PFAFF

Instruction Manual

EcoDrive **P40** ED
P70 ED

Control panel BDF **S3**

This Instruction Manual is valid for drives
from the following software version on:

P40 ED # 1_040_14 ⟶
P70 ED # 1_023_09 ⟶

296-12-18 970/002
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PFAFF Industrie Maschinen AG

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1 Safety

1.01 Directives

This sewing machine drive was built in accordance with the European regulations stated in the Conformity and Manufacturer's Declaration.
In addition to this Instruction Manual, please also observe all generally accepted, statutory and other regulations and legal requirements – also those of the country of operation – and all valid environmental protection regulations! The applicable local regulations of the social insurance society for occupational accidents or other supervisory organisations must also be strictly adhered to!

1.02 General notes on safety

- Before unpacking and commissioning the sewing machine drive this Instruction Manual must be read carefully. Please become familiar with the safety, assembly, operating and maintenance regulations before you set the sewing machine drive, its accessories and attachments into operation for the first time.
- All work on an with the sewing machine drive may only be carried out in compliance with the following general and special safety notes in this Instruction Manual!
- All persons concerned must be aware of these safety notes and must comply with them. Non-compliance with the safety notes can lead to personal injury, damage to objects or to defects and damage to the sewing machine drive.
- The danger and safety warnings attached to the sewing machine drive must be observed!
- The sewing machine drive may only be operated with a protective earth conductor which is connected to a functioning protective system in accordance with all local provisions and regulations.
- The installation and commissioning of the sewing machine drive must be carried out carefully by properly trained personnel. The accident prevention regulations valid in the respective user country and the rules for safe and professional work must be observed.
- To reduce the risk of burns, fire, electric shock or injuries, the alteration or rebuilding of the sewing machine drive are not permitted under any circumstances.
- If additional equipment or appliances are attached to the control unit of the sewing machine drive, these may only be operated with low voltage produced by a safety transformer!
- The sewing machine drive may only be used for the purpose for which it is intended and must not be operated without its safety devices. All applicable safety regulations must be observed.
- Before the removal of covers, the fitting of additional attachments or accessories, such as speed control unit, light barrier etc., the sewing machine drive must be switched off and disconnected from the mains, and the sewing machine drive must have come to a standstill. The case of the control unit may only be opened after **10 minutes**!
- Before leaving the workplace, the machine must be switched off at the main switch. If the machine will be out of operation for a longer period, the mains switch should be disconnected, to protect the sewing machine drive from being switched on accidentally.

- Work is not permitted on parts and equipment which are connected to the power supply! Exceptions to this are contained in the regulations EN 50110.
- Repair work and special maintenance work must only be carried out by specialists or appropriately trained personnel!
- Only spare parts which have been approved by us are to be used for repairs! We expressly point out that any replacement parts or accessories not supplied by us have not been tested and approved by us. The installation and /or use of such products may result in negative changes to the constructional characteristics of the machine. We are not liable for any damage caused by non-original parts.

1.03 Safety and work symbols

Danger!
Points for particular attention

Danger of injury to operating or technical staff!

Dangerous voltage!
Danger of death for operating and technical staff!

Note, information

1.04 Important notes for the user

- This instruction manual belongs to the equipment of the sewing machine drive and must be available to the operating staff at all times. The instruction manual must be read before the equipment is operated for the first time.
- Both operating and technical staff must be instructed on the safety devices of the sewing machine drive and on safe working methods.
- It is the duty of the user to operate the sewing machine drive in perfect running order only.
- The user must ensure that none of the safety devices are removed or put out of working order.
- The user must ensure that only authorized persons work on the sewing machine drive.

For further information please contact your PFAFF agency.

1.05 Operating and technical staff

1.05.01 Operating staff

Operating staff are the persons responsible for setting up, operating and cleaning the machine and for eliminating any malfunctions in the sewing area.

The operating staff is obliged to observe the following points:

- For all work the notes on safety in this Instruction Manual must always be observed!
- Any working methods, which adversely affect the safety o the machine, must be avoided!
- Any changes occurring ton the sewing machine drive, which may affect its safety, must be reported to the user immediately!

1.05.02 Technical staff

Technical staff are persons who have been trained in electrical engineering/electronics and mechanical engineering. They are responsible for servicing, repairing and adjusting the machine.

The operating staff is obliged to observe the following points:

- For all work the notes on safety in this Instruction Manual must always be observed!
- Before carry out any repair work, the main switch must be switched off and measures taken to prevent it from being switched on again!
- Never work on parts or equipment still connected to the power supply! Exceptions are only permissible in accordance with the regulations EN 50110.
- All safety covers must be replaced after the completion of maintenance and repair work!

1.06 Notes on danger

Only operate the sewing machine drive with a protective earth conductor connected to a functioning protective system in accordance with all local regulations and directives! Danger of electric shocks!

Do not disconnect the protective earth conductor!
Do not neutralize the protection by using extension lines without a protective earth conductor!
Danger of electric shocks!

Never operate the sewing machine drive if the air vents are clogged!
Danger of damage to the sewing motor!
Remove threads, fluff, dust etc. from the air vents.

Do not stick or drop any objects, e.g. needles, in the openings!
Danger of damage to the sewing machine drive!

Do not place fingers near moving parts! Danger of injury!

Do not operate the sewing machine drive if aerosols (sprays) or oxygen have been used! Danger of explosions!

2 Proper use

The sewing machine drives P40 ED and P70 ED are not machines which are ready for use. They are intended for installation in machines for the sewing thread processing industry, which are operated in clean, dry rooms.

Any and all uses of this machine, e.g. use outdoors or in a wet environment, or where there is a risk of explosion, which have not been approved by the manufacturer, are considered to be inappropriate! The manufacturer cannot be held liable for any damage caused by inappropriate use! The appropriate use includes the observance of all operational, adjustment, maintenance and repair measures specified by the manufacturer!

3 Specifications▲

Rated values

Voltage: ..... 230 V, single-phase
Frequency: 50/60Hz
Current for drive ED QE3760 / EDL QE5540: ..... 3,5 A / 5,0 A
Current for control unit: ..... 0,6 A
Power output ED QE3760 / EDL QE5540: ..... 375 W / 550 W
Speed: ED QE3760 / EDL QE5540: ..... 6000 min^{-1} / 4000 min^{-1}
Torque: ED QE3760 / EDL QE5540: ..... 0,63 Nm / 1,2 Nm

Moment of inertia of motor (without belt pulley):
ED QE3760 / EDL QE5540: ..... 0,5 $kgcm^2$ / 1,0 $kgcm^2$

Operating mode: ..... S5 (40% rel. on-time for 2.5 s runtime)
Protection system: IP40
Insulation class: ..... E

Limit values

Rated voltage range: ..... 180 - 260 V, single-phase
Max. motor speed: ED QE3760 / EDL QE5540: ..... 9000 min^{-1} / 4500 min^{-1}
Max. torque (short time): ED QE3760 / EDL QE5540: ..... 3 Nm / 7 Nm
Max. power output (short-time): ED QE3760 / EDL QE5540: ..... 1000 W / 1500 W

Moment of inertia of machine (reduced to motor shaft):
ED QE3760 / EDL QE5540: ..... 4,5 $kgcm^2$ / 9,0 $kgcm^2$

Operating requirements

Ambient temperature: ..... +5 to +45° C
Average ambient temperature (over 24 hours): ..... <35° C
Relative humidity: ..... 85% at 30° C

Control voltage for external control elements

Voltage with engine idling: ..... 25 V
Voltage under load: ..... 24 V bei 4 A / 20 V bei 10 A (short-time)
Output: ..... 96 W / 200 W (short-time)
Load current: ..... 4 A
Max. load current (short-time): ..... 10 A

The sum of the load currents of all simultaneously activated control elements must not continuously exceed **4** A .

Weights

Net weight (drive complete with all accessories): ..... approx. 9 kg
Gross weight: ..... approx. 11 kg

▲ Subject to alteration

4 Disposal

- Proper disposal of the sewing machine drive is the responsibility of the customer.
- The materials used for the sewing machine drive are steel, aluminium, brass and various plastic materials. The electrical equipment comprises plastic materials and copper.
- The sewing machine drive must be disposed of according to the locally valid pollution regulations. If necessary, a specialised company should be commissioned.

Care must be taken to see that parts soiled with lubricants are disposed of separately in accordance with the locally valid pollution control regulations!

5 Transportation packing and storage

The sewing machine drive can be transported and stored at temperatures in the range from -25 to +55 ° C. For a period of less than 24 hours temperatures up to +70° C are permitted.

5.01 Transportation to the customer's premises

The sewing machine drives are delivered completely packed.

5.02 Transportation inside the customer's premises

The manufacturer cannot be made liable for transportation inside the customer's premises or to the other operating locations.

5.03 Disposal of packing materials

The packing materials for this sewing machine drive comprise PVC, cardboard and styrofoam. Proper disposal of the packing material is the responsibility of the customer.

5.04 Storage

When the machine is not in use, it can be stored in its packing in a dry environment. If the sewing machine drive is stored for longer periods, the individual parts, in particular the surfaces of moving parts, must be protected against corrosion, e.g. with a film of oil.

6 Control elements

6.01 Main switch

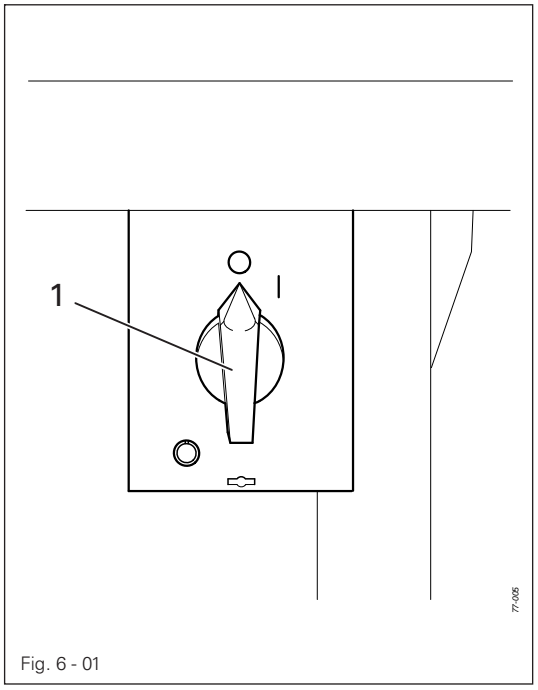


Fig. 6 - 01

- Turn main switch 1 to switch the power supply of the sewing machine drive on or off.

6.02 Control panel

The control panel is used to display and call up the machine functions for setting up and for sewing operation, for entering parameter values and for reading error messages and service settings.

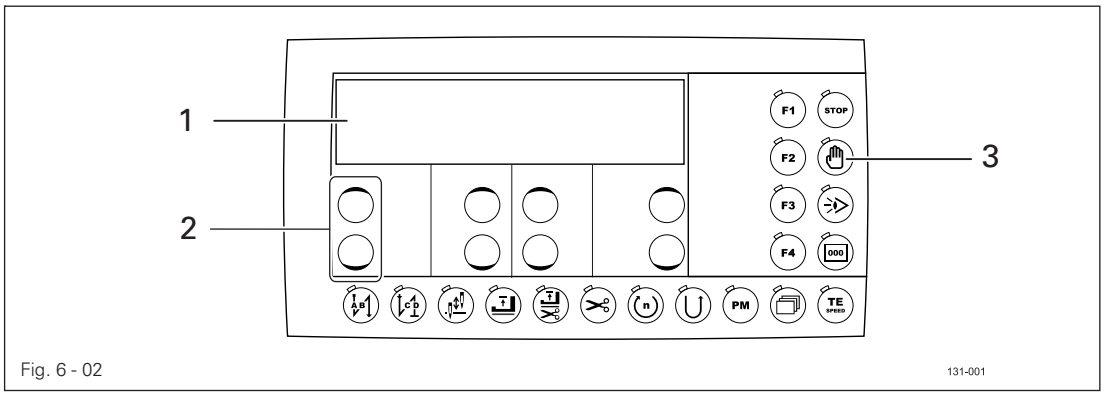


Fig. 6 - 02

The control panel has the following control and display elements:

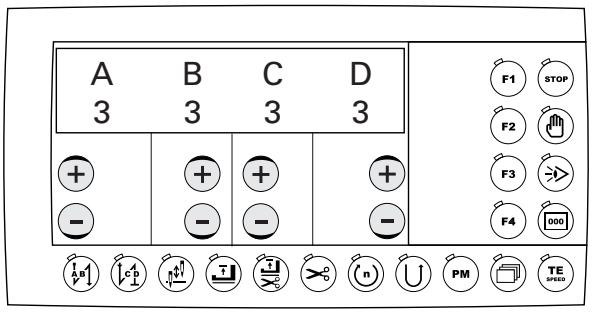
- The display screen 1 consists of a two-line, alphanumerical LCD display with 16 symbols per line and is used to show relevant information and selection parameters.
- The plus-minus keys 2 are used to select or alter the functions and parameters shown on the display.
- The function keys 3 are used to switch the relevant function on or off. Activated functions are shown in each case by an illuminated LED.

6.02.01 Symbols on the display

In addition to texts and set values, the following symbols are shown on the display. The symbols only appear in the programmed sewing mode, see Chapter **8.02 Programmed Sewing.**

	Current program number
	Current seam sector
	Number of stitches in current seam sector
	Maximum speed in current seam sector
	Number of seam sectors in current seam program
	Program number of the seam program to be linked

6.02.02 Plus-minus keys



The relevant plus-minus keys are used for the selection and alteration of the set values concerned (e.g. when entering bartack stitches). In this case the relevant plus or minus key is pressed and held while the set value shown above the key slowly changes. If the key is pressed longer, the set value changes more quickly.

6.02.03 Function keys

The activated function is always shown by the relevant illuminated LED.

Description of the individual functions:

Start bartack

- If this key is pressed, the securing stitches at the beginning of the seam (start bartacks) are switched on or off. The number of forward stitches (A) or reverse stitches (B) for the start bartack can be changed in each case by pressing the +/- key underneath. To change from double tacks to single tacks set the forward stitches (A) at zero.

End bartack

- If this key is pressed, the securing stitches at the end of the seam (end bartacks) are switched on or off. The number of reverse stitches (C) or forward stitches (D) can be changed in each case by pressing the +/- key underneath. To change from double tacks to single tacks set the forward stitches (D) at zero.

Raised needle position after sewing stop

- If this key is pressed, the "raised needle position after sewing stop" function is switched on or off. If the function is switched on, the needle positions in t.d.c. after sewing stops

Raised foot position after sewing stop

- If this key is pressed, the "raised foot position after sewing stop" function is switched on or off. If the function is switched on, the sewing foot is raised after sewing stops.

Raised foot position at end of seam sector (in programmed sewing)

- If this key is pressed, the "raised foot position at end of seam sector" function is switched on or off. If the function is switched on, the sewing foot is raised at the end of the seam sector.

Thread trimming

- If this key is pressed, the "thread trimming" function is switched on or off.

Program speed (only in programmed sewing)

- If this key is pressed, the relevant function is switched on or off.
  If the function is activated, the pedal forwards function is used to select the program speed as a fixed speed. The pedal setting for stopping the fixed speed is chosen with parameter 206.
- If the function is switched off, the speed is regulated with the pedal until program speed is reached.

Reverse sewing direction (only in programmed sewing)

- If this key is pressed, the relevant function is switched on or off. If the function is activated during programmed sewing, the relevant seam sector is sewn in reverse.

Manual sewing sector (only in programmed sewing)

- If this key is pressed, the relevant function is switched on or off.
  If the function is activated, switching to the next seam sector is not carried out by stitch counting or sensor, but manually with the pedal setting "-2".

Programmed sewing stop (only in programmed sewing)

- If this key is pressed, the relevant function is switched on or off.
  If the function is activated, the machine stops at the end of the seam sector.

Sewing with light barrier

- In the manual sewing mode with light barrier, the number of stitches entered with parameter 111 corresponds to the light barrier compensation stitches. In the programmed sewing mode, the number of stitches in the seam sector is used as the number of compensation stitches.

Stitch counting (only in programmed sewing)

- If this key is pressed, the relevant function is switched on or off.
- If the function is activated, in the programmed sewing mode the machine switches to the next seam sector after the number of stitches entered have been sewn.

TE/Speed

- If this key is pressed once while in the manual sewing mode, the menu for entering the maximum speed is selected. If no input is made within 5 seconds, the sewing mode is selected again.
- If this key is pressed twice (within 5 seconds) while in the manual sewing mode, the machine changes to the parameter input function.
- If this key is pressed while in the parameter input function, the altered set values are stored and the sewing mode is called up.
- If this key is pressed three times (within 5 seconds) while in the manual sewing mode, the piece counter display is called up (only if parameter 180 is set at "ON").

Scroll

- Press this key to scroll through the sub-menus of the program.

PM / Operating mode

- If this key is pressed, the machine switches between manual and programmed sewing. If the LED is illuminated, programmed sewing is active.

F1

No function at present.

F2

No function at present..

F3

No function at present.

F4 / reset piece counter

If this key is pressed, the piece counter is reset, when the piece counter menu is called up, see Chapter 8.01.02 Piece counter.

7 Installation and commissioning

Only operate the sewing machine drive with a protective earth conductor connected to a functioning protective system in accordance with all local regulations and directives! Danger of electric shocks!

Do not disconnect the protective earth conductor!
Protection is neutralized by the use of extension lines without a protective earth conductor! Danger of electric shocks!

Before connecting the sewing drive make sure that the mains voltage is within the specified rated voltage range, see Chapter **3 Specifications**.

If the sewing machine drive was stored at temperatures below **+5° C**, it must reach ambient temperature before being operated.

The sewing machine drive many only be operated after establishing that the machine in which this sewing machine drive is to be installed, complies with the regulations of the EC-machine directives.

Never operate the sewing machine drive if the air vents are clogged!
Danger of damage to the sewing motor!
Remove threads, fluff, dust etc. from the air vents.

During installation and commissioning the appropriate Instruction or Set-up Manual for the sewing machine must be observed!

8 Sewing

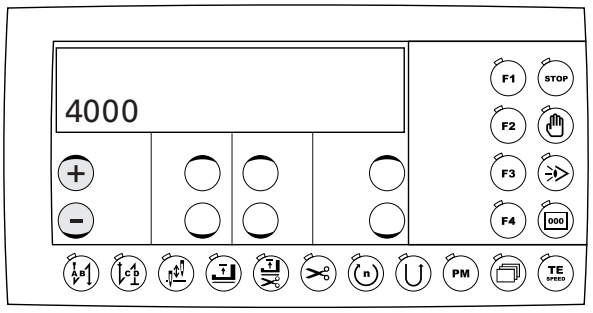
In the sewing mode all settings, which are relevant for the sewing operation, are shown on the display. Functions can be switched on or off by pressing a key.

The "PM" function key is used to choose between manual sewing (LED off) and programmed sewing (LED on).

8.01 Manual sewing

- Switch on the machine.

- Press the "TE/Speed" key once to call up the current speed.



- If necessary, change the maximum speed by pressing the relevant plus-minus key.

Other functions in the manual sewing mode, also see Chapter **6.02.03 Function keys:**


Start tacks on/off


End tacks on/off


Needle position raised when sewing stops on/off


Foot position raised when sewing stops on/off


Foot position raised at end of seam sector on/off

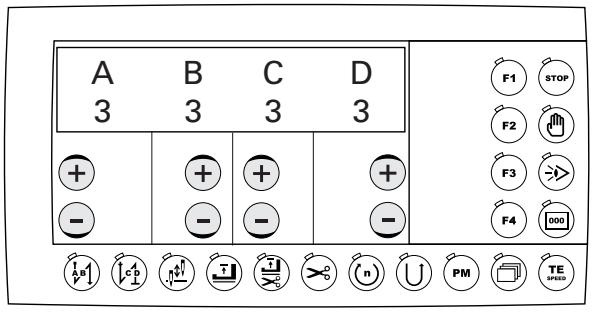

Thread trimming on/off


Sewing with light barrier on/off

- Sewing is carried out with the pedal functions.

8.01.01 Altering the number of bartacks

- Switch on the machine.



- Press the relevant plus-minus key to select the desired value for the number of forward stitches (A) of the start bartack.
- Press the relevant plus-minus key to select the desired value for the number of reverse stitches (B) of the start bartack.
- Press the relevant plus-minus key to select the desired value for the number of reverse stitches (C) of the end bartack.
- Press the relevant plus-minus key to select the desired value for the number of forward stitches (D) of the end bartack.

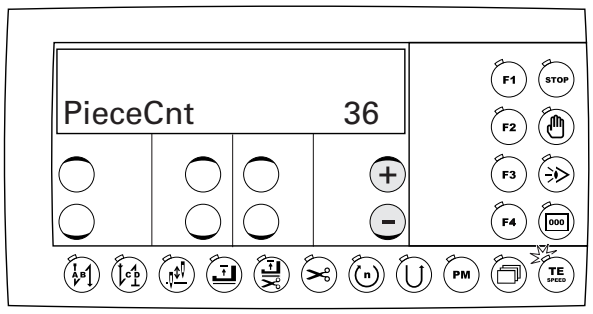
8.01.02 Piece counter

The piece counter display can only be called up if parameter **180** is set at "ON".

- Switch on the machine.

3x TE SPEED

- Press the "TE/speed" key three times, to call up the piece counter menu (LED on).



F4

- Reset the piece counter by pressing the "F4/reset piece counter" key.

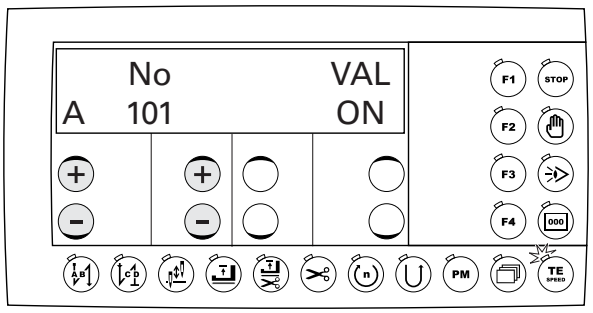
Press the relevant plus-minus keys to change the piece counter value.

8.01.03 Set bobbin thread control by stitch counting

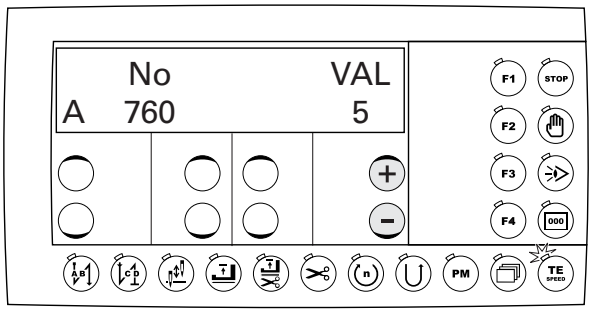
- Switch on the machine.

2x TE SPEED

- Press the "TE/Speed" key twice to call up the parameter input function (LED on).



- Press the relevant plus-minus keys to select parameter **760**.



- Set the number of remaining stitches, which can still be sewn after recognition through the bobbin thread monitoring function, by pressing the relevant plus-minus key. The selected value is multiplied by **200**, in this way showing the number of stitches.

Example:

- Display **5**(x **200**) = **1000** stitches. The setting depends, among other things, on the thread size.

TE SPEED

- Press the "TE/speed" key to take over the value and change to the manual sewing mode.

The remaining bobbin thread counter can only be used, if parameter **660** is set at value "**1**" or "2".

8.01.04 Bobbin thread monitoring on sub-class -926/06 (optional)

Setting the bobbin thread monitor function, see Instruction Manual -**926/0**6 (part no. 296-12-18 770/001).

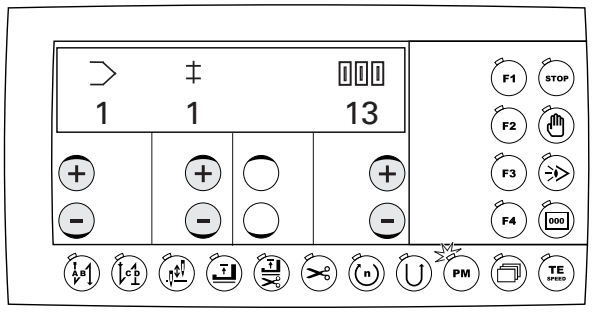
8.02 Programmed sewing

IIn the programmed sewing mode 99 programs, each with 9 seam sectors and 999 stitches can be programmed.
The seam sectors can be programmed by entering the number of stitches or by sewing (teach-function).
Fixed programs are used for the quick and convenient sewing of seams with different numbers of stitches.

- Switch on the machine.

PM

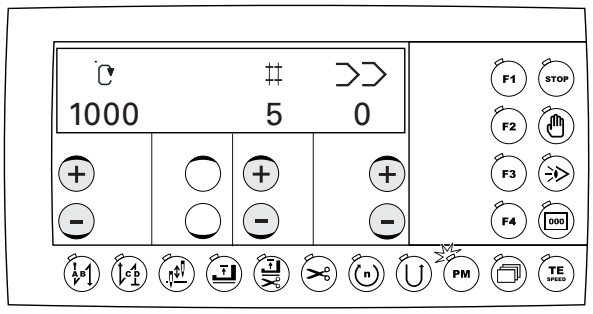
- Activate the programmed sewing mode (LED on).
  First of all the menu for selecting the program number, seam sector and number of stitches appears. The alterations can be made with the relevant plus-minus keys.



Description of the symbols on the display, also see Chapter 6.02.01 Symbols on the display:

	Current program number		Number of stitches in current seam sector
‡	Current seam sector		

- Operate the "scroll" key to display other settings for the current seam program or for the current seam sector. Alterations can be made with the relevant plus-minus keys.



Description of the symbols on the display, also see Chapter 6.02.01 Symbols on the display:

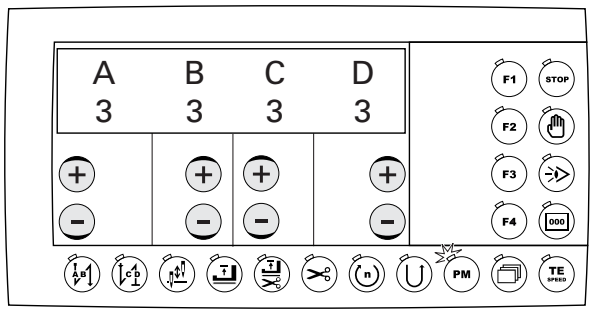
	Maximum speed in current seam program		Program number of the seam program to be linked ("0" = no linking)
⌗	Number of seam sectors in current seam program		

Other functions in the programmed sewing mode, also see Chapter 6.02.03 Function keys:

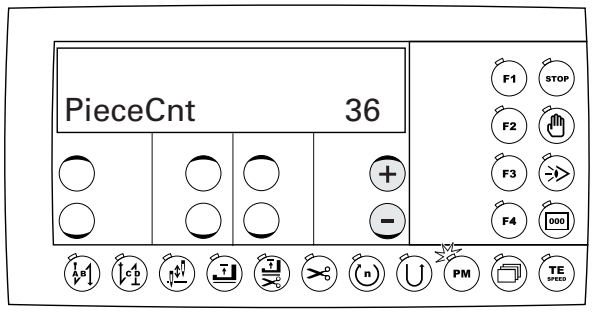
- Start tacks on/off
- End tacks on/off
- Needle position raised when sewing stops on/off
- Foot position raised when sewing stops on/off
- Foot position raised at end of seam sector on/off
- Thread trimming on/off
- Program speed on/off
- Reverse sewing direction on/off
- Manual seam sector on/off
- Programmed sewing stop on/off
- Sewing with light barrier on/off
- Stitch counting on/off

- Sewing is carried out with the pedal functions.

- If the "scroll" key is operated again, the number of bartack stitches is displayed. Alterations can be carried out with the relevant plus-minus keys, see Chapter 8.01.01 Altering the number of bartacks.

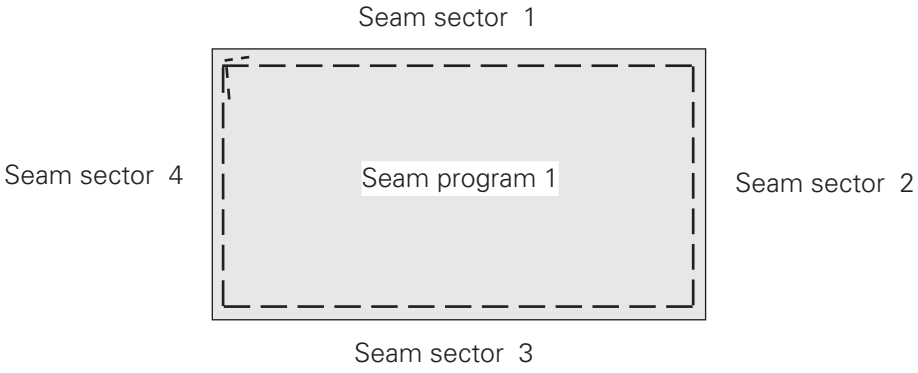


- If the "scroll" key is operated again, the piece counter is displayed. Alterations can be carried out with the relevant plus-minus keys or with the "F4 /reset piece counter" key, see Chapter 8.01.02 Piece counter.



8.02.01 Example of a seam program input by entering the number of stitches

Example: Attaching a label

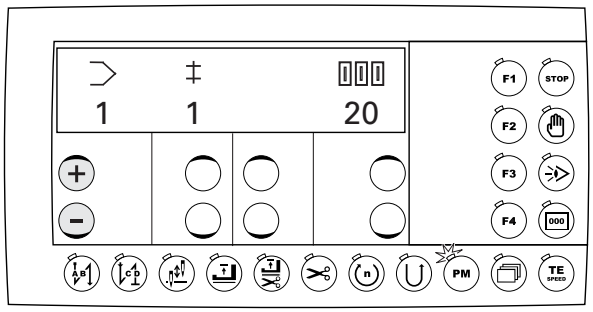


1. **Program number 1**, four seam sectors
2. **Seam sector 1 with 20** stitches,
   Functions: Start bartack, programmed stop and sewing foot raised at end of seam sector,
3. **Seam sector 2 with 10** stitches,
   Functions: Programmed stop and sewing foot raised at end of seam sector,
4. **Seam sector 3 with 20** stitches,
   Functions: Programmed stop and sewing foot raised at end of seam sector,
5. **Seam sector 4 with 10** stitches,
   Functions: End bartack, programmed stop and sewing foot raised at end of seam sector and thread trimming.

- Switch on the machine.

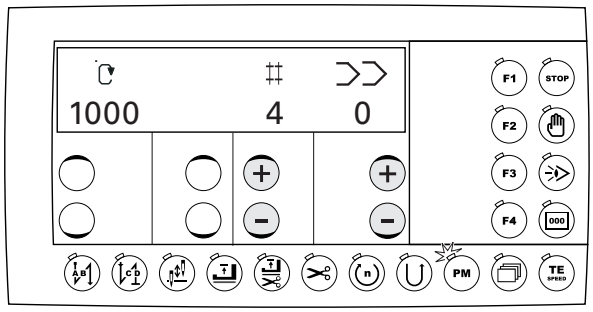
PM

- Activate the programmed sewing mode (LED on):



- Using the relevant plus-minus key, select the program number, e.g. "**1**".

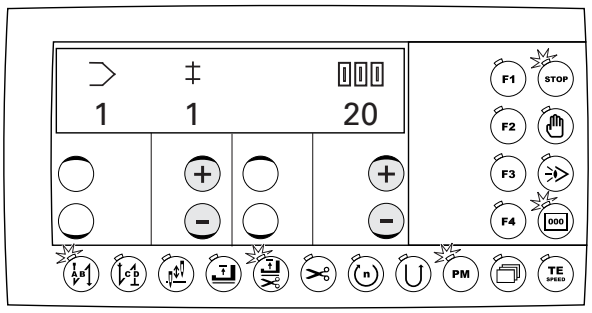
- Call up the menu for entering the seam sectors and the program link.



⌗ ● Using the relevant plus-minus key, select the number of seam sectors, e.g. "4".

⊃⊃ ● Using the relevant plus-minus key, select the linked seam program, e.g. "0", if no program link is to take place.

2x ● Call up the menu for entering the seam sector and the corresponding number of stitches.



‡ ● Using the relevant plus-minus key, select the seam sector "1".

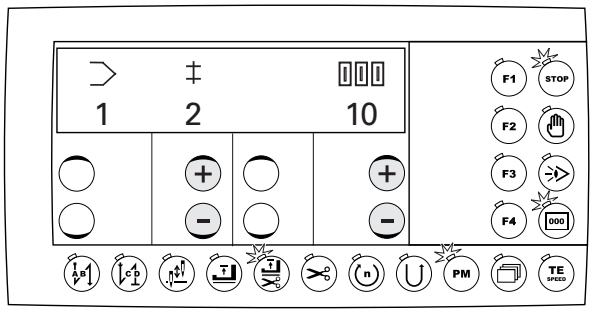
▯▯▯ ● Using the relevant plus-minus key, enter the number of stitches for the seam sector, e.g. "20".

● Activate the start bartacks (LED on).

● Switch on the "programmed sewing stop" function (LED on).

● Switch on the "foot position raised at end of seam sector" function (LED on).

● Switch on the stitch counting function (LED on).



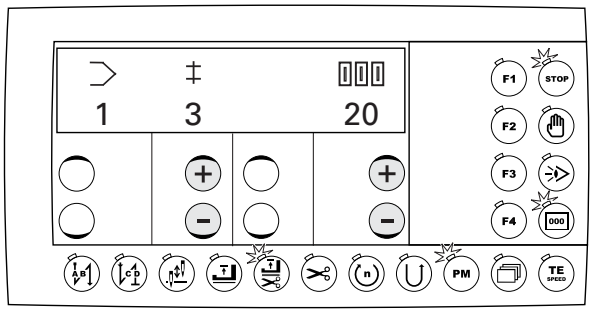
‡ ● Using the relevant plus-minus key, select the seam sector "2".

▯▯▯ ● Using the relevant plus-minus key, enter the number of stitches for the seam sector, e.g. "10".

STOP ● Switch on the "programmed sewing stop" function (LED on).

● Switch on the "foot position raised at end of seam sector" function (LED on).

000 ● Switch on the stitch counting function (LED on).



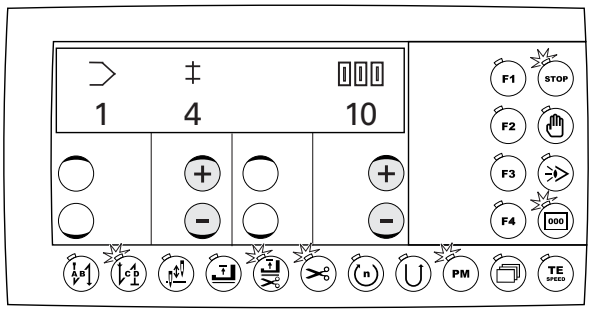
‡ ● Using the relevant plus-minus key, select the seam sector "3".

▯▯▯ ● Using the relevant plus-minus key, enter the number of stitches for the seam sector, e.g. "20".

STOP ● Switch on the "programmed sewing stop" function (LED on).

● Switch on the "foot position raised at end of seam sector" function (LED on).

000 ● Switch on the stitch counting function (LED on).



‡ ● Using the relevant plus-minus key, select the seam sector "4".

▯▯▯ ● Using the relevant plus-minus key, enter the number of stitches for the seam sector, e.g. "10".

● Activate the end bartacks (LED on).

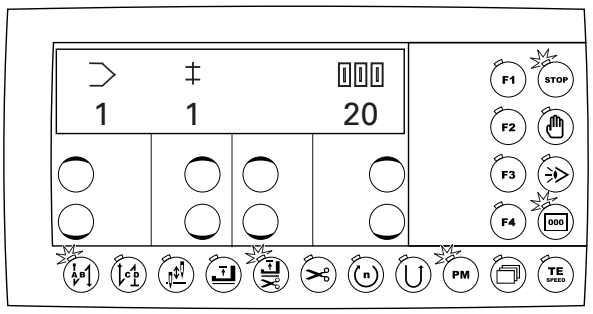
● Switch on the "programmed sewing stop" function (LED on).

● Switch on the "foot position raised at end of seam sector" function (LED on).

● Switch on the stitch counting function (LED on).

● Activate the thread trimming function (LED on).

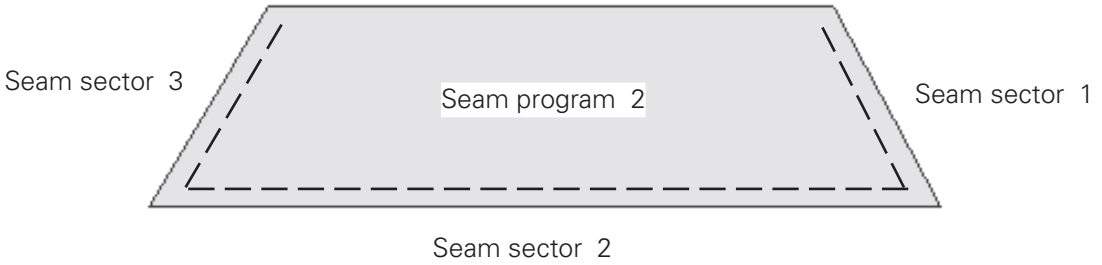
2x ● Call up beginning of program.



● Sew a test seam with the pedal functions.

8.02.02 Example of a seam program input by sewing the seam sectors (teach-function)

Example: Top-stitching a collar

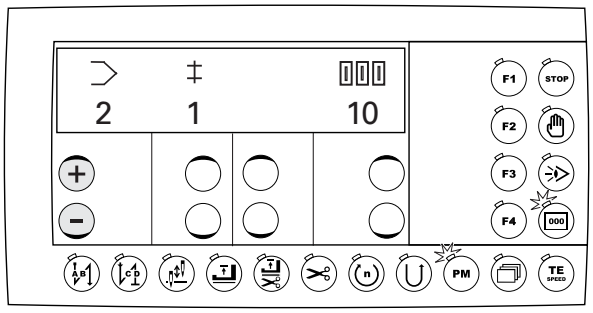


1. **Program number 2**, three seam sectors
2. **Seam sector 1**,
   Functions: Programmed stop and sewing foot raised at end of seam sector,
3. **Seam sector 2**
   Functions: Programmed stop and sewing foot raised at end of seam sector,
4. **Seam sector 3**
   Functions: Programmed stop, sewing foot raised at end of seam sector and thread trimming.

- Switch on the machine.

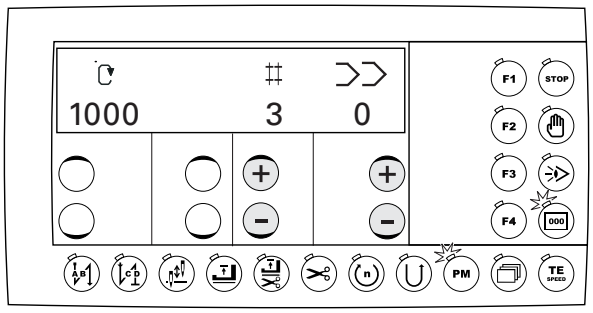
PM

- Activate the programmed sewing mode (LED on):



- Using the relevant plus-minus key, select the program number, e.g. "**2**".

- Call up the menu for entering the seam sectors and the program link.

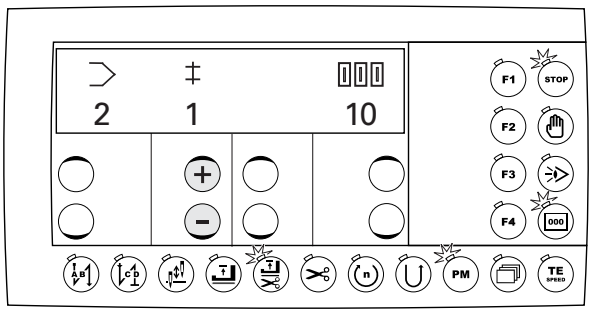


- Using the relevant plus-minus key, select the number of seam sectors, e.g. "3".

- Using the relevant plus-minus key, select the linked seam program, e.g. "0", if no program link is to take place.

2x

- Call up the menu for entering the seam sector and the corresponding number of stitches.



STOP

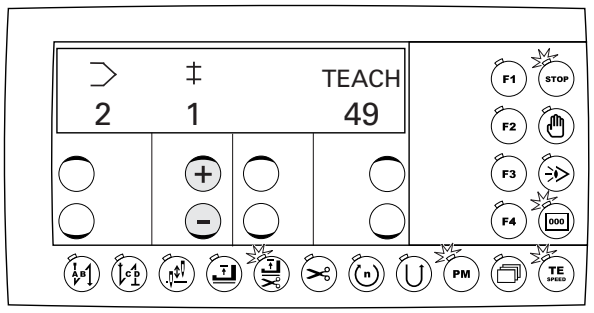
- Switch on the "programmed sewing stop" function (LED on).

- Switch on the "foot position raised at end of seam sector" function (LED on).

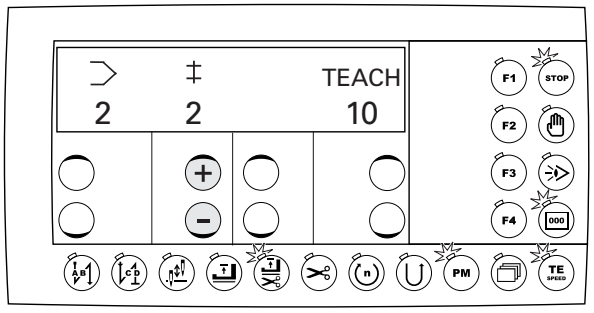
TE SPEED

- Switch on the teach function (LED on).

- Sew seam sector "1" with the pedal functions. The number of stitches sewn is shown on the display, e.g. "49".



- Using the relevant plus-minus key, select the seam sector "2".

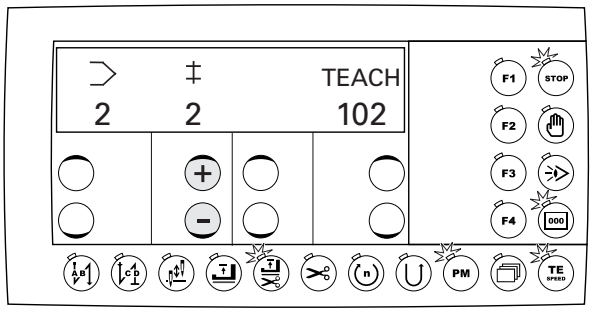


STOP

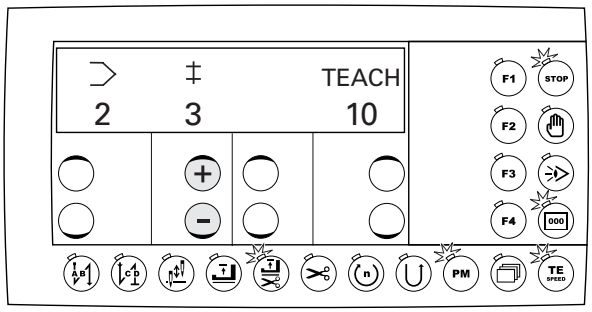
- Switch on the "programmed sewing stop" function (LED on).

- Switch on the "foot position raised at end of seam sector" function (LED on).

- Sew seam sector "2" with the pedal functions. The number of stitches sewn is shown on the display, e.g. "102".



‡ - Using the relevant plus-minus key, select the seam sector "3".



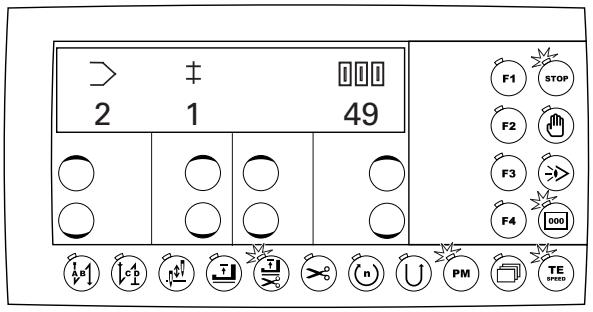
STOP - Switch on the "programmed sewing stop" function (LED on).

- Switch on the "foot position raised at end of seam sector" function (LED on).

- Activate the thread trimming function (LED on).

- Sew seam sector "3" with the pedal functions. The number of stitches sewn is shown on the display, e.g. "49".

TE SPEED - Conclude the teach function (LED off).
The machine automatically carries out a thread trimming operation and changes to the beginning of the sewing program.

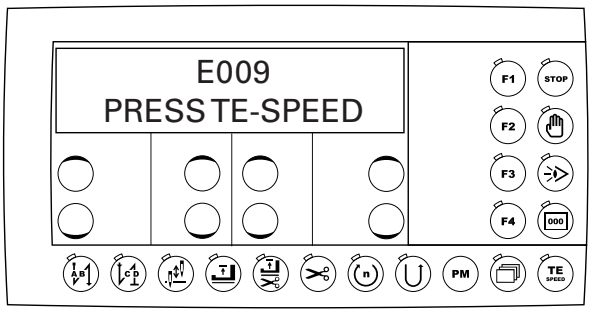


- Sew a test seam with the pedal functions.

8.03 Malfunctions

8.03.01 Error messages

When an error occurs, an error code appears on the display together with short instructions. An error message is caused by incorrect settings, defective elements or seam programs as well as by overload conditions. See Chapter **8.03.02** Description of the error messages for a description of the error codes.



- Eliminate error.

- Acknowledge error elimination by pressing the "TE/speed" key.

8.03.02 Description of the error messages

Error code	Cause	Remedy
E001	Pedal not in rest position when machine is switched on	Check pedal
E009	Start inhibitor at standstill	Bring sewing head to its basic positi-on
E010	Machine class altered	Switch control unit off, then on again.
E062	Voltage of power supply unit (24 V) too low	Check connected consumers
E063	Power supply unit (24 V) overloaded	Check connected consumers
E064	"Mains off" signal when machine is switched on	Contact service
E065	IGBT error when machine is swit-ched on	Contact service
E066	IGBT test with error recognition	Contact service
E067	Mains off	Switch on mains
E068	Overcurrent motor during operation	Contact service

Error code	Cause	Remedy
E069	No increments	Contact service
E070	Motor blocking	Check machine for binding
E071	Incremental transmitter of motor not connected	Check plug of incremental transmitter
E074	No synchronization impulse from sewing head	Check transmitter
E088	RAM defective	Contact service
E092	Start inhibitor running during drive	Check end switch
E173	Motor not connected	Check motor connection

9 Input

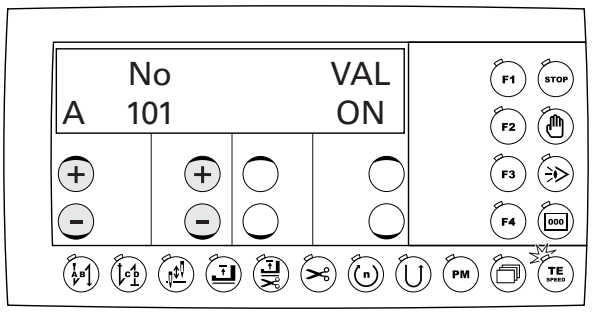
9.01 Parameter input

9.01.01 Example of how to enter the parameters

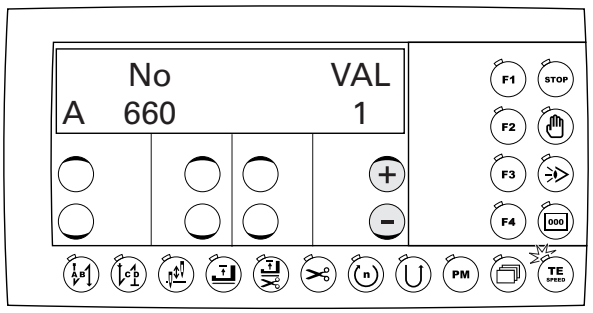
- Switch on the machine.

2x TE SPEED

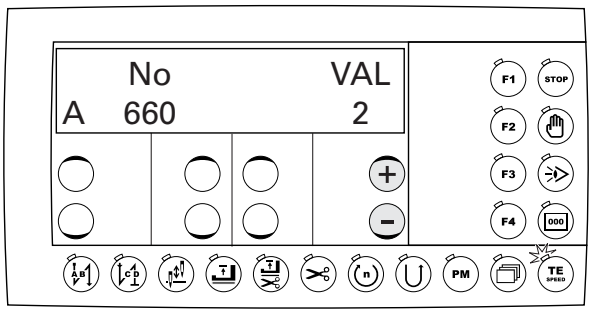
- Press the "TE/Speed" key twice to call up the parameter input function (LED on).



- Select the parameter, e.g. Parameter **660** for bobbin thread monitoring, by pressing the relevant plus-minus keys.



- Enter the desired value for the selected parameter, e.g. "2" for " bobbin thread rest counter on", by pressing the relevant plus-minus keys.



TE SPEED

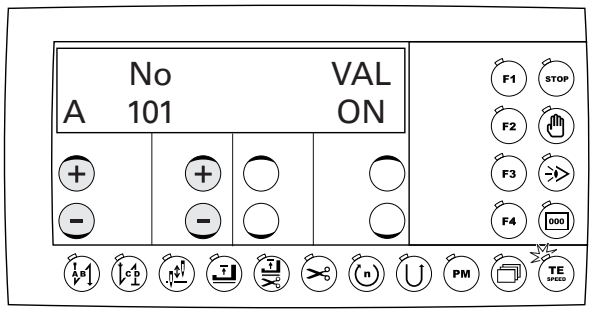
- Conclude the parameter input (LED off).

9.01.02 Selecting the user level

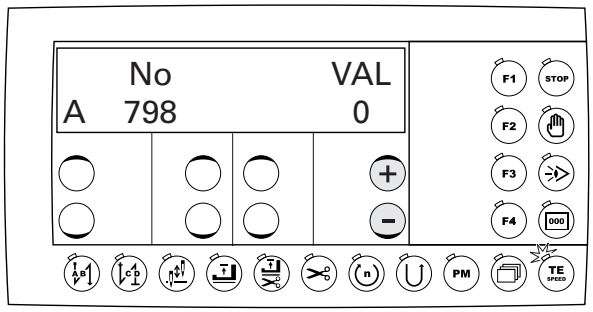
- Switch on the machine.

2x TE SPEED

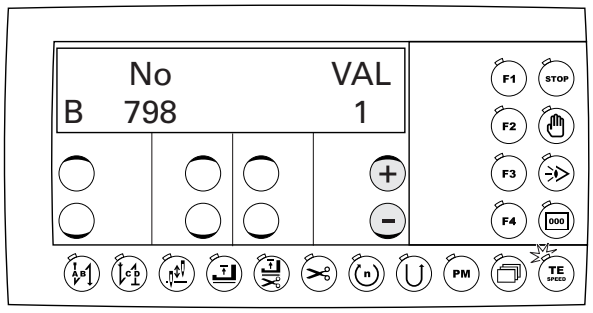
- Press the "TE/Speed" key twice (LED on) to call up the parameter input function.



- Select parameter **798** by pressing the relevant plus-minus keys.



- The standard set value is set at "**0**" (= operator level "A"). Press the relevant plus-minus keys to select the desired user level.



Set value "**0**" = User level "**A**"
Set value "**1**" = Mechanic level "**B**"
Set value "**11**" = Service level "**C**"

The selected user level is shown next to the parameter number.

TE SPEED

- Conclude the parameter input (**LED off**).

If the main switch is switched off and on again, the machine changes back automatically to user lever "**A**".

9.01.03 List of parameters for control unit P40 ED

Only appropriately trained personnel is authorized to alter the set values in the parameters of user level "B" and "C".

With this control unit following machine types are programmable:
Machine type **1** = series 480, 910, 930, 1180 (without -712/..), 3704 and 5480
Machine type **2** = series 570, 590, 330 (except 333,) 1240, 1290
Machine type **3** = 1163
Machine type **4** = 333-712/..
Machine type **5** = 1183-712/..

Group	Parameter	Description	Machine type	User level	Setting range	Set value
1	101	Acoustic signal of control panel keys	1, 2, 3, 4, 5	A	ON - OFF	OFF
	105	Speed at seam start	1 2 3, 4, 5	B B B	100 - 2000 100 - 2000 100 - 2000	1600 700 1200
	106	Speed at seam start ON = variable (pedal-controlled) OFF = constant (as for parameter 105)	1, 2, 3, 4, 5	B	ON - OFF	OFF
	107	Speed at seam start ON = limited by parameter 105 OFF = limited by parameter 607	1, 2, 3, 4, 5	B	ON - OFF	OFF
	110	Speed at seam end	1 2 3, 4, 5	B B	100 - 2000 100 - 2000 100 - 2000	1600 700 1200
	111	Light barrier compensating stitches	1, 2, 3, 4, 5	A	1 - 30	8
	112	No. of stitches for blocking out light barrier for knitted fabrics	1, 2, 3, 4, 5	A	0 - 100	0
	113	Start with light barrier ON = only if light barrier dark OFF = also when light barrier bright	1, 2, 3, 4, 5	B	ON - OFF	OFF
	116	Soft starting stitches (soft start)	1 2, 3, 4, 5	A A	0 - 30 0 - 30	1 0
	117	Speed for soft starting stitches (soft start)	1 2, 3, 4, 5	B B	30 - 4000 30 - 4000	1000 400
	163	Sewing with light barrier	1, 2, 3, 4, 5	B	ON - OFF	OFF

Group	Parameter	Description	Machine type	User level	Setting range	Set value
1	199	Speed for light barrier compensating stitches	1, 2, 3, 4, 5	B	300 - 2000	1200
2	203	Speed for seam program ON = variable (pedal-controlled) OFF = constant	1, 2, 3, 4, 5	B	ON - OFF	ON
	206	Interrupt /stop seam sector at fixed speed ON = with pedal -2, OFF = with pedal 0	1, 2, 3, 4, 5	B	ON - OFF	OFF
3	301	Start voltage of solenoid for feed changeover ON = 24 V, OFF = 32 V	1, 2, 3, 4, 5	C	ON - OFF	OFF
	311	Stop stitch counting ON = with thread trimming OFF = without thread trimming	1, 2, 3, 4, 5	B	ON - OFF	ON
	313	Programs as tack programs	1, 2, 3, 4, 5	B	ON - OFF	OFF
	356	Input E4 is: ON = Presser foot OFF = suction	1, 2, 3, 4, 5	B	ON - OFF	ON
	364	Feed adjustment means ON = tack, OFF = condensed stitches	1, 2, 3 4, 5	B B	ON - OFF ON - OFF	ON OFF
	382	Switch shaft of analogue input for thread monitor ON = quadruple, OFF = double	1, 2, 3, 4, 5	B	0 - 100	15
	387	Output motor operation activated ON = with pedal = 1D (motor running) OFF = with pedal = 1 (lower presser foot)	1, 2, 3, 4, 5	B	ON - OFF	ON
	391	Speed for single stitch	4 5 1, 2, 3	B B B	200 - 700 200 - 700 -	450 600 -

Group	Parameter	Description	Machine type	User level	Setting range	Set value
3	392	Switch to single stitch by pedal	4 5 1, 2, 3	B B B	ON - OFF ON - OFF -	OFF OFF -
	393	Thread tension release from end of seam on	1, 2, 3 4, 5	B B	ON - OFF ON - OFF	ON OFF
4	446	Input E 2 is: 1 = needle raised without trimming 2 = needle position change 3 = single stitch 4 = single stitch with shortened stitch length 5 = tack inversion 6 = tack suppression 7 = switchover position 8 = raise puller 9 = alteration of needle position step by step forwards 10 = alteration of needle position step by step in reverse	1, 2, 3, 4, 5	B	1 - 10	1
	462	Function of speed control unit ON = single stitch in pedal stages 1 - 7, OFF = standard pedal function	4 5 1, 2, 3	B B B	0 - 1 0 - 1 -	OFF ON -
	470	Number of stitches for thread clamp switch off	4 5 1, 2, 3	A A A	0 - 20 0 - 20 -	3 3 -
5	522	Needle position at stop during ornamental tack ON = raised; OFF = lowered	1, 2, 3, 4, 5	B	ON - OFF	OFF
	523	Tack ON = ornamental tack (stitch-in-stitch) OFF = standard tack	1, 3, 4, 5 2	A -	ON - OFF -	OFF -
	528	Stacker switch-on time [ms]	1, 2, 3, 4, 5	B	0 - 2500	120
	530	Maximum speed for ornamental tack	1, 3, 4, 5 2	B B	100 - 2000 100 - 2000	1000 600
	538	Tacting output(thread tension release)	1, 2, 3 4, 5	B B	10 - 90 10 - 90	40 80

Group	Parameter	Description	Machine type	User level	Setting range	Set value
5	584	Tack ON = quadruple, OFF = double	1, 2, 3, 4, 5	B	ON - OFF	OFF
	585	Speed limitation with tack	1, 2, 3, 4, 5	B	300 - 4800	1000
6	602	Seam end at pedal position ON = a little in reverse (-1) OFF = completely in reverse (-2)	1, 2, 3, 4, 5	B	ON - OFF	OFF
	605	Actual speed value in display ON = on, OFF = off	1, 2, 3, 4, 5	B	ON - OFF	OFF
	606	Minimum speed	1, 2, 3, 4, 5	B	30 - 650	180
	607	Maximum speed	1 2 3 4 5	B B B B B	300 - 6000 300 - 3200 300 - 5500 300 - 1500 300 - 1200	▲ ▲ ▲ ▲ ▲
	608	Speed level curve (pedal characteristic) 1 = linear, 2 = non-linear	1, 3, 4, 5 2	B B	ON - OFF ON - OFF	ON OFF
	609	Trimming speed 1	1 2, 3 4, 5	B B B	60 - 300 60 - 300 60 - 300	210 180 160
	615	End recognition with light barrier ON = from bright to dark, OFF = from dark to bright	1, 2, 3, 4, 5	B	ON - OFF	OFF
	618	Return after seam end	1, 2, 3, 4, 5	B	ON - OFF	OFF
	623	Switch-on delay for return in [ms]	1, 2, 3, 4, 5	B	0 - 2000	30
	631	Angle-controlled switching for thread tension release	1, 2, 3 4, 5	- B	- ON - OFF	- OFF
	636	Thread tension release in conjunction with presser foot lift	1, 2, 3 4, 5	B B	ON - OFF -	OFF -

▲ = See Chapter **3 Specifications** of the Instruction Manual for the machine

Group	Parameter	Description	Machine type	User level	Setting range	Set value
6	642	Presser foot lift time from switch-on to tension reduction	1, 2, 3, 4, 5	B	10 - 150	100
	643	Feed adjustment time from switch on to tension reduction	1, 2, 3, 4, 5	B	10 - 150	100
	644	Number of knotting stitches	1, 2, 3, 4, 5	B	0 - 20	**0**
	646	Seam end cycle without trimming	1, 2, 3, 4, 5	B	ON - OFF	OFF
	651	Automatic lowering of presser foot at machine standstill	1, 2, 3, 4, 5	B	ON - OFF	ON
	653	Bearing position before sewing	1, 2, 3, 4, 5	B	ON - OFF	OFF
	660	Bobbin thread monitoring 0 = OFF, 1 = by sensor 2 = by stitch counting	1, 2, 3, 4, 5	B	0 - 2	0
	668	Thread wiper	1, 2, 3, 4, 5	B	ON - OFF	OFF
	680	Start inhibitor when drive is running and machine is tilted back ON = Error 92 appears on the display. After the machine has been set in an upright position, the drive must be switched off then on again. The start inhibitor function is then out of action. OFF = Error 9 appears on the display . After the machine has been set in an upright position, the start inhibitor function is out of action	1, 2 3, 4, 5	B -	ON - OFF -	ON -
	694	Max. speed for angle-controlled switching for thread tension release	1, 2, 3 4,5	- B	- 300 - 800	- 500
7	700*	Needle position 0 Needle reference position	1, 2, 3, 4 5	B B	0 - 255 0 - 255	0 10
	702*	1st needle position (lowered)	1 2 3, 4, 5	B B B	0 - 255 0 - 255 0 - 255	90 15 80

* = These parameters remain unchanged when the set parameter values are reset, see Chapter **10.01 Reset / Cold start.**

Group	Parameter	Description	Machine type	User level	Setting range	Set value
7	703*	Thread take-up lever position raised	1, 3 2 4, 5	B B B	0 - 255 0 - 255 0 - 255	236 230 226
	705*	End of cutting signal	1, 2, 5 3 4	B B B	0 - 255 0 - 255 0 - 255	200 140 100
	706*	Start of cutting signal	1, 5 2 3 4	B B B B	0 - 255 0 - 255 0 - 255 0 - 255	136 15 100 80
	707*	Start thread tension release	1, 3, 4, 5 2	B B	0 - 255 0 - 255	164 195
	710*	Needle position raised	1, 2 3 4, 5	B B B	0 - 255 0 - 255 0 - 255	184 206 212
	715	Switch-on time [ms] for thread wiper	1, 2, 3, 4, 5	B	0 - 2000	60
	718	Stop brake tacting (0 = brake off)	1, 2, 3 4, 5	B B	0 - 100 0 - 100	0 7
	719	Tacting output (presser foot) 100 = 100 % starting	1, 2, 3 4, 5	B -	10 - 60 -	0 -
	721	Tacting output (feed adjustment) 100 = 100 % starting	1, 2, 3, 4, 5	B	10 - 90	40
	722	Acceleration ramp for sewing motor 1 = flat, 50 = steep	1, 2, 3 4, 5	B B	1 - 60 1 - 60	50 30
	723	Brake ramp for sewing motor 1 = flat, 50 = steep	1, 2, 3 4, 5	B B	1 - 60 1 - 60	40 27
	729	Start delay after lowering presser foot [ms]	1 2, 3, 4, 5	B B	10 - 2000 10 - 2000	20 120
	730	Lift delay for presser foot at end of seam	1 2, 3, 4, 5	B B	0 - 2000 0 - 2000	0 50
	734	Tacting output(cutting magnetic)	1, 4, 5 2 3	B B B	0 - 90 0 - 90 0 - 90	10 40 80

* = These parameters remain unchanged when the set parameter values are reset, see Chapter **10.01 Reset / Cold start.**

Group	Parameter	Description	Machine type	User level	Setting range	Set value
7	746	Needle position for switchover Zig-zag or triple stitch	1 2, 3, 4, 5	B -	0 - 255 -	90 -
	748	Input E 3 is: 1 = needle raised without trimming 2 = needle position change 3 = single stitch 4 = single stitch with shortened stitch length 5 = tack inversion 6 = tack suppression 7 = switchover position 8 = raise puller off 9 = alteration of needle position step by step forwards 10 = alteration of needle position step by step in reverse	1, 2, 3, 4, 5	B	1 - 10	5
	757	Stop position for ornamental tack	1, 3, 4, 5, 2	- B	- 0 - 255	- 25
	760	Remaining no. of stitches after reaction of bobbin thread monitor during bobbin thread monitoring 1 = Multiplying factor for fixed value x 10 during direct monitoring 2 = Multiplying factor for fixed value x 200 during indirect monitoring	1, 2, 3, 4, 5	A	0 - 250	5
	761	Extension thread tension release / thread pulling [ms]	1, 2, 3, 4, 5	B -	0 - 80 -	0 -
	762	Switch on angle for thread tension release	1, 2, 3, 4, 5	- B	- 0 - 255	- 196
	763	Switch off angle for thread tension release	1, 2, 3, 4, 5	- B	- 0 - 255	- 1
	770	Lifting delay for presser foot when pedal position is "-1" [ms]	1, 2, 3, 4, 5	B	10 - 250	80

* = These parameters remain unchanged when the set parameter values are reset, see Chapter **10.01 Reset / Cold start.**

Group	Parameter	Description	Machine type	User level	Setting range	Set value
7	774	Needle position raised for thick material(with pedal) ON = t.d.c. needle (parameter 710) OFF = t.d.c. thread take-up lever (parameter 703)	1, 2, 3, 4, 5	B	ON - OFF	OFF
	775	Stop time for ornamental tack [ms]	1, 3, 4, 5, 2	B B	10 - 1000 10 - 1000	100 150
	782	Needle position raised for thick material(with key on machine head) ON = t.d.c. needle (parameter 710) OFF = t.d.c. thread take-up lever (parameter 703)	1, 2, 3, 4, 5	B	ON - OFF	OFF
	789	Needle position 10 (bearing position)	1, 2, 3, 4, 5	B	0 - 255	248
	793	Delay for feed adjustment on till trimming with shortened trim stitch [ms]	1 2, 3, 4, 5,	B -	0 - 2000 -	140 -
	797	Hardware test	1, 2, 3, 4, 5	C	ON - OFF	OFF
	798	User level 0 = user level A 1 = mechanic level B 11 = service level C	1, 2, 3, 4, 5	B	0 - 20	0
	799*	Selected machine class(see Table of machine types on Page 34)	1 2 3 4 5	C C C C C	1 2 3 4 5	1 2 3 4 5
8	800*	Motor rotating direction when looking at V-belt pulley 1= anti-clockwise, 0 = clockwise	1, 5 2, 3, 4, ,	C C	0 - 1 0 - 1	0 1
	801	Reversing angle at end of seam	1, 2, 3, 4, 5	B	10 - 212	32
	814	Change-over of positioning method 1 = Ramp braking in target position 2 = Max. braking at positioning speed and wait till target position is reached.	1, 2, 3, 4, 5	C	1 - 2	1

* = These parameters remain unchanged when the set parameter values are reset, see Chapter **10.01 Reset / Cold start.**

Group	Parameter	Description	Machine type	User level	Setting range	Set value
8	815	Motor starting method after mains on 1 = sinus method, 2 = impulse method	1, 2, 3, 4, 5	C	1 - 2	1
	880	Max. starting current [A]	1, 2, 3 4, 5	C C	1 - 10 1 - 10	5 8
	884	Proportional amplification of speed control of sewing motor	1, 5 2 3 4	B B B B	3 - 24 3 - 30 3 - 24 3 - 24	9 16 10 6
	885	Integral amplification of speed control of sewing motor	1, 2, 3 4, 5,	C C	10 - 80 10 - 80	50 23
	886	Proportional amplification of positioning controller(sewing motor)	1, 2, 3, 4, 5	C	1 - 15	8
	887	Differential amplification of positioning controller(sewing motor)	1, 2, 3, 4, 5	C	1 - 15	8
	889	Time for positioning control in [ms], 0 = always	1, 2, 3, 4, 5	C	0 - 2500	200
	890	Proportional amplification of stop brake	1, 2, 3, 4, 5	C	1 - 25	8
	897*	MINI-motor variant 1 = long, 0 = short	1, 3, 4, 5 2	C C	0 - 1 0 - 1	0 1
	898	Motor current limitation ON = 15A, OFF = 10A	1, 2, 3, 4, 5	C	ON - OFF	OFF
9	900	Proportional amplification of speed controller during trimming	1 2, 3 4 5	B B B B	1 - 24 1 - 30 1 - 24 1 - 24	10 16 6 9
	901	Trimming release-speed	1, 2, 3, 4, 5	B	30 - 500	300
	933	Switchover of display on screen ON = diagnosis display OFF = standard display	1, 2, 3, 4, 5	C	ON - OFF	OFF

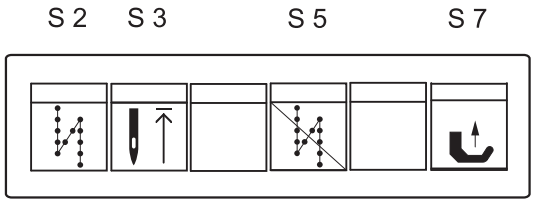
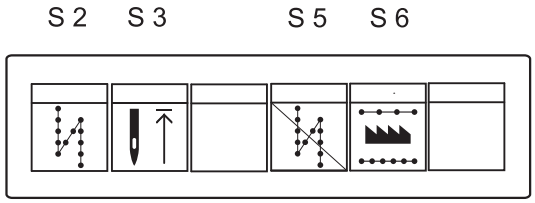
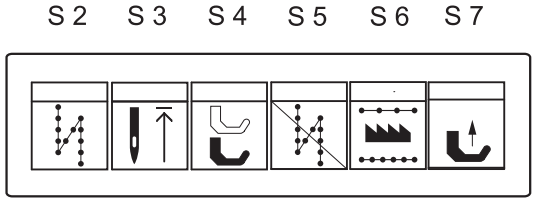
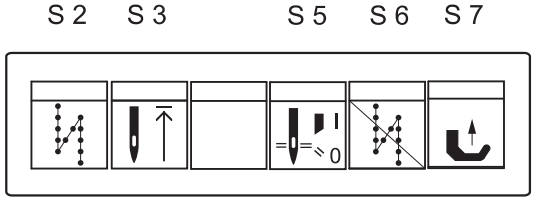
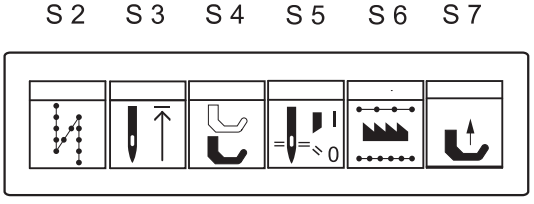
* = These parameters remain unchanged when the set parameter values are reset, see Chapter **10.01 Reset / Cold start.**

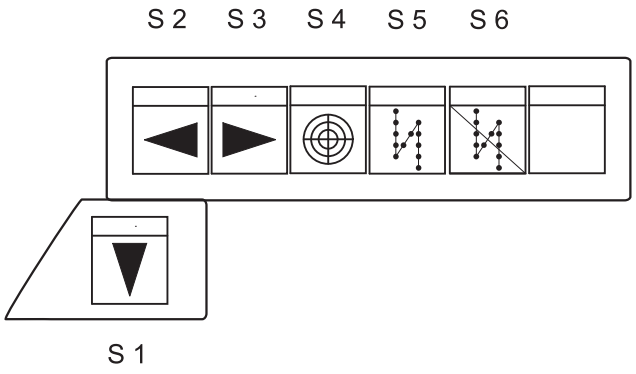
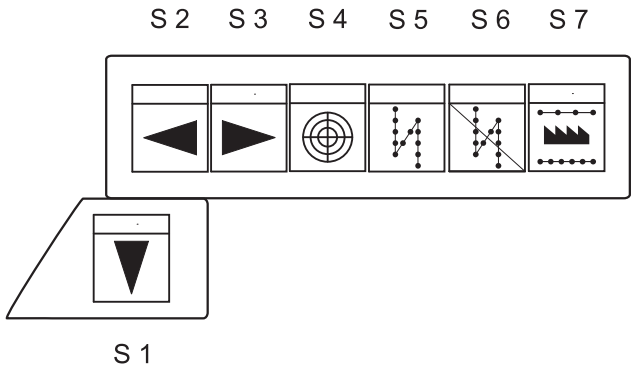
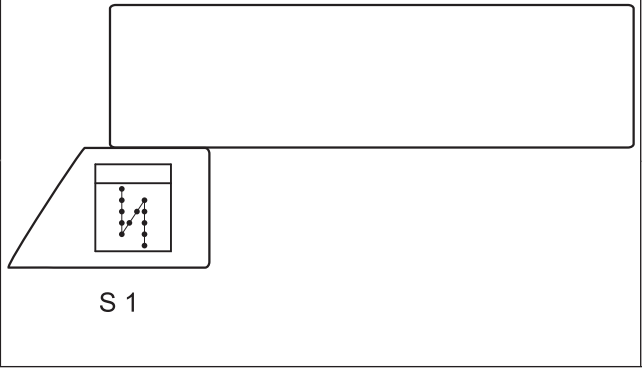
Group	Parameter	Description	Machine type	User level	Setting range	Set value
9	939	Hold-back time (premature electrical switchover) for feed adjustment when switching on [ms]	1, 2, 3, 4, 5	B	10 - 200	30
	968	Hold-back time (premature electrical switchover) for feed adjustment when switching off [ms]	1, 2, 3, 4, 5	B	10 - 200	30
	969	Switch off position for presser foot when thread is clamped at beginning of seam	1, 2 , 3 4, 5	B -	0 - 255 -	100 -
	985	Switch on position for thread clamp	1, 2, 3, 4, 5	B	0 - 255	67
	986	Switch off position for thread clamp	1, 2, 3, 4, 5	B	0 - 255	206
	989	Thread clamp at beginning of seam 0 = Thread clamp off 1 = Thread clamp without presser foot lift 2 = Thread clamp with presser foot lift	1, 2, 3, 4, 5	B	0 - 2	0

* = These parameters remain unchanged when the set parameter values are reset, see Chapter **10.01 Reset / Cold start.**

9.01.04 Machine types and control panel combinations P70 ED

The control panel type can be selected under parameter **790** and the machine type under parameter **799**.
The combinations are listed in the following table:

Machine type	Control panel	Parameter	
		790	799
1422-900/..-910/.. -911/..		1	3
1422-900/..-910/.. -911/..-918/..		2	3
1525-900/.. -910/.. -911/..-918/..		3	3
1525-731/..900/.. -910/..-911/..		6	3
1525-731/..900/.. -910/..-911/.. -918/..		7	3

Machine type	Control panel	Parameter	
		790	799
1422-720/..900/.. -910/..-911/..		1	1
1526-720/..900/.. -910/..-911/..		1	2
1422-720/..900/.. -910/..-911/.. -918/..		2	1
1526-720/..900/.. -910/..-911/.. -918/..		2	2
1422-911/..		3	1
1520-911/..		3	2

9.01.05 List of parameters for control unit P70 ED

Only appropriately trained personnel is authorized to alter the set values in the parameters of user level "B" and "C".

Group	Parameter	Description	Machine type	User level	Setting range	Set value
1	101	Acoustic signal of control panel keys	1, 2, 3	A	ON - OFF	OFF
	105	Speed at seam start	1, 2 3	B B	100 - 6400 100 - 6400	1200 1000
	106	Speed at seam start ON = variable (pedal-controlled) (as for parameter 107) OFF = constant (as for parameter 105)	1, 2, 3	B	ON - OFF	OFF
	107	Speed at seam start ON = limited by parameter 105 OFF = limited by parameter 607	1, 2, 3	B	ON - OFF	OFF
	110	Speed at seam end	1, 2 3	B B	100 - 6400 100 - 6400	1200 1000
	111	Light barrier compensating stitches	1, 2, 3	A	1 - 255	8
	112	No. of stitches for blocking out light barrier for knitted fabrics	1, 2, 3	A	0 - 255	0
	113	Start with light barrier ON = only if light barrier dark OFF = also when light barrier bright	1, 2, 3	B	ON - OFF	OFF
	116	Soft starting stitches (soft start)	1, 2, 3	A	0 - 255	0
	117	Speed for soft starting stitches (soft start)	1, 2, 3	B	30 - 640	400
	118	Output A 37 is: ON = needle cooling OFF = motor operation	1, 2, 3	B	ON - OFF	ON
	147	Move to bearing position ON = in reverse OFF = forwards	1, 2 3	- B	- ON - OFF	- ON

Group	Parameter	Description	Machine type	User level	Setting range	Set value
1	153	Start bartack(also see parameter 523) ON = ornamental tack OFF = standard tack	1, 2, 3	B	ON - OFF	ON
	154	End bartack(also see parameter 523) ON = ornamental tack OFF = standard tack	1, 2, 3	B	ON - OFF	ON
	157	Ornamental start tack with third seam segment ON = yes, OFF = no	1, 2, 3	B	ON - OFF	ON
	174	Stitches to output on	1, 2 3	- B	- 1 - 255	- 4
	175	Switch on time for output A 35	1, 2 3	- B	- 0 - 2550	- 50
	189	Delay time / switch on time t1output A 8	1, 2 3	- B	- 0 - 2550	- 50
	190	Delay time / switch on time 12 output A 34	1, 2 3	- B	- 0 - 2550	- 50
	199	Speed for light barrier compensating stitches	1, 2, 3	B	300 - 6400	1200
2	206	Interrupt /stop seam sector at fixed speed ON = with pedal -2, OFF = with pedal 0	1, 2, 3	B	ON - OFF	OFF
	221	Max. speed for sewing programs	1, 2, 3	B	300 - 6400	1200
3	303	Needle position at end of seam sector with end tack without trimming ON = lowered OFF = raised	1, 2 3	- B	- ON - OFF	- OFF
	304	Stitch compensation during feed changeover	1, 2, 3	B	0 - 2550	30
	307	Delay time till automatic switching off of output after the machine stops [ms]	1, 2, 3	B	0 - 2000	50

Group	Parameter	Description	Machine type	User level	Setting range	Set value
3	311	Stop stitch counting ON = with thread trimming OFF = without thread trimming	1, 2, 3	B	ON - OFF	OFF
	313	Programs as tack programs	1, 2, 3	A	ON - OFF	OFF
	368	Start tack / ornamental start tack ON = quadruple OFF = double	1, 2, 3	B	ON - OFF	OFF
	369	End tack / ornamental start tack ON = quadruple OFF = double	1, 2, 3	B	ON - OFF	OFF
4	400	Input puller ON = switch operation (flip-flop) OFF = key operation	1, 2 3	B -	ON - OFF -	OFF -
	401	Input stroke adjustment ON = switch operation OFF = key operation	1, 2, 3	B	ON - OFF -	OFF -
	402	Speed for stroke adjustment	1, 2, 3	B	300 - 6400	1800
	403	Delay for speed change at end of stroke adjustment [ms]	1, 2, 3	B	0 - 2500	150
	404	Speed for stroke adjustment	1, 2 3	B B	0 - 255 0 - 255	5 1
	418	Switch off of needle bars at end of seam ON = both input controlled OFF = iaw inputs	1, 2 3	B -	ON - OFF -	OFF -
	420	Puller function	1, 2, 3	B	ON - OFF	OFF
	445	Stitches for puller delay	1, 2, 3	B	1 - 255	5
	446	Input E 3 is: 1 = needle raised without trimming 2 = needle position change 3 = single stitch 4 = single stitch with shortened stitch length 9 = alteration of needle position step by step forwards	1, 2 3	B B	1 -4 1	2 1

Group	Parameter	Description	Machine type	User level	Setting range	Set value
4	456	Input E 5 / E 6 is: 0 = puller 1 = tack inversion 2 = alteration of needle position step by step in reverse	1, 2, 3	B	0 - 2	1
	468	Tape feed	1, 2 3	- B	- ON - OFF	- OFF
5	522	Needle position at stop during ornamental tack ON = raised; OFF = lowered	1, 2, 3	B	ON - OFF	OFF
	523	Tack ON = ornamental tack (stitch-in-stitch) OFF = standard tack	1, 3 2	A -	ON - OFF -	OFF -
	530	Maximum speed for ornamental tack	1, 2, 3	B	100 - 2000	1000
	538	Tacting output(thread tension release)	1, 2, 3	B	10 - 90	40
	554	Presser foot position after seam sector with stitch counting and pedal position > +1 ON = raised, OFF = lowered	1, 2, 3	B	ON - OFF	ON
	573	Speed limitation for input E 13	1, 2 3	- B	- 300 - 6400	- 2800
	574	Speed limitation for input E 15	1, 2 3	- B	- 300 - 6400	- 2200
	585	Speed limitation for input E 18	1, 2, 3	B	300 - 6400	3000
6	601	Trimming	1, 2, 3	B	ON - OFF	ON
	605	Actual speed value in display	1, 2, 3	B	ON - OFF	OFF
	606	Minimum speed	1, 2, 3	B	30 - 650	180
	607	Maximum speed	1,2 3	B B	300 - 6000 300 - 6000	▲ ▲
	608	Speed level curve (pedal characteristic) ON = linear OFF = non-linear	1, 2, 3	B	ON - OFF	ON
	609	Trimming speed 1	1, 2, 3	B	60 - 300	180

Group	Parameter	Description	Machine type	User level	Setting range	Set value
6	615	End recognition with light barrier ON = from bright to dark Off = from dark to bright	1, 2, 3	B	ON - OFF	OFF
	618	Return after seam end	1, 2, 3	B	ON - OFF	ON
	623	Switch-on delay for return in [ms]	1, 2, 3, 4, 5	B	0 - 2550	50
	634	Function of switch E 1 ON = Feed adjustment when machine has stopped and during sewing OFF = Feed adjustment only during sewing	1, 2 3	B -	ON - OFF -	OFF -
	636	Thread tension release in conjunction with presser foot lift	1, 2, 3	B	ON - OFF	OFF
	651	Automatic lowering of presser foot when machine stops	1, 2, 3	B	ON - OFF	ON
	653	Bearing position before sewing	1, 2, 3	B	ON - OFF	OFF
	657	Stitch securing	1, 2, 3	B	ON - OFF	OFF
	660	Bobbin thread monitoring 0 = off, 1 = by sensor 2 = by stitch counting	1, 2, 3	B	0 - 2	0
	665	Start inhibitor ON = when contact closed OFF = when contact open	1, 2, 3	B	ON - OFF	OFF
	668	Thread wiper	1, 2, 3	B	ON - OFF	OFF
	680	Start inhibitor when drive is running and machine is tilted back ON = stop function cycle OFF = interrupt function cycle	1, 2, 3	B	ON - OFF	ON
	688	Thread tension release in conjunction with presser foot lift during intermediate stop (parameter 636 = ON)	1, 2, 3	B	ON - OFF	ON

▲ = See Chapter **3 Specifications** of the Instruction Manual for the machine

Group	Parameter	Description	Machine type	User level	Setting range	Set value
6	689	Output "wiper" used for ON = wiper OFF = thread tension	1, 2, 3	B	ON - OFF	ON
	696	"Needle raised without trimming switch" function 1 = seam end, after needle raised without trimming 0 = machine continues sewing manually	1, 2, 3	B	0 - 1	0
7	700*	Needle position 0 Needle reference position	1, 2, 3	B	0 - 255	0
	702*	1st needle position (lowered)	1, 2, 3	B	0 - 255	75
	703*	Thread take-up lever position raised	1, 2 3	B B	0 - 255 0 - 255	213 225
	705*	End of cutting signal(magnetic cutting)	1, 2, 3	B	0 - 255	175
	706*	Start of cutting signal(pneumatic cutting)	1, 2, 3	B	0 - 255	80
	707*	Start thread tension release	1, 2 3	B B	0 - 255 0 - 255	180 185
	710*	Needle position raised	1, 2, 3	B	0 - 255	200
	715	Switch-on time [ms] for thread wiper	1, 2, 3	B	0 - 2550	40
	716	Switch-on delay for thread wiper [ms]	1, 2, 3	B	0 - 2550	120
	718	Stop brake tacting(0 = brake off)	1, 2 3	B B	0 - 40 0 - 40	0 20
	721	Tacting output (feed adjustment) 100 = 100 % starting	1, 2, 3	B	10 - 90	40
	722	Acceleration ramp for sewing motor 1 = flat, 50 = steep	1, 2, 3	B	1 - 50	40
	723	Brake ramp for sewing motor 1 = flat, 50 = steep	1, 2, 3	B	6 - 60	45

* = These parameters remain unchanged when the set parameter values are reset, see Chapter **10.01 Reset / Cold start.**

Group	Parameter	Description	Machine type	User level	Setting range	Set value
7	725	Control panel display ON = actual speed OFF = remaining stitches for bobbin thread	1, 2, 3	B	ON - OFF	ON
	726	Counter for bobbin monitoring	1, 2, 3	B	ON - OFF	OFF
	727	Counter for bobbin monitoring effective- ON = stop and signal on output OFF = signal on output without stop	1, 2, 3	B	ON - OFF	OFF
	729	Start delay after lowering presser foot [ms]	1, 2, 3	B	10 - 2550	140
	730	Lift delay for presser foot at end of seam	1, 2, 3	B	0 - 2000	50
	747	Operating mode for thread clamp ON = pneumatic, OFF = electric	1, 2, 3	B	ON - OFF	OFF
	760	Remaining no. of stitches after reaction of bobbin thread monitor during bobbin thread monitoring 1 = Multiplying factor for fixed value x 10 during direct monitoring 2 = Multiplying factor for fixed value x 200 during indirect monitoring	1, 2, 3	A	0 - 250	10
	761	Extension thread tension release / thread pulling [ms]	1, 2, 3	B	0 - 3000	0
	769	Remaining number of stitches for stitch counter(indirect bobbin thread monitoring)	1, 2, 3	B	1 - 2550	100
	770	Lifting delay for presser foot when pedal position is "-1" [ms]	1, 2 3	B B	10 - 2550 10 - 2550	50 100
	772	Operating mode trimming ON = with shortened trim stitch trimming always with short stitch length (parameter 988 = ON) OFF = standard trimming	1, 2, 3	B	ON - OFF	OFF

* = These parameters remain unchanged when the set parameter values are reset, see Chapter **10.01 Reset / Cold start.**

Group	Parameter	Description	Machine type	User level	Setting range	Set value
7	774	Needle position raised for thick material(with pedal) ON = t.d.c. needle (parameter 710) OFF = t.d.c. thread take-up lever (parameter 703)	1, 2, 3	B	ON - OFF	OFF
	775	Stop time for ornamental tack [ms]	1, 2, 3	B	10 - 2550	200
	777	Reset duration for bobbin thread monitor	1, 2, 3	B	10 - 500	100
	778	Blowing time for cleaning thread monitor [ms]	1, 2, 3	B	10 - 5000	100
	789	Needle position 10 (bearing position)	1, 2, 3	B	0 - 255	225
	790	Program selection for machine type	1, 2 3	B B	1 - 4 1 - 7	▲ ▲
	793	Delay for feed adjustment on till trimming with shortened trim stitch [ms]	1, 2, 3	B	0 - 2550	140
	797	Hardware test	1, 2, 3	C	ON - OFF	OFF
	798	User level 0 = user level A 1 = mechanic level B 11 = service level C	1, 2, 3	A	0 - 20	0
	799*	Selected machine class(see Table of machine types on Pages 44 - 45)	1 2 3	C C C	1 2 3	1 2 3
8	800*	Motor rotating direction when looking at V-belt pulley 1= anti-clockwise, 0 = clockwise	1, 2, 3	C	0 - 1	1
	801	Reversing angle at end of seam	1, 2, 3	B	10 - 200	30
	814	Change-over of positioning method 1 = Ramp braking in target position 2 = Max. braking at positioning speed and wait till target position is reached.	1, 2, 3	C	1 - 2	1

* = These parameters remain unchanged when the set parameter values are reset, see Chapter **10.01 Reset / Cold start.**

▲ = see Table Pages 44 - 45

Group	Parameter	Description	Machine type	User level	Setting range	Set value
8	815	Motor starting method after mains on 1 = sinus method 2 = impulse method	1, 2, 3	C	1 - 2	1
	880	Max. starting current [A]	1, 2, 3	C	1 - 20	10
	884	Proportional amplification of speed control of sewing motor	1, 2, 3	B	1 - 24	18
	885	Integral amplification of speed control of sewing motor	1, 2, 3	C	10 - 80	50
	886	Proportional amplification of positioning controller for sewing motor	1, 2, 3	C	1 - 15	8
	887	Differential amplification of positioning controller for sewing motor	1, 2, 3	C	1 - 15	8
	889	Time for positioning control in [ms], 0 = always	1, 2, 3	C	0 - 2500	200
	890	Proportional amplification of stop brake	1, 2, 3, 4, 5	C	1 - 10	5
	897*	MINI-motor variant 1 = long, 0 = short	1, 2, 3	C	0 - 1	1
	898	Motor current limitation ON = 15A, OFF = 10A	1, 2, 3	C	ON - OFF	OFF
9	900	Proportional amplification of speed controller during trimming	1, 2, 3	B	1 - 30	18
	901	Trimming release-speed	1, 2, 3	B	30 - 500	300
	909	Thread puller on / off	1, 2, 3	B	ON - OFF	OFF
	910	Thread puller delay time [ms]	1, 2, 3	B	10 - 2550	100
	933	Switchover of display on screen ON = diagnosis display OFF = standard display	1, 2, 3	C	ON - OFF	OFF

* = These parameters remain unchanged when the set parameter values are reset, see Chapter **10.01 Reset / Cold start.**

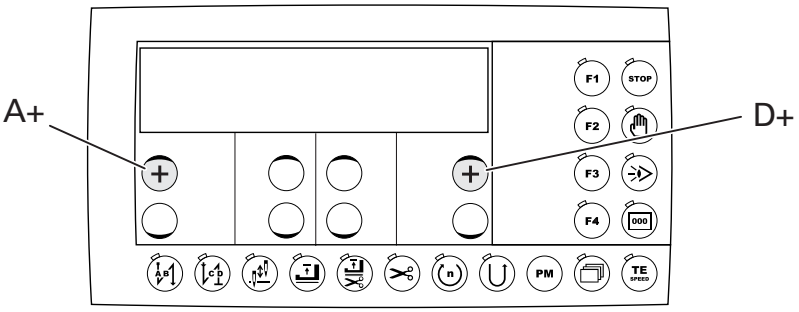
Group	Parameter	Description	Machine type	User level	Setting range	Set value
9	939	Hold-back time (premature electrical switchover) for feed adjustment when switching on [ms]	1, 2, 3	B	10 - 2000	46
	968	Hold-back time (premature electrical switchover) for feed adjustment when switching off [ms]	1, 2, 3	B	10 - 200	64
	969	Switch off position for presser foot when thread is clamped at beginning of seam	1, 2 , 3	B	0 - 255	100
	985	Switch on position for thread clamp	1, 2, 3	B	0 - 255	78
	986	Switch off position for thread clamp	1, 2, 3	B	0 - 255	213
	988	Shortened trim stitch	1, 2, 3	B	ON - OFF	OFF
	989	Thread clamp at beginning of seam 0 = Thread clamp off 1 = Thread clamp without presser foot lift 2 = Thread clamp with presser foot lift	1, 2, 3	B	0 - 2	0
	996	Max. switch on time of electrical thread clamp after end of seam	1, 2 , 3	B	1 - 600	100

* = These parameters remain unchanged when the set parameter values are reset, see Chapter **10.01 Reset / Cold start.**

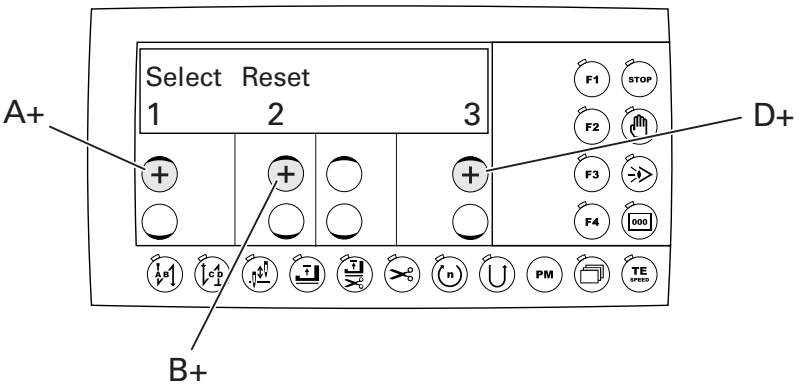
10 Service functions

10.01 Reset / Cold start

After selecting the Reset menu, by pressing the relevant plus key it is possible to delete seam parameters and seam programs or to carry out a cold start.



- Press and hold plus-minus keys "A+" and "D+" and switch on the machine.



1 = Reset seam parameters

- Press plus key "A+".
  All seam parameters are deleted, the message "MASTER-RESET **1**" appears briefly on the display.

2 = Reset seam programs

- Press plus key "B+".
  All seam programs are deleted, the message "MASTER-RESET **2**" appears briefly on the display.

3 = Cold start

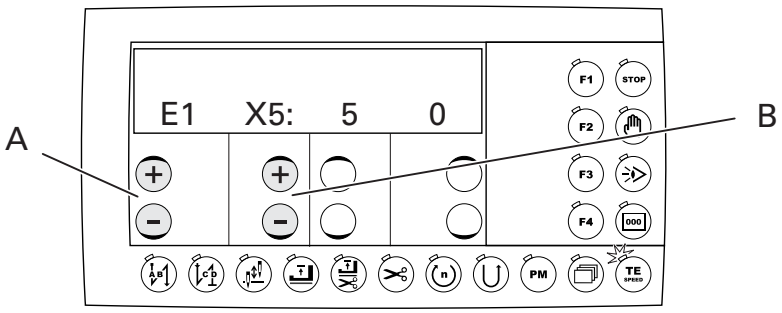
- Press plus key "D+".
  The values of the machine control unit, except the machine class, are set back to their basic values. The message "COLD START" appears briefly on the display.

After the cold start all programmed values are set back to their status at the time of delivery. For this reason, after a cold start the parameters **799**, **8**00 and 700 must by checked and reset if necessary.

10.02 Hardware-test

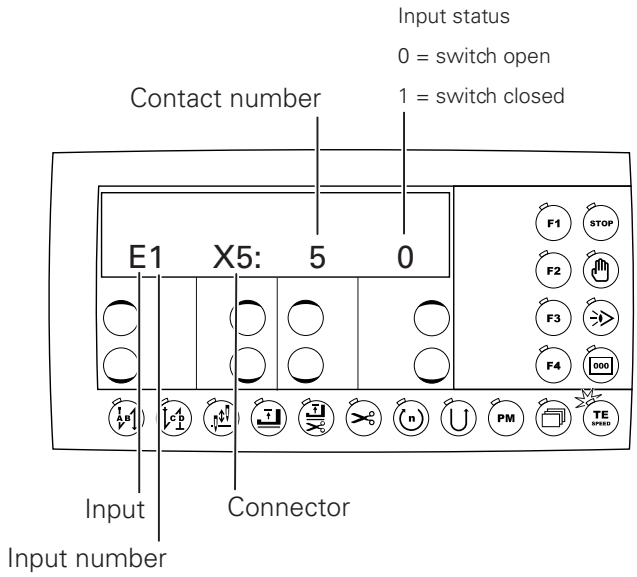
The hardware test is a test program which, with the aid of the control panel, makes it possible to check various components of the control unit and the machine installation. The check involves the test of seven test blocks.

- Switch on the machine.
- Select service level "C", see Chapter **9.01.02** Selecting the user level.
- Select parameter **797** and set at "ON" by pressing the relevant plus-minus key. The first test block appears on the display.



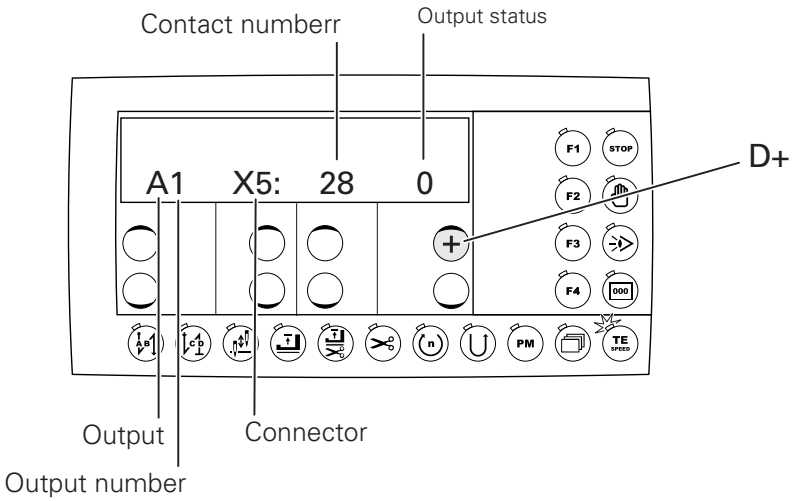
- Further test blocks can be called up by pressing the plus-minus keys "A".
- The relevant inputs or outputs are selected by pressing the plus-minus keys "B".

10.02.01 Test block 1 – inputs



The allocation of the functions of the inputs displayed is shown in the general plan of Chapter **10.03 Connection plan for connector X5**.

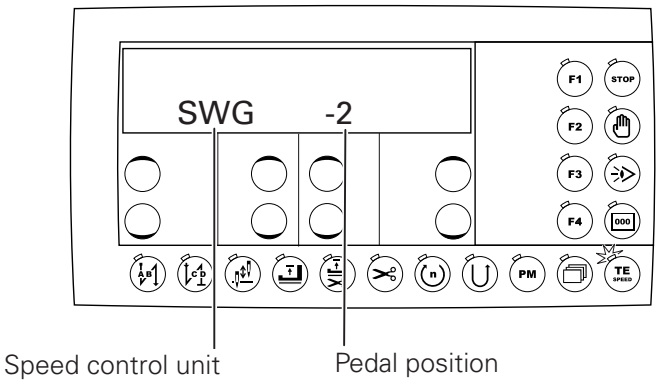
10.02.02 Test block 2 – outputs



- Press plus key "D+" to switch on the relevant output for **200** ms.

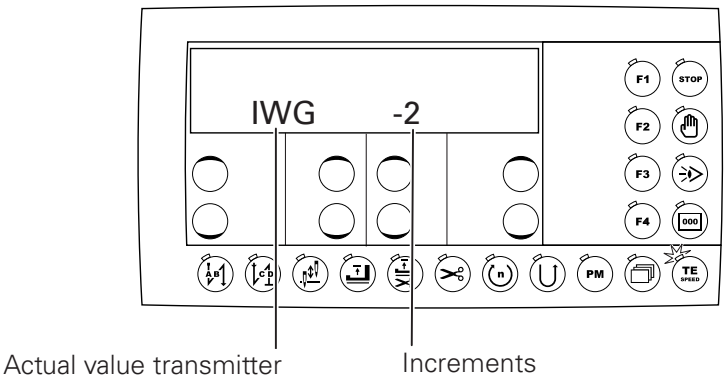
The allocation of the functions of the outputs displayed is shown in the general plan of Chapter **10.03 Connection plan for connector X5**.

10.02.03 Test block 3 – speed control unit



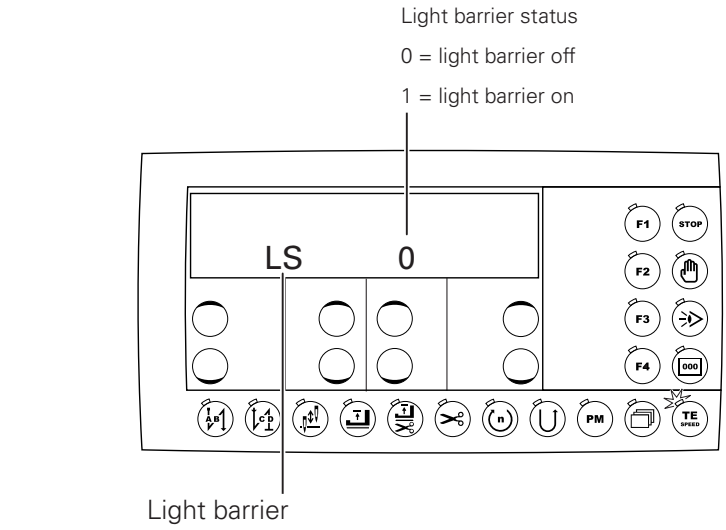
- By pressing pedal operation all **16** control steps can be called up.
  If all displays from **-2**, **-1**, **0**, **1**, **1**D to **12**D appear, the speed control unit is in order.

10.02.04 Test block 4 – actual value transmitter



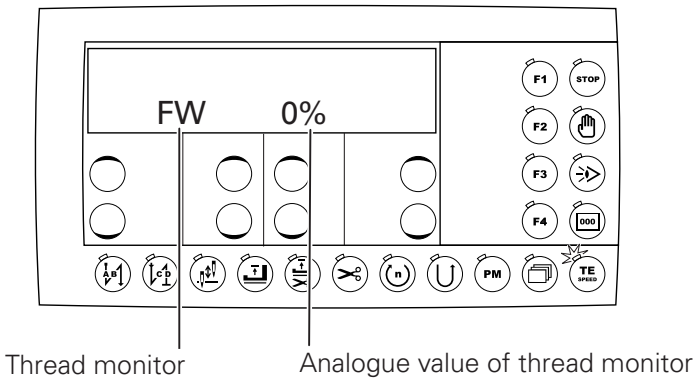
- The actual value can be checked by pressing Turn on the balance wheel.
  If the increments from **0** – **255** appear on the display, the actual value transmitter is in order.

10.02.05 Test block 5 – light barrier



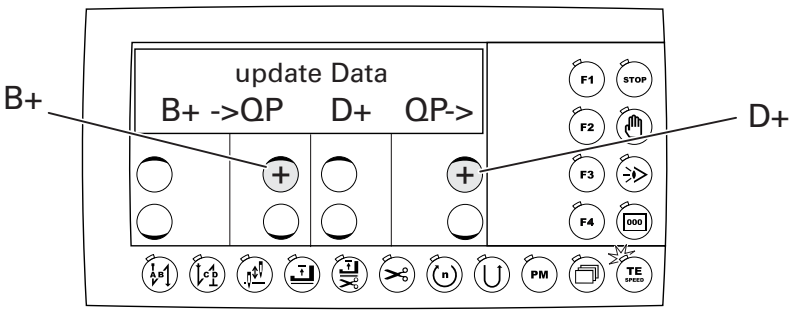
- The light barrier status can be checked here.

10.02.06 Test block 6 – thread monitor (only on subclass -926/06)



- The analogue value of the thread monitor is shown here in %.

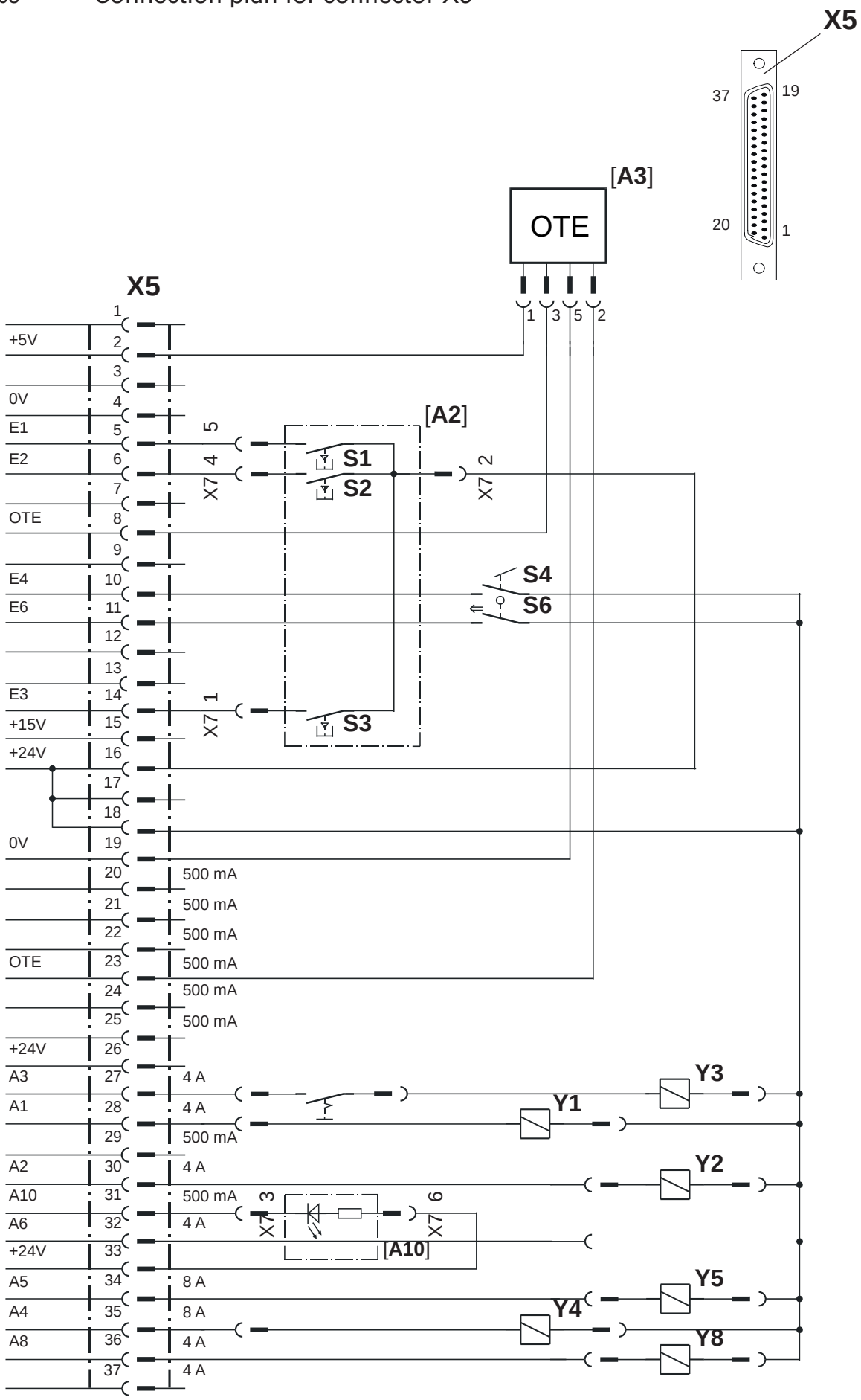
10.02.07 Test block 7 – data transfer



- If the plus key "B+" is pressed, all data from the control unit is transferred to the programming device.
- If the plus key "D+" is pressed, all data from the programming device is transferred to the control unit.

Before the data transfer, the Instruction Manual of the programming device must be observed!

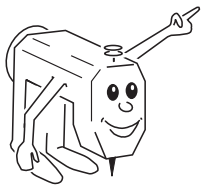
10.03 Connection plan for connector X5



10.04 Description of the solenoids or solenoid valves and key switches

Component	Parameter setting	Function
S1	-	Switch on feed changeover from manual / needle again
S2	446 at "1"	Needle raised without thread trimming
S2	446 at "2"	Needle position change
S2	446 at "3"	Single stitch
S2	446	Invert following tack function
S2	446	Tack suppression
S2	446	Switchover position on zigzag machines
S6	-	Stop start inhibitor
Y2	-	Thread trimming (I max = 4A*)
Y3	-	Thread wiper (I max = 4A*)
Y4	-	Lift presser foot (Imax = 8A*)
Y5	-	Feed changeover
Y8	-	Thread tension release (I max = 4A*)
[A2]	-	Switch case on sewing machine
[A3]	-	Sewing head recognition (OTE)
A10	-	Signal bobbin thread monitor

* The sum of the load currents of all activated control elements (solenoids, solenoid valves) must not exceed the value of 4A.



Note

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