 10.0 [mm] | Material thickness from which the 2 nd sewing foot stroke should be used. |
| <i>2.On</i> | <i>Min. Material thickness</i> Value range 00.0 – 10.0 [mm] | Material thickness from which the 2 nd sewing foot stroke should be used. |



Setting options *Stitch length*

| Menu item | Setting 1 | Setting 2 |
|----------------|--|--|
| <i>linear</i> | <i>Stitch length</i> Value range -50 – 50 [%] | Maximum stitch length variation reached at the upper material thickness limit. |
| | <i>Min. Material thickness</i> Value range 00.0 – 10.0 [mm] | Material thickness at which the increase/reduction of stitch length should start. |
| | <i>Max. Material thickness</i> Value range 00.0 – 10.0 [mm] | Material thickness up to which the increase/reduction of stitch length should occur. |
| <i>2.OnOff</i> | <i>Min. Material thickness</i> Value range 00.0 – 10.0 [mm] | Material thickness from which the 2 nd stitch length should be used. |
| <i>2.On</i> | <i>Min. Material thickness</i> Value range 00.0 – 10.0 [mm] | Material thickness from which the 2 nd stitch length should be used. |


Setting options *Needle thread tension*

| Menu item | Setting 1 | Setting 2 |
|----------------|--|---|
| <i>linear</i> | <i>Needle thread tension</i> Value range 00 – 99 | Maximum needle thread tension reached at the upper material thickness limit. |
| | <i>Min. Material thickness</i> Value range 00.0 – 10.0 [mm] | Material thickness at which the increase in needle thread tension should start. |
| | <i>Max. Material thickness</i> Value range 00.0 – 10.0 [mm] | Material thickness up to which the increase in needle thread tension should occur. |
| <i>2.OnOff</i> | <i>Min. Material thickness</i> Value range 00.0 – 10.0 [mm] | Material thickness from which the 2 nd needle thread tension should be used. |
| <i>2.On</i> | <i>Min. Material thickness</i> Value range 00.0 – 10.0 [mm] | Material thickness from which the 2 nd needle thread tension should be used. |


Setting options *Sewing foot pressure*

| Menu item | Setting 1 | Setting 2 |
|---------------|--|---|
| <i>linear</i> | <i>Sewing foot pressure</i> Value range 00 – 20 | Maximum sewing foot pressure reached at the upper material thickness limit. |
| | <i>Min. Material thickness</i> Value range 00.0 – 10.0 [mm] | Material thickness at which the increase in sewing foot pressure should start. |
| | <i>Max. Material thickness</i> Value range 00.0 – 10.0 [mm] | Material thickness up to which the increase in sewing foot pressure should occur. |




Setting options *Max. sewing speed*

| Menu item | Setting 1 | Setting 2 |
|---------------|--|---|
| <i>linear</i> | <i>Max. Sewing speed</i> Value range 0000 – 4000 | Maximum speed reached at the upper material thickness limit. |
| | <i>Min. Material thickness</i> Value range 00.0 – 10.0 [mm] | Material thickness at which the increase in sewing speed should start. |
| | <i>Max. Material thickness</i> Value range 00.0 – 10.0 [mm] | Material thickness up to which the increase in sewing speed should occur. |

5.6.3.4 Setting the Outputs (*Output*) parameter









This parameter provides virtual outputs that can be assigned customer-specific functions. They can be used when customer-specific applications require a signal from the control of the machine.






This parameter cannot be used unless the virtual outputs have been assigned to a physical output at the Technician level. This requires that the parameter *Additional I/O Configuration* can be configured at the Technician level; for more details, refer to the explanation in the  *Service Instructions*.




5.6.4 Setting the *Segment Begin* parameters

There are various options for setting the Segment Begin parameters. The following table lists all possible options.

Settings that are more complex and therefore require further explanation are described in more detail after the table.

| Icon | Parameter | Setting |
|---|--|---------------------------------|
| Parameter Seam Begin | | |
|  | <i>Needle thread clamp</i> The needle thread clamp is closed at the 1 st stitch of the seam to ensure that the needle thread lies on the underside of the sewing material | Value range On/Off |
| Seam begin bartack settings | | |
|  | <i>Bartack at seam begin</i> | Value range On/Off |
|  | <i>Number of stitches backwards</i> | Value range 01 - 50 |
|  | <i>Number of stitches forward</i> | Value range 01 - 50 |
|  | <i>Number of bartack sections</i> A bartack consists of several sections. If the sewing direction is changed, a new section is started. The number of sections in a bartack can be set here. | Value range 01 - 99 |
|  | <i>Stop-Time for direction change</i> The waiting time at the turning points (e.g. for a change of sewing direction) is set at this point. A short waiting time in milliseconds should ensure consistent seam quality (ornamental-stitch bartack) | Value range 0000 – 1000 [ms] |






| Icon | Parameter | Setting |
|---|--|--|
|  | <p><i>Stitch length default</i> If this function is active, the same needle stitch length is used for the bartack as the one set in Manual mode. If this function is deactivated, a custom input can be entered.</p> | On/Off |
| | | <p><i>Stitch length of stitches forward</i> Value range 01.0 - 12.0 [mm] (depending on subclass)</p> |
| | | <p><i>Stitch length of backwards stitches</i> Value range 01.0 - 12.0 [mm] (depending on subclass)</p> |
|  | <i>Speed in bartack</i> | Value range 0000 - 2000 |
|  | <p><i>Single stitches per pedal</i> If this function is activated, each stitch in the bartack can be sewn individually by pressing the pedal. This function can only be used meaningfully if the speed is set very low for the bartack.</p> | Value range On/Off |
|  | <p><i>Needle thread tension default</i> If this function is active, the same needle thread tension is used for the bartack as the one set in Manual mode. If this function is deactivated, a custom input can be entered.</p> | Value range On/Off |
|  | <p><i>Catch bartack</i> To ensure a safe sewing start and complete sewing of the start bartack, an additional bartack can precede the start bartack. Only the number of forward and backward stitches can be selected. The stitch length cannot be set individually – it corresponds to the stitch length of the normal start bartack.</p> | On/Off |
| | | <p><i>Number of stitches backwards</i> Value range 01 - 50</p> |
| | | <p><i>Number of stitches forward</i> Value range 01 - 50</p> |
| | | <p><i>Number of bartack sections</i> Value range 01 10</p> |





| Icon | Parameter | Setting |
|---|---|---|
|  | <i>First bartack section</i> The 1 st section of the bartack can be programmed with a different number of stitches. All subsequent sections have the preset number of stitches from the settings for the start bartack. | On/Off |
| | | <i>Number of stitches</i> Value range 01 - 50 |
|  | <i>Last bartack section</i> The last section of the bartack can be programmed with a different number of stitches. All previous sections have the preset number of stitches from the settings for the end bartack. | On/Off |
| | | <i>Number of stitches</i> Value range 01 - 50 |
|  | <i>Invert bartack direction</i> Normally, a bartack starts either with the sewing direction (forwards – even number of sections) or against the sewing direction (backwards – odd number of sections), depending on the number of sections. Setting this parameter inverts the sewing direction of the bartack. | Value range On/Off |

5.6.5 Setting the *Segment* parameters

There are various options for setting the parameters in the segment. The following table lists all possible options.

Settings that are more complex and therefore require further explanation are described in more detail after the table.





| Icon | Parameter | Setting |
|---|---|---|
| Seam Parameter | | |
|  | <i>Stitch length</i> | Value range 00.0 - 12.0 [mm] (depending on the sewing equipment and the subclass) |
|  | <i>Needle thread tension</i> | Value range 01 - 99 |
|  | <i>Sewing foot pressure</i> | Value range 01 - 20 |
|  | <i>Sewing foot stroke</i> | Value range 1.0 – 9.0 [mm] |
|  | <i>Max. Speed</i> It is possible to reduce the maximum sewing speed at this point. The maximum sewing speed can be set in the software at the Technician level. | Value range 0050 – 3800 [rpm] (depending on subclass) |








| Icon | Parameter | Setting |
|---|--|---|
|  | <i>Sewing foot lift at stop</i> | Value range On/Off |
|  | <i>Height of sewing foot lift at Sewing stop</i> | Value range 00 – 20 [mm] (depending on subclass) |
|  | <i>Light barrier</i> (optional additional equipment) The light barrier detects the beginning and the end of the material. After a signal was detected, sewing can continue automatically with the specifically set parameters. | Value range On/Off (see  p. 123) |






5.6.6 Setting the *Segment End* parameters

There are various options for setting the Segment End parameters. The following table lists all possible options.

Settings that are more complex and therefore require further explanation are described in more detail after the table.

| Icon | Parameter | Setting |
|---|--|--|
| Parameter Seam End | | |
|  | <i>Sewing foot lift after trim</i> | Value range On/Off |
|  | <i>Height of sewing foot lift after trim</i> | Value range 00 – 20 [mm] (depending on subclass) |
|  | <i>Thread trimmer</i> | Value range On/Off |
| Adjustments for seam end bartack parameters | | |
|  | <i>Bartack at seam end</i> | Value range On/Off |

| Icon | Parameter | Setting |
|---|---|--|
|  | <i>Number of stitches backwards</i> | Value range 01 - 50 |
|  | <i>Number of stitches forward</i> | Value range 01 - 50 |
|  | <i>Number of bartack sections</i> A bartack consists of several sections. If the sewing direction is changed, a new section is started. The number of sections in a bartack can be set here. | Value range 01 - 99 |
|  | <i>Stop-Time for direction change</i> The waiting time at the turning points (e.g. for a change of sewing direction) is set at this point. A short waiting time in milliseconds should ensure consistent seam quality (ornamental-stitch bartack). | Value range 0000 – 1000 [ms] |
|  | <i>Stitch length default</i> If this function is active, the same needle stitch length is used for the bartack as the one set in Manual mode. If this function is deactivated, a custom input can be entered. | On/Off |
| | | <i>Stitch length of stitches forward</i> Value range 01.0 - 12.0 [mm] (depending on subclass) |
| | | <i>Stitch length of backwards stitches</i> Value range 01.0 - 12.0 [mm] (depending on subclass) |
|  | <i>Speed in bartack</i> | Value range 0000 - 2000 |
|  | <i>Single stitches per pedal</i> If this function is activated, each stitch in the bartack can be sewn individually by pressing the pedal. This function can only be used meaningfully if the speed is set very low for the bartack. | Value range On/Off |

| Icon | Parameter | Setting |
|---|--|---|
|  | <i>Needle thread tension default</i> If this function is active, the same needle thread tension is used for the bartack as the one set in Manual mode. If this function is deactivated, a custom input can be entered. | Value range On/Off |
|  | <i>Catch bartack</i> To ensure a safe sewing start and complete sewing of the start bartack, an additional bartack can precede the start bartack. Only the number of forward and backward stitches can be selected. The stitch length cannot be set individually – it corresponds to the stitch length of the normal start bartack. | On/Off |
| | | <i>Number of stitches backwards</i> Value range 01 - 50 |
| | | <i>Number of stitches forward</i> Value range 01 - 50 |
| | | <i>Number of bartack sections</i> Value range 01 - 10 |
|  | <i>First bartack section</i> The 1 st section of the bartack can be programmed with a different number of stitches. All subsequent sections have the preset number of stitches from the settings for the start bartack. | On/Off |
| | | <i>Number of stitches</i> Value range 01 - 50 |
|  | <i>Last bartack section</i> The last section of the bartack can be programmed with a different number of stitches. All previous sections have the preset number of stitches from the settings for the end bartack. | On/Off |
| | | <i>Number of stitches</i> Value range 01 - 50 |
|  | <i>Invert bartack direction</i> Normally, a bartack starts either with the sewing direction (forwards – even number of sections) or against the sewing direction (backwards – odd number of sections), depending on the number of sections. Setting this parameter inverts the sewing direction of the bartack. | Value range On/Off |



5.6.7 Using bobbin wind mode



A bobbin can be wound without sewing. You can choose if you want the winding process to stop automatically when the bobbin is full or not until the bobbin shaft has completed a certain number of rotations.



To use bobbin wind mode:

1. When setting up the user interface ( p. 69), drag the tile for bobbin wind mode onto the main screen.
2. Press  to return to Manual mode.
3. Press on the bobbin wind mode symbol and choose between *Lever* and *Turns*.
4. Define and confirm the settings.
↳ Bobbin wind mode begins.

5.7 Using Automatic mode

Automatic mode is comprised of all stored programs.



To access the Automatic mode:


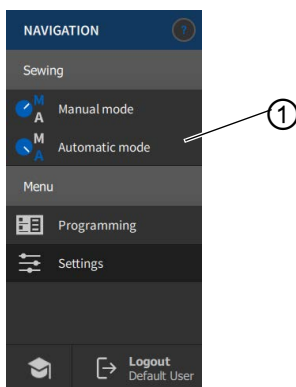
1. Press the symbol  to bring up the navigation pane.
↳ This opens the navigation interface.

Fig. 50: Using Automatic mode (1)



(1) - Automatic mode

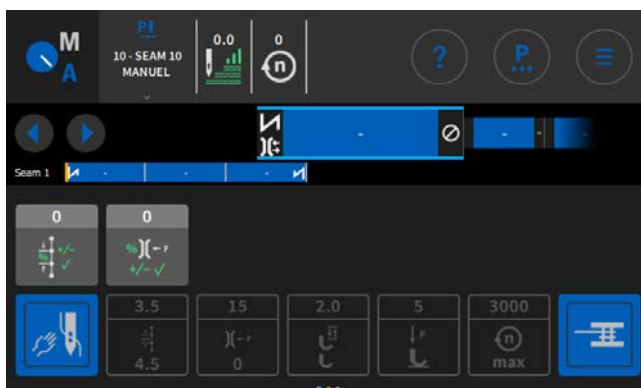


2. Press *Automatic mode* (1).










↳ The interface of Automatic mode opens.
The program stored last is loaded.

The display shows tiles and information below the upper bar that vary with the selected program:

Fig. 51: Using Automatic mode (2)



Explanations of icons/symbols in Automatic mode:

| Symbol/Icon | Meaning |
|--|---|
|  | Selected program |
|  | Move to the next or previous step in seams/ segments - also during the seam |
| X | Abort a seam program |
|  | Seam/segment including information on the settings for seam beginning, seam and seam end |
|  | Display of the entire program including its seams and segments. |
|  | Adjustment factors that can still be adjusted during the seam |
|  | Grayed-out tiles for information on the set parameters can be adjusted by programming ( p. 100). |
|  | Dark gray tiles can only be activated or deactivated. You define which tiles will be visible by programming ( p. 100). |

5.7.2 Canceling a program in Automatic mode



To cancel a program in Automatic mode:

1. Push the pedal fully back.
 - ↳ The program is canceled and the thread cut. The machine takes note of where the program was canceled, and then continues from the same point when sewing resumes.
2. To cancel the program completely, press the pedal all the way backwards again.
 - ↳ The program is canceled, and the machine starts from the first seam section in the program when sewing resumes.



Important

Canceling by pedal is only possible if the parameter segment switch by pedal is NOT active in the program defaults at the Technician level.

If the parameter is still active, you can cancel the program only by pressing the cross on the control panel.

5.8 Using Programming mode



Programming mode allows you to create new programs and copy and adjust existing programs.



To access Programming mode:



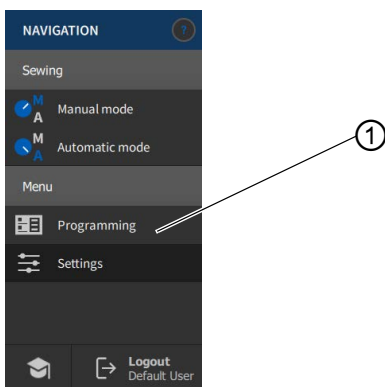
1. Press the symbol  to bring up the navigation pane.
 This opens the navigation interface.

Fig. 53: Using Programming mode (1)



(1) - Programming mode




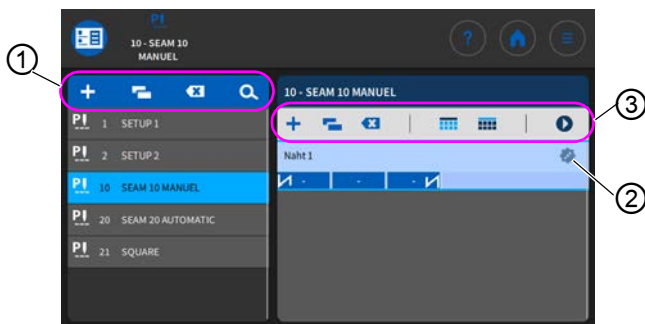
2. Press *Programming*.
 The user interface for Programming mode opens.

Fig. 54: Using Programming mode (2)







(1) - Manage the programs

(2) - Edit the seams/segments

(3) - Manage the seams/segment

5.8.1 Managing programs

You can create, delete and copy programs. Managing the items is quick and easy thanks to the buttons listed below.









| | |
|---|---------------------------|
|  | Create a new program |
|  | Delete a selected program |
|  | Copy and insert a program |
|  | Search for a program name |

5.8.2 Managing seams

You can also add tiles to the main screen or the status bar.

You can also add tiles to the main screen or the status bar.

Managing the items is quick and easy thanks to the buttons listed below.

| Settings in the selected program (edit seam) | |
|---|--|
|  | Add seam |
|  | Delete seam |
|  | Copy and insert a seam |
|  | Place tiles on the main screen of the program (grid), see  p. 69. |
|  | Place information in the status bar of the program, see  p. 69. |
|  | Exit Programming/Edit and return to the beginning of the program (in Automatic mode) |

5.8.3 Editing the segments of a seam

This section allows you to set the parameters for the current seam.




To edit the segments of a seam:

1. Press on the desired seam.
- ↳ The seam is highlighted in blue.

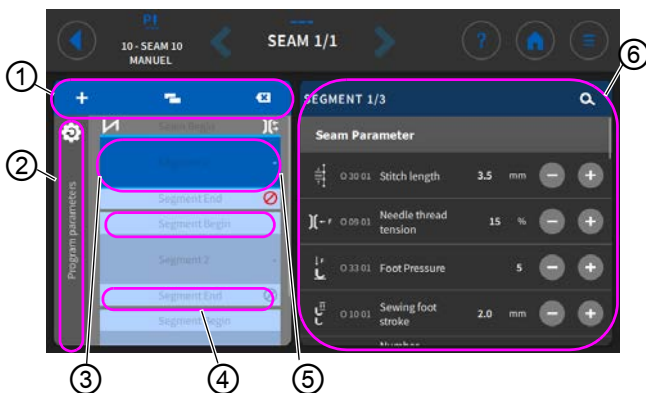
Fig. 55: Editing the segments of a seam (1)



2. Press on the symbol .

↳ The interface used for setting the parameters opens:




Fig. 56: Editing the segments of a seam (2)



- | | |
|---|---|
| (1) - Manage segments | (5) - Parameters Segment Begin/ Seam Begin |
| (2) - Parameters cross-segment | (6) - List of adjustable parameters |
| (3) - Parameters Segment | |
| (4) - Parameters Segment End/ Seam end | |

5.8.4 Managing segments




You can create, delete and copy segments. Managing the items is quick and easy thanks to the buttons listed below.







| Edit segments | |
|---|---------------------------|
|  | Add segment |
|  | Delete segment |
|  | Copy and insert a segment |











5.8.5 Setting program parameters





There are various options for setting the cross-program parameters. The following table lists all possible options.

Settings that are more complex and therefore require further explanation are described in more detail after the table.

| Icon | Parameter | Setting |
|---|--|--|
| Additional values (+) | | |
|  | <i>Additional value stitch length (+)</i> The 2 nd value for the stitch length can be switched on using a button on the push button panel or the tile on the control panel. | Value range 00.0 - 12.0 (depending on sewing equipment and subclass) |
|  | <i>Additional value sewing foot stroke (+)</i> The 2 nd value for the sewing foot stroke can be switched on using a button on the push button panel, the knee button or the tile on the control panel. | Value range 05.0 - 09.0 [mm] |
|  | <i>Additional value needle thread tension (+)</i> The 2 nd value for the needle thread tension can be switched on using a button on the push button panel or the tile on the control panel. | Value range 01 - 99 |

| Icon | Parameter | Setting |
|---|---|---|
|  | <p><i>Gap (2nd value)</i></p> <p>The 2nd value for the gap can be switched on using a button on the push button panel or the tile on the control panel.</p> | <p>Value range 01.0 – 45.0 [mm]</p> |
| Program Cycle | | |
|  | <p><i>Next program</i></p> <p>A subsequent program can be defined. Input via program number.</p> | |
|  | <p><i>Program Cycle</i></p> <p>The program is executed as a loop, which is useful, for instance, for ornamental stitch seams. You select the start segment and the end segment from a program and define how often you wish the selected segments to be sewn.</p> | <p>On/Off</p> |
| | | <p><i>Start Segment</i></p> <p>Value range 00 – 30 (0 = the cycle starts with the first segment)</p> |
| | | <p><i>End Segment</i></p> <p>Value range 00 – 30 (0 = the cycle ends with the last segment)</p> |
| | | <p><i>Repetitions</i></p> <p>Value range 00 – 99 (0 = the cycle continues until the next segment is activated manually)</p> |
| Main Parameter | | |
|  | <p><i>Needle thread clamp</i></p> <p>The needle thread clamp is closed at the 1st stitch of the seam to ensure that the needle thread lies on the underside of the sewing material</p> | <p>Value range On/Off</p> |
|  | <p><i>Bobbin monitor mode</i></p> | <p>(see  p. 107)</p> |




| Icon | Parameter | Setting |
|---|--|--|
|  | <i>Counter Mode</i> Daily piece counter, can be set to count either up or down. | Off/Up/Down |
| | | <i>Reset</i> When the daily piece counter is activated, it must be reset once after entering a value to ensure it counts correctly. |
|  | <i>Point position</i> The distance of the needle from the material can be adjusted to allow precise positioning of the sewing material when starting sewing. The value entered corresponds to the degree number on the handwheel. | 000 - 359 [°] |
| Correction speed effect | | |
|  | <i>Correction speed effect</i> | Value range On/Off (see  p. 109) |
|  | <i>Stitch length</i> | The stitch length changes slightly depending on the speed. For this reason, the stitch length can be adjusted at different speeds by the software. |
|  | <i>Needle thread tension</i> | Depending on the speed, the needle thread tension can be adjusted at different speeds by the software. |
|  | <i>Sewing foot pressure</i> | Depending on the speed, the sewing foot pressure can be adjusted at different speeds by the software. |
| Material thickness detection | | |
|  | <i>Material thickness detection</i> | Value range On/Off (see  p. 113) |
|  | <i>Sewing foot stroke</i> | The sewing foot stroke can be adjusted to different material thicknesses by the software. |






| Icon | Parameter | Setting |
|---|------------------------------|---|
|  | <i>Stitch length</i> | The stitch length changes slightly depending on the material thickness. For this reason, the stitch length can be adjusted to different material thicknesses by the software. |
|  | <i>Needle thread tension</i> | Depending on the material thickness, the needle thread tension can be adjusted to different material thicknesses by the software. |
|  | <i>Sewing foot pressure</i> | The sewing foot pressure can be adjusted to different material thicknesses by the software. |
|  | <i>Max. sewing speed</i> | The maximum sewing speed can be adjusted to different material thicknesses by the software. |



5.8.5.1 Setting the *Bobbin monitor mode* parameters

The amount of remaining thread on the bobbin can be monitored optically or by software using this setting.

| Menu item | Setting 1 | Setting 2 |
|---|---|---|
| <i>Off</i> | | |
| <p><i>Monitor</i></p> <p>Monitor mode can only be used if the additional equipment of the remaining thread monitor is present on the machine. Monitor mode allows for optical monitoring of the bobbin.</p> | <p><i>Sewing stop</i></p>  <p>Sewing stops and a notice is shown on the display when the bobbin is detected to be nearly empty. If the parameter is not activated, only the LEDs on the machine arm give a warning if the bobbin is empty.</p> | <p>Value range On/Off</p> |
| | <p><i>Sewing foot lower position</i></p>  | <p>Value range On/Off</p> |
| | <p><i>t Clean</i></p>  <p>Duration for which the lens is blown clear with compressed air. The process takes place as the thread is cut.</p> | <p>Value range 0000 – 5000 [ms]</p> |

| Menu item | Setting 1 | Setting 2 |
|---|---|------------------------------|
| <i>Software / Stitch Counter</i> In Software mode, the bobbin is monitored by the software based on the number of stitches sewn. | <i>Counter Type</i>  A-D Σ 4 different counters can be applied. The following 3 sub-items can be set for each of the counters. | Value range A/B/C/D |
| | <i>Counter value</i>  Σ:0000 Bobbin supply capacity in stitches. This is a very variable value, which depends on the size of the bobbin and the thickness of the thread. | Value range 00000 - 99999 |
| | <i>Sewing stop</i>  Sewing stops and a notice is shown on the display when the bobbin is detected to be nearly empty. If the parameter is not activated, only the LEDs on the machine arm give a warning if the bobbin is empty. | Value range On/Off |
| | <i>Sewing foot lower position</i>  | Value range On/Off |
| | <i>Reset necessary</i>  It is only possible to resume sewing after changing the bobbin and confirming the message on the control panel. | Value range On/Off |

5.8.5.2 Setting the *Correction speed effect* parameters



Some parameters are affected by high speeds because of the resulting physical effects. To counteract these effects and to achieve consistent results, even at high speeds, adjustment factors can be set depending on the speed.

Overview of settings modes

The correction of the effects of high speeds can be identified in various modes and responded to depending on the setting. This general explanation can be applied to the following specific parameters.

| Setting mode | Description |
|------------------------|---|
| <i>linear</i> | In the linear setting, the size of the parameter increases or decreases steadily as the speed increases. The increase/decrease of the parameter depends on the limits set for the minimum and maximum speed. |
| <i>2. Value On/Off</i> | If a certain speed is exceeded, the 2 nd value of the parameter is activated. If the speed then falls below this level again, it switches to the base value for the parameter. |
| <i>2. Value On</i> | If a certain speed is exceeded, the 2 nd value of the parameter is activated. If the speed then falls below this level again, it does NOT switch to the base value for the parameter. Only after finishing the seam by cutting the thread is the base value for the parameter set again. |


Setting options *Stitch length*

| Menu item | Setting 1 | Setting 2 |
|---------------------------|---|---|
| <i>linear</i> | <i>Stitch length</i> Value range -50 – 50 [%] | Maximum stitch length variation reached at the upper speed limit. |
| | <i>Min. Sewing speed</i> Value range 0000 – 4000 [rpm] (depending on subclass) | Speed at which the increase/reduction of stitch length should start. |
| | <i>Max. Sewing speed</i> Value range 0000 – 4000 [rpm] (depending on subclass) | Speed up to which the increase/reduction of stitch length should occur. |
| <i>2.Value On/Off</i> | <i>Min. Sewing speed</i> Value range 0000 – 4000 [rpm] (depending on subclass) | Speed from which the 2 nd stitch length should be used. |
| <i>2.Value</i> | <i>Min. Sewing speed</i> Value range 0000 – 4000 [rpm] (depending on subclass) | Speed from which the 2 nd stitch length should be used. |



Setting options *Needle thread tension*

| Menu item | Setting 1 | Setting 2 |
|----------------------------|---|--|
| <i>linear</i> | <i>Needle thread tension</i> Value range 00 – 99 | Maximum needle thread tension reached at the upper speed limit. |
| | <i>Min. Sewing speed</i> Value range 0000 – 4000 [rpm] (depending on subclass) | Speed at which the increase in needle thread tension should start. |
| | <i>Max. Sewing speed</i> Value range 0000 – 4000 [rpm] (depending on subclass) | Speed up to which the increase in needle thread tension should occur. |
| <i>2. Value On/Off</i> | <i>Min. Sewing speed</i> Value range 0000 – 4000 [rpm] (depending on subclass) | Speed from which the 2 nd needle thread tension should be used. |
| <i>2. Value On</i> | <i>Min. Sewing speed</i> Value range 0000 – 4000 [rpm] (depending on subclass) | Speed from which the 2 nd needle thread tension should be used. |


Setting options *Sewing foot pressure*

| Menu item | Setting 1 | Setting 2 |
|---------------|---|--|
| <i>linear</i> | <i>Sewing foot pressure</i> Value range 00 – 20 | Maximum sewing foot pressure reached at the upper speed limit. |
| | <i>Min. Sewing speed</i> Value range 0000 – 4000 [rpm] (depending on subclass) | Speed at which the increase in sewing foot pressure should start. |
| | <i>Max. Sewing speed</i> Value range 0000 – 4000 [rpm] (depending on subclass) | Speed up to which the increase in sewing foot pressure should occur. |

5.8.5.3 Setting the *Material thickness detection* parameters



To achieve consistently good sewing results for different material thicknesses, some parameters can be adjusted specifically to the material thickness.

Overview of settings modes

The material thickness can be identified in various modes and responded to depending on the setting. This general explanation can be applied to the following specific parameters.

| Setting mode | Description |
|------------------------|---|
| <i>linear</i> | In the linear setting, the size of the parameter increases or decreases steadily as the material thickness increases. The increase/decrease of the parameter depends on the limits set for the minimum and the maximum material thickness. |
| <i>2. Value On/Off</i> | If a certain material thickness is exceeded, the 2 nd value of the parameter is activated. If the material thickness then falls below this level again, it switches to the base value for the parameter. |
| <i>2. Value On</i> | If a certain material thickness is exceeded, the 2 nd value of the parameter is activated. If the material thickness then falls below this level again, it does NOT switch to the base value for the parameter. Only after finishing the seam by cutting the thread is the base value for the parameter set again. |


Setting options *Sewing foot stroke*

| Menu item | Setting 1 | Setting 2 |
|------------------------|--|--|
| <i>linear</i> | <i>Sewing foot stroke</i> Value range 00 – 09 [mm] | Maximum sewing foot stroke reached at the upper material thickness limit. |
| | <i>Min. Material thickness</i> Value range 00.0 – 10.0 [mm] | Material thickness at which the increase in sewing foot stroke should start. |
| | <i>Max. Material thickness</i> Value range 00.0 – 10.0 [mm] | Material thickness up to which the increase in sewing foot stroke should occur. |
| <i>2. Value On/Off</i> | <i>Min. Material thickness</i> Value range 00.0 – 10.0 [mm] | Material thickness from which the 2 nd sewing foot stroke should be used. |
| <i>2. Value On</i> | <i>Min. Material thickness</i> Value range 00.0 – 10.0 [mm] | Material thickness from which the 2 nd sewing foot stroke should be used. |



Setting options *Stitch length*

| Menu item | Setting 1 | Setting 2 |
|------------------------|--|--|
| <i>linear</i> | <i>Stitch length</i> Value range -50 – 50 [%] | Maximum stitch length variation reached at the upper material thickness limit. |
| | <i>Min. Material thickness</i> Value range 00.0 – 10.0 [mm] | Material thickness at which the increase/reduction of stitch length should start. |
| | <i>Max. Material thickness</i> Value range 00.0 – 10.0 [mm] | Material thickness up to which the increase/reduction of stitch length should occur. |
| <i>2. Value On/Off</i> | <i>Min. Material thickness</i> Value range 00.0 – 10.0 [mm] | Material thickness from which the 2 nd stitch length should be used. |
| <i>2. Value On</i> | <i>Min. Material thickness</i> Value range 00.0 – 10.0 [mm] | Material thickness from which the 2 nd stitch length should be used. |


Setting options *Needle thread tension*

| Menu item | Setting 1 | Setting 2 |
|------------------------|--|---|
| <i>linear</i> | <i>Needle thread tension</i> Value range 00 – 99 | Maximum needle thread tension reached at the upper material thickness limit. |
| | <i>Min. Material thickness</i> Value range 00.0 – 10.0 [mm] | Material thickness at which the increase in needle thread tension should start. |
| | <i>Max. Material thickness</i> Value range 00.0 – 10.0 [mm] | Material thickness up to which the increase in needle thread tension should occur. |
| <i>2. Value On/Off</i> | <i>Min. Material thickness</i> Value range 00.0 – 10.0 [mm] | Material thickness from which the 2 nd needle thread tension should be used. |
| <i>2. Value On</i> | <i>Min. Material thickness</i> Value range 00.0 – 10.0 [mm] | Material thickness from which the 2 nd needle thread tension should be used. |


Setting options *Sewing foot pressure*

| Menu item | Setting 1 | Setting 2 |
|---------------|--|---|
| <i>linear</i> | <i>Sewing foot pressure</i> Value range 00 – 20 | Maximum sewing foot pressure reached at the upper material thickness limit. |
| | <i>Min. Material thickness</i> Value range 00.0 – 10.0 [mm] | Material thickness at which the increase in sewing foot pressure should start. |
| | <i>Max. Material thickness</i> Value range 00.0 – 10.0 [mm] | Material thickness up to which the increase in sewing foot pressure should occur. |







Setting options *Max. sewing speed*






| Menu item | Setting 1 | Setting 2 |
|---------------|--|---|
| <i>linear</i> | <i>Max. Sewing speed</i> Value range 0000 – 4000 | Maximum speed reached at the upper material thickness limit. |
| | <i>Min. Material thickness</i> Value range 00.0 – 10.0 [mm] | Material thickness at which the increase in sewing speed should start. |
| | <i>Max. Material thickness</i> Value range 00.0 – 10.0 [mm] | Material thickness up to which the increase in sewing speed should occur. |





5.8.6 Setting the *Seam Begin/Segment Begin* parameters

There are various options for setting the Seam Begin/Segment Begin parameters. The following table lists all possible options.

Settings that are more complex and therefore require further explanation are described in more detail after the table.

| Icon | Parameter | Setting |
|---|---|------------------------|
| Seam begin bartack settings | | |
|  | <i>Bartack at seam begin</i> | Value range On/Off |
|  | <i>Number of stitches backwards</i> | Value range 01 - 50 |
|  | <i>Number of stitches forward</i> | Value range 01 - 50 |
|  | <i>Number of bartack sections</i> A bartack consists of several sections. If the sewing direction is changed, a new section is started. The number of sections in a bartack can be set here. | Value range 01 - 99 |








| Icon | Parameter | Setting |
|---|---|--|
|  | <i>Stop-Time for direction change</i> The waiting time at the turning points (e.g. for a change of sewing direction) is set at this point. A short waiting time in milliseconds should ensure consistent seam quality (ornamental-stitch bartack). | Value range 0000 – 1000 [ms] |
|  | <i>Stitch length default</i> If this function is active, the same needle stitch length is used for the bartack as the one set in Manual mode. If this function is deactivated, a custom input can be entered. | On/Off |
| | | <i>Stitch length of stitches forward</i> Value range 01.0 - 12.0 [mm] (depending on subclass) <i>Stitch length of backwards stitches</i> Value range 01.0 - 12.0 [mm] (depending on subclass) |
|  | <i>Speed in bartack</i> | Value range 0000 - 2000 |
|  | <i>Single stitches per pedal</i> If this function is activated, each stitch in the bartack can be sewn individually by pressing the pedal. This function can only be used meaningfully if the speed is set very low for the bartack. | Value range On/Off |
|  | <i>Needle thread tension default</i> If this function is active, the same needle thread tension is used for the bartack as the one set in Manual mode. If this function is deactivated, a custom input can be entered. | Value range On/Off |







| Icon | Parameter | Setting |
|--|--|---|
|  | <p><i>Catch bartack</i></p> <p>To ensure a safe sewing start and complete sewing of the start bartack, an additional bartack can precede the start bartack.</p> <p>Only the number of forward and backward stitches can be selected. The stitch length cannot be set individually – it corresponds to the stitch length of the normal start bartack.</p> | On/Off |
| | | <i>Number of stitches backwards</i> Value range 01 - 50 |
| | | <i>Number of stitches forward</i> Value range 01 - 50 |
| | | <i>Number of bartack sections</i> Value range 01 - 10 |
|  | <p><i>First bartack section</i></p> <p>The 1st section of the bartack can be programmed with a different number of stitches. All subsequent sections have the preset number of stitches from the settings for the start bartack.</p> | On/Off |
| | | <i>Number of stitches</i> Value range 01 - 50 |
|  | <p><i>Last bartack section</i></p> <p>The last section of the bartack can be programmed with a different number of stitches. All previous sections have the preset number of stitches from the settings for the end bartack.</p> | On/Off |
| | | <i>Number of stitches</i> Value range 01 - 50 |
|  | <p><i>Invert bartack direction</i></p> <p>Normally, a bartack starts either with the sewing direction (forwards – even number of sections) or against the sewing direction (backwards – odd number of sections), depending on the number of sections. Setting this parameter inverts the sewing direction of the bartack.</p> | Value range On/Off |





5.8.7 Setting the *Segment* parameters

There are various options for setting the parameters in the segment. The following table lists all possible options.

Settings that are more complex and therefore require further explanation are described in more detail after the table.

| Icon | Parameter | Setting |
|---|---|---|
| Seam Parameter | | |
|  | <i>Stitch length</i> | Value range 00.0 - 12.0 [mm] (depending on the sewing equipment and the subclass) |
|  | <i>Needle thread tension</i> | Value range 01 - 99 |
|  | <i>Sewing foot pressure</i> | Value range 01 - 20 |
|  | <i>Sewing foot stroke</i> | Value range 1.0 – 9.0 [mm] |
|  | <i>Seam length in segment</i> or <i>Number of stitches in segment</i> | You can set the active option at the Technician level <i>Machine configuration > Mode segment size</i> . The s.p.m. option is set at the factory. The display remains after the thread has been cut, while counting/measuring will begin when sewing starts again. |
|  | <i>Max. Speed</i> It is possible to reduce the maximum sewing speed at this point. The maximum sewing speed can be set in the software at the Technician level. | Value range 0050 – 3800 [rpm] (depending on subclass) |
|  | <i>Needle position</i> Position of the needle when sewing stops. | Value range On/Off |






| Icon | Parameter | Setting |
|--|--|--|
|  | <i>Sewing foot lift at stop</i> | Value range On/Off |
|  | <i>Height of sewing foot lift at Sewing stop</i> | Value range 00 – 20 [mm] (depending on subclass) |
|  | <i>Backwards</i> When the parameter is activated, the section is sewn backwards. | Value range On/Off |
|  | <i>Seam Center Guide</i> (only on 2-needle machines, optional additional equipment) | Value range On/Off |
|  | <i>Puller</i> (optional additional equipment) The puller supports the transport of the sewing material. The feed of the two rollers is calculated automatically based on the stitch length of the machine. An adjustment may be necessary depending on the application. The rollers of the puller can be adjusted separately. The input is in percent: a positive value increases the roller feed while a negative value reduces the feed. | On/Off |
| | | <i>Correction top roller</i> Value range -100 – 100 [%] |
| | | <i>Correction bottom roller</i> Value range -100 – 100 [%] |
|  | <i>Gap</i> (optional additional equipment) The edge guide helps to precisely position the sewing material. The value set indicates the distance between the needle and edge guide/material edge. | Value range 01.0 - 45.0 [mm] |

| Icon | Parameter | Setting |
|---|--|---|
|  | <i>Light barrier</i> (optional additional equipment) The light barrier detects the beginning and the end of the material. After a signal was detected, sewing can continue automatically with the specifically set parameters. | Value range On/Off (see  p. 123) |
| Output | | |
|  | <i>Output 01-16</i> | (see  p. 124) |




5.8.7.1 Setting the *Light barrier* parameters

The light barrier detects the beginning and the end of the material. After a signal was detected, sewing can continue automatically with the specifically set parameters.

| Icon | Menu item | Setting |
|---|--|------------------------|
|  | <i>Distance</i> Distance from the detection of the signal to the end of the material. The distance signifies the path from the needle to the light barrier. The path is specified in millimeters and used by the machine to independently calculate the number of stitches. | Value range 0 - 255 |
|  | <i>Signal detection at seam begin</i> The signal scan of the light barrier is performed at the beginning of the seam. If the function is activated, the light barrier must detect a signal to allow the machine to sew. If the function is inactive, sewing can take place without signal detection. | Value range On/Off |
|  | <i>Signal detection at seam end</i> The signal scan of the light barrier is performed at the end of the seam. If the function is active, the machine will continue to sew with the specifically set parameters following the signal detection. If the function is inactive, nothing will happen. | Value range On/Off |
|  | <i>Seams</i> Input of the number of signal detections after which the machine is supposed to continue with the specifically set parameters. | Value range 1 - 255 |
|  | <i>Filter stitches</i> Loosely woven fabric with stitches may cause the light barrier to wrongly detect a signal. To prevent this from happening, you enter the number of filter stitches. This number represents the minimum number of stitches with signal detection following the 1 st detection of the signal. | Value range 0 - 255 |

5.8.7.2 Setting the Outputs (*Output*) parameter






This parameter provides virtual outputs that can be assigned customer-specific functions. They can be used when customer-specific applications require a signal from the control of the machine.







This parameter cannot be used unless the virtual outputs have been assigned to a physical output at the Technician level. This requires that the parameter *Additional I/O Configuration* can be configured at the Technician level; for more details, refer to the explanation in the  *Service Instructions*.





5.8.8 Setting the *Segment End/Seam End* parameters

There are various options for setting the Segment End parameters. The following table lists all possible options.

Settings that are more complex and therefore require further explanation are described in more detail after the table.

| Icon | Parameter | Setting |
|---|-------------------------------------|---|
| Parameter Seam End | | |
|  | <i>Sewing stop</i> | Value range On/Off Setting as to what will happen at the end of a segment/seam. (see  p. 127) |
| Adjustments for seam end bartack parameters | | |
|  | <i>Bartack at seam end</i> | Value range On/Off |
|  | <i>Number of stitches backwards</i> | Value range 01 - 50 |
|  | <i>Number of stitches forward</i> | Value range 01 - 50 |





| Icon | Parameter | Setting |
|---|---|--|
|  | <i>Number of bartack sections</i> A bartack consists of several sections. If the sewing direction is changed, a new section is started. The number of sections in a bartack can be set here. | Value range 01 - 99 |
|  | <i>Stop-Time for direction change</i> The waiting time at the turning points (e.g. for a change of sewing direction) is set at this point. A short waiting time in milliseconds should ensure consistent seam quality (ornamental-stitch bartack). | Value range 0000 – 1000 [ms] |
|  | <i>Stitch length default</i> If this function is active, the same needle stitch length is used for the bartack as the one set in Manual mode. If this function is deactivated, a custom input can be entered. | On/Off |
| | | <i>Stitch length of stitches forward</i> Value range 01.0 – 12.0 [mm] (depending on subclass) |
| | | <i>Stitch length of backwards stitches</i> Value range 01.0 – 12.0 [mm] (depending on subclass) |
|  | <i>Speed in bartack</i> | Value range 0000 - 2000 |
|  | <i>Single stitches per pedal</i> If this function is activated, each stitch in the bartack can be sewn individually by pressing the pedal. This function can only be used meaningfully if the speed is set very low for the bartack. | Value range On/Off |
|  | <i>Needle thread tension default</i> If this function is active, the same needle thread tension is used for the bartack as the one set in Manual mode. If this function is deactivated, a custom input can be entered. | Value range On/Off |

| Icon | Parameter | Setting |
|--|---|---|
|  | <p><i>Catch bartack</i></p> <p>To ensure a safe sewing start and complete sewing of the start bartack, an additional bartack can precede the start bartack. Only the number of forward and backward stitches can be selected. The stitch length cannot be set individually – it corresponds to the stitch length of the normal start bartack.</p> | On/Off |
| | | <i>Number of stitches backwards</i> Value range 01 - 50 |
| | | <i>Number of stitches forward</i> Value range 01 - 50 |
| | | <i>Number of bartack sections</i> Value range 01 - 10 |
|  | <p><i>First bartack section</i></p> <p>The 1st section of the bartack can be programmed with a different number of stitches. All subsequent sections have the preset number of stitches from the settings for the start bartack.</p> | On/Off |
| | | <i>Number of stitches</i> Value range 01 - 50 |
|  | <p><i>Last bartack section</i></p> <p>The last section of the bartack can be programmed with a different number of stitches. All previous sections have the preset number of stitches from the settings for the end bartack.</p> | On/Off |
| | | <i>Number of stitches</i> Value range 01 - 50 |
|  | <p><i>Invert bartack direction</i></p> <p>Normally, a bartack starts either with the sewing direction (forwards – even number of sections) or against the sewing direction (backwards – odd number of sections), depending on the number of sections. Setting this parameter inverts the sewing direction of the bartack.</p> | Value range On/Off |

5.8.8.1 Setting the *Sewing stop* parameters




You can set additional parameters for the *Sewing stop*. Possible settings and the corresponding value ranges are listed in the table.

| Icon | Menu item | Setting option |
|---|--|---|
|  | <i>Needle up position</i> | Value range On/Off |
|  | <i>Thread trimmer</i> (can only be set in the last segment) | Value range On/Off |
|  | <i>Sewing foot lift at segment end</i> | Value range On/Off |
|  | <i>High sewing foot lift after thread cutting/at segment end</i> | Value range 00 – 20 [mm] (depending on subclass) |

5.9 Importing/exporting programs

Programs cannot be imported or exported by the Default User.


This process requires that the user be logged in as a technician,
 *Service Instructions*.

5.10 Performing a software update

A software update - for control panel or control - is always performed on the control panel. The software of the control is updated automatically whenever a software update is performed for the control panel. The files necessary for updating the control are already included in the file updates of the control panel.



To perform a software update:

1. Log in as a user with the access rights necessary to perform a software update (see  p. 48 on how to define this setting).
2. Download the software version from the Internet (www.duerkopp-adler.com) and save it to a USB key.
3. Plug the USB key into the port on the control panel.
4. Open the burger menu and select the menu *Settings - Software Update*.
 - ↳ A window listing the files stored on the USB key opens.
5. Select the file containing the software update.
- ↳ Another window opens.
6. To start the software update, press on the *Start Update* button.
7. Wait until advised that the USB key can be removed OR that the control panel was restarted.



Information

If detecting - while the control panel is being restarted - that the software of the control requires an update as well, the system will start this update automatically.

It may take up to 15 minutes for the system to complete the update and restart the control panel successfully.

8. Once the control panel has been restarted, the machine can be used again.
9. If you have not already done so, you can now remove the USB key.

6 Maintenance

WARNING



Risk of injury from sharp parts!

Punctures and cutting possible.

Prior to any maintenance work, switch off the machine or set the machine to threading mode.

WARNING




Risk of injury from moving parts!

Crushing possible.

Prior to any maintenance work, switch off the machine or set the machine to threading mode.

This chapter describes maintenance work that needs to be carried out on a regular basis to extend the service life of the machine and achieve the desired seam quality.

Advanced maintenance work may only be carried out by qualified specialists ( *Service Instructions*).

Maintenance intervals

| Work to be carried out | Operating hours | | | |
|--|-----------------|----|-----|-----|
| | 8 | 40 | 160 | 500 |
| | | | | |
| Cleaning | | | | |
| Removing sewing dust and thread residues | ● | | | |
| | | | | |
| Lubricating | | | | |
| Lubricating the machine head | ● | | | |
| Lubricating the hook | | ● | | |

| Work to be carried out | Operating hours | | | |
|---------------------------------------|-----------------|----|-----|-----|
| | 8 | 40 | 160 | 500 |
| | | | | |
| Servicing the pneumatic system | | | | |
| Adjusting the operating pressure | ● | | | |
| Draining the water condensation | ● | | | |
| Cleaning the filter element | | ● | | |

6.1 Cleaning

WARNING



Risk of injury from flying particles!

Flying particles can enter the eyes, causing injury.

Wear safety goggles.

Hold the compressed air gun so that the particles do not fly close to people.

Make sure no particles fly into the oil pan.

NOTICE

Property damage from soiling!

Sewing dust and thread residues can impair the operation of the machine.

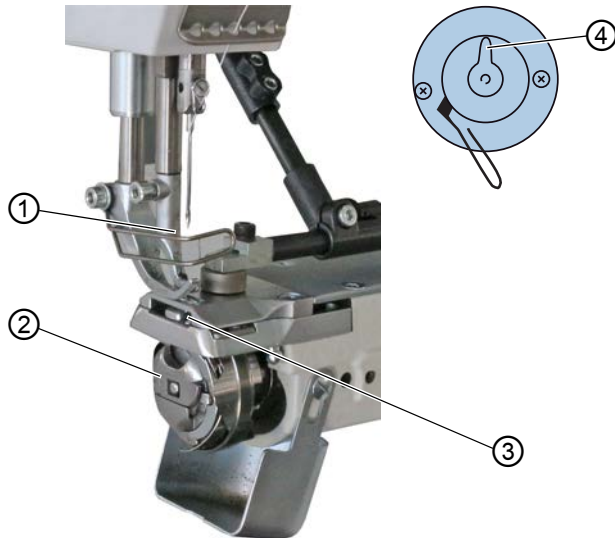
Clean the machine as described.

NOTICE**Property damage from solvent-based cleaners!**

Solvent-based cleaners will damage paintwork.

Use only solvent-free substances for cleaning.

Fig. 57: Areas requiring special cleaning



(1) - Area around the needle

(2) - Hook

(3) - Area under the throat plate

(4) - Knife on the winder

Areas particularly susceptible to soiling:

- Knife on the winder for the hook thread (4)
- Area under the throat plate (3)
- Hook (2)
- Area around the needle (1)



To clean the machine:

1. Switch off the machine.
2. Remove any lint and thread remnants using a compressed air gun or a brush.



Important

If you wish to clean the machine with cleaning agents, do not use just any cleaner. To prevent damage to the surfaces, use the cleaner MONOCLEAN X400. Follow the instructions on how to use this cleaning agent to prevent damage to the machine.

6.2 Lubricating

CAUTION



Risk of injury from contact with oil!

Oil can cause a rash if it comes into contact with skin.

Avoid skin contact with oil.

If oil has come into contact with your skin, wash the affected areas thoroughly.

NOTICE

Property damage from incorrect oil!

Incorrect oil types can result in damage to the machine.

Only use oil that complies with the data in the instructions.

CAUTION**Risk of environmental damage from oil!**

Oil is a pollutant and must not enter the sewage system or the soil.

Carefully collect up used oil.

Dispose of used oil and oily machine parts in accordance with national regulations.

The machine is equipped with a central oil-wick lubrication system. The bearings are supplied from the oil reservoir.

For topping off the oil reservoir, use only lubricating oil **DA 10** or oil of equivalent quality with the following specifications:

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

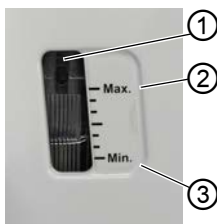
You can order the lubricating oil from our sales offices using the following part numbers.

| Container | Part no. |
|-----------|-------------|
| 250 ml | 9047 000011 |
| 1 l | 9047 000012 |
| 2 l | 9047 000013 |
| 5 l | 9047 000014 |

6.2.1 Lubricating the machine head**Proper setting**

The oil level is between the minimum level marking and the maximum level marking.

Fig. 58: Lubricating the machine head



(1) - Refill opening

(3) - Minimum level marking

(2) - Maximum level marking



To lubricate the machine head:

1. Check the oil level indicator at the inspection glass every day.
2. If the inspection glass lights up red, the machine is not sufficiently supplied with oil.
3. If the oil level is below the minimum level marking (3): Pour oil through the refill opening (1) but no higher than the maximum level marking (2).

6.2.2 Lubricating the hook

The approved oil quantity for hook lubrication is a factory specification.



Proper setting

1. Hold a piece of blotting paper next to the hook.
 2. Allow the machine to run without thread and sewing material for 10 seconds with the sewing feet lifted and at a high speed.
- ☞ The blotting paper will show a thin strip of oil when sewing is complete.

Fig. 59: Lubricating the hook



(1) - Screw



To lubricate the hook:

1. Turn the screw (1):
 - counterclockwise: more oil is released
 - clockwise: less oil is released



Important

The released amount of oil does not change until the operating time has run a few minutes. Sew for several minutes before you check the setting again.

6.3 Servicing the pneumatic system

6.3.1 Adjusting the operating pressure

NOTICE

Property damage from incorrect adjustment!

Incorrect operating pressure can result in damage to the machine.

Ensure that the machine is only used when the operating pressure is set correctly.

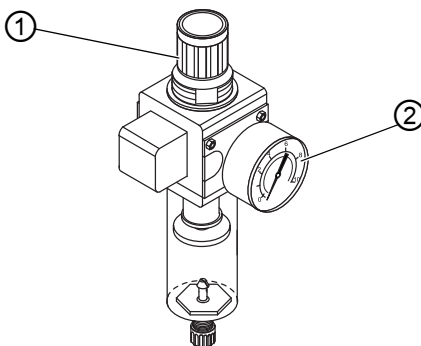


Proper setting

Refer to the **Technical Data** (📖 p. 201) chapter for the permissible operating pressure. The operating pressure cannot deviate by more than ± 0.5 bar.

Check the operating pressure on a daily basis.

Fig. 60: Adjusting the operating pressure



(1) - Pressure regulator

(2) - Pressure gage



To adjust the operating pressure:

1. Pull the pressure regulator (1) up.
2. Turn the pressure regulator until the pressure gage (2) indicates the proper setting:
 - Increase pressure = turn clockwise
 - Reduce pressure = turn counterclockwise
3. Push the pressure regulator (1) down.

6.3.2 Draining the water-oil mixture

NOTICE

Property damage from excess liquid!

Too much liquid can result in damage to the machine.

Drain liquid as required.

The collection tray (2) of the pressure regulator will show accumulation of a water-oil mixture.

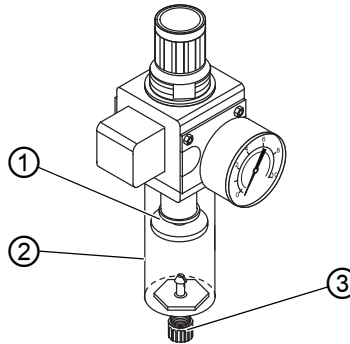


Proper setting

The water-oil mixture must not rise up to the level of the filter element (1).

Check the level of the water-oil mixture in the collection tray (2).

Fig. 61: Draining the water-oil mixture



(1) - Filter element
(2) - Collection tray

(3) - Drain screw



To drain the water-oil mixture:

1. Disconnect the machine from the compressed air supply.
2. Place the vessel under the drain screw (3).
3. Loosen the drain screw (3) completely.
4. Allow the water-oil mixture to drain into the vessel.
5. Tighten the drain screw (3).
6. Connect the machine to the compressed air supply.

6.3.3 Cleaning the filter element

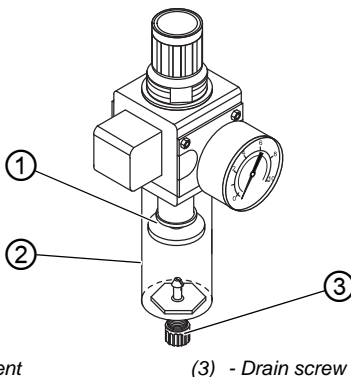
NOTICE

Damage to the paintwork from solvent-based cleaners!

Solvent-based cleaners damage the filter.

Use only solvent-free substances for washing out the filter tray.

Fig. 62: Cleaning the filter element




(1) - Filter element
(2) - Collection tray

(3) - Drain screw



To clean the filter element:

1. Disconnect the machine from the compressed air supply.
2. Drain the water-oil mixture ( p. 136).
3. Unscrew the collection tray (2).
4. Unscrew the filter element (1).
5. Blow out the filter element (1) using the compressed air gun.
6. Wash out the filter tray using benzine.
7. Tighten the filter element (1).
8. Tighten the collection tray (2).
9. Tighten the drain screw (3).
10. Connect the machine to the compressed air supply.

6.4 Parts list

A parts list can be ordered from Dürkopp Adler. Or visit our website for further information at:

www.duerkopp-adler.com



7 Setup

WARNING



Risk of injury from cutting parts!

Cutting injuries may be sustained while unpacking and setting up the machine.

Only qualified specialists may set up the machine.

Wear safety gloves

WARNING



Risk of injury from moving parts!

Crushing injuries may be sustained while unpacking and setting up the machine.

Only qualified specialists may set up the machine.

Wear safety shoes.

7.1 Checking the scope of delivery

The scope of delivery depends on your specific order. Check that the scope of delivery is correct after taking delivery.

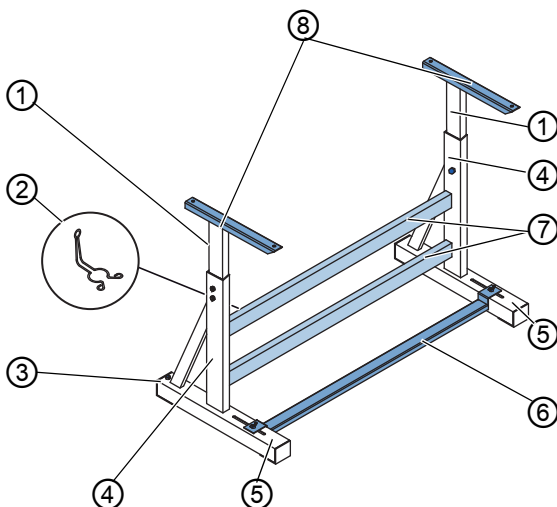
7.2 Removing the transport locks

Remove all transport locks before setting up the machine:

- Lashing straps and wooden blocks from the machine head, the table and the stand
- Supporting wedges between machine arm and throat plate

7.3 Assembling the stand

Fig. 63: Assembling the stand



- (1) - Inner bar
- (2) - Oil can holder
- (3) - Adjusting wheel
- (4) - Stand bar

- (5) - Foot strut
- (6) - Cross strut
- (7) - Cross bar
- (8) - Head section - inner bar



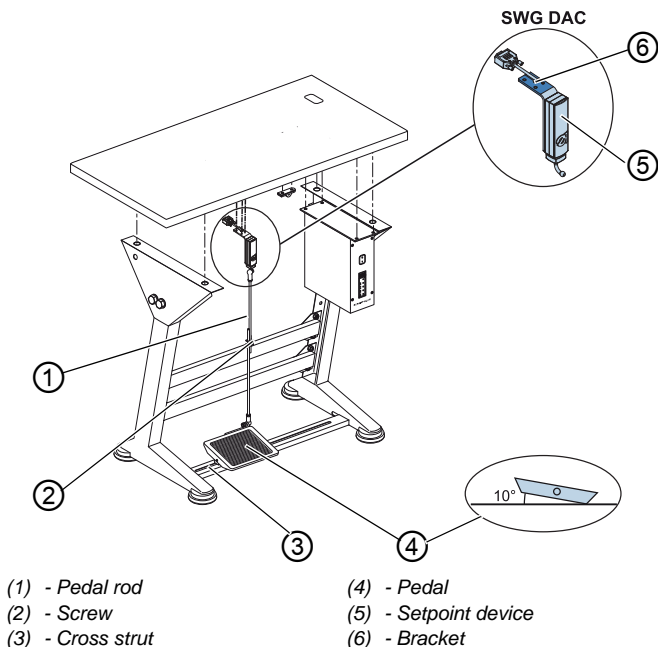
To assemble the stand:

1. Screw the cross bar(s)* (7) onto the stand bars (4).
2. Screw the oil can holder (2) at the rear to the upper cross bar (7).
3. Screw the cross strut (6) to the foot struts (5).
4. Insert the inner bars (1) in such a way that the longer end of the head section (8) is above the longer end of the foot struts (5).
5. Tighten the inner bars (1) down so that both head sections (8) are at the same height.
6. **Important:** Turn the adjusting wheel (3) so that the stand has even contact with the ground.

* Stand components for long arm machines have 2 cross bars, and the other stand components have 1 cross bar.

7.4 Assembling the pedal and setpoint device

Fig. 64: Assembling the pedal and setpoint device



To assemble pedal and setpoint device:

1. Fit the pedal (4) on the cross strut (3) and align it in such a way that the middle of the pedal is under the needle. The cross strut has elongated holes to allow for the alignment of the pedal.
2. Tighten the pedal (4) on the cross strut (3).
3. Screw the bracket (6) under the tabletop so that the pedal rod (1) runs to the pedal (4) at right-angles to the setpoint device (5).
4. Screw the setpoint device (5) onto the bracket (6).
5. Attach the pedal rod (1) with the ball sockets to the setpoint device (5) and to the pedal (4).
6. Pull the pedal rod (1) to the correct length:



Proper setting

10° inclination with pedal (4) released

7. Tighten the screw (2).

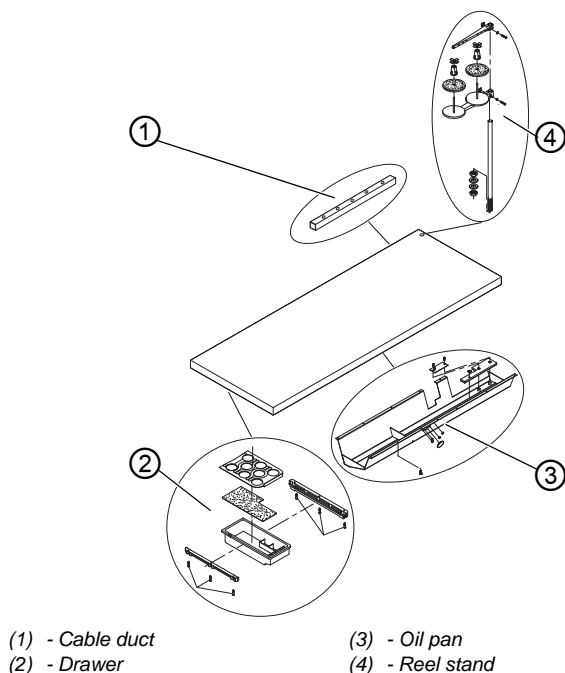
7.5 Tabletop

Ensure that the tabletop has sufficient load-bearing capacity and strength. If you want to make your own tabletop, use the dimensions given in the diagram in the **Appendix** (📖 p. 203) as a template.

7.5.1 Completing the tabletop

The tabletop is optional. For drawings that allow you to independently assemble a tabletop, refer to the appendix (📖 p. 203).

Fig. 65: Completing the tabletop



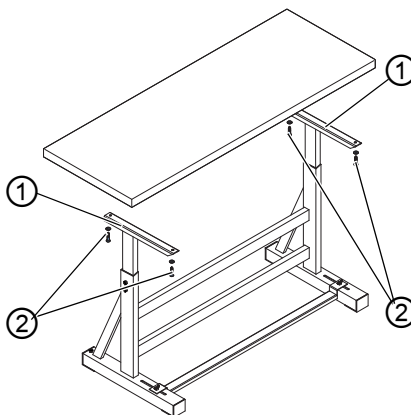


To complete the tabletop:

1. Screw the drawer (2) with the left-hand bracket to the underside of the tabletop.
2. Screw the oil pan (3) in place under the slot for the machine.
3. Screw the cable duct (1) to the underside of the tabletop.
4. Insert the reel stand (4) into the hole.
5. Assemble the reel stand (4) with nut and washer.
6. Tighten the thread reel holder and the thread guide on the reel stand (4) in such a way that they are exactly opposite each other.

7.5.2 Assembling the tabletop to the stand

Fig. 66: Assembling the tabletop to the stand



(1) - Head section

(2) - Screws



To assemble the tabletop to the stand:

1. Place the tabletop on the head sections (1) of the inner bars.
2. Use the screws (2) to fasten the tabletop at the screw holes of the head sections.

7.6 Adjusting the working height

WARNING



Risk of injury from moving parts!

The tabletop can sink under its own weight when the screws on the stand bars are loosened. Crushing possible.

Ensure that your hands are not jammed when loosening the screws.

CAUTION



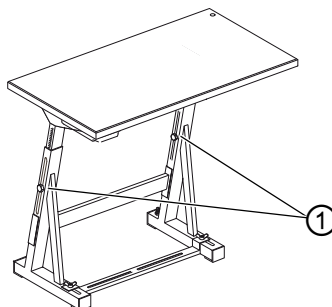
Risk of musculoskeletal damage from incorrect setting!

The operator can sustain musculoskeletal damage if failing to comply with the ergonomic requirements.

Adjust the working height to the body height of the person who will operate the machine.

The working height is continuously adjustable between 750 and 900 mm (clearance between the floor and upper edge of the tabletop).

Fig. 67: Adjusting the working height



(1) - Screws



To adjust the working height:

1. Loosen the screws (1) on the stand bars.
2. Adjust the tabletop to the desired height.



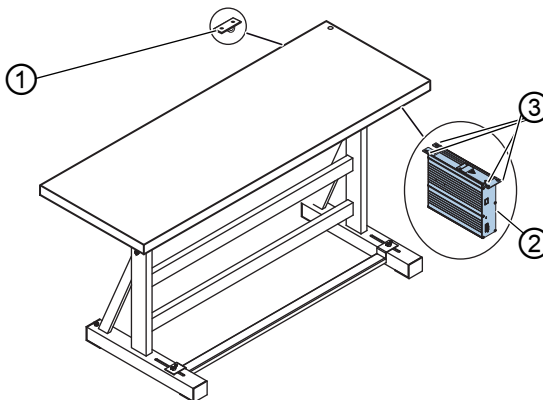
Important

Pull out or push in the tabletop evenly at both sides to prevent it from jamming.

3. Tighten the screws (1) on the stand bars.

7.7 Assembling the control

Fig. 68: Assembling the control



(1) - Strain relief mechanism
(2) - Control

(3) - Screw holder



To assemble the control:

1. Screw the control (2) onto the 4 screw holders (3) under the tabletop.
2. Clamp the power cable of the control (2) into the strain relief mechanism (1).
3. Screw the strain relief mechanism (1) under the tabletop.

7.8 Placing the machine head

WARNING



Risk of injury from moving parts!

The machine head is very heavy.
Crushing possible.

Ensure that your hands are not jammed when inserting the machine head.

NOTICE

Property damage may occur!

Cable may sustain damage and impair the operation of the machine.

Always lay the cables so as not to create any chafing or pinching points.

Fig. 69: Placing the machine head (1)



(1) - Screws

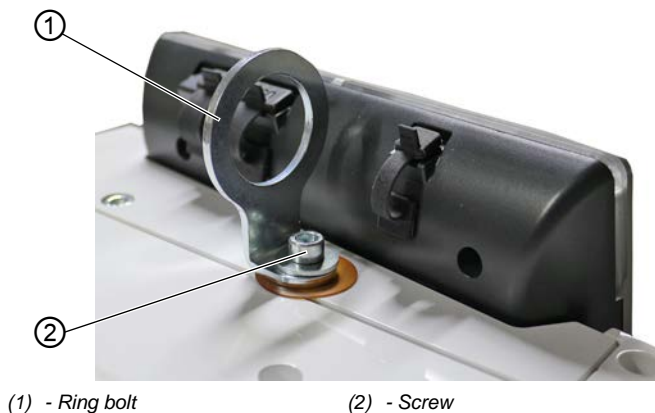


To place the machine head:

1. Place and align the machine head (2) on the tabletop.
2. Tighten the machine head using the screws (1).

7.9 Disassembling the ring bolt

Fig. 70: Disassembling the ring bolt

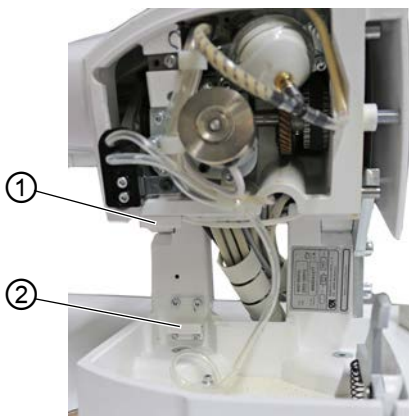


To disassemble the ring bolt:

1. Loosen the screw (2).
2. Remove ring bolt (1) and washer.
3. Re-tighten the screw (2).

7.10 Assembling the tilt sensor

Fig. 71: Assembling the tilt sensor (1)



(1) - Sensor

(2) - Magnet

The tilt sensor has been pre-assembled.

7.11 Changing the handwheel

The handwheel that ships with the machine is the large handwheel.

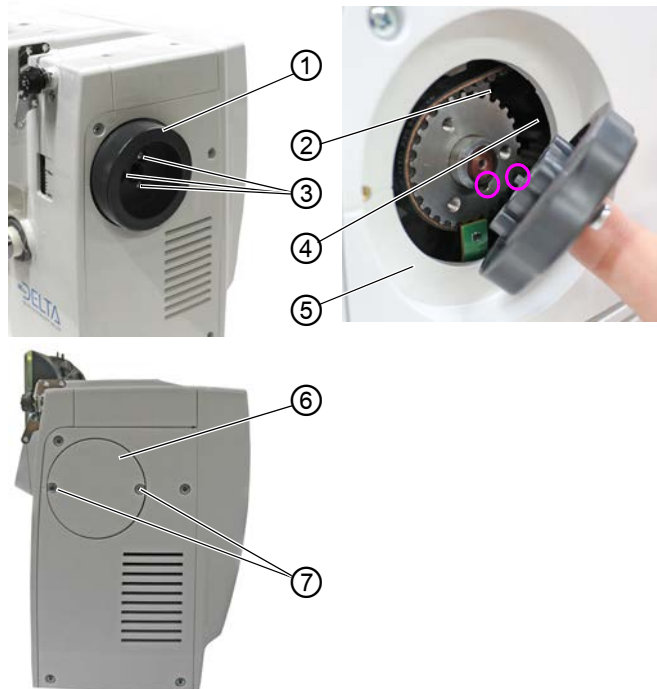
The large handwheel can be replaced with the included small handwheel.



Important

When assembling the small handwheel, the included cover must be positioned above the handwheel and tightened on the machine.

Fig. 72: Changing the handwheel



- (1) - Large handwheel
(2) - Hole
(3) - Screws
(4) - Pin

- (5) - Small handwheel
(6) - Cover
(7) - Screws



To change the handwheel:

1. Loosen the screws (3).
2. Remove the large handwheel (1).
3. Position the small handwheel (5) above the pulley in such a way that the pin (4) protruding on the inside of the handwheel fits into the matching hole (2) in the pulley.
4. Tighten the small handwheel (5) using the screws (3).
5. Place the cover (6) and tighten it using the screws (7).

The handwheel has been changed.

7.12 Assembling the knee button

Fig. 73: Assembling the knee button



(1) - Knee button

(2) - Connecting cable



To assemble the knee button:

1. Screw the knee button (1) in front of the oil pan firmly in place under the tabletop.
2. Guide the connecting cable (2) to the back between the oil pan and the control.
3. Insert the plug of the knee button into the socket of the control.

7.13 Assembling the LED sewing light

NOTICE

Property damage may occur!

Cable may sustain damage and impair the operation of the machine.

Always lay the cables so as not to create any chafing or pinching points.

The following is required for assembling the LED sewing light:

- LED sewing light
- Junction box
- Sewing light transformer

Fig. 74: Assembling the LED sewing light (1)



(1) - Cover



To assemble the sewing light:

1. Switch off the machine.
2. Disassemble the covers (1).

Fig. 75: Assembling the LED sewing light (2)



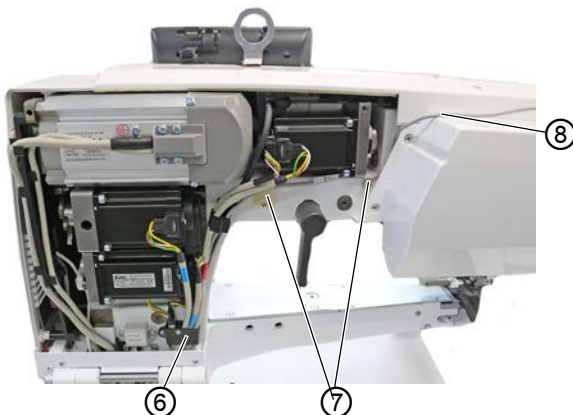
(2) - Clip
(3) - Screw

(4) - Holder
(5) - Sewing light



3. Screw the holder (4) to the head cover using the screw (3).
4. Slide the sewing light (5) into the holder (4) and tighten it at the head cover using the clip (2).

Fig. 76: Assembling the LED sewing light (3)



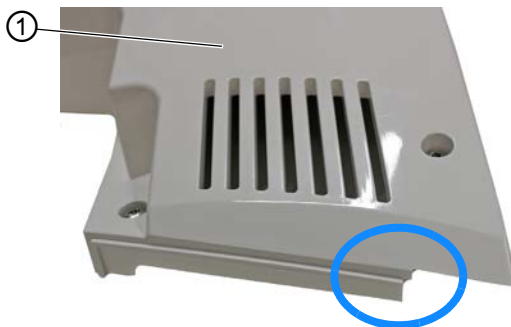
(6) - Guide
(7) - Clips

(8) - Cable



5. Lay the cable (8) inside the machine arm using the clips (7).
6. Lay the cable (8) through the guide (6) under the tabletop.

Fig. 77: Assembling the LED sewing light (4)



(1) - Cover



7. File some material off the cover (1) (marked in blue) to keep the cable (8) from becoming damaged.
8. Assemble the cover (1).

Fig. 78: Assembling the LED sewing light (5)



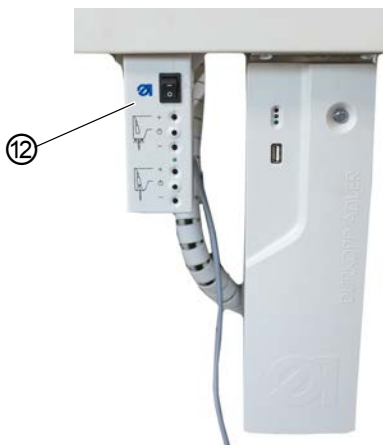
(9) - Cable
(10) - Power cable

(11) - Junction box



9. Screw the junction box (11) under the tabletop, paying attention to the length of the cables.
10. Pull the power cable (10) out of the control and insert it into the junction box (11).
11. Insert the cable (9) of the junction box (11) into the control.


Fig. 79: Assembling the LED sewing light (6)



(12) - Sewing light transformer



12. Assemble the sewing light transformer (12) to the tabletop so that it lies within easy reach of the user.

13. Connect the cable of the LED sewing light to the sewing light transformer (12) as shown in the wiring diagram (**Appendix** ( p. 203)).
14. Tighten the cover of the junction box (11) and lay the cables neatly.

7.14 Assembling the CCEA sewing light

NOTICE

Property damage may occur!

Cable may sustain damage and impair the operation of the machine.

Always lay the cables so as not to create any chafing or pinching points.

The following is required for assembling the sewing light with table clamp:

- Sewing light CCEA
- Junction box

Fig. 80: Assembling the CCEA sewing light (1)



(1) - Cover

(2) - Arm cover



To assemble the sewing light:

1. Switch off the machine.

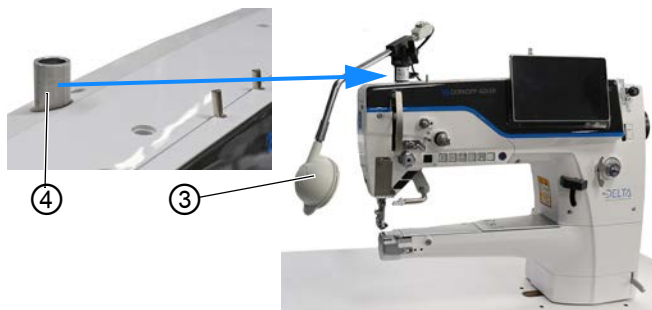
2. Disassemble the cover (1).
3. Disassemble the arm cover (2).

Fig. 81: Assembling the CCEA sewing light (2)



4. Drill a hole (Ø 24 mm) corresponding to the grain on the inside of the arm cover (2).
5. Assemble the arm cover (2).

Fig. 82: Assembling the CCEA sewing light (3)



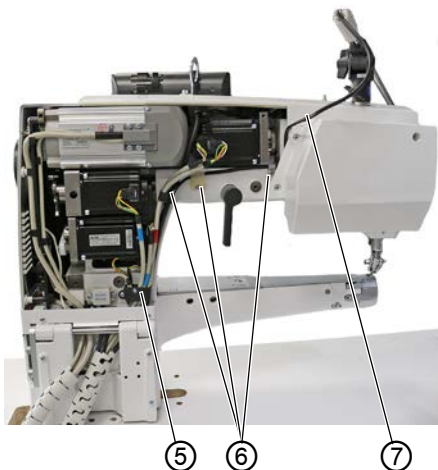
(3) - Sewing light

(4) - Holder



6. Tighten the holder (4) on the machine arm using the screw and the toothed lock washer (CAUTION: Use the M6x30 screw and the split lock washer included in the accessories).
7. Slide the sewing light (3) onto the holder (4) and tighten it.

Fig. 83: Assembling the CCEA sewing light (4)



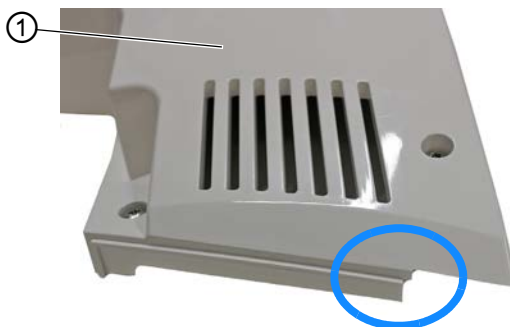
(5) - Guide
(6) - Clips

(7) - Cable



8. Lay the cable (7) inside the machine arm using clips (6) (leave the cable (7) long enough to allow for the free positioning of the sewing light).
9. Lay the cable (7) through the guide (5) under the tabletop.

Fig. 84: Assembling the CCEA sewing light (5)



(1) - Cover



10. File some material off the cover (1) (marked in blue) to keep the cable (7) from becoming damaged.
11. Assemble the cover (1).

Fig. 85: Assembling the CCEA sewing light (6)



(8) - Cable

(10) - Junction box

(9) - Power cable



12. Screw the junction box (10) under the tabletop, paying attention to the length of the cables.
13. Pull the power cable (9) out of the control and insert it into the junction box (10).
14. Insert the cable (8) of the junction box (10) into the control.
15. Connect the cable of the sewing light to the junction box (10) as shown in the wiring diagram (**Appendix** (📖 p. 203)).
16. Tighten the cover of the junction box (10) and lay the cables neatly.

7.15 Assembling the sewing light with table clamp

NOTICE

Property damage may occur!

Cable may sustain damage and impair the operation of the machine.

Always lay the cables so as not to create any chafing or pinching points.

The following is required for assembling the sewing light with table clamp:

- Sewing light
- Junction box
- Power strip

Fig. 86: Assembling the sewing light with table clamp (1)



(1) - Sewing light



To assemble the sewing light with table clamp:

1. Switch off the machine.
2. Attach the sewing light (1) on the tabletop.

Fig. 87: Assembling the sewing light with table clamp (3)



*(2) - Cable
(3) - Power cable*

(4) - Junction box



3. Screw the junction box (4) under the tabletop, paying attention to the length of the cables.
4. Pull the power cable (3) out of the control and insert it into the junction box (4).
5. Insert the cable (2) of the junction box (4) into the control.

Fig. 88: Assembling the sewing light with table clamp (3)



(5) - Power strip

6. Connect the cable of the power strip (5) to the junction box (4) as shown in the wiring diagram (**Appendix** (📖 p. 203)).
7. Tighten the cover of the junction box (4) and lay the cables neatly.
8. Insert the plug of the sewing light (1) into the power strip (5).

7.16 Electrical connection

DANGER



Risk of death from live components!

Unprotected contact with electricity can result in serious injuries or death.

Only qualified specialists may perform work on electrical equipment.



Important

The voltage on the type plate of the sewing motor must correspond to the mains voltage.

7.16.1 Connecting the sewing light transformer

DANGER

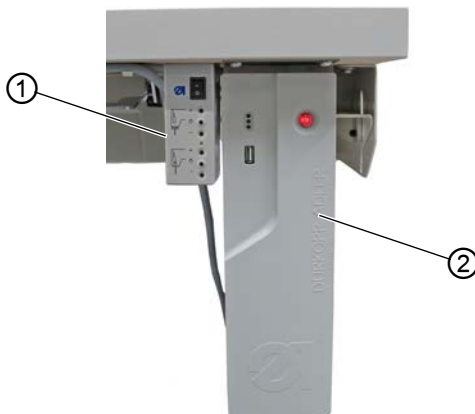


Risk of death from electric shock!

When the sewing machine is switched off at the main switch, the supply voltage for the sewing light remains active.

Disconnect the power plug before assembling the sewing light with sewing light transformer.
Ensure the power plug cannot be unintentionally reinserted.

Fig. 89: Connecting the sewing light transformer



(1) - Sewing light transformer

(2) - Control



To connect the sewing light transformer:

1. Switch off the machine.
2. Screw the sewing light transformer (1) in place next to the control (2) under the tabletop.
3. Connect the sewing light transformer (1) as specified in the wiring diagram (see Appendix (📖 p. 203)).

7.16.2 Establishing equipotential bonding

DANGER



Risk of death from live components!

Unprotected contact with electricity can result in serious injuries or death.

Disconnect the power plug before establishing equipotential bonding. Ensure the power plug cannot be unintentionally reinserted.

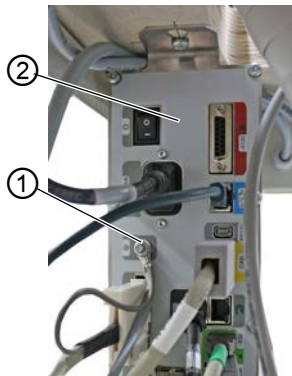
The grounding wire conducts away any static charging of the machine head. While already assembled to the machine, the equipotential bonding must still be connected to the control.

Fig. 90: Establishing equipotential bonding (1)



(1) - Equipotential bonding

Fig. 91: Establishing equipotential bonding (2)



(1) - Equipotential bonding

(2) - Control



To establish equipotential bonding:

1. Connect the equipotential bonding (1) with the control (2).

7.16.3 Connecting the control

DANGER


**Risk of death from live components!**

Unprotected contact with electricity can result in serious injuries or death.

Disconnect the power plug before connecting the control. Ensure the power plug cannot be unintentionally reinserted.



To connect the control:

1. Connect the control as specified in the wiring diagram ( p. 203).

7.17 Pneumatic connection (optional)

NOTICE

Property damage from oily compressed air!

Oil particles in the compressed air can cause malfunctions of the machine and soil the sewing material.

Ensure that no oil particles enter the compressed air supply.

NOTICE

Property damage from incorrect adjustment!

Incorrect system pressure can result in damage to the machine.

Ensure that the machine is only used when the system pressure is set correctly.

The pneumatic system of the machine and of the additional equipment must be supplied with dry and oil-free compressed air. The supply pressure must lie between 8 and 10 bar.



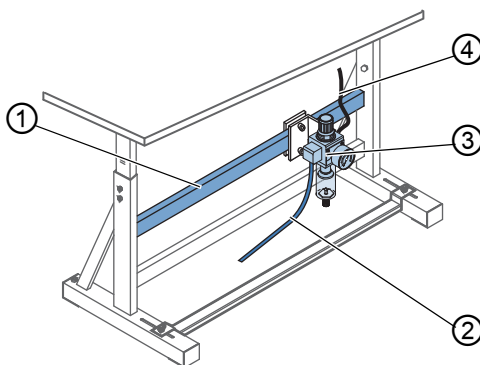
Information

The pneumatic connection package is available under part number 0797 003031. It consists of:

- System connection hose (length 5 m, diameter 9 mm)
- Hose connectors and hose clamps
- Coupling socket and coupling plug

7.17.1 Assembling the compressed air maintenance unit

Fig. 92: Assembling the compressed air maintenance unit



(1) - Cross bar

(3) - Maintenance unit

(2) - System connection hose

(4) - Machine hose



To assemble the compressed air maintenance unit:

1. Assemble the compressed air maintenance unit (3) to the upper cross bar (1) of the stand using the bracket, screws and clip.
2. Connect the machine hose (4) coming out of the machine head to the maintenance unit (3) at the top right.
3. Connect the system connection hose (2) to the pneumatic system.

7.17.2 Adjusting the operating pressure

NOTICE


Property damage from incorrect adjustment!

Incorrect operating pressure can result in damage to the machine.

Ensure that the machine is only used when the operating pressure is set correctly.

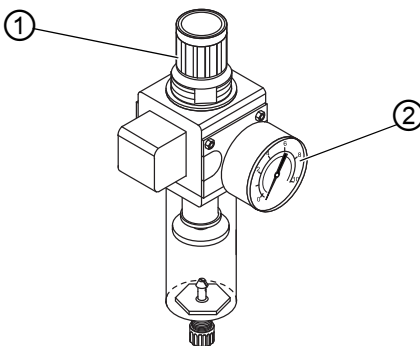


Proper setting

Refer to the **Technical Data** ( p. 201) chapter for the permissible operating pressure. The operating pressure cannot deviate by more than ± 0.5 bar.

Check the operating pressure on a daily basis.

Fig. 93: Adjusting the operating pressure



(1) - Pressure regulator

(2) - Pressure gage



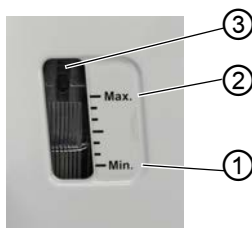
To adjust the operating pressure:

1. Pull the pressure regulator (1) up.
2. Turn the pressure regulator until the pressure gage (2) indicates the proper setting:
 - Increase pressure = turn clockwise
 - Reduce pressure = turn counterclockwise
3. Push the pressure regulator (1) down.

7.18 Checking the lubrication

All wicks and felt bits of the machine head are soaked in oil at the factory. This oil is conveyed to the reservoir during use. This is why you should avoid filling too much oil during initial filling.

Fig. 94: Checking the lubrication




(1) - Minimum level marking

(3) - Inspection glass

(2) - Maximum level marking



To check the lubrication:

1. Sew with the machine for approx. 1 minute.
2. Check at the inspection glass (3) whether the warning indicator is lit red or the oil level has dropped below the minimum marking (1).
3. If this is the case, top off oil ( p. 133).

7.19 Performing a test run

When setup is complete, perform a test run to check the functionality of the machine.

8 Decommissioning

WARNING



Risk of injury from a lack of care!

Serious injuries may occur.

ONLY clean the machine when it is switched off.
Allow ONLY trained personnel to disconnect the machine.

CAUTION



Risk of injury from contact with oil!

Oil can cause a rash if it comes into contact with skin.

Avoid skin contact with oil.

If oil has come into contact with your skin, wash the affected areas thoroughly.

You need to perform a number of activities if the machine is to be shut down for a longer period of time or completely decommissioned.



To decommission the machine:

1. Switch off the machine.
2. Unplug the power plug.
3. If applicable, disconnect the machine from the compressed air supply.
4. Remove residual oil from the oil pan using a cloth.
5. Cover the control panel to protect it from soiling.
6. Cover the control to protect it from soiling.
7. Cover the entire machine if possible to protect it from contamination and damage.

9 Disposal

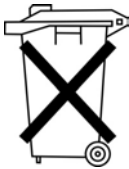
CAUTION



Risk of environmental damage from improper disposal!

Improper disposal of the machine can result in serious environmental damage.

ALWAYS comply with the national regulations regarding disposal.



The machine must not be disposed of in the normal household waste.

The machine must be disposed of in a suitable manner in accordance with all applicable national regulations.

When disposing of the machine, be aware that it consists of a range of different materials (steel, plastic, electronic components, etc.). Follow the national regulations when disposing these materials.

10 Troubleshooting

10.1 Customer Service

Contact for repairs and issues with the machine:

Dürkopp Adler GmbH

Potsdamer Str. 190
33719 Bielefeld, Germany

Tel. +49 (0) 180 5 383 756

Fax +49 (0) 521 925 2594

Email: service@duerkopp-adler.com

Internet: www.duerkopp-adler.com



10.2 Messages of the software

| Code | Type | Possible cause | Remedial action |
|------|-------|---|---|
| 1000 | Error | Sewing motor encoder plug (Sub-D, 9-pin) not connected | <ul style="list-style-type: none"> • Connect encoder cable to the control, • use correct connection |
| 1001 | Error | Sewing motor error Sewing motor plug (AMP) not connected | <ul style="list-style-type: none"> • Check connection and plug in • Test sewing motor phases ($R = 2.8\Omega$, high impedance to PE) • Replace encoder • Replace sewing motor • Replace control |
| 1002 | Error | Sewing motor insulation error | <ul style="list-style-type: none"> • Check motor phase and PE for low-impedance connection • Replace encoder • Replace sewing motor |

| Code | Type | Possible cause | Remedial action |
|------|-------|---|---|
| 1004 | Error | Incorrect sewing motor direction of rotation | <ul style="list-style-type: none"> • Replace encoder • Check motor plug assignment and change it if necessary • Check wiring in machine distributor and change it, if necessary • Test motor phases and check for correct value |
| 1005 | Error | Motor blocked | <ul style="list-style-type: none"> • Check for stiff movement • Replace encoder • Replace sewing motor |
| 1006 | Error | Maximum speed exceeded | <ul style="list-style-type: none"> • Replace encoder • Perform reset • Check class (t 51 04) |
| 1007 | Error | Error in the reference run | <ul style="list-style-type: none"> • Replace encoder • Check for stiff movement |
| 1008 | Error | Sewing motor encoder error | <ul style="list-style-type: none"> • Replace encoder |
| 1010 | Error | External synchronizer plug (Sub-D, 9-pin) not connected | <ul style="list-style-type: none"> • Connect cable of external synchronizer to control, make sure that interface (Sync) is correct • Only recommended for machines with transmission! |
| 1011 | Error | Encoder Z pulse missing | <ul style="list-style-type: none"> • Switch off the control, use handwheel to turn, and switch on the control again • If error is not corrected, check encoder |
| 1012 | Error | Synchronizer fault | <ul style="list-style-type: none"> • Replace synchronizer |
| 1054 | Error | Internal short circuit | <ul style="list-style-type: none"> • Replace control |
| 1055 | Error | Sewing motor overload | <ul style="list-style-type: none"> • Check for stiff movement • Replace encoder • Replace sewing motor |
| 1060 | Error | Sewing motor overload / overvoltage / overcurrent | <ul style="list-style-type: none"> • Check selection of class • Replace control • Replace motor • Replace encoder |
| 1061 | Error | Sewing motor overload / overvoltage / overcurrent | <ul style="list-style-type: none"> • Check selection of class • Replace control • Replace motor • Replace encoder |

| Code | Type | Possible cause | Remedial action |
|------|-------|--|---|
| 1120 | Error | Sewing motor Init fault | <ul style="list-style-type: none"> • Perform a software update • Check selection of class |
| 1121 | Error | Sewing motor watchdog | <ul style="list-style-type: none"> • Perform a software update • Check selection of class |
| 1203 | Error | Position not reached (during thread cutting, reversal, etc.) | <ul style="list-style-type: none"> • Check the controller settings and change them if necessary (e.g. thread trimmer setting, belt tension, etc.) • Check position thread lever at top dead center |
| 1302 | Error | Failure with sewing motor current | <ul style="list-style-type: none"> • Check Service Stop • Check for stiff movement • Replace encoder • Replace motor |
| 1330 | Error | No response from sewing motor | <ul style="list-style-type: none"> • Perform a software update • Replace control |
| 2101 | Error | Stepper motor X30 reference run timeout | <ul style="list-style-type: none"> • Check reference sensor |
| 2105 | Error | Stepper motor card X30 blockage | <ul style="list-style-type: none"> • Check for stiff movement |
| 2121 | Error | Stepper motor card X30 encoder plug (Sub-D, 9-pin) not connected | <ul style="list-style-type: none"> • Connect encoder cable to the control, use the correct interface |
| 2122 | Error | Stepper motor card X30 flywheel position not found | <ul style="list-style-type: none"> • Check stepper motor 1 for stiff movement |
| 2130 | Error | Stepper motor card X30 not responding | <ul style="list-style-type: none"> • Perform a software update • Replace control |
| 2131 | Error | Stepper motor card X30 parameter init error | <ul style="list-style-type: none"> • Perform a software update • Check selection of class |
| 2152 | Error | Stepper motor card X30 overcurrent | <ul style="list-style-type: none"> • Check for stiff movement |
| 2171 | Error | Stepper motor card X30 Watchdog (Stitch length) | <ul style="list-style-type: none"> • Perform a software update • Check selection of class |

| Code | Type | Possible cause | Remedial action |
|------|-------|--|--|
| 2172 | Error | Stepper motor card X30 motor overload / overvoltage /overcurrent (Stitch length) | <ul style="list-style-type: none"> • Check selection of class • Replace control • Replace encoder • Replace stepper motor |
| 2173 | Error | Stepper motor card X30 Sewing motor encoder not connected (Stitch length) | <ul style="list-style-type: none"> • Replace control |
| 2174 | Error | Stepper motor card X30 Sewing motor encoder not init (Stitch length) | <ul style="list-style-type: none"> • Perform a software update • Check selection of class |
| 2175 | Error | Stepper motor card X30 Init Position not found (Stitch length) | <ul style="list-style-type: none"> • Check for stiff movement • Replace encoder • Replace motor |
| 2176 | Error | Stepper motor card X30 not Enabled (Stitch length) | <ul style="list-style-type: none"> • Replace control |
| 2177 | Error | Stepper motor card X30 Overload (Stitch length) | <ul style="list-style-type: none"> • Check for stiff movement • Replace encoder • Replace motor |
| 2178 | Error | Stepper motor card X30 Encoder failure (Stitch length) | <ul style="list-style-type: none"> • Replace encoder |
| 2179 | Error | Stepper motor card X30 Current sensor failure (Stitch length) | <ul style="list-style-type: none"> • Replace control |
| 2180 | Error | Stepper motor card X30 Incorrect stepping motor direction of rotation (Stitch length) | <ul style="list-style-type: none"> • Replace encoder • Check if plugs have been mixed up • Check the wiring in the machine distributor and change it if necessary |
| 2181 | Error | Stepper motor card X30 Reference drive failure (Stitch length) | <ul style="list-style-type: none"> • Check for stiff movement • Replace encoder • Replace motor |
| 2183 | Error | Stepper motor card X30 overcurrent (Stitch length) | <ul style="list-style-type: none"> • Replace control |

| Code | Type | Possible cause | Remedial action |
|------|-------|--|--|
| 2184 | Error | Stepper motor card X30 parameter init (Stitch length) | <ul style="list-style-type: none"> • Perform a software update • Check selection of class |
| 2185 | Error | Stepper motor card X30 insulation error (Stitch length) | <ul style="list-style-type: none"> • Check motor phase and PE for low-impedance connection • Replace encoder • Replace sewing motor |
| 2187 | Error | Stepper motor card X30 transport interval failure (Stitch length) | <ul style="list-style-type: none"> • Perform a software update • Check selection of class |
| 2188 | Error | Stepper motor card X30 Reference drive failure (Stitch length) | <ul style="list-style-type: none"> • Check for stiff movement • Replace encoder • Replace motor |
| 2201 | Error | Stepper motor X40 reference run timeout | <ul style="list-style-type: none"> • Check reference sensor |
| 2205 | Error | Stepper motor card X40 stepper motor blockage | <ul style="list-style-type: none"> • Check for stiff movement |
| 2221 | Error | Stepper motor card X40 encoder plug (Sub-D, 9-pin) not connected | <ul style="list-style-type: none"> • Connect encoder cable to the control, use the correct interface |
| 2222 | Error | Stepper motor card X40 flywheel position not found | <ul style="list-style-type: none"> • Check stepper motor 1 for stiff movement |
| 2230 | Error | Stepper motor card X40 not responding | <ul style="list-style-type: none"> • Perform a software update • Replace control |
| 2231 | Error | Stepper motor card X40 parameter init error | <ul style="list-style-type: none"> • Perform a software update • Check selection of class |
| 2252 | Error | Stepper motor card X40 overcurrent | <ul style="list-style-type: none"> • Check for stiff movement |
| 2271 | Error | Stepper motor card X40 Watchdog (sewing foot lift) | <ul style="list-style-type: none"> • Perform a software update • Check selection of class |
| 2272 | Error | Stepper motor card X40 motor overload / overvoltage / overcurrent (Sewing foot lift) | <ul style="list-style-type: none"> • Check selection of class • Replace control • Replace encoder • Replace stepper motor |

| Code | Type | Possible cause | Remedial action |
|------|-------|--|--|
| 2273 | Error | Stepper motor card X40 Sewing motor encoder not connected (Sewing foot lift) | <ul style="list-style-type: none"> • Replace control |
| 2274 | Error | Stepper motor card X40 Sewing motor encoder not init (Sewing foot lift) | <ul style="list-style-type: none"> • Perform a software update • Check selection of class |
| 2275 | Error | Stepper motor card X40 Init Position not found (Sewing foot lift) | <ul style="list-style-type: none"> • Check for stiff movement • Replace encoder • Replace motor |
| 2276 | Error | Stepper motor card X40 not Enabled (Sewing foot lift) | <ul style="list-style-type: none"> • Replace control |
| 2277 | Error | Stepper motor card X40 I²t (Sewing foot lift) | <ul style="list-style-type: none"> • Check for stiff movement • Replace encoder • Replace motor |
| 2278 | Error | Stepper motor card X40 Encoder failure (Sewing foot lift) | <ul style="list-style-type: none"> • Replace encoder |
| 2279 | Error | Stepper motor card X40 Current sensor failure (Sewing foot lift) | <ul style="list-style-type: none"> • Replace control |
| 2280 | Error | Stepper motor card X40 Incorrect stepper motor direction of rotation (Sewing foot lift) | <ul style="list-style-type: none"> • Replace encoder • Check if plugs have been mixed up • Check the wiring in the machine distributor and change it if necessary |
| 2281 | Error | Stepper motor card X40 Reference drive failure (Sewing foot lift) | <ul style="list-style-type: none"> • Check for stiff movement • Replace encoder • Replace motor |
| 2283 | Error | Stepper motor card X40 overcurrent (Sewing foot lift) | <ul style="list-style-type: none"> • Replace control |
| 2284 | Error | Stepper motor card X40 parameter init (Sewing foot lift) | <ul style="list-style-type: none"> • Perform a software update • Check selection of class |

| Code | Type | Possible cause | Remedial action |
|------|-------|--|--|
| 2285 | Error | Stepper motor card X40 insulation error (Sewing foot lift) | <ul style="list-style-type: none"> • Check motor phase and PE for low-impedance connection • Replace encoder • Replace sewing motor |
| 2287 | Error | Stepper motor card X40 transport interval failure (Sewing foot lift) | <ul style="list-style-type: none"> • Perform a software update • Check selection of class |
| 2288 | Error | Stepper motor card X40 Reference drive failure (Sewing foot lift) | <ul style="list-style-type: none"> • Check for stiff movement • Replace encoder • Replace motor |
| 2301 | Error | Stepper motor card X50 Reference drive failure (Stitch length) | <ul style="list-style-type: none"> • Check reference sensor |
| 2305 | Error | Stepper motor card X50 stepper motor blockage | <ul style="list-style-type: none"> • Check for stiff movement |
| 2321 | Error | Stepper motor card X50 encoder plug (Sub-D, 9-pin) not connected | <ul style="list-style-type: none"> • Connect encoder cable to the control, use the correct interface |
| 2322 | Error | Stepper motor card X50 flywheel position not found | <ul style="list-style-type: none"> • Check stepper motor 1 for stiff movement |
| 2330 | Error | Stepper motor card X50 not responding | <ul style="list-style-type: none"> • Perform a software update • Replace control |
| 2331 | Error | Stepper motor card X50 parameter init error | <ul style="list-style-type: none"> • Perform a software update • Check selection of class |
| 2352 | Error | Stepper motor card X50 overcurrent | <ul style="list-style-type: none"> • Check for stiff movement |
| 2371 | Error | Stepper motor card X50 Watchdog (sewing foot lift) | <ul style="list-style-type: none"> • Perform a software update • Check selection of class |
| 2372 | Error | Stepper motor card X50 motor overload / overvoltage / overcurrent (Sewing foot stroke) | <ul style="list-style-type: none"> • Check selection of class • Replace control • Replace encoder • Replace stepper motor |

| Code | Type | Possible cause | Remedial action |
|------|-------|--|--|
| 2373 | Error | Stepper motor card X50 Sewing motor encoder not connected (Sewing foot stroke) | <ul style="list-style-type: none"> • Replace control |
| 2374 | Error | Stepper motor card X50 Sewing motor encoder not init (Sewing foot stroke) | <ul style="list-style-type: none"> • Perform a software update • Check selection of class |
| 2375 | Error | Stepper motor card X50 Init Position not found (Sewing foot stroke) | <ul style="list-style-type: none"> • Check for stiff movement • Replace encoder • Replace motor |
| 2376 | Error | Stepper motor card X50 not Enabled (Sewing foot stroke) | <ul style="list-style-type: none"> • Replace control |
| 2377 | Error | Stepper motor card X50 Overload (Sewing foot stroke) | <ul style="list-style-type: none"> • Check for stiff movement • Replace encoder • Replace motor |
| 2378 | Error | Stepper motor card X50 Encoder failure (Sewing foot stroke) | <ul style="list-style-type: none"> • Replace encoder |
| 2379 | Error | Stepper motor card X50 Current sensor failure (Sewing foot stroke) | <ul style="list-style-type: none"> • Replace control |
| 2380 | Error | Stepper motor card X50 Incorrect stepper motor direction of rotation (Sewing foot stroke) | <ul style="list-style-type: none"> • Replace encoder • Check if plugs have been mixed up • Check the wiring in the machine distributor and change it if necessary |
| 2381 | Error | Stepper motor card X50 Reference drive failure (Sewing foot stroke) | <ul style="list-style-type: none"> • Check for stiff movement • Replace encoder • Replace motor |
| 2383 | Error | Stepper motor card X50 overcurrent (Sewing foot stroke) | <ul style="list-style-type: none"> • Replace control |
| 2384 | Error | Stepper motor card X50 parameter init (Sewing foot stroke) | <ul style="list-style-type: none"> • Perform a software update • Check selection of class |

| Code | Type | Possible cause | Remedial action |
|------|-------|--|--|
| 2385 | Error | Stepper motor card X50 insulation error (Sewing foot stroke) | <ul style="list-style-type: none"> • Check motor phase and PE for low-impedance connection • Replace encoder • Replace sewing motor |
| 2387 | Error | Stepper motor card X50 transport interval failure (Sewing foot stroke) | <ul style="list-style-type: none"> • Perform a software update • Check selection of class |
| 2388 | Error | Stepper motor card X50 Reference drive failure (Sewing foot stroke) | <ul style="list-style-type: none"> • Check for stiff movement • Replace encoder • Replace motor |
| 2401 | Error | Stepper motor card X60 reference run timeout (Edge guide) | <ul style="list-style-type: none"> • Check reference sensor |
| 2405 | Error | Stepper motor card X60 stepper motor blockage (Edge guide) | <ul style="list-style-type: none"> • Check for stiff movement |
| 2421 | Error | Stepper motor card X60 encoder plug (Sub-D, 9-pin) not connected | <ul style="list-style-type: none"> • Connect encoder cable to the control, use the correct interface |
| 2422 | Error | Stepper motor card X60 flywheel position not found | <ul style="list-style-type: none"> • Check stepper motor 1 for stiff movement |
| 2430 | Error | Stepper motor card X60 not responding | <ul style="list-style-type: none"> • Perform a software update • Replace control |
| 2431 | Error | Stepper motor card X60 parameter init error | <ul style="list-style-type: none"> • Perform a software update • Check selection of class |
| 2471 | Error | Stepper motor card X60 Watchdog (Edge guide) | <ul style="list-style-type: none"> • Perform a software update • Check selection of class |
| 2472 | Error | Stepper motor card X60 motor overload / overvoltage / overcurrent (Edge guide) | <ul style="list-style-type: none"> • Check selection of class • Replace control • Replace encoder • Replace stepper motor |
| 2473 | Error | Stepper motor card X60 Sewing motor encoder not connected (Edge guide) | <ul style="list-style-type: none"> • Replace control |

| Code | Type | Possible cause | Remedial action |
|------|-------|--|--|
| 2474 | Error | Stepper motor card X60 Sewing motor encoder not init (Edge guide) | <ul style="list-style-type: none"> • Perform a software update • Check selection of class |
| 2475 | Error | Stepper motor card X60 Init Position not found (Edge guide) | <ul style="list-style-type: none"> • Check for stiff movement • Replace encoder • Replace motor |
| 2476 | Error | Stepper motor card X60 not Enabled (Edge guide) | <ul style="list-style-type: none"> • Replace control |
| 2477 | Error | Stepper motor card X60 Overload (Edge guide) | <ul style="list-style-type: none"> • Check for stiff movement • Replace encoder • Replace motor |
| 2478 | Error | Stepper motor card X60 Encoder failure (Edge guide) | <ul style="list-style-type: none"> • Replace encoder |
| 2479 | Error | Stepper motor card X60 Current sensor failure (Edge guide) | <ul style="list-style-type: none"> • Replace control |
| 2480 | Error | Stepper motor card X60 Incorrect stepper motor direction of rotation (Edge guide) | <ul style="list-style-type: none"> • Replace encoder • Check if plugs have been mixed up • Check the wiring in the machine distributor and change it if necessary |
| 2481 | Error | Stepper motor card X60 Reference drive failure (Edge guide) | <ul style="list-style-type: none"> • Check for stiff movement • Replace encoder • Replace motor |
| 2483 | Error | Stepper motor card X60 overcurrent (Edge guide) | <ul style="list-style-type: none"> • Replace control |
| 2484 | Error | Stepper motor card X60 parameter init (Edge guide) | <ul style="list-style-type: none"> • Perform a software update • Check selection of class |
| 2485 | Error | Stepper motor card X60 insulation error (Edge guide) | <ul style="list-style-type: none"> • Check motor phase and PE for low- impedance connection • Replace encoder • Replace sewing motor |
| 2487 | Error | Stepper motor card X60 transport interval failure (Edge guide) | <ul style="list-style-type: none"> • Perform a software update • Check selection of class |

| Code | Type | Possible cause | Remedial action |
|------|-------|--|---|
| 2488 | Error | Stepper motor card X60 Reference drive failure (Edge guide) | <ul style="list-style-type: none"> • Check for stiff movement • Replace encoder • Replace motor |
| 2501 | Error | Stepper motor card X70 reference run timeout (upper Puller) | <ul style="list-style-type: none"> • Check reference sensor |
| 2505 | Error | Stepper motor card X70 stepper motor blockage (upper Puller) | <ul style="list-style-type: none"> • Check for stiff movement |
| 2521 | Error | Stepper motor card X70 encoder plug (Sub-D, 9-pin) not connected | <ul style="list-style-type: none"> • Connect encoder cable to the control, use the correct interface |
| 2522 | Error | Stepper motor card X70 flywheel position not found | <ul style="list-style-type: none"> • Check stepper motor 1 for stiff movement |
| 2530 | Error | Stepper motor card X70 not responding | <ul style="list-style-type: none"> • Perform a software update • Replace control |
| 2531 | Error | Stepper motor card X70 parameter init error | <ul style="list-style-type: none"> • Perform a software update • Check selection of class |
| 2571 | Error | Stepper motor card X70 Watchdog (upper Puller) | <ul style="list-style-type: none"> • Perform a software update • Check selection of class |
| 2572 | Error | Stepper motor card X70 motor overload / overvoltage / overcurrent (upper Puller) | <ul style="list-style-type: none"> • Check selection of class • Replace control • Replace encoder • Replace stepper motor |
| 2573 | Error | Stepper motor card X70 Sewing motor encoder not connected(upper Puller) | <ul style="list-style-type: none"> • Replace control |
| 2574 | Error | Stepper motor card X70 Sewing motor encoder not init (upper Puller) | <ul style="list-style-type: none"> • Perform a software update • Check selection of class |
| 2575 | Error | Stepper motor card X70 Init Position not found (upper Puller) | <ul style="list-style-type: none"> • Check for stiff movement • Replace encoder • Replace motor |

| Code | Type | Possible cause | Remedial action |
|------|-------|---|--|
| 2576 | Error | Stepper motor card X70 not Enabled (upper Puller) | <ul style="list-style-type: none"> • Replace control |
| 2577 | Error | Stepper motor card X70 Overload (upper Puller) | <ul style="list-style-type: none"> • Check for stiff movement • Replace encoder • Replace motor |
| 2578 | Error | Stepper motor card X70 Encoder failure (upper Puller) | <ul style="list-style-type: none"> • Replace encoder |
| 2579 | Error | Stepper motor card X70 Current sensor failure (upper Puller) | <ul style="list-style-type: none"> • Replace control |
| 2580 | Error | Stepper motor card X70 Incorrect stepper motor direction of rotation (upper Puller) | <ul style="list-style-type: none"> • Replace encoder • Check if plugs have been mixed up • Check the wiring in the machine distributor and change it if necessary |
| 2581 | Error | Stepper motor card X70 Reference drive failure(upper Puller) | <ul style="list-style-type: none"> • Check for stiff movement • Replace encoder • Replace motor |
| 2583 | Error | Stepper motor card X70 overcurrent (upper Puller) | <ul style="list-style-type: none"> • Replace control |
| 2584 | Error | Stepper motor card X70 parameter init (upper Puller) | <ul style="list-style-type: none"> • Perform a software update • Check selection of class |
| 2585 | Error | Stepper motor card X70 insulation error (upper Puller) | <ul style="list-style-type: none"> • Check motor phase and PE for low-impedance connection • Replace encoder • Replace sewing motor |
| 2587 | Error | Stepper motor card X70 transport interval failure (upper Puller) | <ul style="list-style-type: none"> • Perform a software update • Check selection of class |
| 2588 | Error | Stepper motor card X70 Reference drive failure(upper Puller) | <ul style="list-style-type: none"> • Check for stiff movement • Replace encoder • Replace motor |

| Code | Type | Possible cause | Remedial action |
|------|-------|---|---|
| 2601 | Error | Stepper motor X80 reference run timeout (bottom puller) | <ul style="list-style-type: none"> • Check reference sensor |
| 2605 | Error | Stepper motor card X80 stepper motor blockage (bottom puller) | <ul style="list-style-type: none"> • Check for stiff movement |
| 2621 | Error | Stepper motor card X82 encoder plug (Sub-D, 9-pin) not connected (bottom puller) | <ul style="list-style-type: none"> • Connect encoder cable to the control, use the correct interface |
| 2622 | Error | Stepper motor card X80 flywheel position not found (bottom puller) | <ul style="list-style-type: none"> • Check stepper motor 6 for stiff movement |
| 2630 | Error | Stepper motor card X80 not responding (bottom puller) | <ul style="list-style-type: none"> • Perform a software update • Replace control |
| 2631 | Error | Stepper motor card X80 init failure (bottom puller) | <ul style="list-style-type: none"> • Perform a software update • Check selection of class |
| 2671 | Error | Stepper motor card X80 Watchdog (bottom puller) | <ul style="list-style-type: none"> • Perform a software update • Check selection of class |
| 2672 | Error | Stepper motor card X80 motor overload / overvoltage / overcurrent (bottom puller) | <ul style="list-style-type: none"> • Check selection of class • Replace control • Replace encoder • Replace stepper motor |
| 2673 | Error | Stepper motor card X80 Sewing motor encoder not connected (bottom puller) | <ul style="list-style-type: none"> • Replace control |
| 2674 | Error | Stepper motor card X80 Sewing motor encoder not init (bottom puller) | <ul style="list-style-type: none"> • Perform a software update • Check selection of class |
| 2675 | Error | Stepper motor card X80 Init Position not found (bottom puller) | <ul style="list-style-type: none"> • Check for stiff movement • Replace encoder • Replace motor |

| Code | Type | Possible cause | Remedial action |
|------|-------|--|--|
| 2676 | Error | Stepper motor card X80 not Enabled (bottom puller) | <ul style="list-style-type: none"> • Replace control |
| 2677 | Error | Stepper motor card X80 I²t (bottom puller) | <ul style="list-style-type: none"> • Check for stiff movement • Replace encoder • Replace motor |
| 2678 | Error | Stepper motor card X80 Encoder failure (bottom puller) | <ul style="list-style-type: none"> • Replace encoder |
| 2679 | Error | Stepper motor card X80 Current sensor failure (bottom puller) | <ul style="list-style-type: none"> • Replace control |
| 2680 | Error | Stepper motor card X80 Incorrect stepper motor direction of rotation (bottom puller) | <ul style="list-style-type: none"> • Replace encoder • Check if plugs have been mixed up • Check the wiring in the machine distributor and change it if necessary |
| 2681 | Error | Stepper motor card X80 Reference drive failure (bottom puller) | <ul style="list-style-type: none"> • Check for stiff movement • Replace encoder • Replace motor |
| 2683 | Error | Stepper motor card X80 overcurrent (bottom puller) | <ul style="list-style-type: none"> • Replace control |
| 2684 | Error | Stepper motor card X80 parameter init (bottom puller) | <ul style="list-style-type: none"> • Perform a software update • Check selection of class |
| 2685 | Error | Stepper motor card X80 insulation error (bottom puller) | <ul style="list-style-type: none"> • Check motor phase and PE for low-impedance connection • Replace encoder • Replace sewing motor |
| 2687 | Error | Stepper motor card X80 transport interval failure (bottom puller) | <ul style="list-style-type: none"> • Perform a software update • Check selection of class |
| 2688 | Error | Stepper motor card X80 Reference drive failure (bottom puller) | <ul style="list-style-type: none"> • Check for stiff movement • Replace encoder • Replace motor |

| Code | Type | Possible cause | Remedial action |
|------|-------------|---|---|
| 2901 | Error | General Reference Timeout of the stepper motors | <ul style="list-style-type: none"> • Check the reference sensors |
| 3010 | Error | U100 V start-up error | <ul style="list-style-type: none"> • Disconnect the stepper motor plugs; if error persists, replace control |
| 3011 | Error | U100 V short circuit | <ul style="list-style-type: none"> • Disconnect motor plug; replace control if error is not corrected: Replace control |
| 3012 | Error | U100 V (I ² T) overload | <ul style="list-style-type: none"> • one or several stepper motors defective |
| 3020 | Error | U24 V start-up error | <ul style="list-style-type: none"> • Disconnect magnet plug; replace control if error is not corrected: Replace control |
| 3021 | Error | U24 V short circuit | <ul style="list-style-type: none"> • Disconnect magnet plug; replace control if error is not corrected: Replace control |
| 3022 | Error | U24 V (I ² T) overload | <ul style="list-style-type: none"> • One or several magnets defective |
| 3030 | Error | Motor phase failure | <ul style="list-style-type: none"> • Replace control |
| 3104 | Warning | Pedal is not in position 0 | <ul style="list-style-type: none"> • When switching the control on, take your foot off the pedal |
| 3109 | Warning | Operation lock | <ul style="list-style-type: none"> • Check tilt sensor on machine |
| 3110 | Information | Right thread tension magnet is not connected | <ul style="list-style-type: none"> • Check the connection of right thread tension magnet |
| 3111 | Information | Left thread tension magnet is not connected | <ul style="list-style-type: none"> • Check the connection of left thread tension magnet |
| 3150 | Information | Maintenance necessary | <ul style="list-style-type: none"> • For information on maintenance of the machine, see the service instructions for the machine |
| 3217 | Information | RFW right | <ul style="list-style-type: none"> • Bobbin is empty • Insert a new bobbin |
| 3223 | Information | Skip stitch detection | <ul style="list-style-type: none"> • - |
| 3224 | Information | Bobbin rotation monitor | <ul style="list-style-type: none"> • The bobbin is not rotating • Check the bobbin, advance the initial thread |

| Code | Type | Possible cause | Remedial action |
|------|-------------|---|---|
| 3225 | Information | SSD sensor is soiled | <ul style="list-style-type: none"> • Use compressed air or a soft cotton cloth to clean the sensor |
| 3354 | Information | Failure in thread trimmer process | <ul style="list-style-type: none"> • Perform a software update |
| 3383 | Information | Failure in with the motor referencing process | <ul style="list-style-type: none"> • Check motor • Perform a software update |
| 4201 | Warning | Failure SD-Card | <ul style="list-style-type: none"> • Insert SD card • Replace control |
| 4430 | Warning | OP3000: Connection lost | <ul style="list-style-type: none"> • Check connection to OP3000 • Replace OP3000 • Replace control |
| 4440 | Error | OP3000: DAC receive buffer exceeded | <ul style="list-style-type: none"> • Check connection to OP3000 • Replace OP3000 • Replace control |
| 4441 | Warning | OP3000: DAC receiver timeout | <ul style="list-style-type: none"> • Check connection to OP3000 • Replace OP3000 • Replace control |
| 4442 | Warning | OP3000: DAC unknown message | <ul style="list-style-type: none"> • Check connection to OP3000 • Replace OP3000 • Replace control |
| 4443 | Warning | OP3000: DAC invalid checksum | <ul style="list-style-type: none"> • Check connection to OP3000 • Replace OP3000 • Replace control |
| 4445 | Error | OP3000: DAC send buffer exceeded | <ul style="list-style-type: none"> • Check connection to OP3000 • Replace OP3000 • Replace control |
| 4446 | Warning | OP3000: DAC no response | <ul style="list-style-type: none"> • Check connection to OP3000 • Replace OP3000 • Replace control |
| 4447 | Warning | OP3000: DAC invalid response | <ul style="list-style-type: none"> • Check connection to OP3000 • Replace OP3000 • Replace control |

| Code | Type | Possible cause | Remedial action |
|------|-------------|--|---|
| 4450 | Error | OP3000: DAC OP Receive buffer exceeded | <ul style="list-style-type: none"> • Check connection to OP3000 • Replace OP3000 • Replace control |
| 4451 | Warning | OP3000: DAC OP receiver timeout | <ul style="list-style-type: none"> • Check connection to OP3000 • Replace OP3000 • Replace control |
| 4452 | Warning | OP3000: DAC OP unknown message | <ul style="list-style-type: none"> • Check connection to OP3000 • Replace OP3000 • Replace control |
| 4456 | Warning | OP3000: DAC no response | <ul style="list-style-type: none"> • Check connection to OP3000 • Replace OP3000 • Replace control |
| 4460 | Warning | OP7000 connection lost | <ul style="list-style-type: none"> • Check connection to OP7000 • Replace OP7000 • Replace control |
| 4906 | Information | Not in translation table | <ul style="list-style-type: none"> • Check machine ID port • Reset or machine class change necessary |
| 4907 | Information | Not in translation table | <ul style="list-style-type: none"> • Reset or machine class change necessary |
| 4908 | Information | Not in translation table | <ul style="list-style-type: none"> • Reset necessary |
| 4911 | Information | Not in translation table | <ul style="list-style-type: none"> • Reset necessary |
| 4918 | Warning | Invalid update file | <ul style="list-style-type: none"> • Contact DA Service |
| 4919 | Warning | Reset failed | <ul style="list-style-type: none"> • Contact DA Service |
| 4920 | Warning | Error in update log | <ul style="list-style-type: none"> • Contact DA Service |
| 4921 | Warning | The update was interrupted | <ul style="list-style-type: none"> • Contact DA Service |
| 4922 | Error | Unable to find user database | <ul style="list-style-type: none"> • Contact DA Service |
| 4923 | Error | Synchronization failed | <ul style="list-style-type: none"> • Contact DA Service |
| 4930 | Information | Control replaced | <ul style="list-style-type: none"> • Data transfer from control panel to control |








| Code | Type | Possible cause | Remedial action |
|------|-------------|---|---|
| 4931 | Information | Checksum error of the control | <ul style="list-style-type: none"> • Data transfer from control panel to control |
| 6353 | Error | EEProm Timeout | <ul style="list-style-type: none"> • Switch off the control, wait until the LEDs are off, check connection for machine ID, and switch on control again |
| 5001 | Information | Incorrect class | <ul style="list-style-type: none"> • Change class • Perform reset |
| 5002 | Information | Incorrect class or machine ID connection error | <ul style="list-style-type: none"> • Change class • Perform reset |
| 5003 | Information | Data version is too old | <ul style="list-style-type: none"> • Perform reset |
| 5004 | Information | Checksum is incorrect | <ul style="list-style-type: none"> • Perform reset |
| 6360 | Information | No valid data on external EEPROM (internal data structures are not compatible with the external data storage device) | <ul style="list-style-type: none"> • Software update |
| 6361 | Information | No external EEPROM connected | <ul style="list-style-type: none"> • Connect machine ID |
| 6362 | Information | No valid data on internal EEPROM (internal data structures are not compatible with the external data storage device) | <ul style="list-style-type: none"> • Check machine ID connection • Switch off the control, wait until the LEDs have gone out, and then switch on the control again • Software update |
| 6363 | Information | No valid data on internal and external EEPROM (software version is not compatible with the internal data storage device, emergency operating features only) | <ul style="list-style-type: none"> • Check machine ID connection • Switch off the control, wait until the LEDs have gone out, and then switch on the control again • Software update |










| Code | Type | Possible cause | Remedial action |
|------|-------------|---|---|
| 6364 | Information | No valid data on internal EEPROM and no external EEPROM connected (the internal data structures are not compatible with the external data storage device) | <ul style="list-style-type: none"> • Check machine ID connection • Switch off the control, wait until the LEDs have gone out, and then switch on the control again • Software update |
| 6365 | Information | Internal EEPROM defective | <ul style="list-style-type: none"> • Replace control |
| 6366 | Information | Internal EEPROM defective and external data not valid (emergency operating features only) | <ul style="list-style-type: none"> • Replace control |
| 6367 | Information | Internal EEPROM defective and external data not valid (emergency operating features only) | <ul style="list-style-type: none"> • Replace control |
| 7270 | Information | External CAN | <ul style="list-style-type: none"> • Check connection cables • Perform a software update • Replace CAN slaves |
| 9310 | Error | Tape feeder not connected | <ul style="list-style-type: none"> • Check connection cables • Perform a software update • Replace the control of the tape feeder |
| 9320 | Error | Tape feeder in lowered position | <ul style="list-style-type: none"> • No remedial action entered in translation table |
| 9330 | Information | Material thickness sensor not connected | <ul style="list-style-type: none"> • Check connection cables • Perform a software update • Replace material thickness sensor |
| 9340 | Error | Remaining thread monitor not connected | <ul style="list-style-type: none"> • Check connection cables • Perform a software update • Replace remaining thread monitor |
| 9910 | Warning | Sewing stop | <ul style="list-style-type: none"> • Check tilt sensor on machine • Check 24V • Replace control |
| 9911 | Warning | Power down | <ul style="list-style-type: none"> • The control is switched off |

| Code | Type | Possible cause | Remedial action |
|------|---------|-----------------------------|---|
| 9912 | Warning | Restart necessary | • Switch off the control |
| 9913 | Warning | Empty bobbin | • Please insert a full bobbin |
| 9914 | Warning | Reset | • Remove USB key! |
| 9915 | Warning | Please Wait! | • Please wait and do not remove USB key |
| 9916 | Warning | Erase internal Memory | • Delete the SD card. Continue with OK; cancel with ESC |
| 9917 | Warning | Erase USB key | • Delete the USB key. Continue with OK; cancel with ESC |
| 9918 | Warning | No USB key present | • Please insert USB key |
| 9919 | Warning | Sewing stop | • Machine in stop mode for threading the thread |
| 9920 | Warning | Referencing | • Please wait for motor referencing |
| 9921 | Warning | Show Message from QONDAC | • Show Message |
| 9922 | Warning | Service Stop | • Check the Service Stop button • Check 24V • Replace control |
| 9923 | Warning | Update required | • Press OK for Restart or ESC for cancel |
| 9924 | Warning | Security key generated | • Creation of a security key on a USB key |
| 9925 | Warning | Security Key changed! | • Overwrite Security Key? |
| 9926 | Warning | Please Confirm Reset | • Really reset? |
| 9927 | Warning | Reset | • Reset successfully |
| 9928 | Warning | Referencing? | • Press pedal backwards (pedal position-2) |
| 9929 | Warning | Not enough thread available | • Please insert a full bobbin |

| Code | Type | Possible cause | Remedial action |
|------|-------------|----------------------|---|
| 9930 | Warning | Empty bobbin | <ul style="list-style-type: none"> • Please insert a full bobbin |
| 9931 | Information | Bobbin Wind mode | <ul style="list-style-type: none"> • Press pedal backwards exit bobbin wind mode |
| 9932 | Information | No program available | <ul style="list-style-type: none"> • Automatic mode is not available without a program. Please use programming mode to define a program. |

10.3 Errors in sewing process

| Error | Possible causes | Remedial action |
|-------------------------------|--|---|
| Unthreading at seam beginning | Needle thread pretension is too firm | Check needle thread pretension ( p. 32). |
| Thread breaking | Needle thread and hook thread have not been threaded correctly | Check threading path ( p. 24). |
| | Needle is bent or sharp-edged | Replace the needle ( p. 22). |
| | Needle is not inserted correctly into the needle bar | Insert the needle correctly into the needle bar ( p. 22). |
| | The thread used is unsuitable | Use recommended thread ( p. 201). |
| | Thread tensions are too tight for the thread used | Check thread tensions ( p. 32). |
| | Thread-guiding parts, such as thread guides, are sharp-edged | Check threading path ( p. 24). |
| | Throat plate or hook have been damaged by the needle | Have parts reworked by qualified specialists |

| Error | Possible causes | Remedial action |
|-----------------|---|---|
| Skip stitches | Needle thread and hook thread have not been threaded correctly | Check threading path ( p. 24). |
| | Needle is blunt or bent | Replace the needle ( p. 22). |
| | Needle is not inserted correctly into the needle bar | Insert the needle correctly into the needle bar ( p. 22). |
| | The needle thickness used is unsuitable | Use recommended needle thickness ( p. 201). |
| | The reel stand is assembled incorrectly | Check the assembly of the reel stand |
| | Thread tensions are too tight | Check thread tensions ( p. 32). |
| | Throat plate or hook have been damaged by the needle | Have parts reworked by qualified specialists |
| | Distance from the hook to the needle is not set correctly | Set the correct distance ( Service Instructions) |
| Loose stitches | Thread tensions are not adjusted to the sewing material, the sewing material thickness or the thread used | Check thread tensions ( p. 32). |
| | Needle thread and hook thread have not been threaded correctly | Check threading path ( p. 24). |
| Needle breakage | Needle thickness is unsuitable for the sewing material or the thread | Use recommended needle thickness ( p. 201). |

11 Technical data

11.1 Data and characteristic values

| Technical data | Unit | D669 |
|--------------------|----------------------|------------------------|
| Type of stitches | | Double lockstitch 301 |
| Hook type | | Horizontal hook, large |
| Number of needles | | 1 |
| Needle system | | 134 - 35 |
| Needle strength | [Nm] | 80 - 150 |
| Thread strength | [Nm] | 80/3 - 15/3 |
| Stitch length | [mm] | 9/9 |
| Speed maximum | [min ⁻¹] | 3000 |
| Speed on delivery | [min ⁻¹] | 3000 |
| Mains voltage | [V] | 230 |
| Mains frequency | [Hz] | 50/60 |
| Operating pressure | [bar] | 6 |
| Length | [mm] | 600 |
| Width | [mm] | 300 |
| Height | [mm] | 490 |
| Weight | [kg] | 59 |

11.2 Requirements for fault-free operation

Compressed air quality must conform to ISO 8573-1: 2010 [7:4:4].

Fig. 96: Wiring diagram (2)

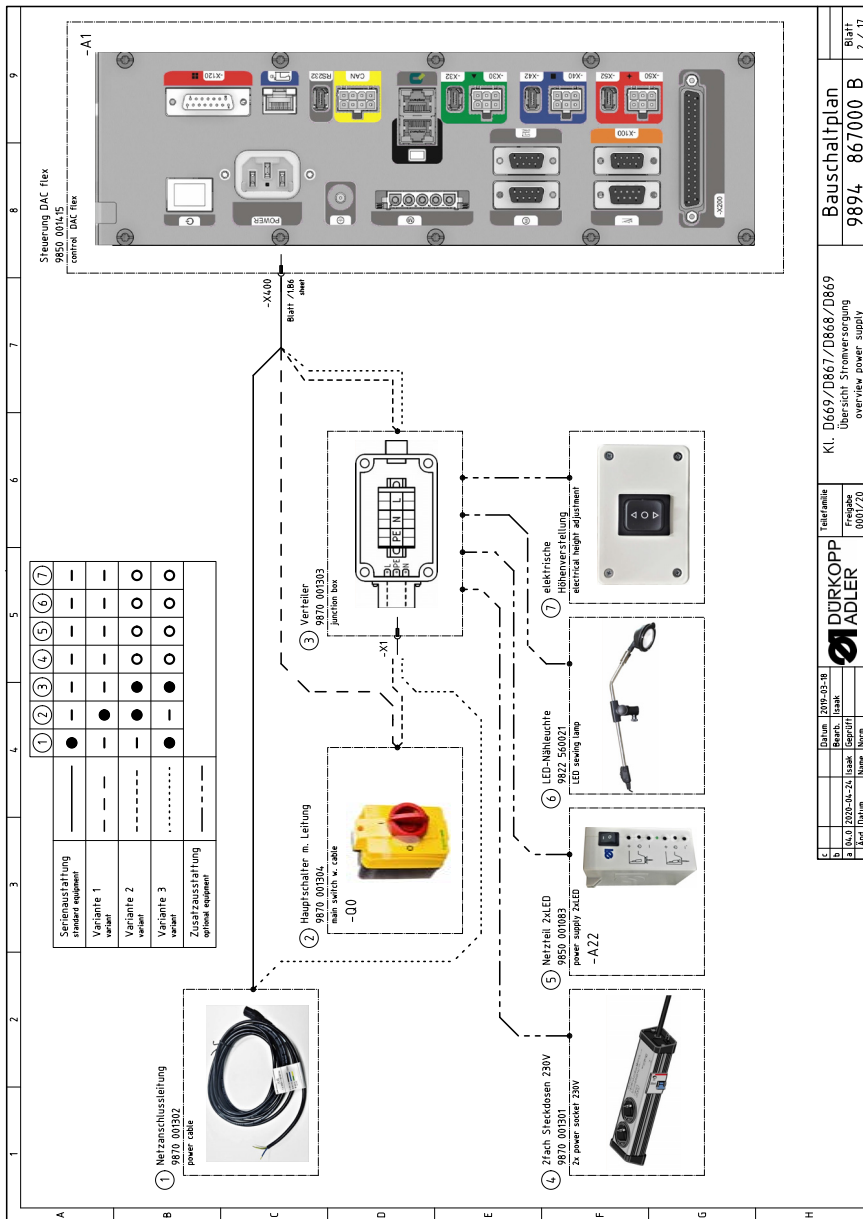
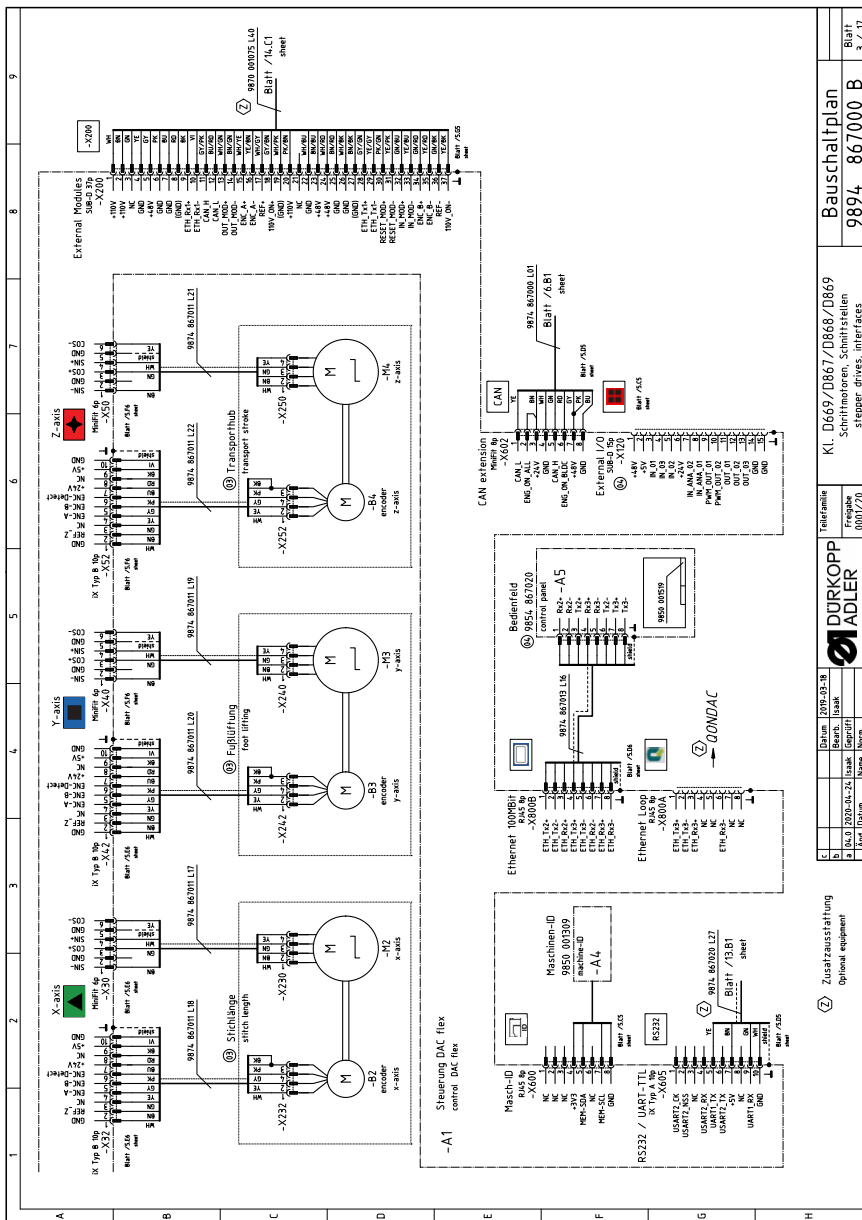


Fig. 97: Wiring diagram (3)



| Datum | | 2019-05-18 | |
|-------------------------|-------|------------|-------|
| a | 104.2 | 2020-04-22 | Isack |
| b | | Beinh. | Isack |
| c | | Geprüft | |
| Telefon | | Freigabe | |
| DURKOPP ADLER | | Freigabe | |
| Kl. D649/D867/D868/D869 | | Freigabe | |
| 9894 867000 B | | Freigabe | |
| Bauschaltplan | | Freigabe | |
| 9894 867000 B | | Freigabe | |
| Bat | | Freigabe | |

Fig. 99: Wiring diagram (5)

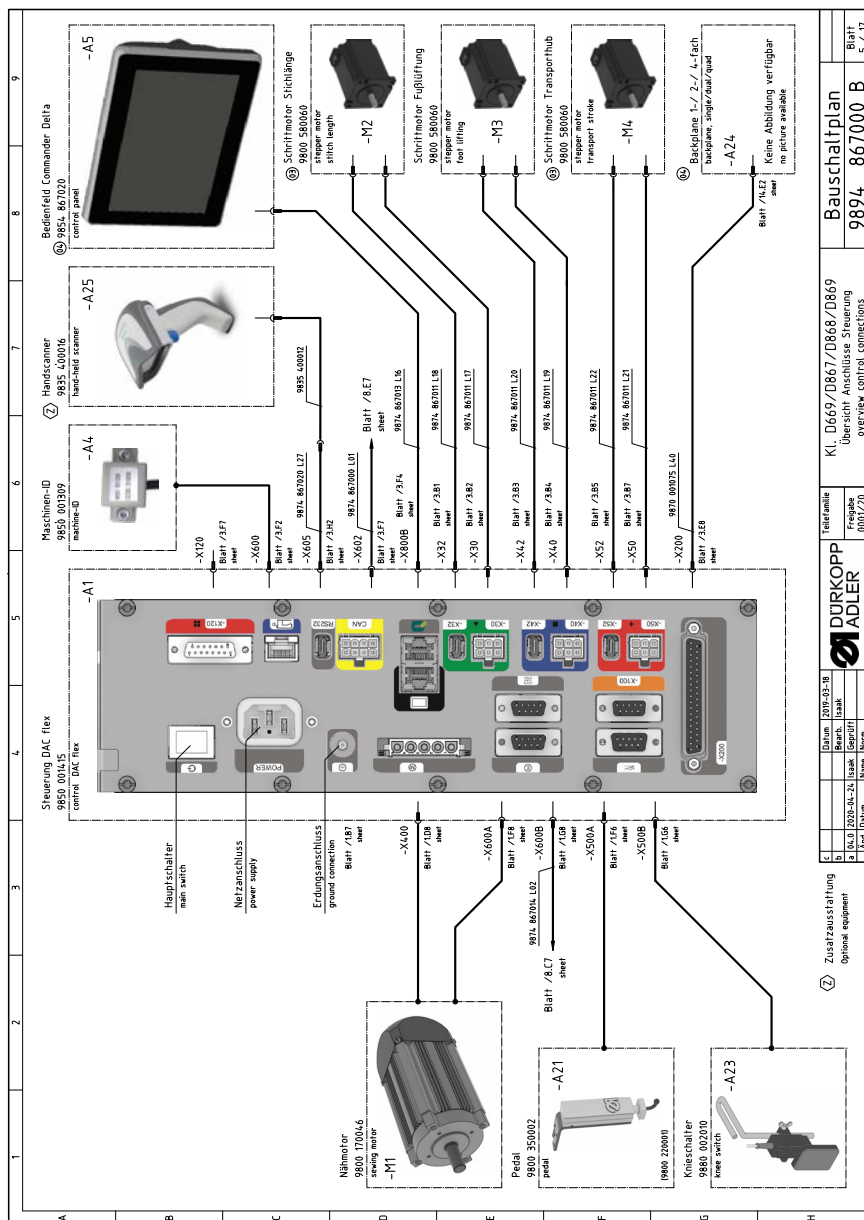
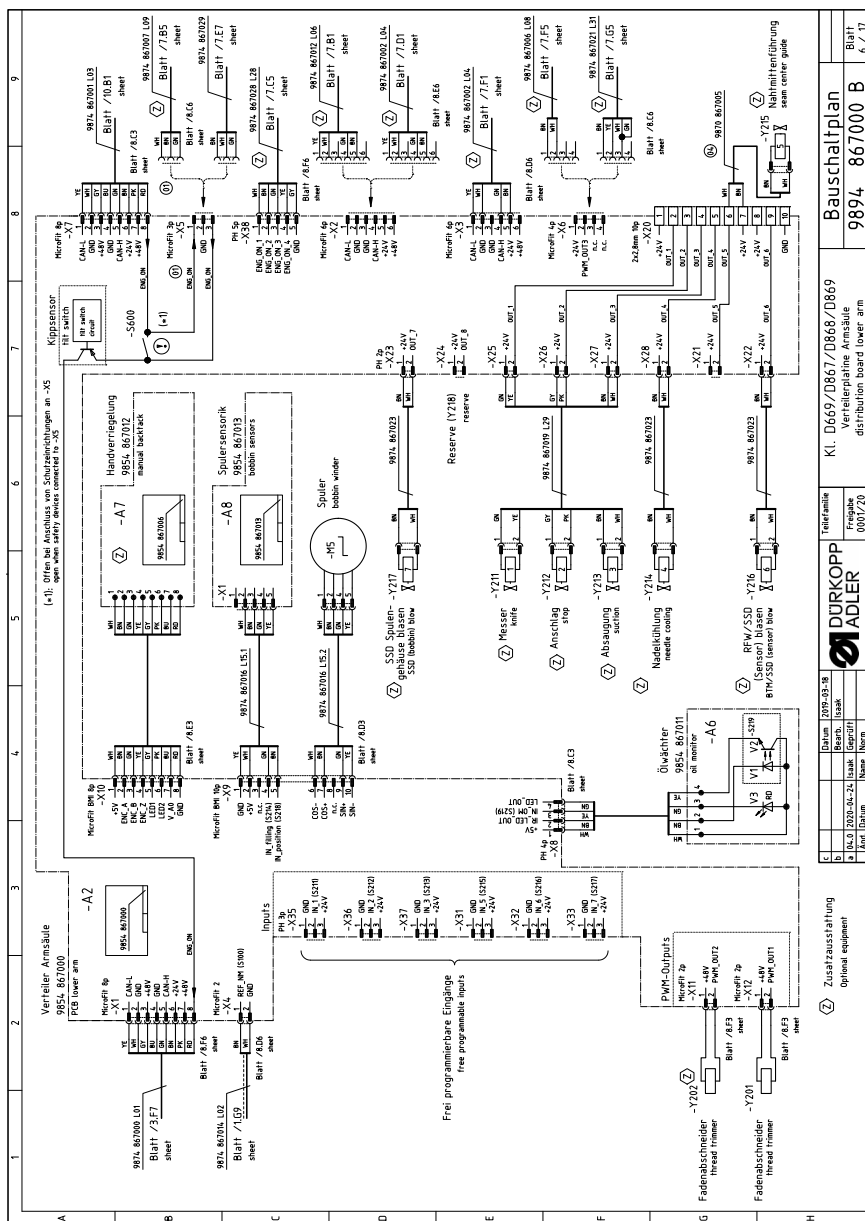


Fig. 100: Wiring diagram (6)



| | | | | | |
|------------------------------|--|--|--------|--|--|
| Bauschaltplan | | | Blatt | | |
| 9894 867000 B | | | 6 / 17 | | |
| Kl. D669/D867/D868/D869 | | | | | |
| Verteilerplane Armature | | | | | |
| distribution board lower arm | | | | | |
| Teilnummer | | | | | |
| DÜRKOPP ADLER | | | | | |
| Fragebogen | | | | | |
| 0001/20 | | | | | |
| Name | | | | | |
| Datum | | | | | |
| Zeichner | | | | | |
| 9894.86.70 | | | | | |
| Bezeichnet | | | | | |
| a 04.12.2020 | | | | | |
| Geprüft | | | | | |
| Name | | | | | |
| Datum | | | | | |

Fig. 101: Wiring diagram (7)

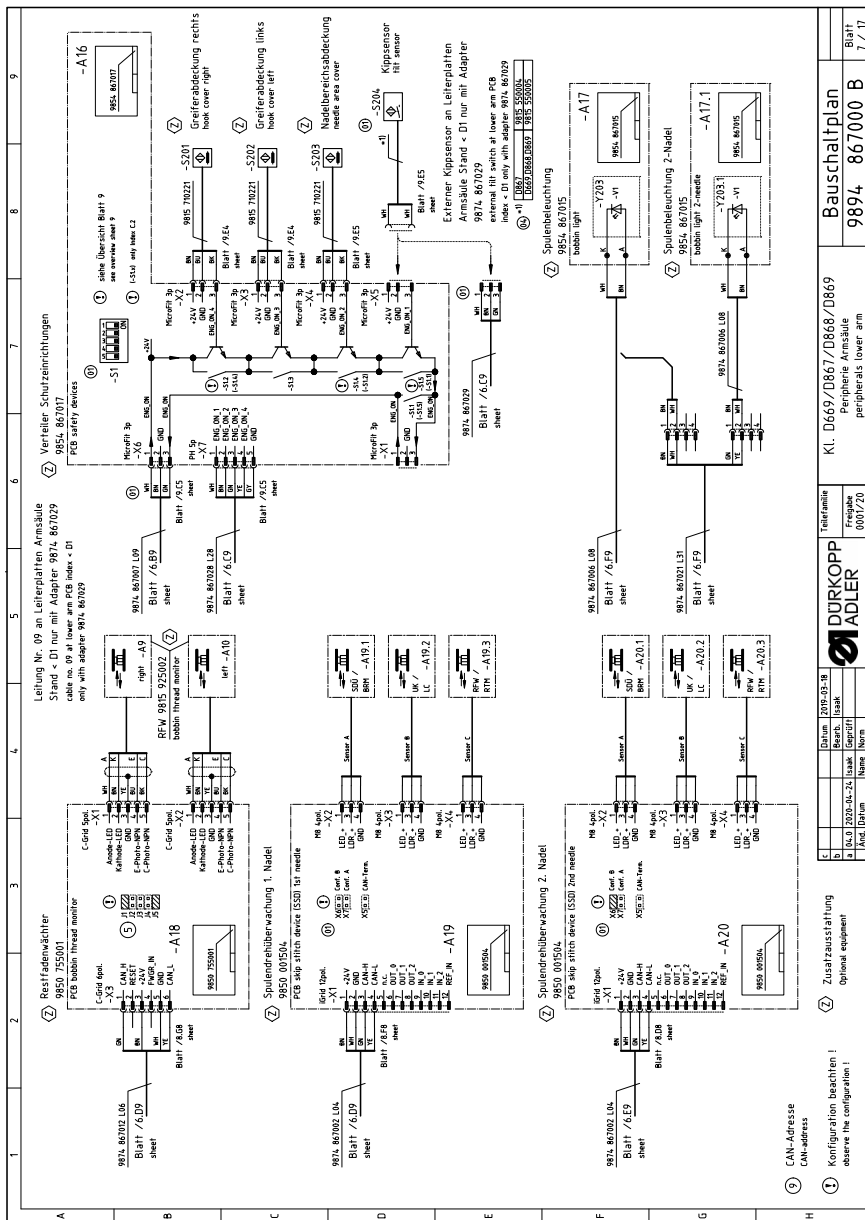


Fig. 102: Wiring diagram (8)

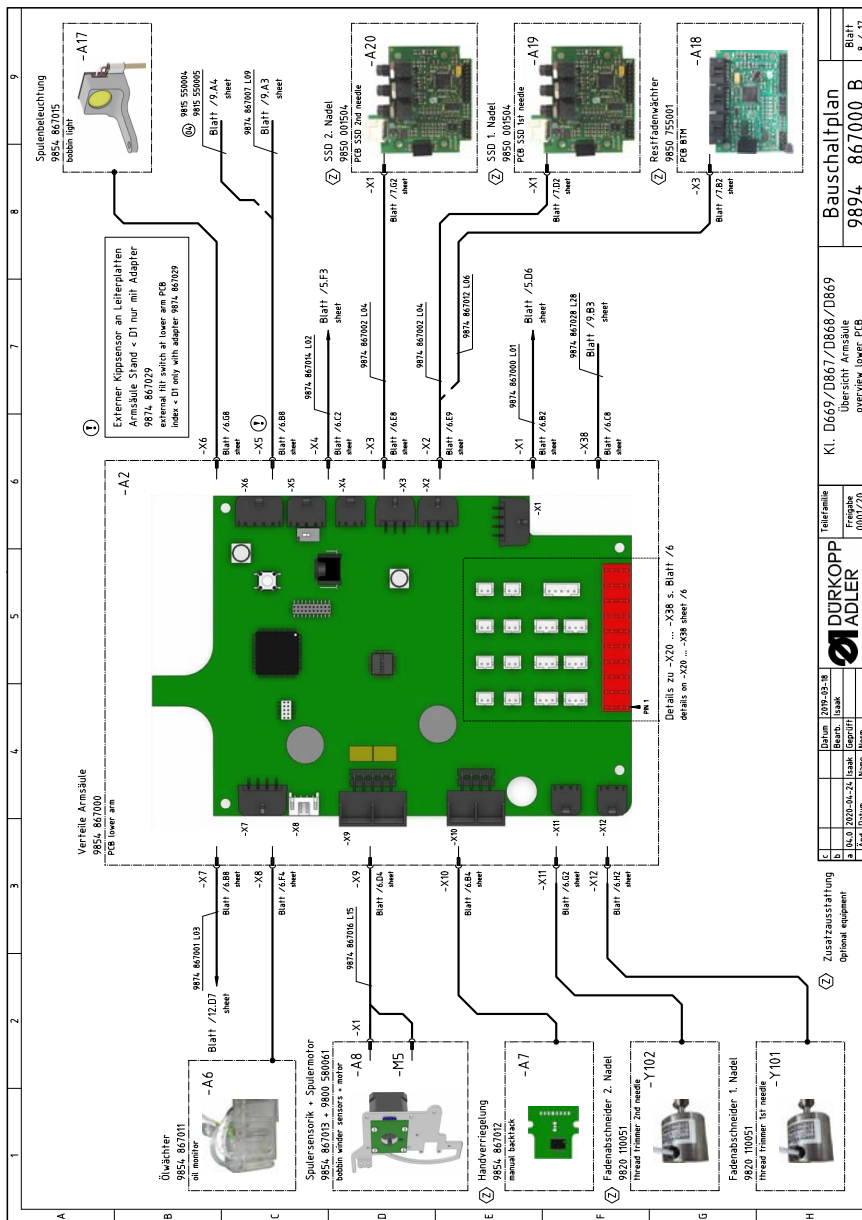


Fig. 103: Wiring diagram (9)

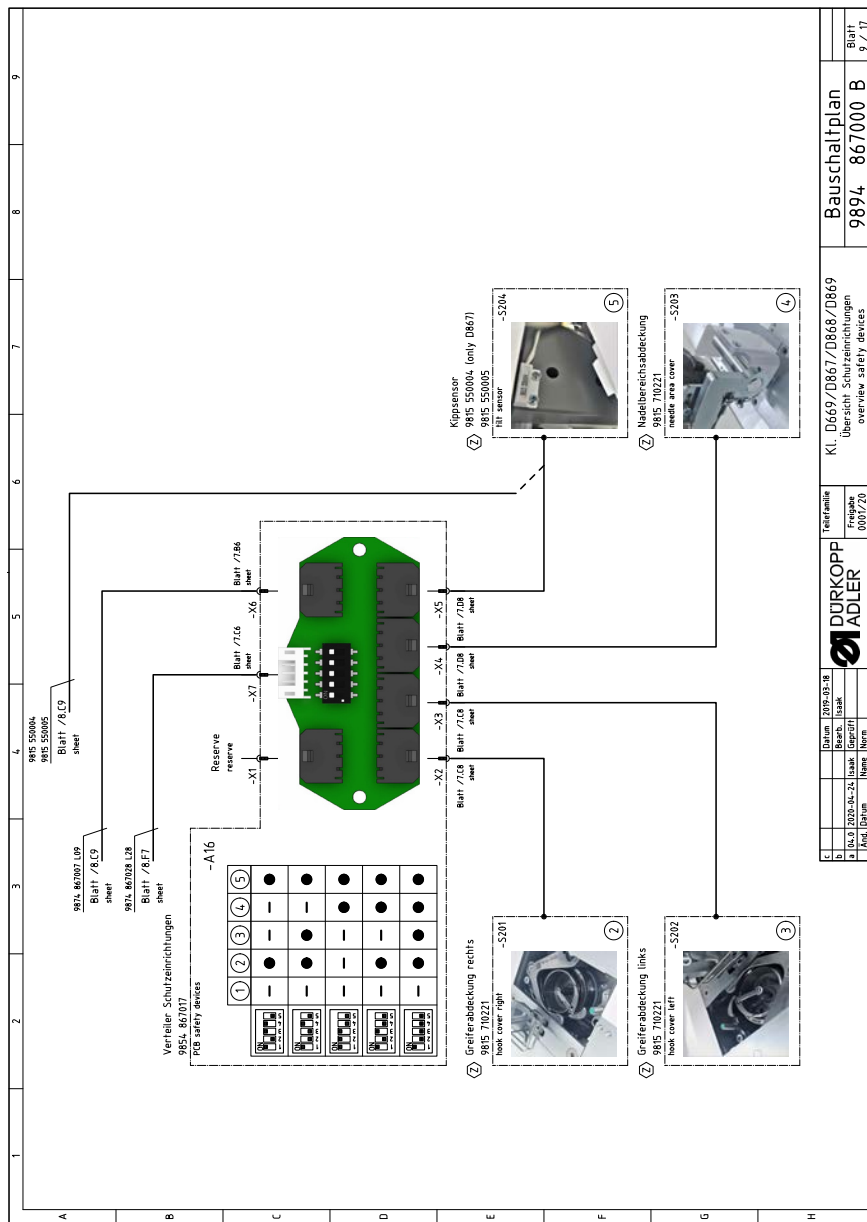


Fig. 104: Wiring diagram (10)

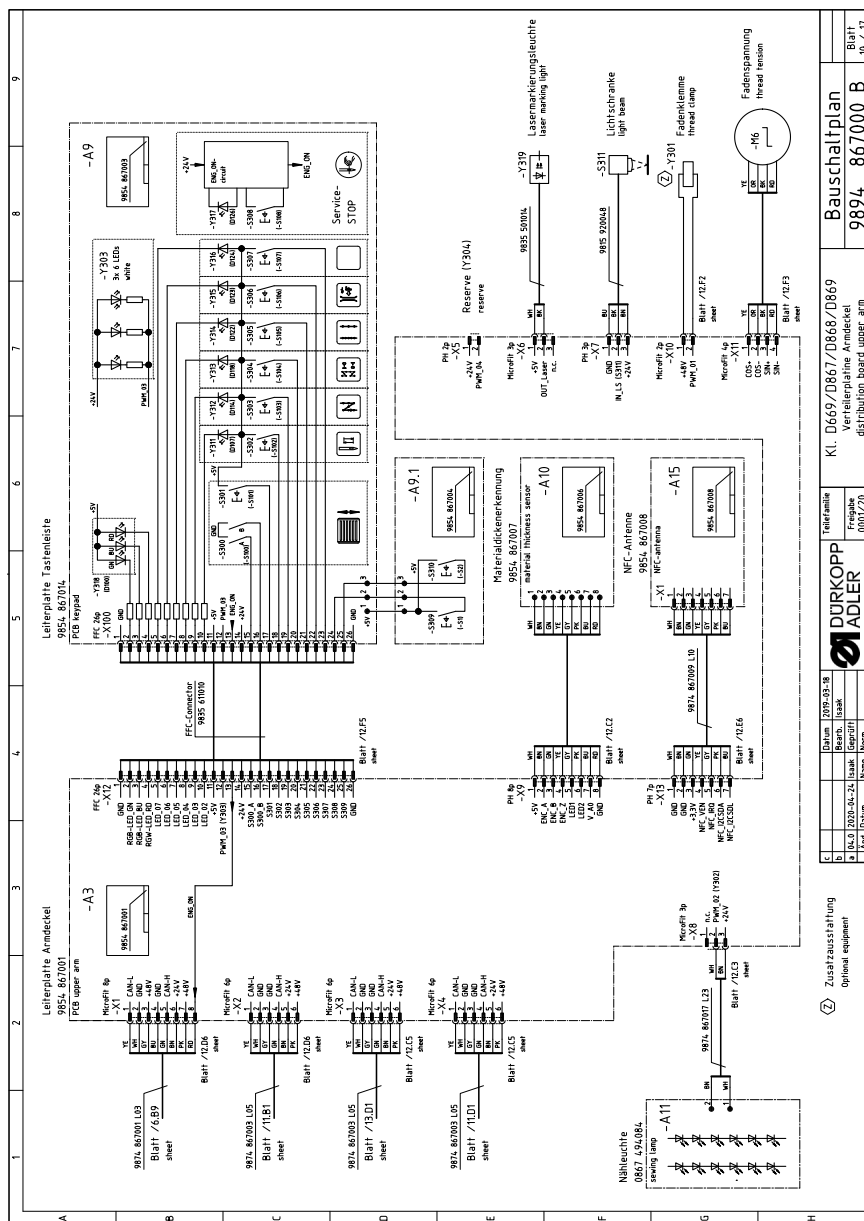


Fig. 105: Wiring diagram (11)

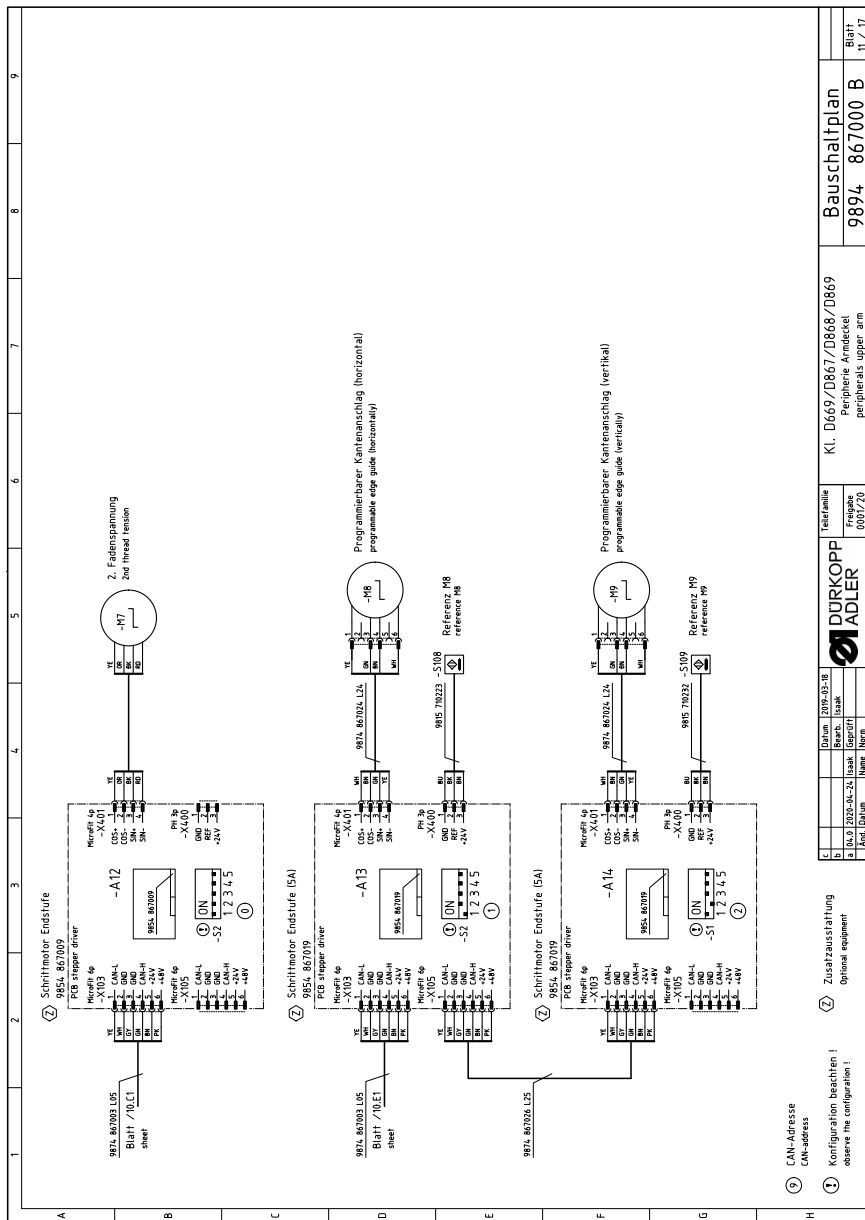


Fig. 106: Wiring diagram (12)

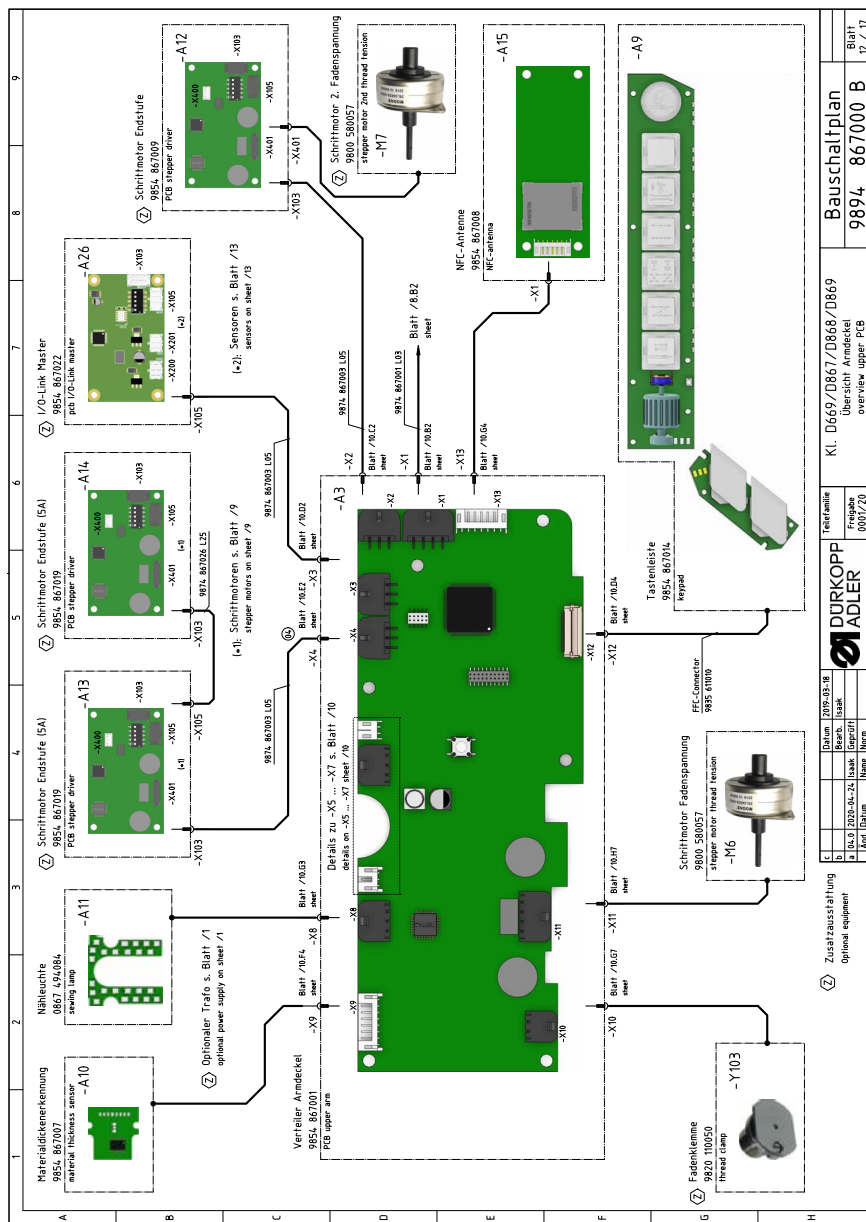


Fig. 107: Wiring diagram (13)

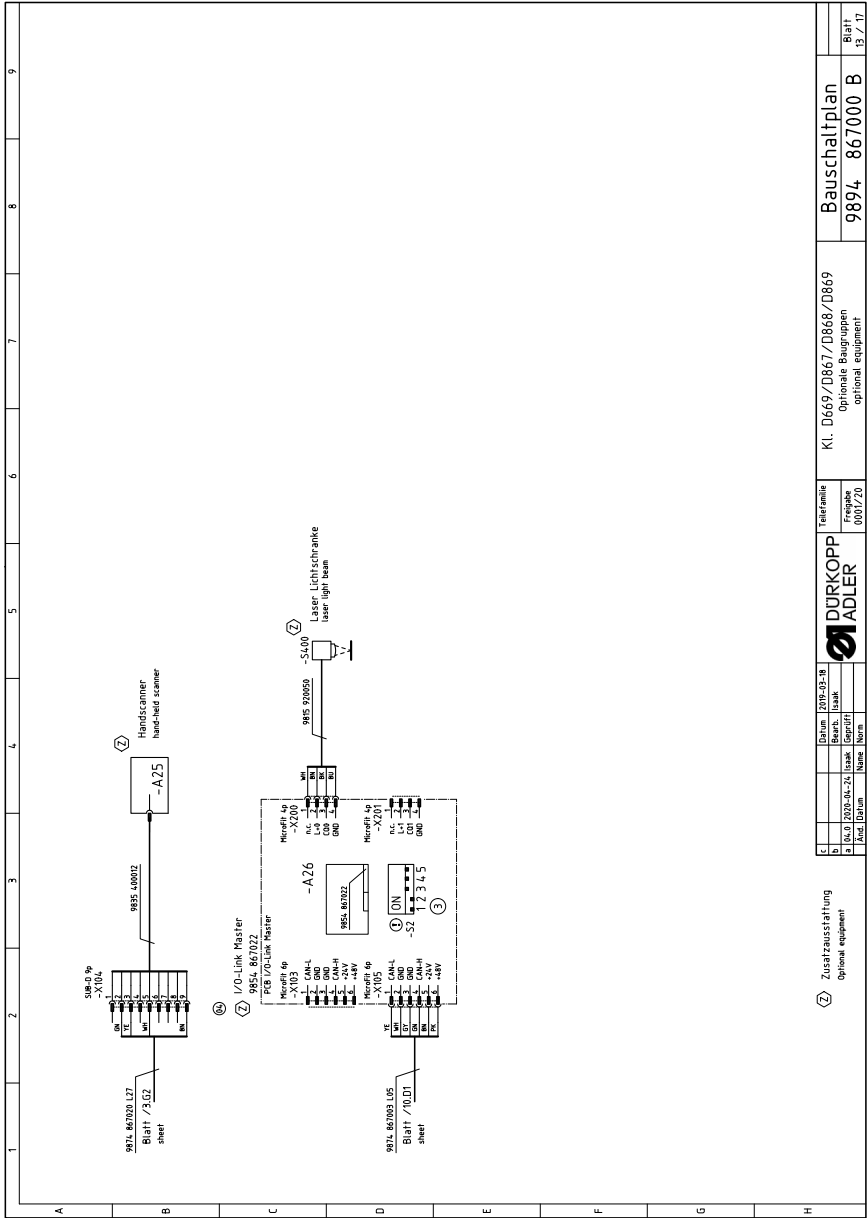


Fig. 108: Wiring diagram (14)

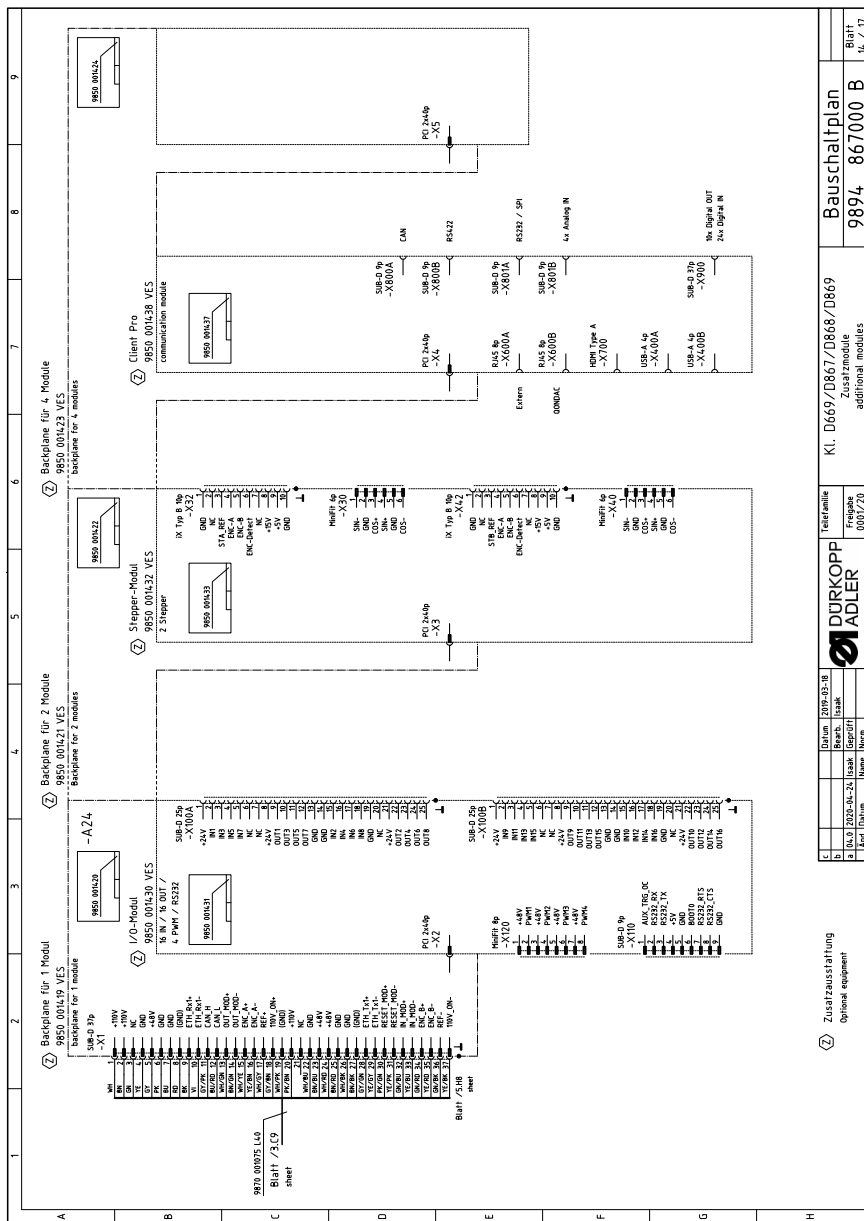


Fig. 109: Wiring diagram (15)


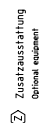
| | 1 | 2 | 3 | 4 | 5 | 6 | 7 | 8 | 9 | |
|--|-----------------------------|--|--|--|-----------------------------|------|--|-------------|--|--|
| A | Bezeichnung denomination | | Teilern. Baugruppe partno. assembly | | Bezeichnung denomination | | Teilern. Baugruppe partno. assembly | | Teilern. Schaltplan partno. schematic | |
| | -A1 | Steuerung DAC (flex control DAC flex) | 9850 001415 | 9850 001409 9850 001412 9850 001411 | | -A21 | Pedal pedal | 9850 220001 | | |
| | -A2 | Verteiler Armsäule PFB lower arm | 9854 867000 | 9854 867000 | | ⊕ | Nählichttrafo power supply f. sewing lamp | 9850 001083 | 9850 001083 | |
| | -A3 | Verteiler Armsäule PFB upper arm | 9854 867001 | 9854 867001 | | ⊕ | Knieschalter knee switch | 9880 002010 | 9880 002010 | |
| | -A4 | Maschinen-ID machine-ID | 9850 001309 | 9850 001309 | | ⊕ | Backplane backplane | 9850 001421 | 9850 001422 | |
| | -A5 | Bedienfeld Commander Delta control panel | 9850 001520 | 9850 001519 | | ⊕ | Handscanner hand-held scanner | 9835 400016 | — | |
| | -A6 | Ölwächter oil monitor | 9854 867011 | 9854 867011 | | ⊕ | I/O-Link Master I/O-Link master | 9854 867022 | 9854 867022 | |
| | ⊕ | Handverriegelung manual lockout | 9854 867012 | 9854 867006 | | -M1 | Nähmotor sewing drive | 9800 170046 | | |
| | -A8 | Spulensensorik bobbin under sensors | 9854 867013 | 9854 867019 | | -M2 | Schrittmotor Stichtlänge stepper drive stitch length | 9800 580060 | | |
| | -A9 | Tasteneinleite keypad | 9854 867014 | 9854 867003 9854 867004 | | -M3 | Schrittmotor Fußlüftung stepper drive foot lifting | 9800 580060 | | |
| | -A10 | Materialdickenmessung material thickness sensor | 9854 867007 | 9854 867006 | | -M4 | Schrittmotor Transporthub stepper drive transport stroke | 9800 580060 | | |
| | -A11 | Nähleuchte sewing lamp | 0867 494084 | 9854 867002 | | -M5 | Schrittmotor Spüler stepper drive bobbin under | 9800 580061 | | |
| | ⊕ | Schrittmotor Einstufe 2. Fadenspannung PFB stepper driver 2nd thread tension | 9854 867009 | 9854 867009 | | ⊕ | Schrittmotor Fadenspannung stepper drive thread tension | 9800 580057 | | |
| | -A13 | Schrittmotor Einstufe Karteneinschlag (horizontal) PFB stepper driver edge guide (horizontal) | 9854 867019 | 9854 867019 | | ⊕ | Schrittmotor 2. Fadenspannung stepper drive 2nd thread tension | 9800 580057 | | |
| | ⊕ | Schrittmotor Einstufe Karteneinschlag (vertikal) PFB stepper driver edge guide (vertical) | 9854 867019 | 9854 867019 | | ⊕ | Schrittmotor Karteneinschlag (horizontal) stepper drive edge guide (horizontal) | 9800 580059 | | |
| | -A15 | NFC-Antenne NFC-antenna | 9854 867008 | 9854 867008 | | ⊕ | Schrittmotor Karteneinschlag (vertikal) stepper drive edge guide (vertical) | 9800 580059 | | |
| | ⊕ | Verteiler Schutzvorrichtungen PFB safety devices | 9854 867017 | 9854 867017 | | ⊕ | Höhenverstellung height adjustment | — | | |
| | ⊕ | Spulenbeleuchtung bobbin light | 9854 867015 | 9854 867015 | | ⊕ | | | | |
| | ⊕ | Reifadenwächter PFB bobbin thread monitor | 9850 755001 | 9850 755001 | | ⊕ | | | | |
| | ⊕ | S50 1. Nadel PFB S50 top needle | 9850 001504 | 9850 001504 | | ⊕ | | | | |
| | ⊕ | S50 2. Nadel PFB S50 2nd needle | 9850 001504 | 9850 001504 | | ⊕ | | | | |
| A D C B E F G H | | | | | | | | | | |
| <div> DÜRKOPP ADLER</div> <div>Teilernummer part no. 0001/20</div> <div>Teilernummer part no. 0001/20</div> <div>Teilernummer part no. 0001/20</div> | | | | | | | | | | |
| Zusatzausstattung Optional equipment | | | | | | | | | | |
| Blatt 15 / 17 | | | | | | | | | | |

Fig. 110: Wiring diagram (16)

| 1 | 2 | 3 | 4 | 5 | 6 | 7 | 8 | 9 |
|---|-------|-------------------------------------|---|----------------------------|-------------------------------------|--|----------------------------|---|
| A | | Angegeschlossen an: connected to | Bezeichnung designation | Tellenummer part number | Angegeschlossen an: connected to | Bezeichnung designation | Tellenummer part number | |
| | | | | | | | | |
| | -S1 | Blatt / 7306 sheet | IN.1 / Reserve reserve | | -S300 | IN.1 / Scrollrad scroll wheel | | |
| | -S2 | Blatt / 7306 sheet | IN.2 / Reserve reserve | | -S301 | Blatt / 70L6 sheet | | |
| | -S3 | Blatt / 7306 sheet | IN.3 / Reserve reserve | | -S302 | Blatt / 70L6 sheet | | |
| | -S4 | Blatt / 70L6 sheet | IN.4 / Knieeschalter knee switch | | -S303 | Blatt / 70L6 sheet | | |
| | -S5 | Blatt / 70L6 sheet | IN.5 / Knieeschalter knee switch | | -S304 | Blatt / 70L7 sheet | | |
| | -S100 | Blatt / ALC sheet | Referenz Nähmotor reference sewing drive | | -S305 | Blatt / 70L7 sheet | | |
| | -S108 | Blatt / 70L5 sheet | Referenz Schrittmotor reference stepper drive | 9815 710223 | -S306 | Blatt / 70L7 sheet | | |
| | -S109 | Blatt / 7105 sheet | Referenz Schrittmotor reference stepper drive | 9815 710232 | -S307 | Blatt / 70L8 sheet | | |
| | -S201 | Blatt / 7309 sheet | Referenz Stapper drive edge guide (vertical) reference stapper drive edge guide (vertical) | 9815 710221 | -S308 | Blatt / 70L5 sheet | | |
| | -S202 | Blatt / 7108 sheet | ENG_ON.2 / Greiferabdeckung rechts book cover right | 9815 710221 | -S309 | Blatt / 70L5 sheet | | |
| | -S203 | Blatt / 7308 sheet | ENG_ON.3 / Greiferabdeckung links book cover left | 9815 710221 | -S310 | Blatt / 70L5 sheet | | |
| | -S204 | Blatt / 7307 sheet | ENG_ON.4 / Kippsensor needle area cover | 9815 550004 9815 550005 | -S311 | Blatt / 70L8 sheet | | |
| | -S211 | Blatt / ALC sheet | IN.1 / Reserve reserve | | -S400 | Blatt / 70L6 sheet | | |
| | -S212 | Blatt / ALCB sheet | IN.2 / Reserve reserve | | -S700 | Hauptschalter DAC flex main switch DAC flex | | |
| | -S213 | Blatt / ALCB sheet | IN.3 / Reserve reserve | | -S701 | Standby-Taster DAC flex standby button DAC flex | | |
| | -S214 | Blatt / ALC sheet | IN.4 / Spüler Füllst and bobbins under filling | | | | | |
| | -S215 | Blatt / ALC sheet | IN.5 / Reserve reserve | | | | | |
| | -S216 | Blatt / ALC sheet | IN.6 / Reserve reserve | | | | | |
| | -S217 | Blatt / ALC sheet | IN.7 / Reserve reserve | | | | | |
| | -S218 | Blatt / ALC sheet | IN.8 / Spüler Position bobbins under position | | | | | |
| | -S219 | Blatt / ALC sheet | IN.9 / Ölwechsler oil monitor | | | | | |


**DÜRKOPP
ADLER**

| C | Datum | 2020-05-18 |
|---|------------|------------|
| a | 04.02.2020 | 04.02.2020 |
| b | 04.02.2020 | 04.02.2020 |
| c | 04.02.2020 | 04.02.2020 |
| d | 04.02.2020 | 04.02.2020 |
| e | 04.02.2020 | 04.02.2020 |
| f | 04.02.2020 | 04.02.2020 |
| g | 04.02.2020 | 04.02.2020 |
| h | 04.02.2020 | 04.02.2020 |
| i | 04.02.2020 | 04.02.2020 |
| j | 04.02.2020 | 04.02.2020 |
| k | 04.02.2020 | 04.02.2020 |
| l | 04.02.2020 | 04.02.2020 |
| m | 04.02.2020 | 04.02.2020 |
| n | 04.02.2020 | 04.02.2020 |
| o | 04.02.2020 | 04.02.2020 |
| p | 04.02.2020 | 04.02.2020 |
| q | 04.02.2020 | 04.02.2020 |
| r | 04.02.2020 | 04.02.2020 |
| s | 04.02.2020 | 04.02.2020 |
| t | 04.02.2020 | 04.02.2020 |
| u | 04.02.2020 | 04.02.2020 |
| v | 04.02.2020 | 04.02.2020 |
| w | 04.02.2020 | 04.02.2020 |
| x | 04.02.2020 | 04.02.2020 |
| y | 04.02.2020 | 04.02.2020 |
| z | 04.02.2020 | 04.02.2020 |

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ADLER**

Bauschaltplan
9894 867000 B

Blatt
16 / 17

Fig. 111: Wiring diagram (17)

[illegible]

12.2 Tabletop drawings

Fig. 112: Tabletop drawing (1)

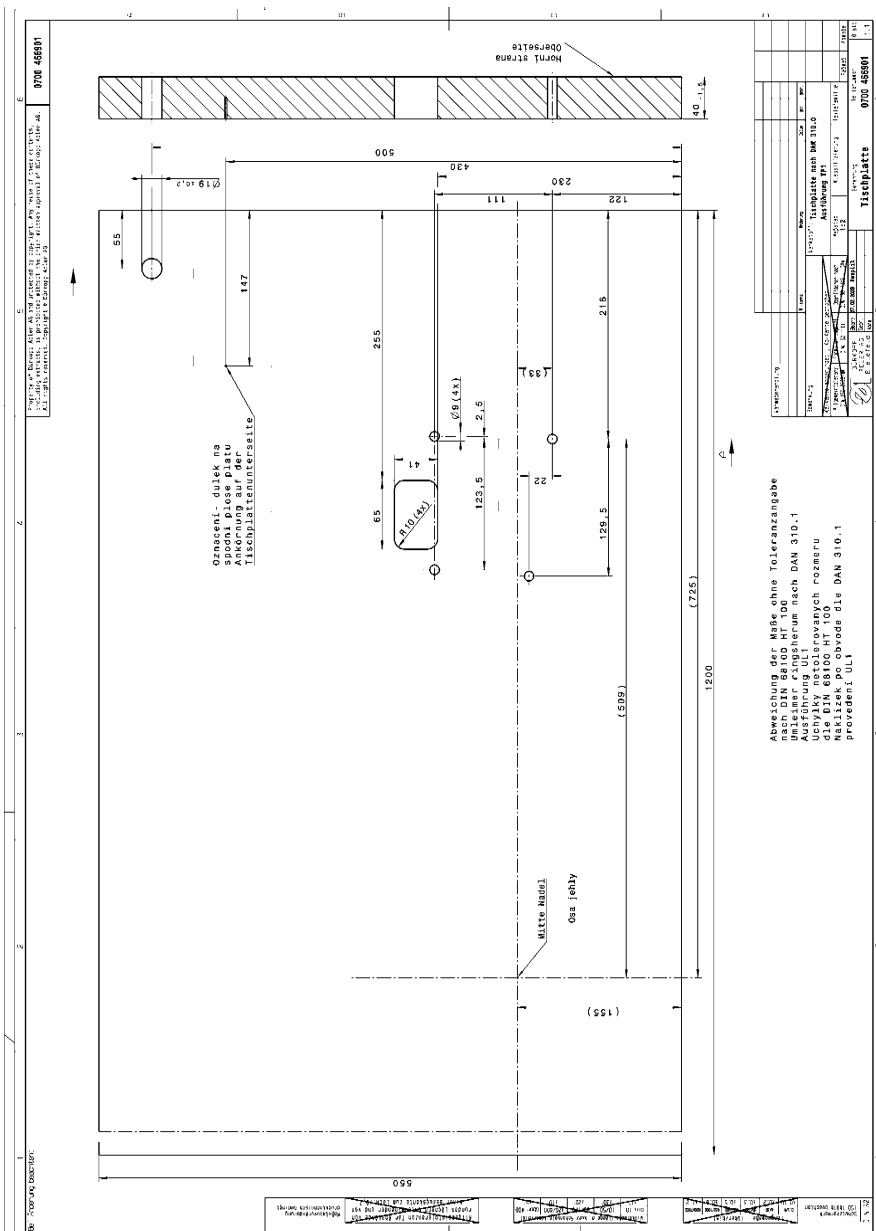


Fig. 113: Tabletop drawing (2)

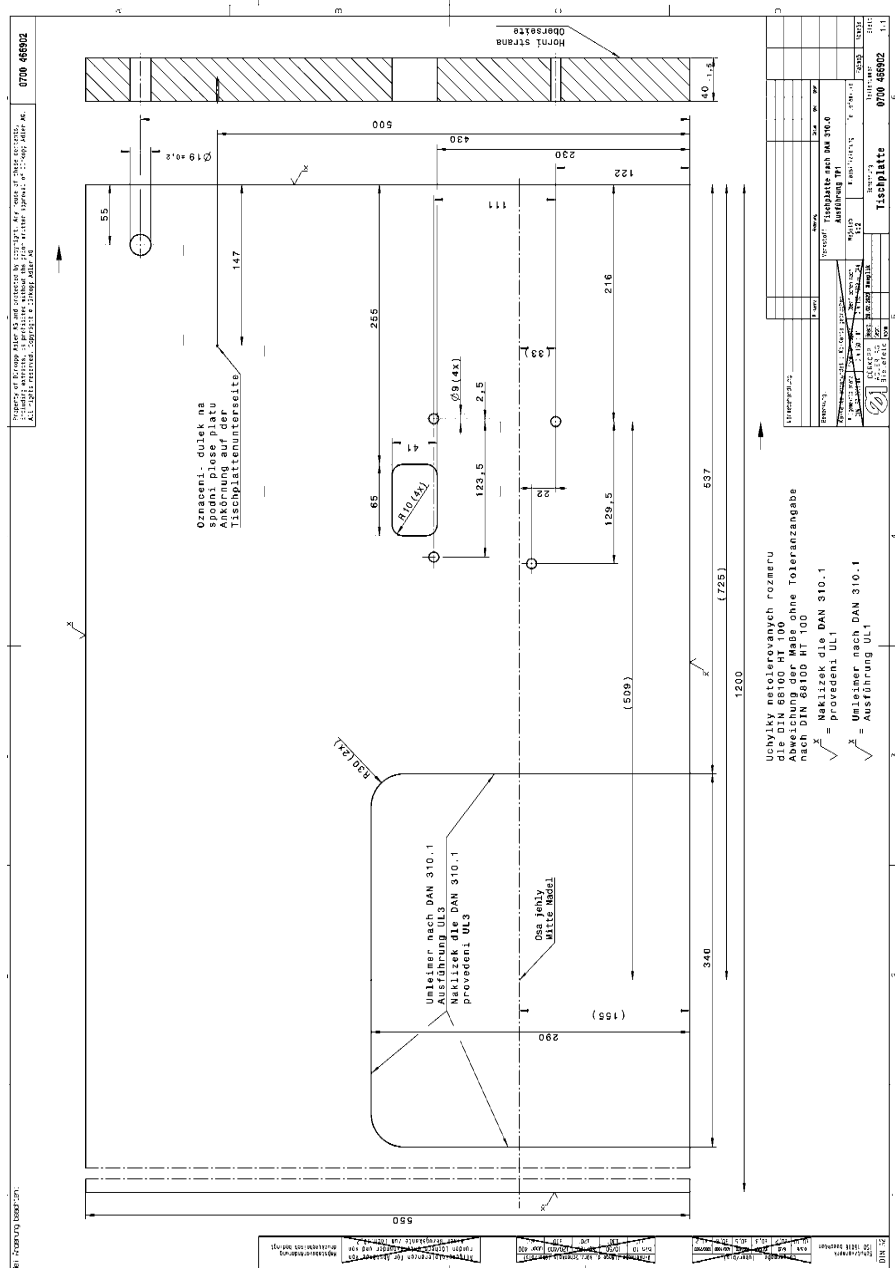
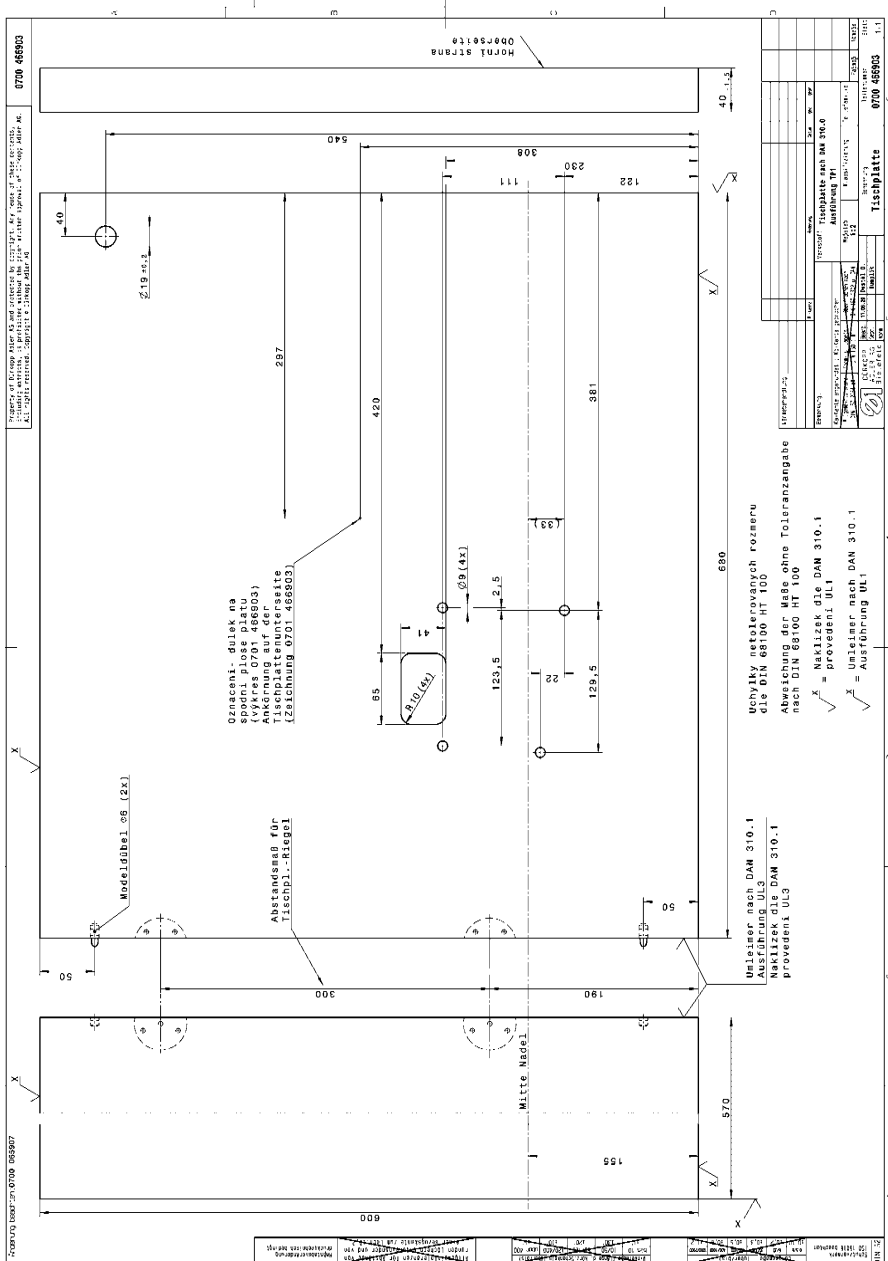


Fig. 114: Tabletop drawing (3)





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