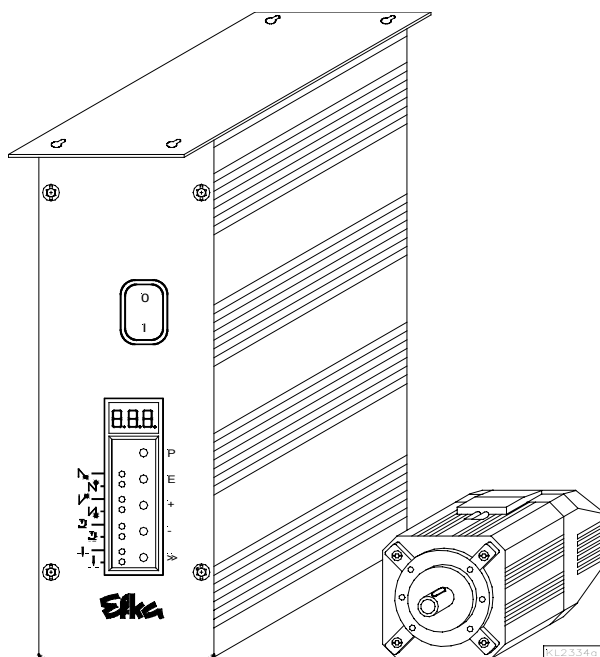


Efka dc 1550

CONTROL

DA320G5350



INSTRUCTION MANUAL

No. 402302

English

Efka
FRANKL & KIRCHNER
GMBH & CO KG

Efka
EFKA OF AMERICA INC.

Efka
EFKA ELECTRONIC MOTORS
SINGAPORE PTE. LTD.

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1 Important Safety Instructions

When using an EFKA drive and accompanying devices (e.g. for sewing machines), basic safety precautions should always be followed, including the following:

- Read all instructions thoroughly before using this drive.
- Drive, its accessories and accompanying devices should be mounted and put into operation by qualified personnel in accordance with the guidelines provided in the instruction manual.

To reduce the risk of burns, fire, electric shock, or personal injury:

- Use this drive only for its intended use as described in the instruction manual.
- Use only attachments recommended by the manufacturer or as contained in the instruction manual.
- Do not operate without corresponding protective devices.
- Never operate this drive if one or more parts (e.g. cables, plugs) are damaged, if it is not working properly, if any damages can be identified or are to be suspected (e.g. after it has been dropped). Only qualified personnel are authorized to make adjustments, eliminate faults and complete repair work.
- Never operate the drive with the air openings blocked. Keep ventilation openings of the drive free from the accumulation of lint, dust and loose cloth.
- Never drop or insert any object into any opening.
- Do not use drive outdoors.
- Do not operate where aerosol (spray) products are being used or where oxygen is being administered.
- To disconnect, turn off main switch, then remove plug from outlet.
- Do not unplug by pulling on cord. To unplug, grasp the plug, not the cord.
- Keep fingers away from all moving machine parts. Special care is required e.g. around the sewing machine needle and the V-belt.
- Before mounting and adjusting accompanying devices, i.e. position transmitter, reversing device, light barrier, etc., disconnect drive from mains (turn off main switch, remove mains plug from outlet [DIN VDE 0113 part 301; EN 60204-3-1; IEC 204-3-1]).
- Always switch off (0) machine and remove plug from outlet, when removing covers, mounting accompanying devices, position transmitter especially, light barrier, etc., or any other devices mentioned in the instruction manual.
- Only qualified personnel are authorized to work on the electrical components.

- Work on high voltage circuit areas is forbidden, except as stated in the respective regulations, e.g. DIN VDE 0105 part 1.
- Only specially trained personnel are authorized to complete repair work.
- Cables to be wired must be protected against expectable strain and fastened adequately.
- Cables near moving machine parts (e.g. V-belts) must be wired at a minimum distance of 25 mm (see DIN VDE 0113 part 301; EN 60204-3-1; IEC 204-3-1).
- For safety it is preferred to wire the cables separately from each other.
- Before connecting the mains line make sure that the mains voltage corresponds to the specifications on the motor rating plate and on the nameplate of the power pack.
- Connect this drive to a properly grounded outlet only. See Grounding Instructions.
- Electric accompanying devices and accessories must only be connected to safety low voltage.
- EFKA DC drives are protected according to overvoltage class 2 (DIN VDE 0160 § 5.3.1).
- Observe all safety guidelines before undertaking conversions or modifications.
- For repair and maintenance use only original replacement parts.



Warnings in the instruction manual which point out particular risks of personal injury or risk to the machine are marked with this symbol wherever applicable.



This symbol is a warning on the control and in the instruction manual. It indicates hazardous voltage.

CAUTION – In the case of failure this area can be current-carrying even after having turned the power off (non discharged capacitors).

- The drive is not an independently operating unit, but is designed to be incorporated into other machinery. It must not be put into service until the machinery into which it is to be incorporated has been declared in conformity with the provisions of the EC Directive.

Save these instructions for future reference.

2 Range of Applications

The drive is suitable for lockstitch, machine models 069, 205, 267, 268, 269, 271, 272, 273, 274, 275, 367, 381, 382, 467, 767, 768, 4180 und 4280

2.1 Use in Accordance with Regulations

The drive is not an independently operating machine, but is designed to be incorporated into other machinery. It must not be put into service until the machinery into which it is to be incorporated has been declared in conformity with the provisions of the EC Directive (Appendix II, paragraph B of the Directive 89/392/EEC and supplement 91/368/EEC).

The drive has been developed and manufactured in accordance with the relevant EC standards:

EN 60204-3-1:1990 Electrical equipment of industrial machines:
Particular requirements for industrial sewing machines, sewing units and sewing systems.

Operate the drive only in dry areas.



CAUTION

When selecting the installation site and the layout of the connecting cable, the Safety Instructions in chapter 1 must be followed with no exceptions.
Particular attention should be paid to maintaining the proper distance from moving parts!

3 Scope of Supply

1	Direct current motor	DC1550
1	Electronic control	DA320G5350
	- Power pack	N204
1	Actuator	EB301A
1	Set of standard accessories consisting of:	B156
		Plastic bag for B156
		Documentation
1	Set of accessories consisting of:	Z54
		Pitman rod 400...700mm long
		Bracket for fastening EB3..

Note

If there is no metallical contact between drive (motor) and machine head, the potential equalization cord supplied with the unit is to be wired from the machine head to the terminal provided on the control box!

3.1 Special Accessories

Control panel Variocontrol V810

Control panel Variocontrol V820

Reflection light barrier module LSM002

Hall sensor module HSM001

Pulse encoder IPG001

EFKANET interface IF232-2, complete

Adapter cord for the connection of light barrier module and Hall sensor module

HSM001 or pulse encoder IPG001, or light barrier module, Hall sensor module

HSM001 or pulse encoder IPG001 and EFKANET

Actuating solenoid type EM1.. (for e. g. sewing foot lifting, backtacking, etc.)

- part no. 5970153

- part no. 5970154

- part no. 6100031

- part no. 6100032

- part no. 6100033

- part no. 7900068

- part no. 1113229

Extension cable approx. 1000 mm long for commutation transmitter DC15..

Extension cable approx. 1000 mm long for DC15.. line

Potential equalization cord 700 mm long, LIY 2.5 mm², grey, with forked cable brackets on both sides

Foot control type FB302 with three pedals for standing operation, with approx. 1400 mm connecting cable and plug

Fitting piece for position transmitter

Knee switch type KN3 (pushbutton) with cord of approx. 950 mm length without plug

Undertable mounting kit for DC15..

Sewing light transformer

- see specification

“solenoids” for

available models

- part no. 1113151

- part no. 1113150

- part no. 1100313

- part no. 4170025

- part no. 0300019

- part no. 5870013

- part no. 1113235

- please indicate line

voltage and sewing light

voltage (6,3V or 12V)

- part no. 0504135

- part no. 0504136

- part no. 0101523

- part no. 1112900

- part no. 1112899

9-contact SubminD male connector

9-contact SubminD male connector

Half-shell housing for 9-contact SubminD

37-pin SubminD male connector, complete

Single pins for 37-pin SubminD with strand of 5cm length

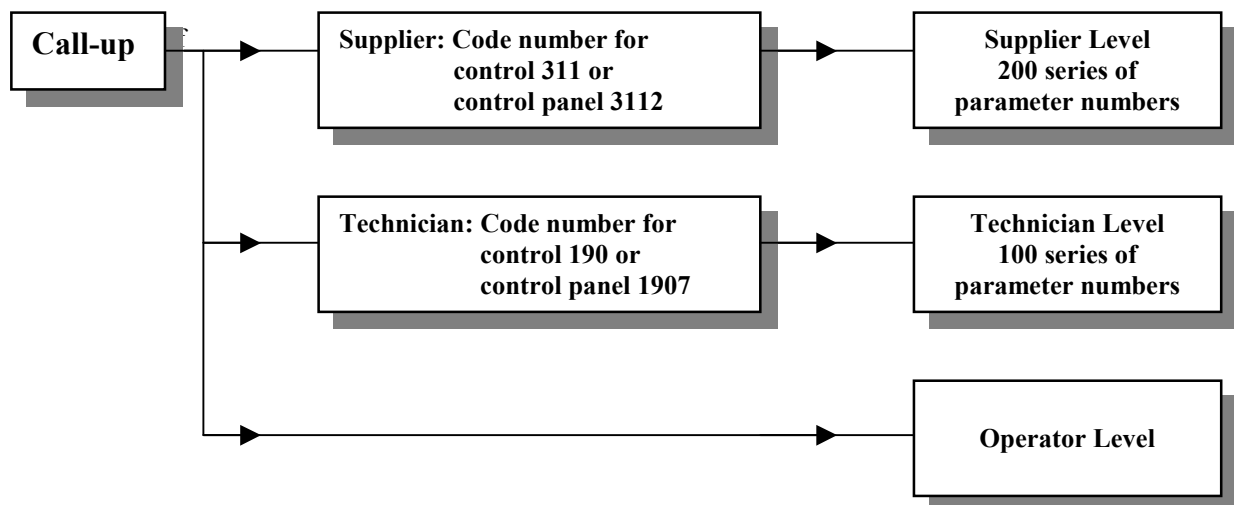
4 Control Operation without Control Panel

4.1 Access Authorization upon Command Input

In order to prevent unintentional changes of preset functions the command input is distributed at various levels.

The following persons have access:

- the supplier to the highest and all subordinate levels using a code number
- the technician to the next lower and all subordinate levels using a code number
- the operator to the lowest level without using a code number

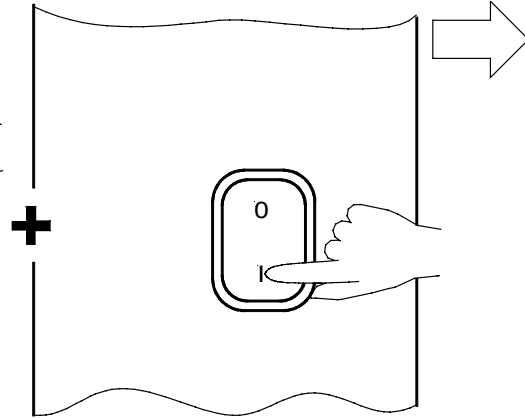
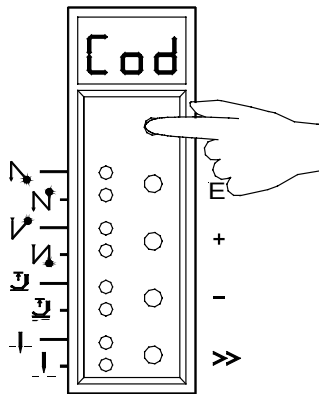


4.2 Programming the Code Number

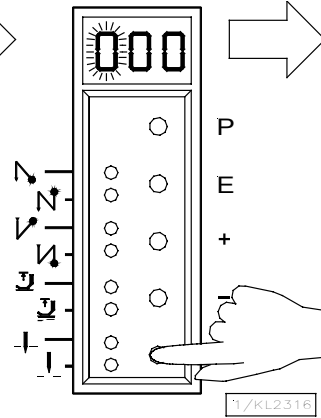
Note

The parameter numbers in the illustrations below serve as examples and may not be available in all program versions. In this case, the display shows the next higher parameter number. See List of Parameters.

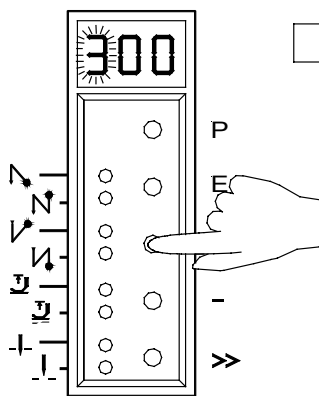
1. Press the **P** key and turn power on



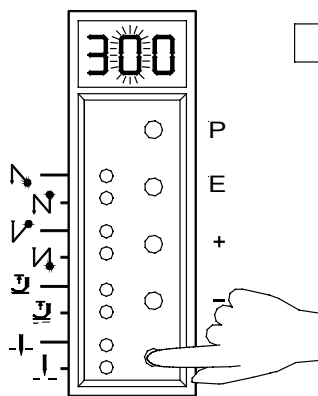
2. Press the **>>** key (1st digit blinks)



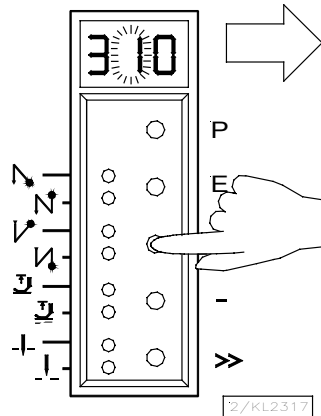
3. Press the **+** or **-** key to select the 1st digit
Technician level → Code no. 190
Supplier level → Code no. 311



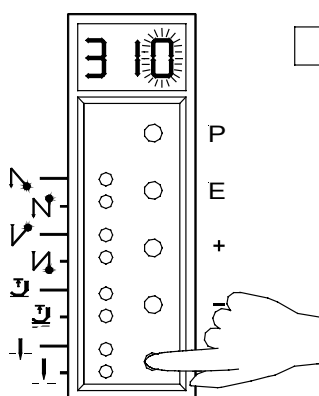
4. Press the **>>** key (2nd digit blinks)



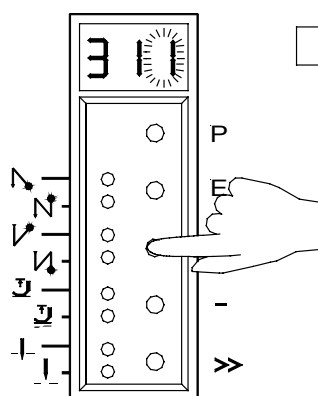
5. Press the **+** or **-** key to select the 2nd digit



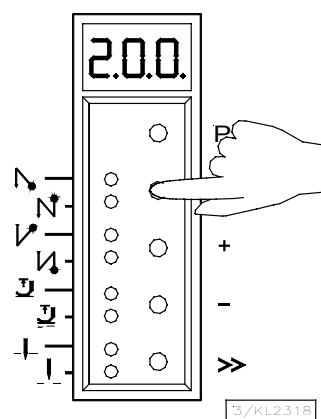
6. Press the **>>** key (3rd digit blinks)



7. Press the **+** or **-** key to select the 3rd digit



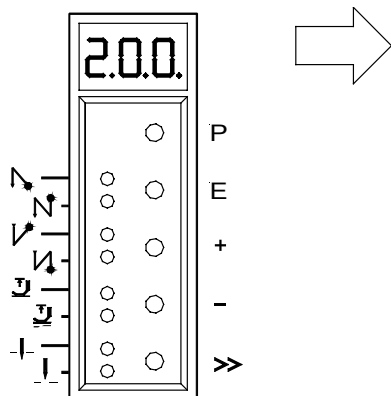
8. Press the **E** key; the parameter number is displayed, which is indicated by points between the digits.



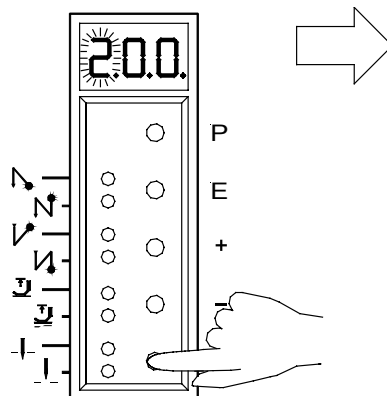
4.3 Parameter Selection

4.3.1 Direct Selection

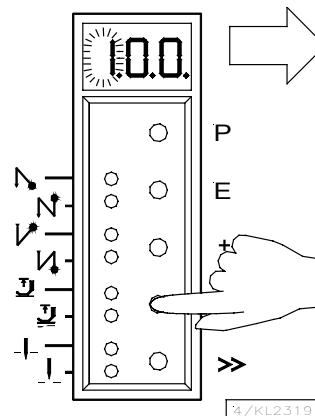
1. After code number input at the programming level



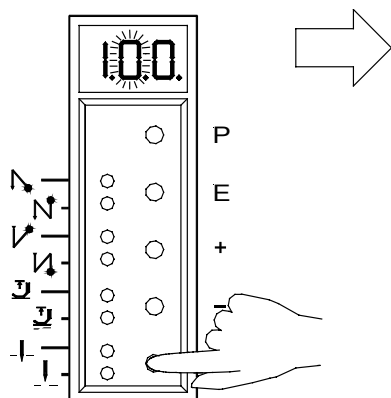
2. Press the >> key (1st digit blinks)



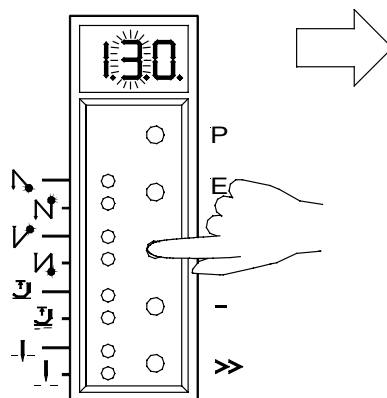
3. Press the + or - key to select the 1st digit



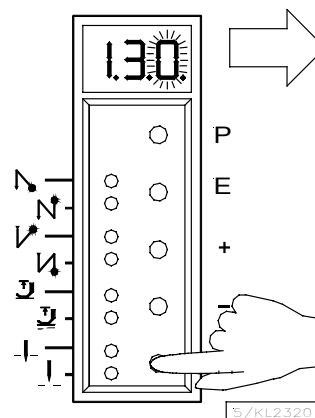
4. Press the >> key (2nd digit blinks)



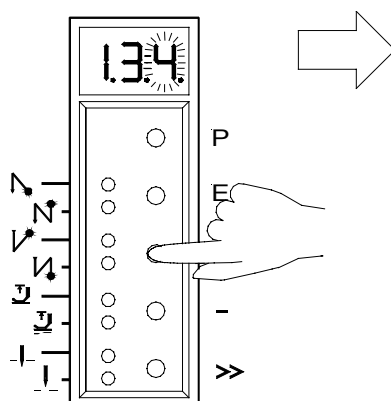
5. Press the + or - key to select the 2nd digit



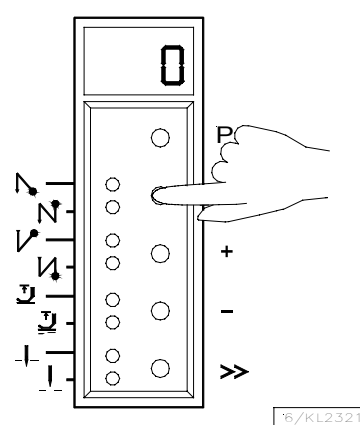
6. Press the >> key (3rd digit blinks)



7. Press the + or - key to select the 3rd digit



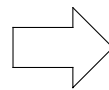
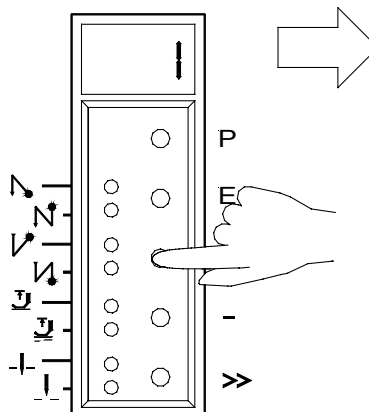
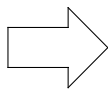
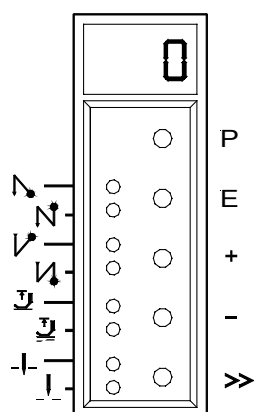
8. Press the E key; the parameter value is displayed. There are no points between the digits.



4.3.2 Changing Parameter Values

1. Display after parameter value selection

2. Change the parameter value by pressing the + or - key

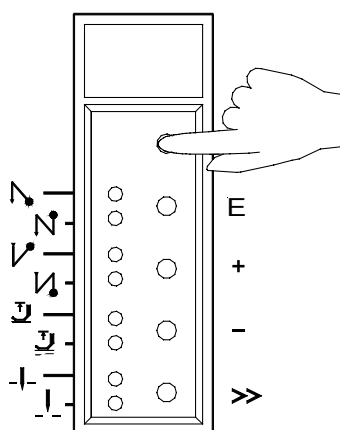
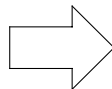
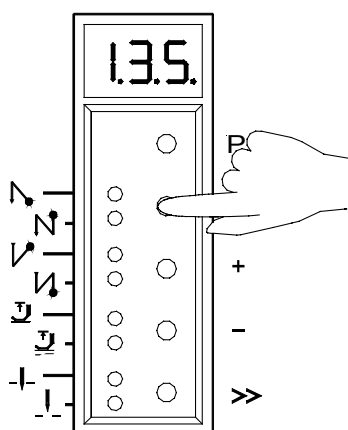
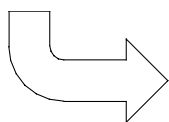


7/KL2322

Option 1

Press the **E** key. The **next** parameter number is displayed.

Press the **P** key. Exit programming.
The changed parameter values will be saved when you start sewing again!

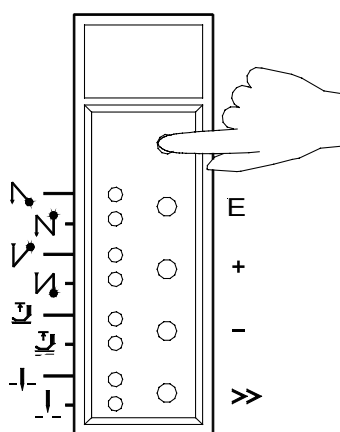
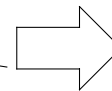
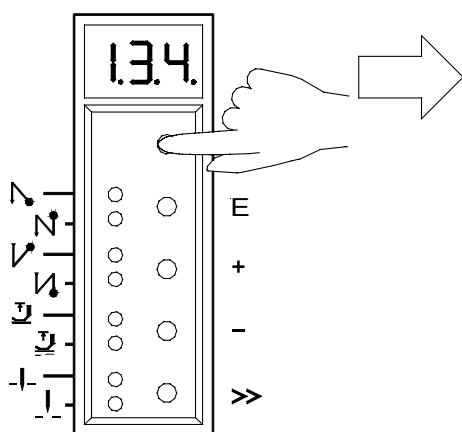
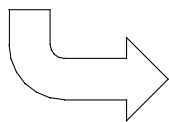


8/KL2323

Option 2

Press the **P** key. The **same** parameter number is displayed.

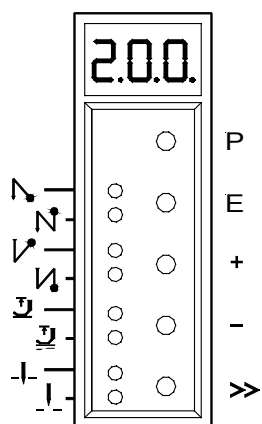
Press the **P** key. Exit programming.
The changed parameter values will be saved when you start sewing again!



9/KL2324

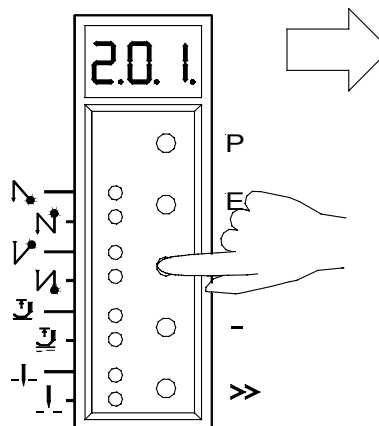
4.3.3 Parameter Selection with the +/- Keys

1. After code number input at the programming level

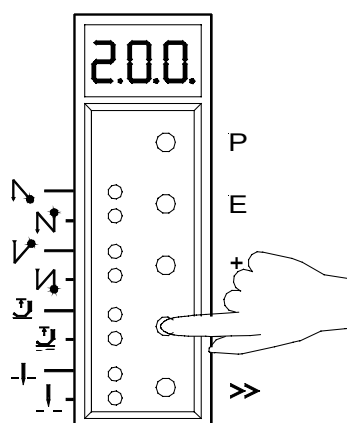


10/KL2325

2. Select the next parameter by pressing the + key

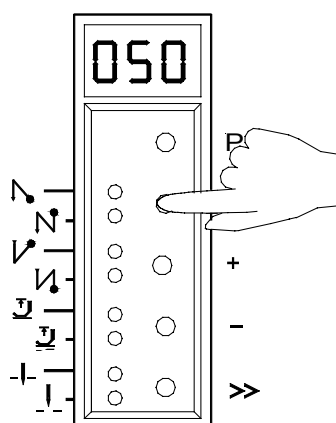


3. Select the previous parameter by pressing the - key



11/KL2326

4. After pressing the E key, the parameter value is displayed



These values are saved when you start sewing. They remain in effect even after turning the machine off!
Using parameter 401 is another possibility for immediate storage without having to start sewing.

4.3.4 Immediate Storage of All Changed Data

Functions	Parameter
Immediate storage of all changed data (EEP)	401

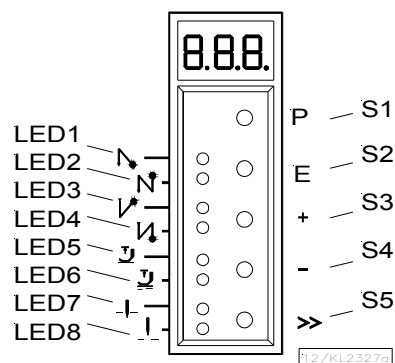
- Input code number 3112 after power On
- Input parameter 401
- Set display from **0** to **1**
- All data are stored!

- ➔ Press the **E** key
- ➔ Press the **E** key
- ➔ Press the **E** or **P** key

4.4 Changing All Parameter Values at the Operator Level

All parameter values at the operator level can be changed without code number input (see List of Parameters).

- Press the **P** key → The first parameter number will be displayed
- Press the **E** key → The parameter value will be displayed
- Press the +/- keys → The parameter value will be changed
- Press the **E** key → The next parameter will be displayed
- Press the **E** key → The parameter value will be displayed
- Press the +/- keys → The parameter value will be changed etc.
- Press the **P** key twice → Exit programming at the operator level



4.5 Function Switchover

Switchable functions can be changed by pressing the appropriate key. The switching state is indicated by light emitting diodes (LED). See above illustration!

Table: Assignment of functions to keys and LEDs

Function	Key	LED number	
Single start backtack	E (S2)	1 = on	2 = off
Double start backtack	E	1 = off	2 = on
Start backtack Off	E	1 = off	2 = off
Single end backtack	+ (S3)	3 = on	4 = off
Double end backtack	+	3 = off	4 = on
End backtack Off	+	3 = off	4 = off
Sewing foot lift at stop in the seam (automatic)	- (S4)	5 = on	6 = off
Sewing foot lift at the seam end (automatic)	-	5 = off	6 = on
Sewing foot lift at stop in the seam and at the seam end (automatic)	-	5 = on	6 = on
Sewing foot lift (automatic) Off	-	5 = off	6 = off
Basic position down (position 1)	>> (S5)	7 = on	8 = off
Basic position up (position 2)	>>	7 = off	8 = on

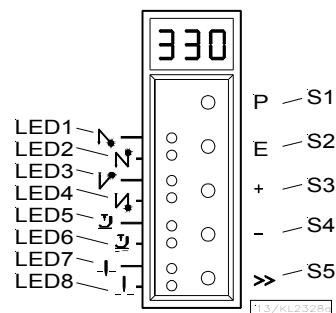
4.6 Direct Input of Maximum Speed Limitation without Control Panel

The maximum speed of the machine must be limited to the specific level according to the application. Do the setting at the operator level on the control using the +/- keys during operation or at intermediate machine stop. This function is blocked at the start of the seam or after the seam end. The actual value shown on the display must be multiplied by 10. When using a control panel, the full speed value is displayed. See also chapter 5.4!

Example:

The value 330 on the control display corresponds to a speed of 3300 RPM.

Important! If the speed is changed, it is saved only after trimming and when you start sewing again.

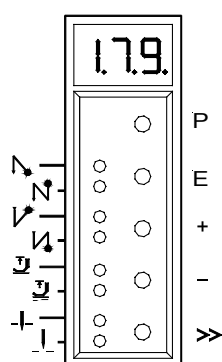


4.7 Program Identification on the Control

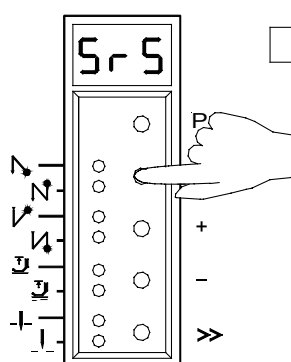
Function without control panel	Parameter
Program number, modification index and identification number display	179

After having selected parameter 179, the following information is displayed in succession:

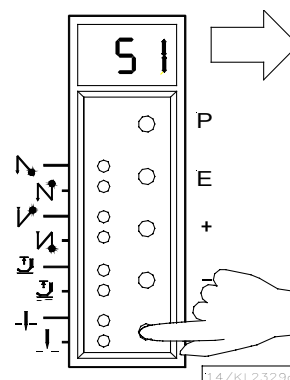
1. Select parameter 179.



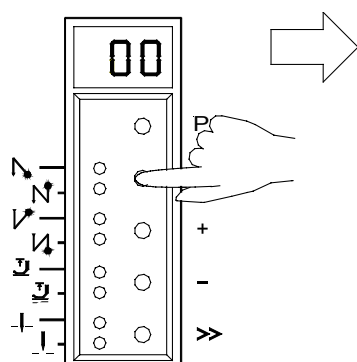
2. Press the E key.
Abbreviation **Sr5** is displayed.



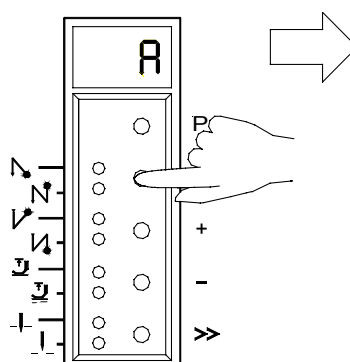
3. Press the >> key.
The first 2 digits of the program number are displayed.



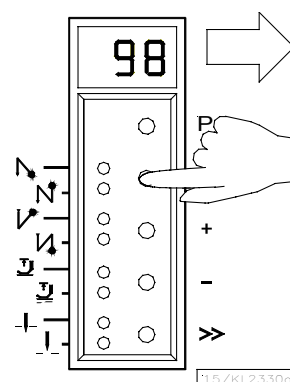
4. Press the E key.
The second 2 digits of the program number are displayed.



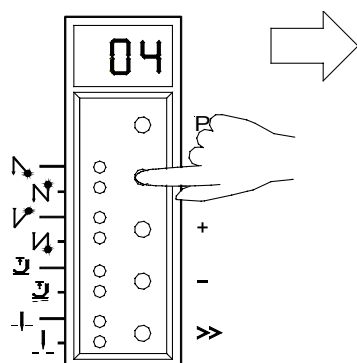
5. Press the E key.
The program modification index is displayed.



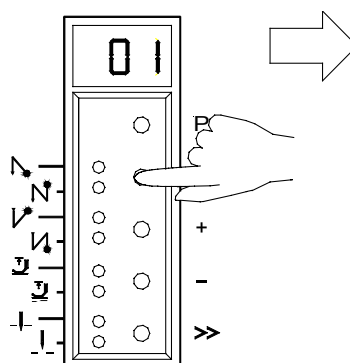
6. Press the E key.
The identification number digits 1 and 2 are displayed.



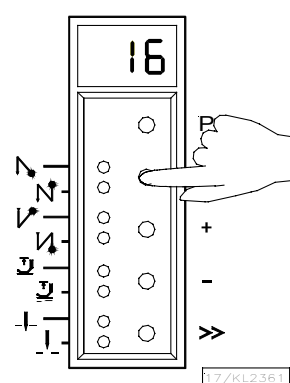
7. Press the E key.
The identification number digits 3 and 4 are displayed.



8. Press the E key.
The identification number digits 5 and 6 are displayed.



9. Press the E key.
The identification number digits 7 and 8 are displayed.



The routine is repeated after pressing the E key. Exit the routine after pressing the P key once. The next parameter number is displayed. Exit programming after pressing the P key. The drive is again ready for sewing.

5 Control Operation with Control Panel

5.1 Operation of the V810 Control Panel

5.1.1 Code Number Input on the V810 Control Panel

Technician Level Code Number => 1907 and Supplier Level Code Number => 3112

Example: Technician level CODE number selection on the V810 control panel

		TURN POWER OFF		
P	+	TURN POWER ON. First digit blinks !	→	C - 0 0 0 0
+	-	Press the + or – key to select the first digit !	→	C - 1 0 0 0
»		Press the >> key ! Second digit blinks !	→	C - 1 0 0 0
+	-	Press the + or – key to select the second digit !	→	C - 1 9 0 0
»	»	Press the >> key twice ! Fourth digit blinks !	→	C - 1 9 0 0
+	-	Press the + or – key to select the fourth digit!	→	C - 1 9 0 7
E		If the CODE number is correct, the first PARAMETER number at the selected level is displayed !	→	F - 1 0 0

5.1.2 Parameter Input at the Operator Level on the V810 Control Panel

Example: CODE number has not been input !

		TURN POWER ON !	→	d A 3 2 0 G
P		First parameter at the operator level is displayed.	→	F - 0 0 0
+		Second parameter at the operator level is displayed. The next or previous parameter can be called by pressing the +/- keys.	→	F - 0 0 1
E		Parameter value is displayed !	→	0 0 3
+		Change parameter value by pressing the +/- keys.	→	X X X
E		Parameter value is entered. Display advances to the next parameter.	→	F - 0 0 2
+		Press the + key several times until the desired parameter is displayed !	→	F - 0 0 9
E		Parameter value is displayed !	→	0

+	New parameter value is displayed !	→	1
E	Next parameter is displayed !	→	F - 0 1 3
or			
P	Exit programming !	→	d A 3 2 0 G

These values are saved when you start sewing. They remain in effect even after turning the machine off!
Using parameter 401 is another possibility for immediate storage without having to start sewing.

Note! The parameter number can also be selected directly, like the code number!

5.1.3 Parameter Input at the Technician/Supplier Level on the V810 Control Panel

Example: After CODE number input at the technician level.

	After CODE number input, the first PARAMETER number is displayed!	→	F - 1 0 0
+	Press the + key ! The next parameter number is displayed !	→	F - 1 1 0
E	Press the E key ! The parameter value is displayed !	→	0 1 8 0
+ -	Change the parameter value !	→	0 X X X
E	Parameter value is entered. Display advances to the next parameter.	→	F - 1 1 1
or			
P	Parameter value is entered. The actual PARAMETER number is displayed!	→	F - 1 1 0
or			
P P	Press the P key twice ! Exit programming !	→	d A 3 2 0 G

These values are saved when you start sewing. They remain in effect even after turning the machine off!
Using parameter 401 is another possibility for immediate storage without having to start sewing.

5.2 V820 Control Panel Operation

5.2.1 Code Number Input on the V820 Control Panel

Technician Level Code Number => 1907 and Supplier Level Code Number => 3112

Example: Technician level CODE number selection on the V820 control panel

	TURN POWER OFF !		
P	+	TURN POWER ON !	→ C-0000
1 9 0 7		Input CODE number !	→ C-1907

E	If CODE number is incorrect, repeat input !	→	C-0000 InFo F1
E	If CODE number is correct, the first PARAMETER number at the selected level is displayed.	→	F-100

5.2.2 Parameter Input at the Operator Level on the V820 Control Panel

Example: CODE number has not been input !

	TURN POWER ON !	→	4000 dA320G
P	Display shows no reading !	→	
E	First parameter at the operator level is displayed. PARAMETER number is not displayed.	→	c2 003
+ -	Change the parameter value !	→	c2 XXX
E	Parameter value is entered. Display advances to the next parameter.	→	c1 003
or			
P	Exit programming !	→	4000 dA320G

5.2.3 Parameter Input at the Technician/Supplier Level on the V820 Control Panel

Example: After CODE number input at the technician level.

	After CODE number input, the first PARAMETER number is displayed.	→	F-100
E	The most significant digit of the PARAMETER number blinks.	→	F-100
1 1 0	Input desired PARAMETER number!	→	F-110
E	If PARAMETER number is incorrect, repeat input!	→	F-XXX InFo F1
E	If PARAMETER number is correct	→	F-110 n1 180
+ -	Change the parameter value!	→	F-110 n1 XXX
E	Parameter value is entered. Display advances to the next parameter.	→	F-111 n2- 4000
or			
P	Parameter value is entered. A new PARAMETER number can be selected.	→	F-XXX
or			
P P	Press the P key twice. Exit programming!	→	4000 dA320G

These values are saved when you start sewing. They remain in effect even after turning the machine off!
Using parameter 401 is another possibility for immediate storage without having to start sewing.

5.3 Program Identification

Function with control panel	Parameter
Program number, modification index and identification number display	179

Display example parameter 179 on the V810 control panel:

- Select parameter 179!
- Press the **E** key → **Sr5** [°] is displayed
- Press the **>>** key → e. g. **5350A** is displayed (Program number with index)
- Press the **E** key → e. g. **010108** is displayed (1st part of identification number)
- Press the **E** key → e. g. **15** is displayed (2nd part of identification number)
- Press the **P** key twice → **dA320G** is displayed (Sewing process can be started)

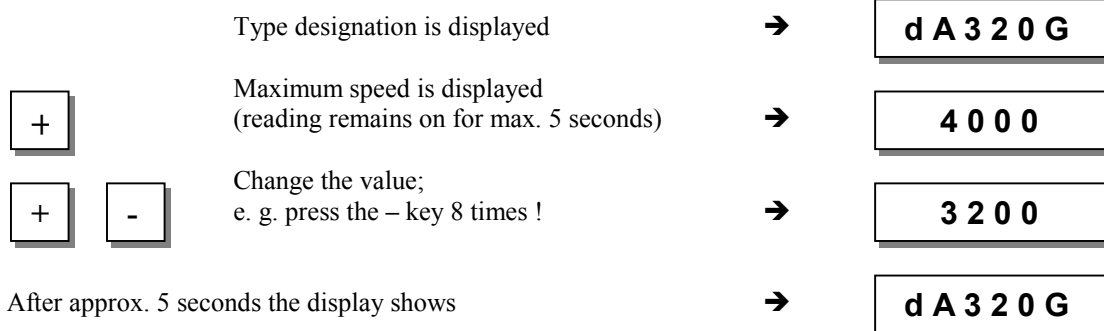
Display example parameter 179 on the V820 control panel:

- Select parameter 179!
- Press the **E** key → **F-179 Sr5** [°] is displayed
- Press the **>>** key → e. g. **5350A** is displayed (Program number with index)
- Press the **E** key → e. g. **01010815** is displayed (Identification number)
- Press the **P** key twice → **dA320G** is displayed (Sewing process can be started)

5.4 Direct Input of Maximum Speed Limitation (DED) with Control Panel

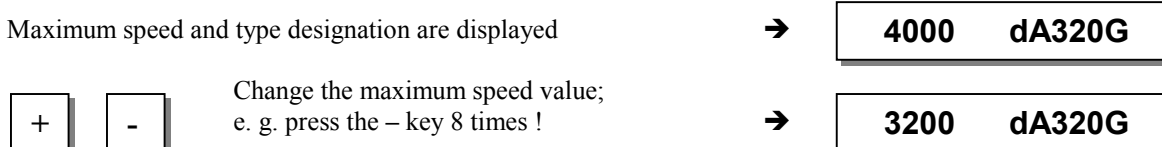
The maximum speed of the machine must be limited to the specific level according to the application. Do the setting at the operator level using the +/- keys at any time. The actual value is shown on the display. The speed setting range is between parameter 111 (upper limit) and parameter 121 (lower limit).

5.4.1 Setting on the V810 Control Panel



5.4.2 Setting on the V820 Control Panel

Actual display value, in the direct mode



Note

Changing the setting of the maximum speed limitation also affects the start backtack, end backtack and stitch counting speeds.

5.5 Keys for Background Information (HIT) with V820

(key assignment see figure on the last page)

Note

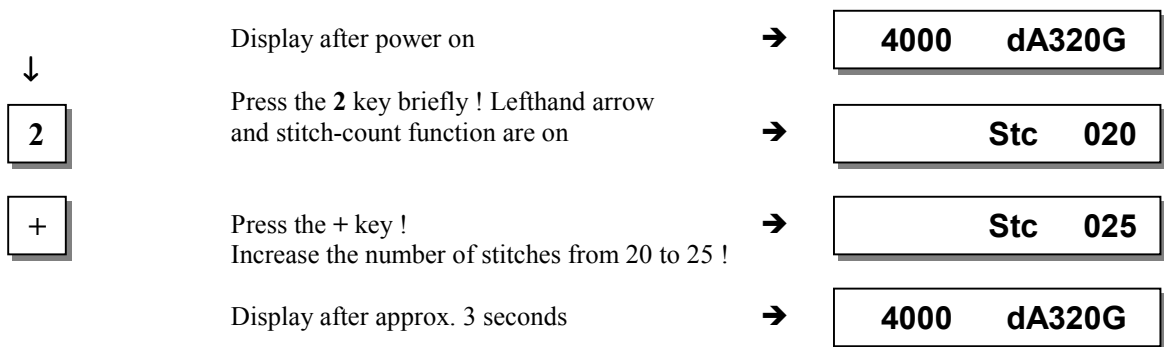
The following functions are possible only with the V820 control panel!

For fast operator information, the values of functions switched on using key 1, 2, 3, 4 or 9 are displayed on the control panel for approx. 3 seconds. During this time, the respective values can be varied directly by pressing the + or - key.

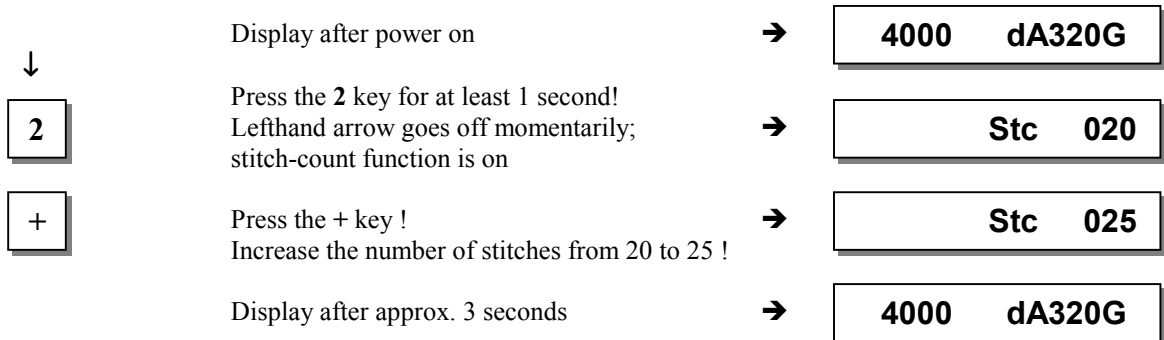
5.5.1 Example of HIT

Increase stitch-count seam section from 20 stitches to 25 stitches.

Stitch-count function (2 key) is off.



Stitch-count function (2 key) is already on.



These values are saved when you start sewing. They remain in effect even after turning the machine off!
Using parameter 401 is another possibility for immediate storage without having to start sewing.

Function key F

Various parameters, even higher-level parameters, can be switched on or off by pressing the function key (9 key).
 The following functions may be assigned to the function key:

1. Softstart ON/OFF
2. Ornamental backtack ON/OFF
3. High lift for walking foot operational mode stored = ON / operational mode not stored = OFF
4. Needle cooling ON/OFF
5. Signals A1 and/or A2 On/Off with slide-in strips 1...4 (lefthand arrow = A1, righthand arrow = A2)

The key assignment can be changed as follows:

	Display after power on	→	4000 dA320G
P	Press the P key!	→	
E	Press the E key!	→	c2 002
E	Press the E key several times until the letter symbol -F- appears ! (ornamental backtack On/Off)	→	-F- 2
-	Press the - key! (softstart On/Off)	→	-F- 1
P	Press the P key!	→	4000 dA320G
The assignment is completed.			

The number of softstart stitches can be changed as follows:

Example: change number of stitches from 1 to 3 (softstart function (9 key) is off).

9	Press the 9 key briefly ! The arrow above the key lights up (softstart function is On)	→	SSc 001
+	Press the + key ! Number of stitches increases.	→	SSc 003
	Display after 3 seconds	→	4000 dA320G

Example: change number of stitches from 1 to 3 (softstart function (9 key) is already on).

9	Press the 9 key for at least 1 sec. ! The arrow above the key goes off momentarily (softstart function is On)	→	SSc 001
+	Press the + key ! Number of stitches increases.	→	SSc 003
	Display after 3 seconds	→	4000 dA320G

These values are saved when you start sewing. They remain in effect even after turning the machine off!
Using parameter 401 is another possibility for immediate storage without having to start sewing.

5.5.2 Further Functions of the V810/V820 Control Panels

- Press the >> key → The most significant digit blinks.
- Press the +/- key briefly → The blinking digit changes by ±1.
- Keep the +/- pressed down → The blinking digit keeps changing its value, as long as the key is pressed down.
- Press the >> key once more → The next digit blinks.
- Press the +/- key as above!
- Press the **E** key → The setting is completed.

With the code number and parameter number there is no carry over when changing from 0 to 9 or vice versa. Parameter values are, however, carried over. Therefore, you can use the +/- keys to change the value between the minimum and maximum value.

If the value change is significant, it is better to use the >> key. If the value change is insignificant, use the +/- keys.

For setting the minimum or maximum value, select the most significant digit using the >> key. Then keep pressing the - key for the minimum or the + key for the maximum value.

The above description is applicable to both control panels, V810 and V820. Direct input of values is possible with the V820 using the 0...9 keys.

5.5.3 Special Functions of the V820 Control Panel

The example below shows how minimum or maximum values can be set quickly.

2	0	0	Select parameter 200	→	F-200
E			Press the E key. The set value is displayed.	→	F-200 t1 050
0	0	0	Press the 0 key three times. The minimum value is displayed.	→	F-200 t1 000
9	9	9	Press the 9 key three times. The maximum value is displayed.	→	F-200 t1 500

5.6 Programming of Seams (TEACH IN)

- A maximum of 99 patterns with a total of 99 seams can be programmed, i. e. 1 pattern with 99 seams each or 99 patterns with 1 seam each. In between, all combinations are possible.
- Programming is possible with or without code number.
- The functions “start backtack”, “end backtack”, “stitch counting”, “light barrier”, “thread trimmer”, “sewing foot lift” and “needle positions” can be assigned individually to each seam.
- The functions of signals A1 and A2 can also be assigned to each seam, on condition that slide-in strip 6, 8, 9, 10 has been inserted into the V820 control panel and activated using the respective parameter 292.
- The stitches for start and end backtack and stitch counting as well as the compensating stitches for the light barrier function can be programmed individually for each seam section.
- Several counted seam sections can be linked (9 key).

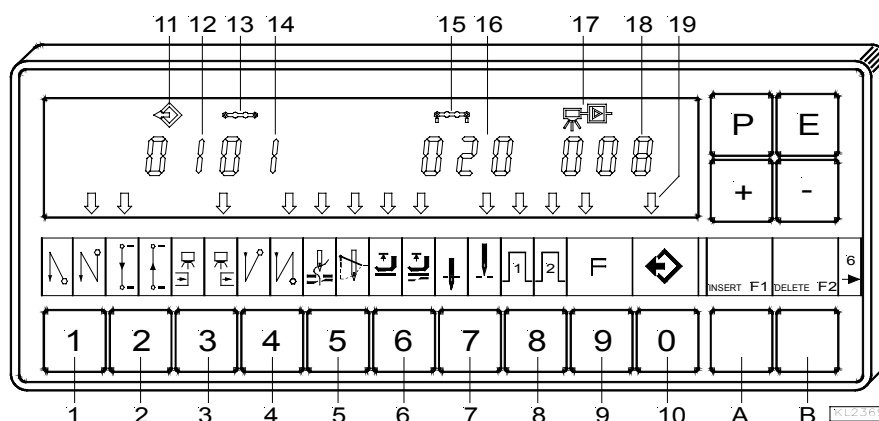
Attention! The “TEACH IN“ function has been changed as compared to the 62 and 82 type series!

Seams and/or patterns can be added by pressing the **INSERT F1** key or erased by pressing the **DELETE F2** key. Before programming new patterns and/or seams it is advisable to erase previously saved patterns and/or seams by pressing the **DELETE F2** key according to chapter 5.6.5. If patterns or seams are to be inserted between existing ones, press the **INSERT F1** key according to chapter 5.6.4.

Example: 3 patterns are in the memory. Delete the 2nd pattern by pressing the **DELETE F2** key. The 3rd pattern takes the place of the 2nd pattern. A new 2nd pattern can be installed by pressing the **INSERT F1** key. The pattern in 2nd place will go back to being pattern no. 3.

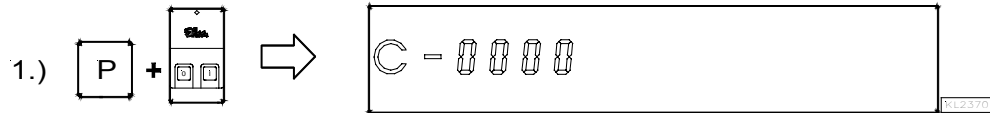
If patterns and/or seams are only to be added, proceed as described in the following chapters.

The figure below shows all the functions assigned to programming of seams **TEACH IN**.

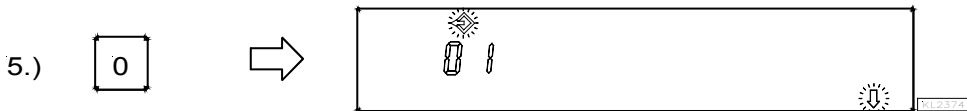
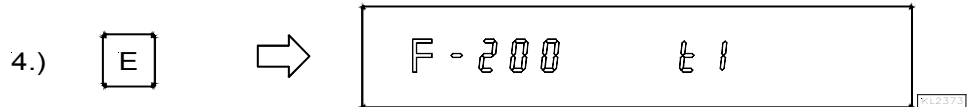
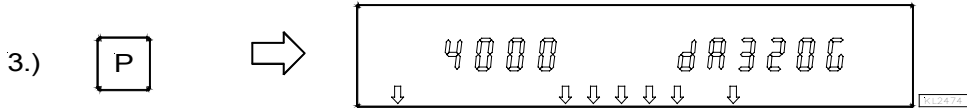
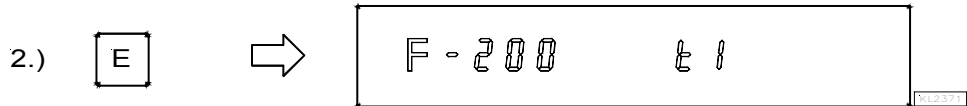


- | | |
|---|--|
| <p>1 = Single start backtack On (lefthand arrow)
Double start backtack On (righthand arrow)
Start backtack Off</p> <p>2 = Counted seam forward On (lefthand arrow)
Counted seam backward On (righthand arrow)
Counted seam Off</p> <p>3 = Light barrier uncovered/covered On (lefthand arrow)
Light barrier covered/uncovered On (righthand arrow)
Light barrier Off</p> <p>4 = Single end backtack On (lefthand arrow)
Double end backtack On (righthand arrow)
End backtack Off</p> <p>5 = Thread trimmer On (lefthand arrow)
Thread wiper On (righthand arrow)
Thread trimmer and thread wiper On (both arrows)
Thread trimmer and thread wiper Off</p> <p>6 = Sewing foot in the seam On (lefthand arrow)
Sewing foot after seam end On (righthand arrow)
Sewing foot in the seam and after seam end On (both arrows)
Sewing foot Off</p> <p>7 = Basic position down (lefthand arrow)
Basic position up (righthand arrow)</p> | <p>8 = Signal A1 On (lefthand arrow)
Signal A2 On (righthand arrow)
Signal A1 and A2 On (both arrows)
Signal A1 and A2 Off</p> <p>9 = Switching from one seam to the next On (lefthand arrow)
Switching from one seam to the next Off</p> <p>10 = Programmed seams TEACH IN On (lefthand arrow)
Programmed seams TEACH IN Off</p> <p>11 = Program symbol</p> <p>12 = Display of program number</p> <p>13 = Seam symbol</p> <p>14 = Display of seam number</p> <p>15 = Symbol for number of stitches of a seam</p> <p>16 = Display of number of stitches</p> <p>17 = Light barrier symbol</p> <p>18 = Display of light barrier compensating stitches</p> <p>19 = Arrow for TEACH IN</p> <p>A = INSERT → Insert seams or patterns</p> <p>B = DELETE → Delete seams or patterns</p> |
|---|--|

5.6.1 Programming after Code Number Input



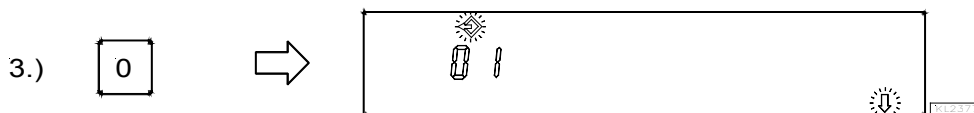
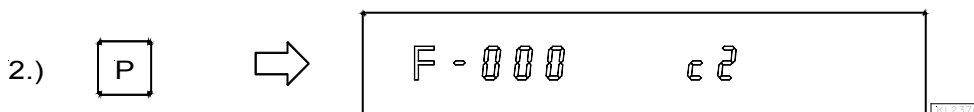
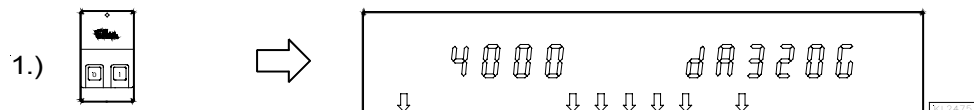
- Input code number using the 0...9 keys.



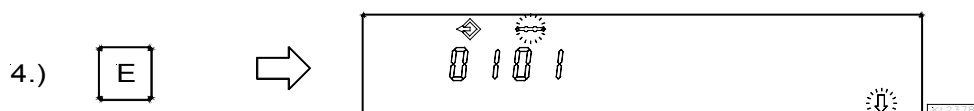
- Activate programming of seams TEACH IN using key 0 / Display of pattern number. New pattern numbers are determined using the 0...9 keys. The next available program number is selected using the + key.

Continue the programming of seams as described in the next chapter “Programming without Code Number Input” from item 4.) onwards.

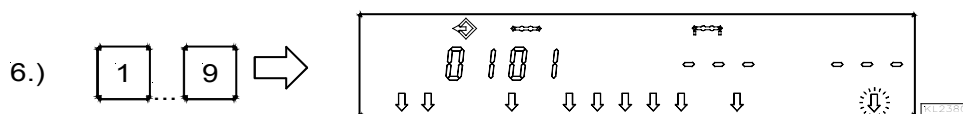
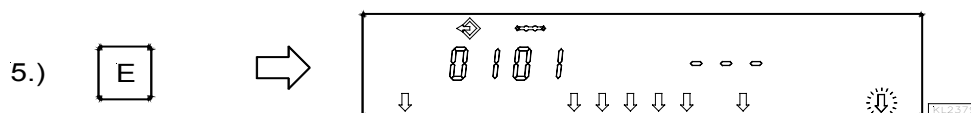
5.6.2 Programming without Code Number Input



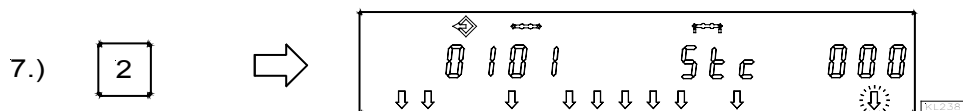
- Activate programming of seams TEACH IN using key 0 / Display of pattern number. New pattern numbers are determined using the 0...9 keys. The next available program number is selected using the + key.



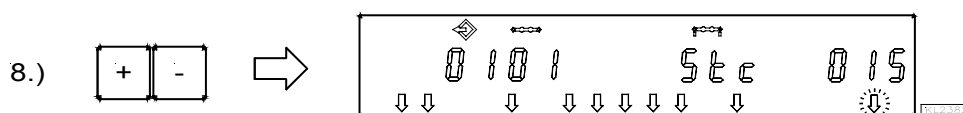
- Display of seam number



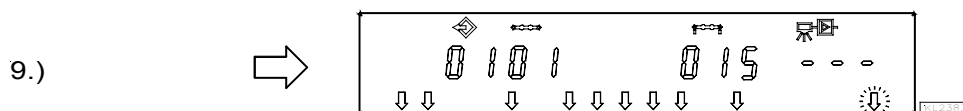
- Enable all desired functions of the actual seam. as for ex. light barrier, by pressing the 1...9 keys.



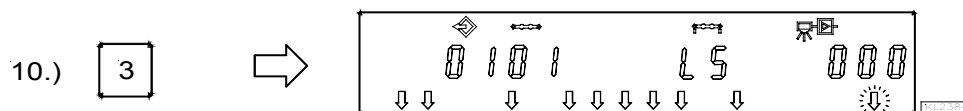
- After having enabled stitch counting using key 2, the number of stitches can be varied within 2 seconds. If stitch counting has already been selected, press key 2 for approx. 2 seconds in order to vary the number of stitches. The arrow above key 2 switches briefly.



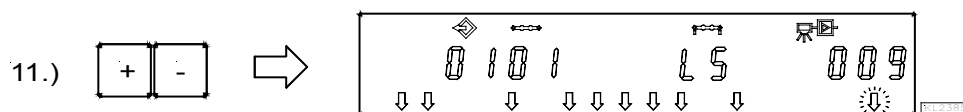
- Press key + / - immediately.



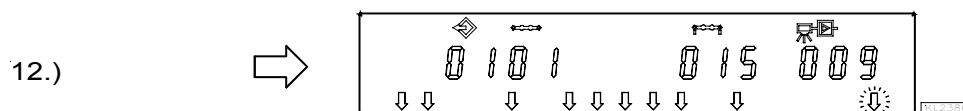
- If the + / - key has not been pressed within 2 seconds, the previously input number of stitches will be displayed under the corresponding symbol (normal display).



- After having enabled the light barrier using key 3, the number of light barrier compensating stitches can be varied within 2 seconds. If the light barrier has already been selected, press key 3 for approx. 2 seconds in order to vary the number of light barrier compensating stitches. The arrow above key 3 switches briefly.



- Press key + / - immediately.



- If the + / - key has not been pressed within 2 seconds, the previously input number of stitches will be displayed under the corresponding symbol (normal display).
- Change to the next seam by pressing the E key once.
- Exit programming of seams by pressing the P key twice.
- **Start sewing** in order to save the values.

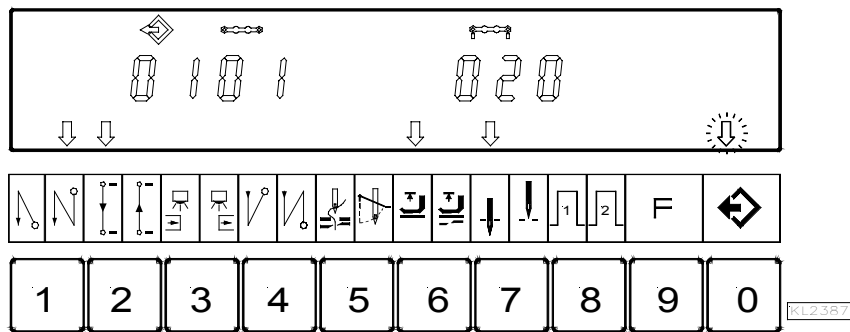
5.6.3 Detailed Example

A seam 01 with double start backtack, stitch counting forward, position down, sewing foot up, a seam 02 with stitch counting forward, position down and a seam 03 with light barrier, double end backtack, thread trimming, position up, sewing foot up, are to be programmed (without code number input) under the next possible pattern number, e.g. 01.

- Turn power on
- Press the **P** key → Parameter 000 is displayed.
- Press the **0** key → Pattern number is displayed. The pattern symbol and the lefthand arrow above the 0 key blink.
- Press the **F2** key → Existing patterns will be deleted. If there is a 2nd pattern or more patterns, pattern number 01 must be inserted by pressing the INSERT F1 key.

Set functions of seam 01:

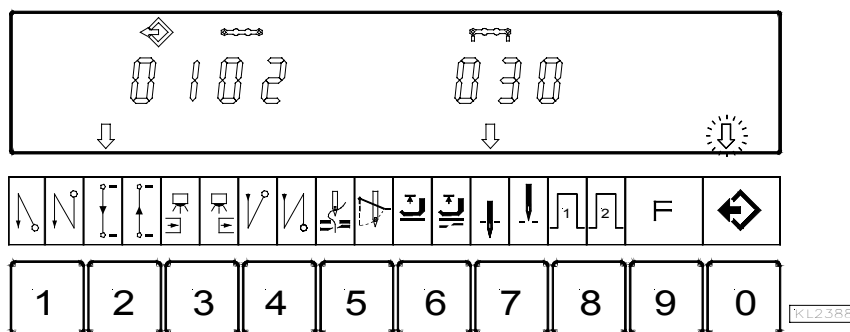
- Press the **E** key → Seam number **01** is displayed.
- Press the **E** key → Functions can be programmed.
- Press the **1** key → The righthand arrow above the 1 key indicates that the double start backtack is On. The start backtack stitches must be input individually.
- Press the **2** key → The lefthand arrow above the 2 key indicates that stitch counting forward is On. The number of stitches can be varied as previously shown.
- Press the **6** key → The lefthand arrow above the 6 key indicates that the sewing foot is automatically lifted in the seam.
- Press the **7** key → The lefthand arrow above the 7 key indicates that the needle is in the down position.



Display of seam **01** after correct function input

Set functions of seam 02:

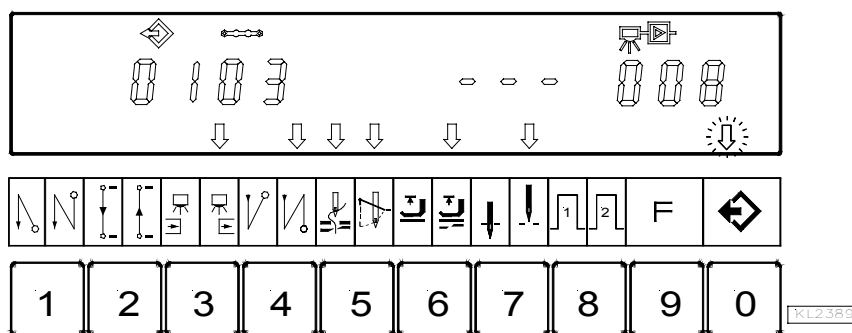
- Press the **E** key → Seam number **02** is displayed.
- Press the **2** key → The lefthand arrow above the 2 key indicates that stitch counting forward is On. The number of stitches can be varied as previously shown.
- Press the **7** key → The lefthand arrow above the 7 key indicates that the needle is in the down position.



Display of seam **02** after correct function input

Set functions of seam 03:

- Press the **E** key → Seam number **03** is displayed.
- Press the **3** key → The righthand arrow above the 3 key indicates that the light barrier operates covered → uncovered. The light barrier compensating stitches can be varied as previously shown.
- Press the **4** key → The righthand arrow above the 4 key indicates that the double end backtack is On. The end backtack stitches must be input individually.
- Press the **5** key → Both arrows above the 5 key indicate that thread trimmer and thread wiper are On.
- Press the **6** key → The lefthand arrow above the 6 key indicates that the sewing foot is automatically lifted in the seam.
- Press the **7** key → The lefthand arrow above the 7 key indicates that the needle is in the up position.



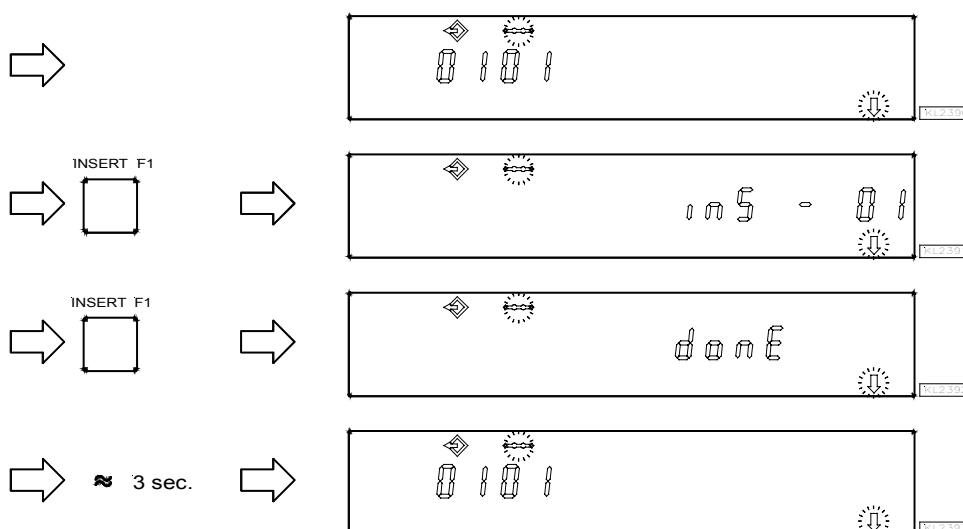
Display of seam 03 after correct function input

- Press the **P** key twice → Exit programming of seams.
- Start sewing once → The programmed data are saved.

5.6.4 Inserting a Seam or Pattern

A pattern or seam can be inserted using the **A "INSERT F1"** key, on condition that the symbol above the pattern or seam number is blinking during programming.

- Select the pattern or seam number where the new number is to be inserted. The symbol above the pattern or seam number must be blinking. Proceed as shown in chapters **"Programming with or without Code Number Input"**.
- Press the **A "INSERT F1"** key twice in brief succession. The new pattern or seam number will be inserted. All subsequent numbers are automatically augmented by "1". The following example shows how a seam is inserted before the existing seam.

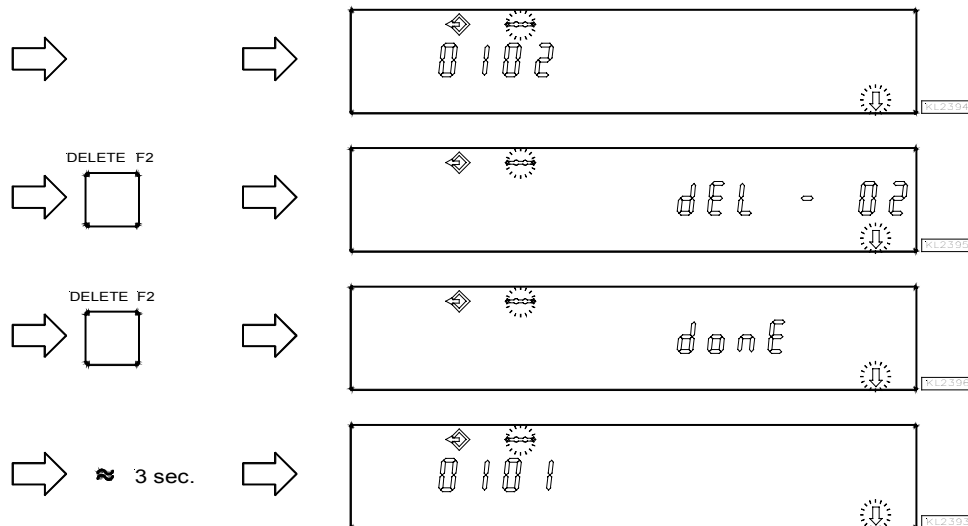


- Any desired function can now be assigned to the new seam.

5.6.5 Deleting a Seam or Pattern

A pattern or seam can be deleted using the B “DELETE F2” key, on condition that the symbol above the pattern or seam number is blinking during programming.

- Select the pattern or seam number to be deleted. The symbol above the pattern or seam number must be blinking. Proceed as shown in chapters “Programming with or without Code Number Input”.
- Press the B “DELETE F2” key twice in brief succession. The pattern or seam number will be deleted. All subsequent numbers are automatically reduced by “1”. The following example shows how seam number 2 is deleted.



5.6.6 Execution (Pattern) Mode

- Press the **0** key → The programmed seams are enabled. Arrow above the 0 key is On (but it does not blink).
- Press the **+/-** key → Selection of pattern. Only if several patterns have been programmed.
- Press the **E** key → If you do not wish to start with the first seam, select a different seam number. Press the E key several times until the desired seam number is displayed.
- The drive can now be started by pressing the pedal, and the pattern can be executed.
- Press the **0** key → The programmed seams are disabled. Arrow above the 0 key is Off.

5.6.7 Further Settings for TEACH IN

Functions	Parameter
Seam suppression if 0 stitches are set (Std)	321

Parameter 321 = 0 Seam suppression disabled: i. e. if the light barrier is Off and stitch counting is set at 0 stitches, a free seam will be performed.

Parameter 321 = 1 Seam suppression enabled: i. e. if the light barrier is Off and stitch counting is set at 0 stitches, the program switches to the next seam if the function is On. In case functions such as start of end backtack, thread trimmer, signals A1 / A2 are On, they will be performed before switching to the next seam.

Functions	Parameter
Correction seam On/Off, seam or pattern interruption by thread trimmer (dkn)	322

Parameter 322 = 0 Correction seam disabled:

- The seam can be interrupted by pressing the pedal to pos. -2. The control switches automatically to the next seam number.

Parameter 322 = 1 Correction seam enabled:

- The seam can be interrupted by pressing the pedal to pos. -2 and thread trimming, and a correction seam (free seam) can be performed manually.
- The correction seam can be completed by pressing the pedal to pos. -2 or by light barrier if it is On. Then the control switches automatically to the next seam number.

Parameter 322 = 2 Seam or pattern interruption by thread trimming:

- The seam can be interrupted by pressing the pedal to pos. -2 and thread trimming, even if the thread trimmer is Off. Then the program switches back to the **first** seam of the selected pattern.

Sewing foot lift functions if TEACH IN is On:

After power on the sewing foot is down even if sewing foot lifting after thread trimming is On on the control panel. the sewing foot can be lifted by pressing the pedal to pos. -1 or -2.

If sewing foot lifting is On at the seam end (righthand arrow above the 6 key on the V820 control panel On), the sewing foot is lifted after completing the seam. After having pressed the pedal to pos. 0 (neutral) the control switches to the next seam, and the sewing foot remains lifted until sewing is started. Whether or not the sewing foot is On or Off does not influence the seam end in the new seam.

Automatic sewing foot lift with pedal forward at the seam end, if light barrier or stitch counting is On:

Parameter 023 = 0 Automatic sewing foot lift Off

Parameter 023 = 1 Automatic sewing foot lift On

Parameter 023	6 key (righthand arrow)	Sewing foot with pedal forward after the seam end	Sewing foot with pedal = 0
0	0	Off	Off
1	0	On	Off
1	1	On	On
0	1	On	On

Functions	Parameter
Sewing foot lifted after power On, or as programmed (FLn)	323

This function is active only if TEACH IN is On.

Parameter 323 = 0 After power On, the sewing foot lift function works as programmed.

Parameter 323 = 1 The sewing foot is always lifted after power On, even if automatic sewing foot lift is not programmed.

Functions	Parameter
TEACH IN On/Off (ti)	324

Using this parameter, TEACH IN can be enabled and disabled without control panel. However, TEACH IN programming is possible only with the V820 control panel.

When the V820 is connected, TEACH IN is enabled and disabled using key 0.

6 Putting into Service

Before putting the control into service, the following must be ensured, checked and/or adjusted:

- The correct installation of the drive, position transmitter and accompanying devices, if necessary
- If necessary, the correct adjustment of the direction of motor rotation using parameter 161
- The setting of the transmission ratio between motor shaft and machine shaft using parameter 272
- The setting of the type of position sensor using parameter 270
- If necessary, the setting of the number of angular degrees after the sensor position using parameter 271
- The correct positioning speed using parameter 110
- The correct maximum speed compatible with the sewing machine using parameter 111
- The setting of the remaining relevant parameters
- Start sewing in order to save the set values

7 Setting and Putting into Service with the Aid of the Fast Installation Routine (SIR)

The Fast Installation Routine (SIR) passes through all parameters necessary for programming the functional sequence and the positions.

Input parameter 500



Parameter for direction of motor rotation



Parameter for transmission ratio



Important! The transmission ratio should be determined and indicated as precisely as possible.

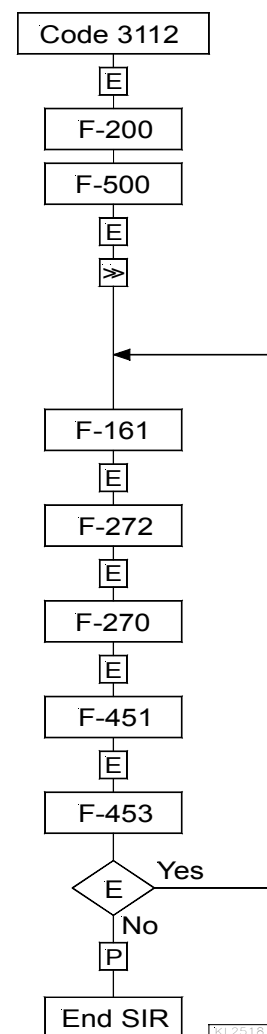
Parameter for type of position sensor



Parameter for position 1



Parameter for position 2



The values can be varied by pressing the +/- keys. When the parameter is displayed on the V810 control panel, press the E key once more for the value to be displayed.

Exit the routine any time by pressing the P key once, and select a new parameter. Exit programming by pressing the P key twice, and the drive is ready for a new sewing operation.

Functions	Parameter
Call-up of the Fast Installation Routine SIR	(Sir) 500

Setting on the V810 control panel:

- Input code number **3112!**
- Press the **E** key → The lowest parameter **2.0.0.** appears at this level
- Select **500** → Parameter **5.0.0.** is displayed
- Press the **E** key → Character **[o]** appears blinking
- Press the **E** key → Parameter **1.6.1.** appears (direction of motor rotation)
- Press the **E** key → Parameter value **1** appears
- Press the +/- key → Parameter value can be changed
- Press the **E** key → Parameter **2.7.2.** appears (transmission ratio)
- Press the **E** key → Parameter value **100** appears
- Press the +/- key → Parameter value can be changed
- Press the **E** key → Parameter **2.7.0.** appears (type of position sensor)
- Press the **E** key → Parameter value **0** appears
- Press the +/- key → Parameter value can be changed
- Press the **E** key → Parameter **4.5.1.** appears (position 1 leading edge; position 1 trailing edge is automatically set at 60°)
- Press the **E** key → Parameter value appears
- Press the +/- key → Parameter value can be changed
- or turn the handwheel → Set position after min. 1 rotation
- Press the **E** key → Parameter **4.5.3.** appears (position 2 leading edge; position 2 trailing edge is automatically set at 60°)
- Press the **E** key → Parameter value appears
- Press the +/- key → Parameter value can be changed
- or turn the handwheel → Set position after min. 1 rotation
- Upon pressing the **E** key once more the program returns to parameter 290
- Press the **P** key twice → Exit SIR routine

Setting on the V820 control panel:

- Input code number **3112!**
- Press the **E** key → The lowest parameter **2.0.0.** appears at this level
- Select **500** → Parameter **5.0.0.** is displayed
- Press the **E** key → Character **[o]** appears blinking
- Press the **E** key → Parameter **161 drE 1.** appears (direction of motor rotation)
- Press the +/- key → Parameter value can be changed
- Press the **E** key → Parameter **272 trr 100** appears (transmission ratio)
- Press the +/- key → Parameter value can be changed
- Press the **E** key → Parameter **270 PGm 0** appears (type of position sensor)
- Press the +/- key → Parameter value can be changed
- Press the **E** key → Parameter **451** appears (position 1 leading edge; position 1 trailing edge is automatically set at 60°)
- Press the +/- key → Parameter value can be changed
- or turn the handwheel → Set position after min. 1 rotation
- Press the **E** key → Parameter **453** appears (position 2 leading edge; position 2 trailing edge is automatically set at 60°)
- Press the +/- key → Parameter value can be changed
- or turn the handwheel → Set position after min. 1 rotation
- Upon pressing the **E** key once more the program returns to parameter 290
- Press the **P** key twice → Exit SIR routine

8 Setting the Basic Functions

8.1 Direction of Motor Rotation

Function with or without control panel	Parameter
Direction of motor rotation (drE)	161

Parameter 161 = 0 Clockwise motor rotation (look at the motor shaft)
Parameter 161 = 1 Counterclockwise motor rotation

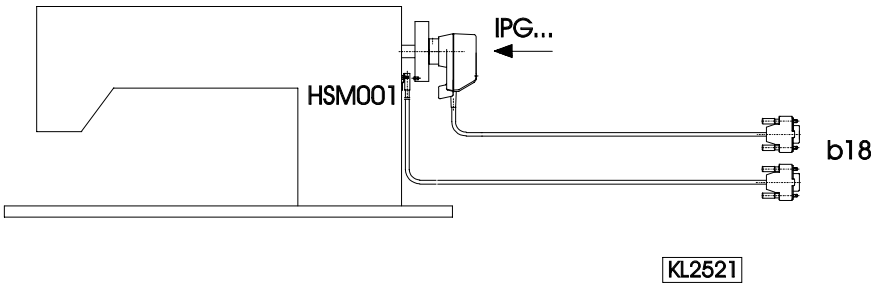


ATTENTION

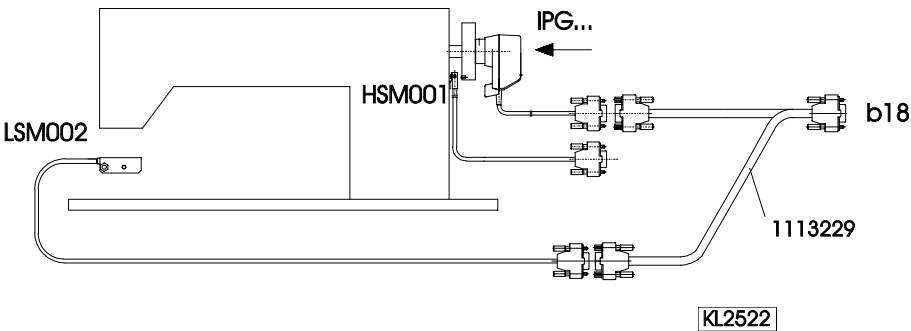
If the motor is mounted differently, e. g. at a different angle or with gear, make sure that the value set using parameter 161 corresponds to the direction of rotation.

8.2 Use of a HSM001 Hall Sensor Module or IPG... Pulse Encoder

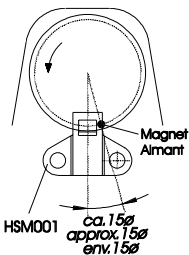
Representation and installation of a HSM001 Hall sensor module or IPG... pulse encoder



Representation and installation of a HSM001 Hall sensor module or IPG... pulse encoder together with a LSM002 light barrier module using adapter cord no. 1113229



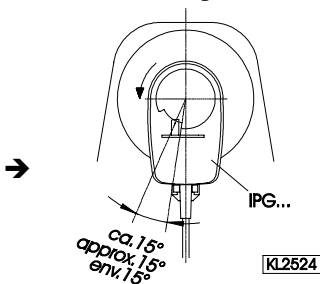
Operation with HSM001 Hall sensor module



KL2523

- ← - Get machine to the needle-up position.
- Position bore for magnet such that the magnet is located approx. 15° after the sensor in the sense of rotation.
- Get machine to the needle-up position.
- Turn disk in the pulse encoder such that the leading edge will be located approx. 15° after the sensor on the board.

Operation with IPG... pulse encoder



8.3 Selection of the Machine Series

Function with or without control panel	Parameter
Display of the machine series (SEL)	280

The various machine models are specified by resistors. The following resistance values (tolerance $\pm 1\%$) are provided:

Machine model = 271, 272, 273, 274, 275	= 100 Ω
205	= 220 Ω
069, 267, 268, 269, 4180, 4280	= 680 Ω
367, 381, 382, 467, 767, 768	= 1000 Ω

The special functional sequences for this machine type and the various preset values are activated depending on the resistor identified. The machine select is displayed using parameter 280. The resistance value is displayed in Ohm directly on the control panel.

8.3.1 Emergency Run Function If Machine Select Is Invalid

If the control cannot identify an admissible value for the machine select resistor, only emergency run functions are possible. All parameter settings and preset values are preserved.

Display:

	V810	V820
Emergency run function due to invalid machine select →	InF A5	InF A5

Available emergency run functions

- Speed is limited to 1000 RPM
- Machine run blockage (safety switch)
- Sewing foot lift when heeling the pedal back (-1, -2)

8.4 Transmission Ratio

Note

The transmission ratio must always be input, because only motors with integrated incremental transmitter will be used.

The transmission ratio should be determined and set as precisely as possible!

The transmission ratio between motor shaft and shaft of the sewing machine head must be input, so that the set speeds of parameters 110...117 correspond to the sewing speeds.

Function with or without control panel	Parameter
Transmission ratio between motor shaft and machine shaft (trr)	272

The transmission ratio can be selected within a range of 020...255 using parameter 272.

Example: With a motor pulley diameter of 40mm and a sewing machine head pulley diameter of 80mm the value 50 can be calculated using the formula below. If the value 200 has been selected in parameter 272, it follows that the motor pulley is double the size of the sewing machine head pulley.

$$\text{Value of parameter 272} = \frac{\text{Motor pulley diameter}}{\text{Machine pulley diameter}} \times 100$$

8.5 Positioning Speed

Function with or without control panel	Parameter
Positioning speed (n1)	110

The positioning speed can be set using parameter 110 on the control within a range of 70...390 RPM.

8.6 Maximum Speed Compatible with the Sewing Machine

The maximum speed of the machine is determined by the selected pulley and by the following settings:

- Set the maximum speed using parameter 111 (n2)
- Set the maximum speed limitation to the specific level according to the application as described in chapter "Direct Input of Maximum Speed Limitation (DED)".

8.7 Maximum Speed

Function with or without control panel	Parameter
Maximum speed (n2)	111

Note

See instruction manual of the sewing machine manufacturer for the maximum speed of the sewing machine.

Note

Select the pulley such that the motor runs at approx. 4000 RPM with max. number of stitches.

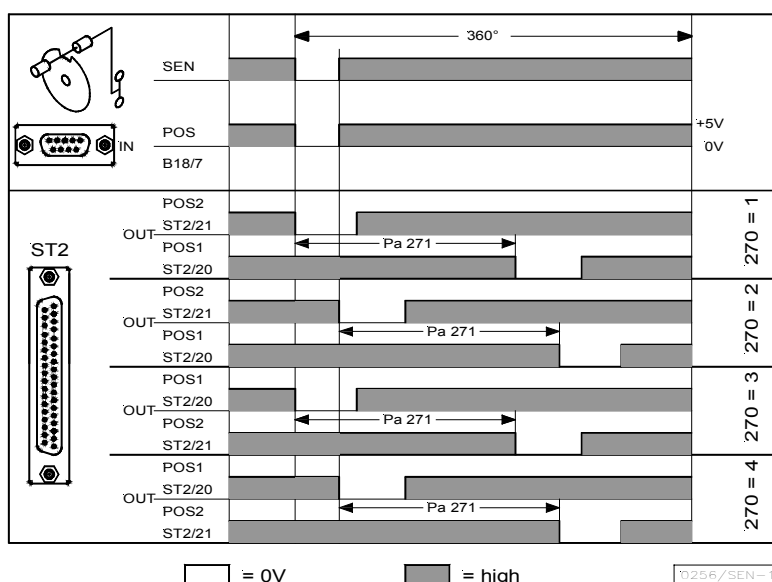
When programming 3-digit or 4-digit parameter values on the control (without control panel), the 2-digit or 3-digit values displayed must be multiplied by 10.

8.8 Positions

Function with or without control panel	Parameter
Selection according to position sensor (PGm)	270
Number of angular degrees from the sensor position to position 2 (PGr)	271
Transmission ratio between motor shaft and machine shaft (trr)	272

After setting parameter 270 at "1, 2, 3 or 4" an angular degree must be selected using parameter 271, which determines the stop in position 2 or 1 after the sensor position. The transmission ratio must already have been input using parameter 272. Connection of a sensor e. g. light barrier to socket B18/7. The following settings are possible using parameter 270:

- Parameter 270 = 0** - The positions can be generated with the help of the transmitter incorporated in the motor and can be set using parameter 171.
- Parameter 270 = 1** - Setting the sensor to position 2.
- Position 1 is set according to the angular degree setting using parameter 271.
 - Start measuring from leading edge position 2.
 - 0V at input B18/7 (inside of the window)
 - +5V at input B18/7 (outside of the window)
- Parameter 270 = 2** - Setting the sensor to position 2.
- Position 1 is set according to the angular degree setting using parameter 271.
 - Start measuring from trailing edge position 2.
 - Input and output level as with setting "1"
- Parameter 270 = 3** - Setting the sensor to position 1.
- Position 2 is set according to the angular degree setting using parameter 271.
 - Start measuring from leading edge position 1.
 - Input and output level as with setting "1"
- Parameter 270 = 4** - Setting the sensor to position 1.
- Position 2 is set according to the angular degree setting using parameter 271.
 - Start measuring from trailing edge position 1.
 - Input and output level as with setting "1"
- Parameter 270 = 5** - There is no position sensor. The drive stops unpositioned. The thread trimmer is suppressed.



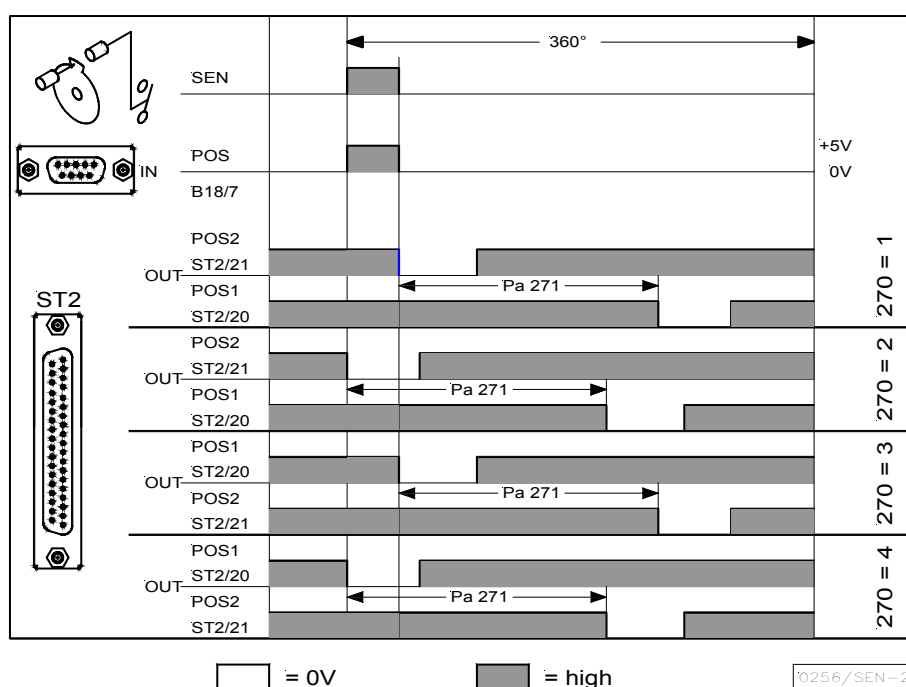
□ = 0V

■ = high

30256/SEN-1

Connection of a sensor e. g. light barrier or proximity switch to socket B18/7. The following settings are possible using parameter 270:

- Parameter 270 = 1**
- Setting the sensor to position 2.
 - Position 1 is set according to the angular degree setting using parameter 271.
 - Start measuring from trailing edge position 2.
 - 0V at input B18/7 (inside of the window)
 - +5V at input B18/7 (outside of the window)
- Parameter 270 = 2**
- Setting the sensor to position 2.
 - Position 1 is set according to the angular degree setting using parameter 271.
 - Start measuring from leading edge position 2.
 - Input and output level as with setting "1"
- Parameter 270 = 3**
- Setting the sensor to position 1.
 - Position 2 is set according to the angular degree setting using parameter 271.
 - Start measuring from trailing edge position 1.
 - Input and output level as with setting "1"
- Parameter 270 = 4**
- Setting the sensor to position 1.
 - Position 2 is set according to the angular degree setting using parameter 271.
 - Start measuring from leading edge position 1.
 - Input and output level as with setting "1"



□ = 0V

■ = high

30256/SEN-2

OUT (position window) = npn transistor (emitter to 0V) is conductive.
The width of position window cannot be adjusted.

8.8.1 Setting the Reference Position (Parameter 270 = 0)

The angular positions necessary on the machine e.g. “needle down position“ or “thread lever up position“ are stored in the control. A reference position is needed in order to establish a relationship between position transmitter information and actual mechanical position.

The reference position must be set:

- for initial operation
- after replacing the motor
- after replacing the microprocessor

Setting the reference position on the control

- Input code number and select parameter 170.
- Press the **E** key → Display **Sr1**
- Press the **>>** key → Display **P o** (character o rotating)
- Turn handwheel until rotating character **o** goes off on the display. → Display **P**
- Then position the notch on the handwheel → Set machine reference point to marking F on the machine.
- Press the **P** key once → Actual parameter number is displayed
- Press the **P** key twice → Exit programming at the technician level

Setting the reference position on the V810 control panel

- Input code number and select parameter 170.
- Press the **E** key → Display **Sr1 [o]**
- Press the **>>** key → Display **PoS0 o** (character o rotating)
- Turn handwheel until rotating character **o** goes off on the display. → Display **PoS0**
- Then position the notch on the handwheel → Set machine reference point to marking F on the machine.
- Press the **P** key once → Actual parameter number is displayed
- Press the **P** key twice → Exit programming at the technician level

Setting the reference position on the V820 control panel

- Input code number and select parameter 170.
- Press the **E** key → Display **F-170 Sr1 [o]**
- Press the **>>** key → Display **PoS0 o** (character o rotating)
- Turn handwheel until rotating character **o** goes off on the display. → Display **PoS0**
- Then position the notch on the handwheel → Set machine reference point to marking F on the machine.
- Press the **P** key once → Actual parameter number is displayed
- Press the **P** key twice → Exit programming at the technician level

If error message F3 (reference position not set) appears, repeat the above setting sequence!

8.8.2 Setting the Positions on the Control (Parameter 270 = 0)

If parameter 270 = 0, the positions integrated in the motor are activated and can be set as follows:

- Input code number and select parameter 171.
- Press the **E** key → **[o]** is displayed
- Press the **>>** key → **P1E** is displayed; set “position 1 On“ on the handwheel
- Press the **E** key → **P2E** is displayed; set “position 2 On“ on the handwheel
- Press the **E** key → **P1A** is displayed; set “position 1 Off“ on the handwheel
- Press the **E** key → **P2A** is displayed; set “position 2 Off“ on the handwheel
- Press the **P** key twice → Exit programming at the technician level

8.8.3 Setting the Positions on the V810 Control Panel (Parameter 270 = 0)

If parameter 270 = 0, the positions integrated in the motor are activated and can be set as follows:

	Select parameter 171	→	F - 171
E	Press the E key	→	[o]
>>	Press the >> key (B key). Display of the 1st parameter value of position 1	→	P 1 E 000
+ -	If necessary, change parameter value by pressing the >> or +/- key or by turning the handwheel	→	P 1 E XXX
E	Parameter value of position 2 appears on the display	→	P 2 E 257
+ -	If necessary, change parameter value by pressing the >> or +/- key or by turning the handwheel	→	P 2 E XXX
E	Parameter value of position 1A appears on the display	→	P 1 A 070
+ -	If necessary, change parameter value by pressing the >> or +/- key or by turning the handwheel	→	P 1 A XXX
E	Parameter value of position 2A appears on the display	→	P 2 A 338
+ -	If necessary, change parameter value by pressing the >> or +/- key or by turning the handwheel	→	P 2 A XXX
P P	Press the P key twice. Settings are completed. Exit programming.	→	d A 320 G

These values are saved when you start sewing. They remain in effect even after turning the machine off!

8.8.4 Setting the Positions on the V820 Control Panel (Parameter 270 = 0)

If parameter 270 = 0, the positions integrated in the motor are activated and can be set as follows:

	Display before programming	→	4000 dA320G
P	A parameter number blinks on the display	→	F-XXX
1 7 1	Input parameter number 171	→	F-171
E	The abbreviation of the parameter appears on the display	→	F-171 Sr2 [o]
>>	Display of the 1st parameter value of position 1 (B key)	→	P1E 000
0 ... 9	If necessary, change parameter value by pressing the +/- or 0...9 keys or by turning the handwheel.	→	P1E XXX

E		Parameter value of position 2 appears on the display	→	P2E 257	
0	...	9	If necessary, change parameter value by pressing the +/- or 0...9 keys or by turning the handwheel.	→	P2E XXX
E		Parameter value of position 1A appears on the display	→	P1A 070	
0	...	9	If necessary, change parameter value by pressing the +/- or 0...9 keys or by turning the handwheel.	→	P1A XXX
E		Parameter value of position 2A appears on the display	→	P2A 338	
0	...	9	If necessary, change parameter value by pressing the +/- or 0...9 keys or by turning the handwheel.	→	P2A XXX
P	P	Settings are completed. Exit programming.	→	4000 dA320G	

Note
When setting the positions by turning the handwheel, make sure that the displayed numerical value changes.

The setting values of the positions are programmed in the factory. After setting the reference position the machine is ready for use. Changing these settings is necessary only on non-standard machines or for fine tuning.

- The display unit of the set position values is “degrees“.

8.9 Display of the Signal and Stop Positions

Function with or without control panel	Parameter
Display of positions 1 and 2 (Sr3)	172

The position settings can easily be checked using parameter 172.

- Select parameter 172
- Without control panel, the control display shows "PoS"
- With control panel, the control panel display shows "Sr3"
- Turn handwheel according to the direction of motor rotation

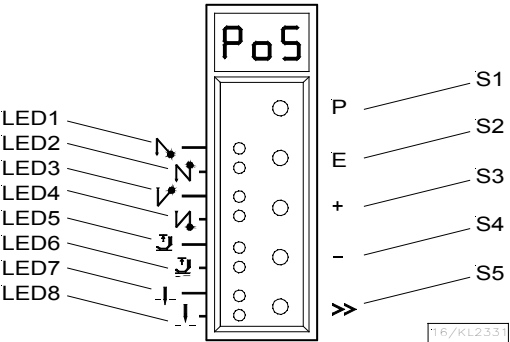
Control display without control panel

- LED 7 on corresponds to position 1
- LED 7 turns off corresponds to position 1A
- LED 8 on corresponds to position 2
- LED 8 turns off corresponds to position 2A

V810/V820 control panel display

- Arrow above symbol "position 1" on the 4 key (V810) / on the 7 key (V820) corresponds to position 1
- Arrow above symbol "position 1" on the 4 key (V810) / on the 7 key (V820) corresponds to position 1A
- Arrow above symbol "position 2" on the 4 key (V810) / on the 7 key (V820) corresponds to position 2
- Arrow above symbol "position 2" on the 4 key (V810) / on the 7 key (V820) corresponds to position 2A

If the V810/V820 control panel is connected, the positions will be displayed only on the control panel!



8.10 Positioning Shift

Function with or without control panel	Parameter
Positioning shift (PSv)	269

Determine using parameter 269 whether the drive is to stop exactly on the position (parameter 269 = 0) or some increments after the position.

8.11 Braking Characteristics

Function with or without control panel	Parameter
Braking effect when varying the preset value ≤ 4 stages (br1)	207
Braking effect when varying the preset value ≥ 5 stages (br2)	208

- Parameter 207 regulates the braking effect between speed stages
- Parameter 208 influences the braking effect for the stop

The following applies to all setting values:
the higher the value, the stronger the braking reaction!

8.12 Braking Power at Standstill

Function with or without control panel	Parameter
Braking power at standstill (brt)	153

This function prevents unintentional "wandering" of the needle at standstill.
The effect can be checked by turning the handwheel.

- The braking power is effective at standstill
 - at stop in the seam
 - after the seam end
- The effect can be set
- The higher the set value, the stronger the braking power

8.13 Starting Characteristics

Function with or without control panel	Parameter
Starting edge (ALF)	220

The drive acceleration dynamics can be adapted to the sewing machine characteristic (light/heavy).

- High setting value = high acceleration

With a high starting edge setting and, in addition, possibly high braking parameter values on a light machine, the characteristic may appear coarse. In this case, one should try to optimize the settings.

8.14 Actual Speed Display

Function with or without control panel	Parameter
Actual speed display (nIS)	139

If parameter 139 = 1, the V810/820 display shows the following information:

During operation:

- The actual speed
- **Example:** 2350 revolutions per minute

2350

2350

At stop in the seam:

- The stop indication



StoP

StoP

At standstill after trimming:

- On the V810, indication of the type of control
- On the V820, indication of the set maximum speed and the type of control
- **Example:** 3300 revolutions per minute and type of control DA320G



DA320G

3300 dA320G

9 Functions with or without Control Panel

9.1 Softstart

Function with or without control panel	Parameter
Softstart On/Off (SSt)	134

Functions:

- after power on
- at the beginning of a new seam
- speed pedal controlled and limited to (n6)
- lower speed of a parallel function prevailing (e. g. start backtack, stitch counting)
- stitch counting synchronized to position 1
- suspension with pedal in position 0 (neutral)
- interruption by full heelback (position -2)

When using the V820 control panel, direct access by means of the function key (9 key) is possible!

Function with control panel	Parameter
Softstart On/Off (-F-)	008 = 1

9.1.1 Softstart Speed

Function with or without control panel	Parameter
Softstart speed (n6)	115

When programming 3-digit or 4-digit parameter values on the control, the 2-digit or 3-digit values displayed must be multiplied by 10.

9.1.2 Softstart Stitches

Function with or without control panel	Parameter
Number of softstart stitches (SSc)	100

The letter symbols in parentheses () are visible only if the V820 control panel is connected!

9.2 Sewing Foot Lifting

Function without control panel	Control	
Automatic in the seam Automatic after thread trimming	lefthand LED above key On righthand LED above key On	S4 key S4 key

Function with control panel	V810	V820
Automatic in the seam Automatic after thread trimming	lefthand arrow above key On righthand arrow above key On 3 key 3 key	6 key 6 key

Function with or without control panel	Parameter
Automatic sewing foot with pedal forward at the seam end if light barrier or stitch counting is On (AFL)	023
Switch-on delay with pedal in position -1 (half heelback) (t2)	201
Start delay after switching off the sewing foot lift signal (t3)	202
Time of full power (t4)	203
Duty ratio (ED) with pulsing (t5)	204
Delay after thread wiping until sewing foot lifting (t7)	206
Fast disabling of sewing foot lift On/Off (FLS)	216
Time monitoring of sewing foot lift (tFL)	297
Upper limit ON period of sewing foot lifting 1...100 (EF-)	298

Sewing foot is lifted:

- in the seam
 - by half heelback (position -1)
 - or automatically (using key **S4** on the control, lefthand LED lights up)
 - or automatically (using key **3** on the V810 control panel)
 - or automatically (using key **6** on the V820 control panel)
 - by pressing the key for manual sewing foot lift
- after thread trimming
 - by heelback (position -1 or -2)
 - or automatically (using key **S4** on the control, righthand LED lights up)
 - or automatically (using key **3** on the V810 control panel)
 - or automatically (using key **6** on the V820 control panel)
 - by pressing the key for manual sewing foot lift
 - automatically using the light barrier with pedal forward according to the setting of parameter 023
 - automatically by stitch counting with pedal forward according to the setting of parameter 023
 - switch-on delay after thread wiper (t7)

It is possible to prevent unintentional foot lifting before thread trimming when changing from pedal position 0 (neutral) to position -2 by setting a switch-on delay (t2) using parameter 201.

Note

If the sewing foot solenoid is On for more than 1 minute, it will switch off automatically. It can then be switched on again by half heelback (-1).

Holding power of the lifted foot:

The sewing foot is lifted by full power. Then the system switches automatically to partial power in order to reduce the load for the control and the connected solenoid.

Set the duration of full power using parameter 203 and the partial holding power using parameter 204.

**CAUTION!**

If the holding power is set too high, the solenoid and the control may be permanently damaged. Please observe the permissible duty ratio (ED) of the solenoid, and set the appropriate value according to the table below.

Value	Duty ratio (ED)	Effect
1	1 %	low holding power
100	100 %	high holding power (full power)

Sewing foot lowers:

- Press pedal to position 0 (neutral)
- Press pedal to position ½ (slightly forward)
- Release key for manual sewing foot lift
- After the time limit set with parameter 297

Upon pressing the pedal forward from lifted sewing foot, the start delay (t3), that can be set using parameter 202, becomes effective.

See also chapter "Timing Diagrams"!

9.3 Start Backtack

Function without control panel	Control
Single start backtack Double start backtack Start backtack Off	LED 1 On LED 2 On both LEDs Off S2 key

Function with control panel	V810/V820
Single start backtack Double start backtack Start backtack Off	lefthand arrow above key On righthand arrow above key On both arrows Off 1 key

Function with or without control panel	Parameter
Stitch length during backtack (SLu) Start and end backtack can be interrupted with pedal in position 0 (neutral) (StP)	137 284

The start backtack starts by pressing the pedal forward at the beginning of the seam. From lifted sewing foot the backtack is delayed by the time t3 (start delay after switching off the sewing foot lift signal). The start backtack is executed automatically at speed n3. They cannot be interrupted. If softstart is running parallel, the respective lower speed is prevailing.

Whether or not an interruption of the start and end backtack is possible can be determined with parameter 284. It does not work with the ornamental backtack.

- **Parameter 284 = 0** Automatic backtack can not be interrupted
- **Parameter 284 = 1** Backtack can be interrupted by pedal position 0 (neutral)

By pressing the pedal forward after an interrupted start backtack, the backtack can be continued; by half heelback (-1), the the sewing foot can be lifted, or, by full heelback (-2), trimming without end backtack can be completed. The sewing foot is not automatically lifted when interrupting the backtack.

The start backtack stitch length is set with the following parameter:

- **Parameter 137 = 0** Backtack is performed with long stitches.
- **Parameter 137 = 1** Backtack is performed with normal stitch length.

The stitch length (normal or long stitch) during backtack can be selected with parameter 137. The indicator does not light up during backtack.

Counting as well as switching the stitch regulator on and off is synchronized to position 1.

The stitch regulator will be switched off after completion of the backward section and the start backtack speed after a delay time t1. Then pedal control is returned.

9.3.1 Speed n3 at the Start of the Seam

Function with or without control panel	Parameter
Start backtack speed (n3)	112

When programming 3-digit or 4-digit parameter values on the control, the 2-digit or 3-digit values displayed must be multiplied by 10.

9.3.2 Stitch Counting for Start Backtack

Function with or without control panel	Parameter
Number of stitches forward (c2) Number of stitches backward (c1)	000 001

The start backtack stitches forward or backward can be programmed and varied using the above parameters directly on the control or on a connected V810/V820 control panel.

For fast operator information (HIT) when using the V820 control panel, the value of the function switched on by means of key 1 can be displayed for approx. 3 seconds. During this time, the value can be varied directly by pressing key + or -.

9.3.3 Stitch Correction and Speed Release

Function with or without control panel	Parameter
Stitch correction time (t8)	150
Delay until speed release after start backtack (t1)	200

Speed release after single and double backtack can be influenced by parameter 200.

In the case of slow backtack mechanisms it is possible to delay disabling of the stitch regulator in the single and double start backtack by the time t8 (start backtack stitch correction) and thereby prolong the backward section. This time-lag can be selected using parameter 150.

9.3.4 Double Start Backtack

The forward section will be sewn for a number of stitches that can be set. Then the stitch regulator signal will be issued and the backward section will be executed. The number of stitches for the two sections can be set separately.

9.3.5 Single Start Backtack

The backtacking signal will be issued and the backward section will be executed for a number of stitches that can be set.

9.4 End Backtack

Function without control panel	Control
Single end backtack Double end backtack End backtack Off	LED 3 On LED 4 On both LEDs Off S3 key

Function with control panel	V810	V820
Single end backtack Double end backtack End backtack Off	lefthand arrow above key On righthand arrow above key On both arrows Off 2 key	4 key

The end backtack starts by heelback, in a seam with stitch counting at the end of counting, or, from the light barrier seam at the end of the light barrier compensating stitches. The stitch regulator is immediately enabled from machine standstill. After lowering the sewing foot, the switch-on point of the signal is delayed by the time t3 (start delay after switching off the sewing foot lift signal). The first leading edge of position 1 counts as 0 stitch whenever the function is not started in position 1. Counting and switching the stitch regulator off is synchronized to position 1.

End backtack as well as end stitch condensing are performed automatically at speed n4. They cannot be interrupted.

From full machine run, the end backtack will be switched in only after having reached the speed n4 and synchronization to position 1.

Whether or not an interruption of the start and end backtack is possible can be determined with parameter 284. It does not work with the ornamental backtack.

- **Parameter 284 = 0** Automatic backtack can not be interrupted
- **Parameter 284 = 1** Backtack can be interrupted by pedal position 0 (neutral)

By pressing the pedal forward after an interrupted end backtack, the backtack can be continued; by half heelback (-1), the the sewing foot can be lifted, or, by full heelback (-2), trimming without end backtack can be completed. The sewing foot is not automatically lifted when interrupting the backtack.

The end backtack stitch length is set with the following parameter:

- **Parameter 137 = 0** Backtack is performed with long stitches.
- **Parameter 137 = 1** Backtack is performed with normal stitch length.

The stitch length (normal or long stitch) during backtack can be selected with parameter 137. The indicator does not light up during backtack.

9.4.1 Speed n4 at the Seam End

Function with or without control panel	Parameter
End backtack/end stitch condensing speed (n4)	113

When programming 3-digit or 4-digit parameter values on the control, the 2-digit or 3-digit values displayed must be multiplied by 10.

9.4.2 Stitch Counting for End Backtack

Function with or without control panel	Parameter
Number of stitches forward (c3)	002
Number of stitches backward (c4)	003

The end backtack stitches backward or forward can be programmed and varied using the above parameters directly on the control or on a connected V810/V820 control panel.

For fast operator information (HIT) when using the V820 control panel, the value of the function switched on by means of key **4** can be displayed for approx. 3 seconds. During this time, the value can be varied directly by pressing key + or -.

9.4.3 Stitch Correction and Last Stitch Backward

Function with or without control panel	Parameter
Last stitch backward On/Off (FAR)	136
Stitch correction time (c9)	151

The backtack solenoid can be delayed in the double end backtack by selecting a stitch correction time (t9) using parameter 151.

For some sewing procedures it is desirable that the backtack solenoid in the single end backtack is disabled only after trimming. These functions can be selected using parameter 136.

Parameter 136 = 0 Trimming stitch forward and thread wiper function On.
Parameter 136 = 1 Trimming stitch backward and thread wiper function On.
Parameter 136 = 2 Trimming stitch forward with short trimmer signal On. Thread wiper function Off.

9.4.4 Double End Backtack

The backward section and/or end stitch condensing will be executed for a number of stitches that can be set. Then the stitch regulator will be disabled and the forward section and/or normal stitch condensing stitches will be executed. The number of stitches for the two sections can be set separately.

After stitch counting (parameter 003) the trimming function will be initiated. During the entire operation the sewing speed is reduced to speed n4, with the exception of the last stitch, which will be performed at positioning speed n1.

In the case of slow backtack mechanisms it is possible to delay disabling of the stitch regulator in the single and double end backtack by the time t9 (end backtack stitch correction).

9.4.5 Single End Backtack

The stitch regulator signal will be issued and the backward section will be executed for a number of stitches that can be set. During the last stitch the speed is reduced to positioning speed.

9.4.6 Backtack Synchronization

Function with or without control panel	Parameter
Backtack synchronization for start and end backtack On/Off (nSo)	123
Backtack synchronization speed (nrS)	124

If parameter 123 is on, the backtack speed will be switched to backtack synchronization speed one stitch before engaging and disengaging of the backtack solenoid. The backtack speed is released at the next position 2. If the synchronization speed, that can be set using parameter 124, is higher than the backtack speed, the latter is maintained. Backtack synchronization is possible in the start and end backtack.

9.5 Start Ornamental Backtack

Function without control panel	Control
Single start ornamental backtack Double start ornamental backtack Start ornamental backtack Off	LED 1 On LED 2 On both LEDs Off S2 key

Function with control panel	V810/V820
Single start ornamental backtack Double start ornamental backtack Start ornamental backtack Off	lefthand arrow above key On righthand arrow above key On both arrows Off 1 key

Function with or without control panel	Parameter
Number of ornamental backtack stitches forward (SAv)	080
Number of ornamental backtack stitches backward (SAr)	081
Start backtack speed (n3)	112
Function "ornamental backtack" On/Off (SrS)	135
Start delay after switching off the sewing foot lift signal (t3)	202
Ornamental backtack stop time (tSr)	210
Last counted forward section in the start ornamental backtack On/Off (Zrv)	215

Difference from the standard start backtack:

- The drive stops for stitch regulator switching.
- The stop time can be set.
- After the backtack section backward follows a backtack section forward with the same number of stitches as the backward section according to the setting of parameter 215.
- The number of ornamental backtack stitches can be set with separate parameters.
- Machines with autoselect resistor 100Ω emit the signal "switch stitch length" during backtack.

When using the V820 control panel, direct access by means of the function key (9 key) is possible!

Function with control panel	Parameter
Ornamental backtack On/Off (-F-)	008 = 2

The letter symbols in parentheses () are visible only if the V820 control panel is connected!

9.6 End Ornamental Backtack

Function without control panel	Control
Single end ornamental backtack Double end ornamental backtack End ornamental backtack Off	LED 3 On LED 4 On both LEDs Off S3 key

Function with control panel	V810	V820
Single end ornamental backtack Double end ornamental backtack End ornamental backtack Off	lefthand arrow above key On righthand arrow above key On both arrows Off	2 key 4 key

Function with or without control panel	Parameter
Number of ornamental backtack stitches backward (SEv)	082
Number of ornamental backtack stitches forward (SEr)	083
End backtack speed (n4)	113
Function "ornamental backtack" On/Off (SrS)	135
Start delay after switching off the sewing foot lift signal (t3)	202
Ornamental backtack stop time (tSr)	210

Difference from the standard end backtack:

- The drive stops for stitch regulator switching
- The stop time can be set
- The number of ornamental backtack stitches can be set with separate parameters.
- Machines with autoselect resistor 100Ω emit the signal "switch stitch length" during backtack.

When using the V820 control panel, direct access by means of the function key (9 key) is possible!

Function with control panel	Parameter
Ornamental backtack On/Off (-F-)	008 = 2

9.7 Intermediate Backtack

Upon pressing an external key on socket A/5-33, the backtack solenoid can be switched on anywhere in the seam and at standstill. The speed limitation of parameter 288 or 289 becomes effective according to the setting of parameters 135 and 287.

See List of Parameters chapter **Connection Diagram!**

Function with or without control panel	Parameter
Speed limitation DB3000 for manual backtack On/Off (dbA)	287
Speed limitation for manual ornamental backtack (n9)	288
Speed limitation for manual backtack (n11)	289

Intermediate backtack:

Backward sewing with speed limitation according to the setting of parameter 289 is performed when the key is pressed down.

Intermediate ornamental backtack:

By pressing the key in the seam, the drive stops and the backtack solenoid is activated. The speed limitation according to the setting of parameter 288 is effective during the entire intermediate backtack operation. Backward sewing is performed when the key is pressed down and the stitches are counted. When releasing the key, the drive stops, the backtack solenoid is switched off and a forward seam is performed according to the counted stitches after the ornamental backtack stop time. After that the speed limitation is released.

9.8 Backtack Suppression/Recall

Effective in standard and ornamental backtack

The next backtack operation can be suppressed or recalled once by pressing an external key on socket A/14-33. This is acknowledged by a light emitting diode connected to socket A/24. It goes off when the backtack function is completed or the key is pressed again.

Upon pressing	Start backtack On	Start backtack On	End backtack On	End backtack On
Before start of seam	No backtack	Backtack	---	---
In the seam	---	---	No backtack	Backtack

The double backtack is performed in the above cases.
See List of Parameters chapter **Connection Diagram!**

9.9 Holding Power of the Stitch Regulator Solenoid

Function with or without control panel	Parameter
Time of full power (t10)	212
Holding power of the stitch regulator solenoid (t11)	213
Upper limit stitch regulator ON period (EV-)	299

The stitch regulator solenoid is engaged by full power. Then the system switches automatically to partial power in order to reduce the load for the control and the connected solenoid. Set the duration of full power using parameter 203 and the partial holding power using parameter 204.



CAUTION!

If the holding power is set too high, the solenoid and the control may be permanently damaged. Please observe the permissible duty ratio (ED) of the solenoid and set the appropriate value according to the table below.

Value	Duty ratio (ED)	Effect
1	1 %	low holding power
100	100 %	high holding power (full power)

9.10 Reverse Motor Rotation

Function with or without control panel	Parameter
Positioning speed (n1)	110
Number of reversion increments (ird)	180
Switch-on delay of reverse motor rotation (drd)	181
Reverse motor rotation On/Off (Frd)	182

The function "reverse motor rotation" is performed after trimming. When the stop position is reached, the drive stops for the duration of the switch-on delay of reverse motor rotation (parameter 182). Then it runs in reverse direction at positioning speed for an adjustable number of degrees. After reversion the thread wiper will be activated for the time t6.

9.11 Machine Run Blockage (Safety Switch)



CAUTION!

This is not a safety function. The line voltage must still be switched off during maintenance and repair work.

Function with or without control panel	Parameter
New sewing start after machine run blockage (PdO)	281
Functioning of the switch for machine run blockage (LOS)	282
Function "machine run blockage" (LSP)	283

Select how the drive is restarted after deactivating machine run blockage using parameter 281.

- **Parameter 281 = 0** Immediate start from any pedal position
- **Parameter 281 = 1** Start only with pedal in position 0 (neutral)

Determine the functioning of the safety switch using parameter 282.

- **Parameter 282 = 0** Make contact [N.O.] (switch closed = machine run blockage On)
- **Parameter 282 = 1** Break contact [N.C.] (switch open = machine run blockage On)

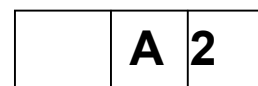
Switch the function "machine run blockage" using parameter 283.

- **Parameter 283 = 0** Machine run blockage Off
- **Parameter 283 = 1** Function "machine run blockage" 1 (safety function) fastest stop without positioning
- **Parameter 283 = 2** Function "machine run blockage" 2 (control function) with positioning in the actual position

The function "machine run blockage" is enabled by connecting a switch to socket A/11-33 or B/2-3. When using a V810 / V820 control panel, an audible signal can be switched on and/or off using parameter 127.

Display after enabling machine run blockage without control panel:

Control display



Display and signal after enabling machine run blockage with control panel:

V810 control panel display

(symbol blinks and audible signal if parameter 127 = 1)



V820 control panel display

(symbol blinks and audible signal if parameter 127 = 1)



In all variants of the function "machine run blockage" sewing foot lifting is possible, needle up/down or its variants, however, is not.

9.11.1 Machine Start Blockage (Blockage 1 and 2)

If the input "machine run blockage" is activated at machine standstill, the run of the drive is blocked despite pressing the pedal. Machine start is possible only after deactivating the input.

9.11.2 Function "Machine Run Blockage" 1 (Safety Function) Parameter 283 = 1

In the start backtack:

- Fastest stop without positioning. The start backtack will be interrupted.
- Trimming is impossible.
- After deactivating the machine run blockage the start backtack and the seam will be continued by pressing the pedal to position >1, or thread trimming will be initiated by full heelback (-2).

In the free seam:

- Fastest stop without positioning.
- Trimming is impossible.
- After deactivating the machine run blockage the seam will be continued by pressing the pedal to position >1, or thread trimming will be initiated by full heelback (-2).

During stitch counting:

- Fastest stop without positioning. Stitch counting will be interrupted.
- Trimming is impossible.
- After deactivating the machine run blockage stitch counting will be continued by pressing the pedal to position >1, or thread trimming will be initiated by full heelback (-2).

During the light barrier compensating stitches:

- Fastest stop without positioning. The light barrier compensating stitches will be interrupted.
- Trimming is impossible.
- After deactivating the machine run blockage the light barrier compensating stitches will be continued by pressing the pedal to position >1, or thread trimming will be initiated by full heelback (–2).

In the end backtack:

- Fastest stop without positioning. The end backtack will be interrupted.
- Trimming is impossible.
- After deactivating the machine run blockage the end backtack will be continued by pressing the pedal to position >1, or thread trimming will be initiated by full heelback (–2).

9.11.3 Function “Machine Run Blockage” 2 (Control Function) Parameter 283 = 2**In the start backtack, during stitch counting and the light barrier compensating stitches:**

- Stop in the selected position.
- Trimming without end backtack by full heelback is possible when machine run blockage is On. In this case, a new seam will be started after deactivating machine run blockage.
- After deactivating the machine run blockage the start backtack or stitch counting will be continued by pressing the pedal to position >1, or thread trimming will be initiated by full heelback (–2).

In the free seam:

- Stop in the selected position.
- Trimming without end backtack by full heelback is possible when machine run blockage is On. In this case, a new seam will be started after deactivating machine run blockage.
- After deactivating the machine run blockage the seam will be continued by pressing the pedal to position >1, or thread trimming will be initiated by full heelback (–2).

In the end backtack:

- The end backtack will be completed with a stop in the selected position. The start of the next seam is blocked.
- Trimming by full heelback is possible when machine run blockage is On.
- After deactivating the machine run blockage the sewing operation will be completed by thread trimming by half heelback, unless the thread has been trimmed before.
- If the thread is trimmed when machine run blockage is On, a new seam will be started after deactivating the machine run blockage.

During thread trimming:

- Thread trimming will be completed. The start of the next seam is blocked.
- After deactivating the machine run blockage the start of the next seam is possible.

9.12 Bobbin Thread Monitor

Function with or without control panel	Parameter
Stop after completion of bobbin thread monitor stitch counting	(cFw) 085
Bobbin thread monitor On/Off	(rFw) 195

If the bobbin thread monitor function is On (parameter 195 = 1...4), the type of control and the set maximum speed are displayed for 1 sec. After power On.

Display of maximum speed:
(e. g. 4000 RPM)



4000 dA320G



Type of control

Then the bobbin thread monitor status display appears.

Number of bobbin thread monitor stitches: →
(e. g. 250 stitches)

250

--||--



Status display

At this point (after power On) the number of stitches can be regulated in steps of 10 with the +/- key.

The function **DED = Direct Input of Speed Limitation** is available only after having started sewing or trimming.

9.12.1 Input Signals

The form of input signal helps distinguish which of the bobbins is empty.

Righthand bobbin empty:	= Continuous signal (min. 1 sec.)
Lefthand bobbin empty:	= Frequency 5 Hz or signal for approx. 100 msec
Lefthand and righthand bobbin empty:	= Frequency 10 Hz or signal for approx. 50 msec

9.12.2 Parameter 195 = 0 – No Bobbin Thread Monitor Function

The bobbin thread monitor function is Off.

9.12.3 Parameter 195 = 1 – Model 270 / No Stop / Sewing Foot Down after Seam End

After the bobbin is empty, the bobbin thread counter is activated when receiving an input signal, and the bobbin thread monitor symbol blinks on the display of the V810 or V820 control panel. After counting, **C** is displayed for the lefthand bobbin and **D** for the righthand bobbin on the V810 control panel. On the V820 control panel, another symbol for the righthand, lefthand bobbin or both bobbins is displayed instead of the type designation. This symbol is also displayed on the control unit. Furthermore, the respective LEDs blink with approx. 4 Hz on the machine (righthand, lefthand or both). The displays remain on even if the input signal is no longer received. The sewing foot is not lifted after thread trimming and after counting. The sewing foot is lifted only after the pedal has been heeled back from position 0 (neutral). The displays go off (the blinking frequency of 4 Hz is switched off), if no more input signals are received after thread trimming and the subsequent sewing start after 14 stitches. This is an indicator that the bobbin has been replaced, and the bobbin thread counter is reset to zero.

9.12.4 Parameter 195 = 2 – Model 767, N291 / With Stop / Sewing Foot Up after Seam End

After the bobbin is empty, the bobbin thread counter is activated when receiving an input signal, and the bobbin thread monitor symbol blinks on the display of the V810 or V820 control panel. After counting, **C** is displayed for the lefthand bobbin and **D** for the righthand bobbin on the V810 control panel. On the V820 control panel, another symbol for the righthand, lefthand bobbin or both bobbins is displayed instead of the type designation. This symbol is also displayed on the control unit. Furthermore, the respective LEDs blink with approx. 4 Hz on the machine (righthand, lefthand or both), and the drive stops. Even automatic seam sections like seams with stitch counting or light barrier seams are interrupted. They can be completed by pressing the pedal forward from position 0 (neutral).

Note the following exceptions:

- If bobbin thread counting is completed in the start backtack, the latter will be completed and the drive stops.
- If bobbin thread counting is completed in the end backtack, the latter will be fully completed with the thread trimming operation.

After thread trimming the sewing foot is automatically lifted. The displays go off (the blinking frequency of 4 Hz is switched off), if no more input signals are received after thread trimming and the subsequent sewing start after 14 stitches. This is an indicator that the bobbin has been replaced, and the bobbin thread counter is reset to zero.

9.12.5 Parameter 195 = 3 – Model 767, N291 / With Stop / Sewing Foot Down after Seam End

After the bobbin is empty, the bobbin thread counter is activated when receiving an input signal, and the bobbin thread monitor symbol blinks on the display of the V810 or V820 control panel. After counting, **C** is displayed for the lefthand bobbin and **D** for the righthand bobbin on the V810 control panel. On the V820 control panel, another symbol for the righthand, lefthand bobbin or both bobbins is displayed instead of the type designation. This symbol is also displayed on the control unit. Furthermore, the respective LEDs blink with approx. 4 Hz on the machine (righthand, lefthand or both), and the drive stops. The sewing foot is not lifted after thread trimming. The sewing foot is lifted only after the pedal has been heeled back from position 0 (neutral).

The displays go off (the blinking frequency of 4 Hz is switched off), if no more input signals are received after thread trimming and the subsequent sewing start after 14 stitches. This is an indicator that the bobbin has been replaced, and the bobbin thread counter is reset to zero.

9.12.6 Parameter 195 = 4 – With Bobbin Thread Monitor Stitch Counting

By pressing a key connected to socket A/12-33, a stitch counter is activated (max. 25500 stitches), and the bobbin thread monitor symbols are continuously displayed. When a V820 control panel is connected, the function can be activated using key 8.

At each intermediate stop, the remaining number of stitches will be displayed. When counting is completed, the bobbin thread monitor symbol (righthand or lefthand) blinks on the display of the V820 control panel. **C** is displayed for the lefthand bobbin and **D** for the righthand bobbin on the V810 control panel. Furthermore, the respective LEDs blink with approx. 4 Hz on the machine, and the drive stops. Even automatic seam sections, except start and end backtack, are interrupted. The seam can be continued by pressing the pedal forward from position 0 (neutral). The number of stitches is set such that after completing these stitches, the bobbin is not completely empty. After replacing the bobbin, the key must be pressed so that the counter is reset to the preset value and activated again.

If the drive is switched off during bobbin thread monitor counting, this value is saved and counting is continued after power On. If the key is pressed for less than one second, the counter is set to the preset value.

Key pressed >1 sec. → Bobbin thread monitor function is deactivated

Key pressed <1 sec. → Counter is set to the preset value

9.13 Needle Cooling / Under-Edge Trimmer

Function with or without control panel	Parameter
Switch speed for needle cooling On/Off (nnk)	120
Switch-off delay of needle cooling after stop (dnk)	183
Needle cooling/under-edge trimmer function (Fnk)	185

Parameter 185 = 1 Needle cooling: Needle cooling is switched on during the entire sewing operation. Switching off after the stop can be delayed by the time “switch-off delay of needle cooling after stop”, which can be set with parameter 183.

Parameter 185 = 2 Under-edge trimmer: The output will be activated by pressing the pedal forward.

Parameter 185 = 3 Needle cooling depending on speed: The corresponding switch speed can be set using parameter 120.

When using the V820 control panel, direct access by means of the function key (9 key) is possible!

Function with control panel	Parameter
Needle cooling On/Off (-F-)	008 = 4

9.14 Function Modules for Output A

Depending on the mode selected with parameter 250 several sequences can be initiated by pressing the A key (socket A/8). Affected are, inter alia, the functions “output A” (socket A/30), “indicator LED A” (socket A/29), “sewing process”, “backtacking” and “speed limitation”.

9.14.1 Function Modules for Output A / No Function (Parameter 250 = 0)

- Function module for output A is switched off.

9.14.2 Function Module for Output A / Switch Stitch Length (Pa. 250 = 1)

Function with or without control panel	Parameter
Switch stitch length with output A (FmA)	250 = 1
Light barrier compensating stitches for long stitch length (LS)	004
Light barrier compensating stitches for normal stitch length (cLS)	010
Output A remains active or becomes inactive after the seam end (AFA)	251
Output A inverted/not inverted (Ain)	252
Speed limitation DB3000 (n11)	289

- If output A is activated, the normal stitch length is effective. LED A is off.
- Output A can be inverted with parameter 252.
- After power On, the normal stitch length will be switched on, i.e. output A = On and LED A = Off.
- By pressing the A key, output A is switched off and LED A is switched on. The maximum speed is limited to DB3000 (parameter 289). Start and end backtack will be suppressed.
- When the key is pressed again, the status after power On is reset.
- If parameter 251 = 1, the status after power On will be activated after thread trimming.
- When completing the seam by light barrier, different parameters (004, 010) apply to the two light barrier stitch counts.

	Output A	LED A	Speed limitation	Backtack	Remark
Power On	On	Off	DB3000	suppressed	normal stitch length
A key	Off	On			long stitch length
A key again	On	Off			normal stitch length
Thread trimming, if 251=1	On	Off			normal stitch length

9.14.3 Function Module for Output A / Fullness Control with Speed Limitation (Pa. 250 = 2)

Function with or without control panel	Parameter
Fullness control with speed limitation at output A	(FmA) 250 = 2
Number of end ornamental backtack stitches backward	(SEr) 082
Number of end ornamental backtack stitches forward	(SEv) 083
Output A remains active or becomes inactive after the seam end	(AFA) 251
Speed limitation DB3000	(n11) 289

- After power On, output A and LED A are switched off.
- Output A and LED A can be switched on any time by pressing the A key. The speed is limited to DB3000 (parameter 289).
- Output A, LED A and the speed limitation are switched off by pressing the key again.
- If an intermediate backtack is switched on and output A is activated, the latter is deactivated first and the backtack solenoid output is switched on after a certain time (parameter 210). LED A remains On during this process.
- When the intermediate backtack is switched off, output A is switched on immediately.
- During start backtack, output A is off and LED A remains on.
- If output A is on, the end backtack will be performed as follows. When activating the end backtack function, the drive stops. Output A is switched off and the backtack solenoid is switched on. After the time set with parameter 210 has elapsed, the drive restarts and performs the end backtack.
- After thread trimming, the setting of parameter 251 determines whether output A and LED A are switched on or off at the beginning of the next seam.
- If parameter 251 = 1, the status after power On will be activated after thread trimming.

	Output A	LED A	Speed limitation	Backtack	Remark
Power On	Off	Off	DB3000 Speed n3 Speed n4 DB3000	End backtack	Fullness Off
A key	On	On			Fullness On
In the start backtack	Off	On			Fullness Off
In the end backtack	Off	On			Fullness Off
After thread trimming + 251=0	On	On			Fullness On
After thread trimming + 251=1	Off	Off			Fullness Off

9.14.4 Function Module for Output A / Fullness Control without Speed Limitation (Pa. 250 = 3)

Function with or without control panel	Parameter
Fullness control without speed limitation at output A	(FmA) 250 = 3
Number of end ornamental backtack stitches backward	(SEr) 082
Number of end ornamental backtack stitches forward	(SEv) 083
Output A remains active or becomes inactive after the seam end	(AFA) 251

- After power On, output A and LED A are switched on.
- Output A and LED A can be switched off any time by pressing the A key.
- Output A and LED A are switched on by pressing the key again.
- If an intermediate backtack is switched on and output A is activated, the latter is deactivated first and the backtack solenoid output is switched on after a certain time (parameter 210). LED A remains On during this process.
- When the intermediate backtack is switched off, output A is switched on immediately.
- During start backtack, output A is off and LED A remains on.
- If output A is on, the end backtack will be performed as follows. When activating the end backtack function, the drive stops. Output A is switched off and the backtack solenoid is switched on. After the time set with parameter 210 has elapsed, the drive restarts and performs the end backtack.
- After thread trimming, the setting of parameter 251 determines whether output A and LED A are switched on or off at the beginning of the next seam.
- If parameter 251 = 1, the status after power On will be activated after thread trimming.

	Output A	LED A	Speed limitation	Backtack	Remark
Power On	On	On			Fullness On
A key	Off	Off			Fullness Off
A key again	On	On			Fullness On
In the start backtack	Off	On	Speed n3		Fullness On
In the end backtack	Off	On	Speed n4	End backtack	Fullness Off
After thread trimming + 251=1	On	On			Fullness On

9.14.5 Function Module for Output A / Single Stitch with Short Stitch Length (Pa. 250 = 4)

Function with or without control panel	Parameter
Single stitch with reduced stitch length (FmA)	250 = 4

- Output A will be switched on by pressing a key after the start of sewing, at intermediate stop and with the sewing foot down. One full rotation will be performed on condition that the drive had been positioned in position 1.
- If the key remains pressed down and the pedal is pressed forward after a single stitch, output A and LED A remain On. Sewing is performed with short stitch length until the key is pressed again, or output A and LED A are switched off by the end backtack or the thread trimmer.
- If the A key is pressed during sewing, or sewing is started when pressing the key, output A and LED A will be switched on.
- Output A and LED A will be switched off by pressing the key again or by the end backtack or the thread trimmer.
- A manual backtack is impossible when output a is switched on.
- Pressing a key during automatic seams by stitch counting or light barrier has no effect.

	Output A	LED A	Remark
Power On	Off	Off	
A key after start of sewing	On for one rotation	On	
Sewing foot down			
Press A key during sewing, or press A key first and then start	On, sewing with short stitch length	On	Manual backtack impossible
End backtack without thread trimming	Off	Off	

9.14.6 Function Module for Output A / Lift/Lower Roller (Pa. 250 = 5)

Function with or without control panel	Parameter
Lift/lower roller (output A) (FmA)	250 = 5
Number of stitches until lowering the roller (cA)	253
Time interval which can be varies by the number of stitches set with parameter 253 On/Off(PLc)	260
Roller lifting depending on sewing foot lift and backtack (FLk)	261
When enabling high lift for walking foot, roller remains lowered/lifted (hPt)	262

- After power On, output A and LED A are switched on.
- By pressing a key after power On before starting the seam output A and LED A are switched off.
- By pressing the key again after power On before starting the seam the roller function and LED A is switched on. Output A remains on (roller up).
- After the start of the seam (roller function on) the roller will be lowered after a number of stitches that can be set (parameter 253) after the start backtack has been completed (if start backtack off, at the start of the seam). The function of the set stitches can be enabled and disabled using parameter 260. Counting can be interrupted by pressing a key. The roller is immediately lowered.
- If the sewing foot is lifted and the roller is down, the roller is also lifted. After the sewing foot has been lowered, the roller is also lowered after the number of stitches set with parameter 253. Counting can be interrupted by pressing a key. The roller is immediately lowered. If the number of stitches is set to 0, the roller is immediately lowered together with the sewing foot.
- Whenever a manual backtack is performed with the roller down, the roller is immediately lifted. After the backtack the roller is immediately lowered.
- When the key is pressed for the first time during the sewing operation, the roller function is disabled. The roller is lifted and LED A goes off. This status remains until the key is pressed again (even after thread trimming). By pressing the key once more the roller function is enabled again. The roller is lowered and LED A switched on.
- The roller is lifted when starting the end backtack or the thread trimmer.

	Output A	LED A	Roller	Sewing foot lift
Power On	On	On	up	
A key	Off	Off	down	
Press A key once more	On	On	up	
In the start backtack	On	On	up	down
After the start backtack during counting *)	On	On	up	down
A key, after the start backtack during counting *)	Off	Off	down	down
After the start backtack after counting *)	Off	Off	down	down
Manual backtack	On	On	up	down
Sewing foot up	On	On	up	up
After actuating the sewing foot during counting *)	On	On	up	down
A key after actuating the sewing foot during counting *)	Off	Off	down	down
A key in the seam	On	On	up	
A key once more in the seam	Off	Off	down	
In the end backtack and during thread trimming	On	On	up	down
After thread trimming if roller On	On	On	up	
After thread trimming if roller Off	On	On	up	

*) Number of stitches until output A is enabled (parameter 253).

The following functions can be set with parameter 261:

Parameter 261 = 0 The roller is lifted without sewing foot lift and backtack.

Parameter 261 = 1 The roller is lifted with sewing foot lift and backtack.

Parameter 261 = 2 The roller is lifted with sewing foot lift. After the sewing foot has been lowered, the roller will be lowered after the number of stitches set with parameter 253 and their enabling using parameter 260, or pressing a key.

Parameter 261 = 3 The roller is lifted with the backtack. After the backtack the roller will be immediately lowered. If the roller is lifted when activating the intermediate backtack, it remains lifted until after completing the backtack.

The following function can be set with parameter 262 if parameter 250 is set at "11" and 255 at "5" or parameter 250 at "5" and 255 at "11".

Parameter 262 = 0 The roller remains lowered when enabling high lift for walking foot.

Parameter 262 = 1 The roller is lifted when enabling high lift for walking foot.

9.14.7 Function Module for Output A / Lift/Lower Fabric Stop (Pa. 250 = 6)

Function with or without control panel	Parameter
Lift/lower fabric stop (output A) (FmA)	250 = 6
Output A inverted / not inverted (Ain)	252

- The fabric stop is lifted by enabling output A. It is effective if output A is off. LED A lights up when the fabric stop is down or output A is off.
- After power On, output A is On and LED A is Off.
- Output A can be inverted with parameter 252.

- By pressing a key, output A is switched off and LED A is switched on. The fabric stop is effective. This status is maintained until after thread trimming and can be cancelled only by pressing the key again or by power Off/On.
- If the sewing foot is lifted, the fabric stop is as well lifted. Output A is switched on and LED A remains on.
- If the sewing foot is lowered, the fabric stop is as well lowered. Output A is switched off and LED A remains on.
- By pressing the key again, the fabric stop is disabled. Output A is switched on and LED A is switched off. This status is maintained until after thread trimming and can be cancelled only by pressing the key again.

	Output A	LED A	Fabric stop	Sewing foot lift
Power On	On	Off	up	
Press A key; sewing foot up	On	On	up	up
Press A key once more; sewing foot up	On	Off	up	up
Press A key once more; sewing foot down	Off	On	down	down
Sewing foot up	On	On	up	up
After thread trimming and sewing foot up	On	On	up	up
After thread trimming and sewing foot down	Off	On	down	down

9.14.8 Function Module for Output A / Second Thread Tension (Pa. 250 = 7)

Function with or without control panel	Parameter
Second thread tension (output A) (FmA)	250 = 7
Output A remains active or becomes inactive after the seam end (AFA)	251
Output A inverted / not inverted (Ain)	252

- The second thread tension can be enabled or disabled as desired, not however, during automatic seam sections.
- After power On, output A and LED A are switched off.
- Output A can be inverted with parameter 252.
- By pressing the key for the first time, output A and LED A are switched on.
- By pressing the key for the second time, output A and LED A are switched off again.
- If parameter 251 = 1, the status after power On will be activated after thread trimming.

Functional sequence if →	Parameter 252 = 0		Parameter 252 = 1	
	Output A	LED A	Output A	LED A
Power On	Off	Off	On	Off
Press A key	On	On	Off	On
Press A key again or thread trimming if parameter 251 = 1	Off	Off	On	Off

9.14.9 Function Module for Output A / Manual Edge Trimmer (Pa. 250 = 8)

Function with or without control panel	Parameter
Manual edge trimmer (output A) (FmA)	250 = 8
Output A remains active or becomes inactive after the seam end (AFA)	251

The edge trimmer is enabled by activating output A. If parameter 251 = 1, the edge trimmer will be disabled after thread trimming.

- After power On, the edge trimmer and LED A are switched off.
- The edge trimmer can be enabled any time by pressing the A key (output A and LED A On).
- The edge trimmer is disabled by pressing the key again (output A and LED A Off).
- If parameter 251 = 1, the edge trimmer will be activated after thread trimming as after power On.

	Output A	LED A	Remark
Power On	Off	Off	Edge trimmer Off
Press A key	On	On	Edge trimmer On
Press A key again	Off	Off	Edge trimmer Off
After thread trimming if pa. 251 = 1	Off	Off	Edge trimmer Off

9.14.10 Function Module for Output A / Automatic Edge Trimmer (Pa. 250 = 9)

Function with or without control panel	Parameter
Automatic edge trimmer (output A)	(FmA) 250 = 9
Edge trimmer remains active at the seam end as before thread trimming, or it will be activated as after power On	(AFA) 251
Number of stitches until enabling the edge trimmer	(cA) 253
Number of stitches until disabling the edge trimmer	(cA_) 254

The edge trimmer is enabled by activating output A (M6 on socket A/30). This is indicated by LED A (M10 on socket A/29). The starting torque of the edge trimmer is determined using parameter 253 (number of stitches). The edge trimmer ON period is set using parameter 254 (number of stitches).

The following operational statuses are possible:

Automatic operation: Parameter 253 >0, Parameter 254 >0, Parameter 251 = 0 or Parameter 251 = 1

Semiautomatic operation: Parameter 253 >0, Parameter 254 = 0, Parameter 251 = 0 or Parameter 251 = 1

Parameter 253 = 0, Parameter 254 >0, Parameter 251 = 0 or Parameter 251 = 1

Manual operation: Parameter 253 = 0, Parameter 254 = 0, Parameter 251 = 0 or Parameter 251 = 1

Parameter 251 = 0 The edge trimmer switching state is maintained as before thread trimming.

Parameter 251 = 1 The edge trimmer switching state is set as after power On.

Automatic Operation:

Parameter 253 > 0, 254 > 0, 251 = 0	Output A	LED A	Remark
Power On	Off	Off	
Press A key before start of the seam	On	On	
Press A key again before start of the seam	Off	Off	
After start of the seam counting pa. 253	Off	Blinking	Counting can be interrupted with the A key
End counting pa. 253	On	On	
Start counting pa. 254	On	On	Counting can be interrupted with the A key
End counting pa. 254	Off	Off	
Press A key	On	On	Manual enabling
Press A key	Off	Off	Manual disabling
After thread trimming	Off	Off	

Semiautomatic Operation:

Parameter 253 > 0, 254 = 0, 251 = 0	Output A	LED A	Remark
Power On	Off	Off	
Press A key before start of the seam	On	On	
Press A key again before start of the seam	Off	Off	
After start of the seam counting pa. 253	Off	Blinking	Counting can be interrupted with the A key
End counting pa. 253	On	On	
Start counting pa. 254 = 0	On	On	Edge trimmer disabled only manually
Press A key	Off	Off	Manual disabling
After thread trimming	Off	Off	

Parameter 253 > 0, 254 = 0, 251 = 1	Output A	LED A	Remark
Power On	Off	Off	
Press A key before start of the seam	On	On	
Press A key again before start of the seam	Off	Off	
After start of the seam counting pa. 253	Off	Blinking	Counting can be interrupted with the A key
End counting pa. 253	On	On	
Start counting pa. 254 = 0	On	On	Edge trimmer disabled only manually
After thread trimming	Off	Off	Status as after power On

Parameter 253 = 0, 254 > 0, 251 = 0	Output A	LED A	Remark
Power On	Off	Off	Trigger key On (special case)
Press A key before start of the seam	On	On	
Press A key again before start of the seam	Off	Off	
After start of the seam counting pa. 253 = 0	Off	Off	
Press A key	On	On	
Start counting pa. 254	On	On	Manual enabling Manual disabling
End counting pa. 254	Off	Off	
Press A key	On	On	
Press A key	Off	Off	
After thread trimming	Off	Off	

Parameter 253 = 0, 254 > 0, 251 = 1	Output A	LED A	Remark
Power On	Off	Off	Trigger key On (special case)
Press A key before start of the seam	On	On	
Press A key again before start of the seam	Off	Off	
After start of the seam counting pa. 253 = 0	Off	Off	
Press A key	On	On	
End counting pa. 253	On	On	Manual enabling
Start counting pa. 254	On	On	
End counting pa. 254	Off	Off	
Press A key	On	On	
After thread trimming	Off	Off	

Manual Operation:

Parameter 253 = 0, 254 = 0, 251 = 0	Output A	LED A	Remark
Power On	Off	Off	
Press A key before start of the seam or in the seam	On	On	
Press A key before start of the seam or in the seam	Off	Off	
Press A key before start of the seam or in the seam	On	On	
After thread trimming	On	On	

Parameter 253 = 0, 254 = 0, 251 = 1	Output A	LED A	Remark
Power On	Off	Off	
Press A key before start of the seam or in the seam	On	On	
Press A key before start of the seam or in the seam	Off	Off	
Press A key before start of the seam or in the seam	On	On	
After thread trimming	Off	Off	

9.14.11 Function Module for Output A / Triflex Function (Pa. 250 = 10)

Function with or without control panel	Parameter
Triflex function (FmA)	250 = 10
Speed limitation DB2000 (n10)	117
Output A remains active or becomes inactive after the seam end (AFA)	251
Output A inverted / not inverted (Ain)	252
Function second thread tension with output B (Fmb)	255 = 7

The "Triflex" function affects stitch length, thread tension, speed limitation and backtacking. First a "normal" seam with short stitch length, without speed limitation, with normal thread tension and backtacking will be performed. A "basted seam" will be performed by pressing the key, i.e. long stitch length, low thread tension (output B), speed limitation and backtacking. The seam is reset to "normal" by pressing the key for the second time or by thread trimming (if parameter 251 = 1). While using this "Triflex" function, output B must be set to mode 7 (parameter 255 = 7).

- After power On, output A is On and LED A is Off.
- By pressing the A key, output A is switched off and LED A is switched on.. The speed is limited to DB2000 (parameter 117); start and end backtack are off. Manual backtack is impossible.
- The status after power On will be reset by pressing the key again.
- If parameter 251 = 1, the status after power On will be activated after thread trimming.
- The signal at output A can be inverted with parameter 252.

	Output A	LED A	Speed limitation	Remark
Power On	On	Off	DB2000	Output A can be inverted with parameter 252 Manual backtack impossible, start and end backtack are suppressed
Press A key	Off	On		
Press A key again or initiate thread trimming if parameter 251 = 0	On	Off		

9.14.12 Function Module for Output A / High Lift for Walking Sewing Foot (Pa. 250 = 10)

Function with or without control panel	Parameter
High lift for walking foot with output A (FmA)	250 = 11
High lift walking speed (n10)	117
High lift for walking foot operational mode stored = 1 / not stored = 0 (hPr)	138
Run-out time of high lift walking speed after disabling high lift for walking foot (thP)	152
Number of stitches until disabling of output A (cA_)	254
When enabling high lift for walking foot, the roller remains lowered/lifted (hPt)	262

By pressing the A key, output A and LED A are switched on and set to maximum high lift. The solenoid valve can be switched on any time. The maximum speed is limited to high lift walking speed (DB2000). If the actual speed is higher than high lift walking speed, the drive slows down to high lift walking speed, before output A is enabled.

Output A and LED A are immediately switched off by disabling the maximum high lift. The speed limitation will, however, be released only after a time lag that can be set (parameter 152).

3 different modes of operation are possible and can be selected with a parameter:

High lift for walking foot operational mode stored (parameter 138 = 1).

When actuating the A key or a knee switch, output A is enabled and is disabled when pressing it for the second time.

High lift for walking foot operational mode not stored (parameter 138 = 0, parameter 254 = 0).

While actuating the A key or a knee switch, output A is enabled.

High lift for walking foot operational mode not stored with minimum number of stitches (parameter 138 = 0, parameter 254 > 0).

When actuating the A key or a knee switch, output A is enabled and remains On until the set number of stitches (parameter 254) has been completed.

- When pressing the A key at drive standstill, high lift for walking foot is enabled and remains On after the start of sewing, at least for the set number of stitches.
- The ON period can be prolonged if the key is pressed down until after the end of stitch counting.
- If the key is pressed during counting, counting is reset.

The following function can be set with parameter 262 if parameter 250 is set at "11" and 255 at "5" or parameter 250 at "5" and 255 at "11".

Parameter 262 = 0 The roller remains lowered when enabling high lift for walking foot.

Parameter 262 = 1 The roller is lifted when enabling high lift for walking foot.

When using the V820 control panel, direct access by means of the function key (9 key) is possible!

Function with control panel	Parameter
High lift for walking foot operational mode stored = 1 / not stored = 0 (-F-)	008 = 3

9.14.13 Function Module for Output A / Sewing Foot Pressure Reduction (Pa. 250 = 12)

Function with or without control panel	Parameter
Sewing foot pressure reduction by external switch at output A (FmA)	250 = 12
Switching full power or holding power of sewing foot lift (FLd)	332
Full power if sewing foot lift is stored (t4_)	333
Holding power if sewing foot lift is stored (t5_)	334

After setting parameter 250 = 12, sewing foot pressure reduction can be enabled by pressing the external key at input A (socket A/8). If sewing foot lift is stored, full power and holding power are effective according to the setting of parameter 332 and the following pedal positions.

- Pedal position **0** Holding power according to setting of parameter **334**
- Pedal position **>1** Holding power according to setting of parameter **334**
- Pedal position **+1** Sewing foot is lowered
- Pedal position **-1** Holding power according to setting of parameter **204**
- Pedal position **-2** Holding power according to setting of parameter **204**

- **Parameter 332 = 0** The settings of parameters 203 and 204 determine the sewing foot lift function.
- **Parameter 332 = 1** If sewing foot lifting is stored in the seam, the solenoid will be fully activated based on the settings of parameter 333, and pulsed based on the settings of parameter 334.

9.14.14 Function Module A / Handwheel Runs in the Direction of Rotation (Pa. 250 = 13)

Function with or without control panel	Parameter
Handwheel runs in the direction of rotation using the external switch at input A (FmA)	250 = 13
Handwheel increments (ihr)	263
Handwheel speed (nhr)	264
Delay time until the key is pressed down causing the handwheel to rotate continuously (dhr)	265
Sewing foot lift function during handwheel rotation (LFL)	266

After setting parameter 250 = 13, the handwheel can be made to rotate according to the setting of parameter 161 by pressing the external key at input A (socket A/8). The number of increments for handwheel rotation after briefly pressing the key can be selected using parameter 263. The speed of handwheel rotation can be selected using parameter 264. A delay time is set using parameter 265. If the key is pressed briefly, i.e. for less than the set time, the increments set using parameter 263 are carried out. If the key is kept pressed down for more than the set delay time, the handwheel rotates continuously.

The sewing foot can be set as follows using parameter 266.

Parameter 266 = 0 When pressing the key, the sewing foot lowers during handwheel rotation.

Parameter 266 = 1 The sewing foot remains lifted during handwheel rotation, if the pedal is pressed to pos. -1 or automatic sewing foot lifting has been set.

When using a control panel, the functions can be assigned to the F1 and F2 keys using parameters 293 and 294.

Parameter 293/294 = 8 Press key F1/F2 for the handwheel to run in the direction of rotation

Parameter 293/294 = 9 Press key F1/F2 for the handwheel to run in the opposite direction of rotation

9.14.15 Function Module A / Handwheel Runs in the Opposite Direction of Rotation (Pa. 250 = 13)

Function with or without control panel	Parameter
Handwheel runs in the opposite direction of rotation by external switch at input A (FmA)	250 = 14

After setting parameter 250 = 14, the handwheel runs in the opposite direction of rotation. All other parameters fulfill the same functions as with setting "13".

9.15 Function Modules for Output B

- The functions for the modules of outputs A and B are identical. Therefore, use description of function module A, with the exception of the parameters.
- Parameters 255...259 are assigned for functions modules B.
- In case the settings of function modules A and B are identical, function module A has priority. The functions of function module B would be disabled in that case.

Function with or without control panel	Parameter
Function modules for output B (socket A/32) (Fmb)	255
Output B remains active or becomes inactive after the seam end (bFA)	256
Output B inverted / not inverted (bin)	257
Number of stitches until enabling of output B (cb)	258
Number of stitches until disabling of output B (cb_)	259
Time interval which can be varied by the number of stitches set with parameter 258 On/Off (PLc)	260
Roller lifting depending on sewing foot lift and backtack (FLk)	261
When enabling high lift for walking foot, the roller remains lowered/lifted (hPt)	262
Handwheel increments (ihr)	263
Handwheel speed (nhr)	264
Delay time until the key is pressed down causing the handwheel to rotate continuously (dhr)	265
Sewing foot lift function during handwheel rotation (LFL)	266

Depending on the mode selected with parameter 255 several sequences can be initiated by pressing the B key (in1 on socket A/7). Functions “output B” (M5 on socket A/32), indicator LED B (M11 on socket A/31), sewing process, backtacking and speed limitation, inter alia, are affected.

9.16 Speed Limitation

9.16.1 Speed Limitation DB2000/DB3000

Function with or without control panel	Parameter
High lift walking speed (DB2000) (n10)	117
Speed limitation (DB3000) (n11)	289

The speed is limited to 2000 RPM or 3000 RPM using the control inputs on A/9 (DB2000) and A/10 (DB3000). The speed limitations can be varied using parameters 117 and 289. When changing the switching state of the control inputs, the respective speed limitation is delayed by approx. 50 ms or is released.

Note

If several speed limitations are activated at the same time, the maximum speed is limited to the lower value.

9.16.2 Analog Speed Limitation

The maximum speed can be limited by an analog voltage on input A/3. The analog voltage is generated by a potentiometer which functions as voltage divider. If no potentiometer is connected, the maximum voltage is applied to the input. A potentiometer for speed limitation on the control is also possible.

9.16.3 Analog Speed Limitation Speedomat

The speedomat function enables a speed limitation depending on the set sewing foot high lift (21 levels). The actual value of the high lift is transmitted to the control by the position of a potentiometer (10k Ω) with an angle of rotation of 60°, which is coupled with the high lift shaft.

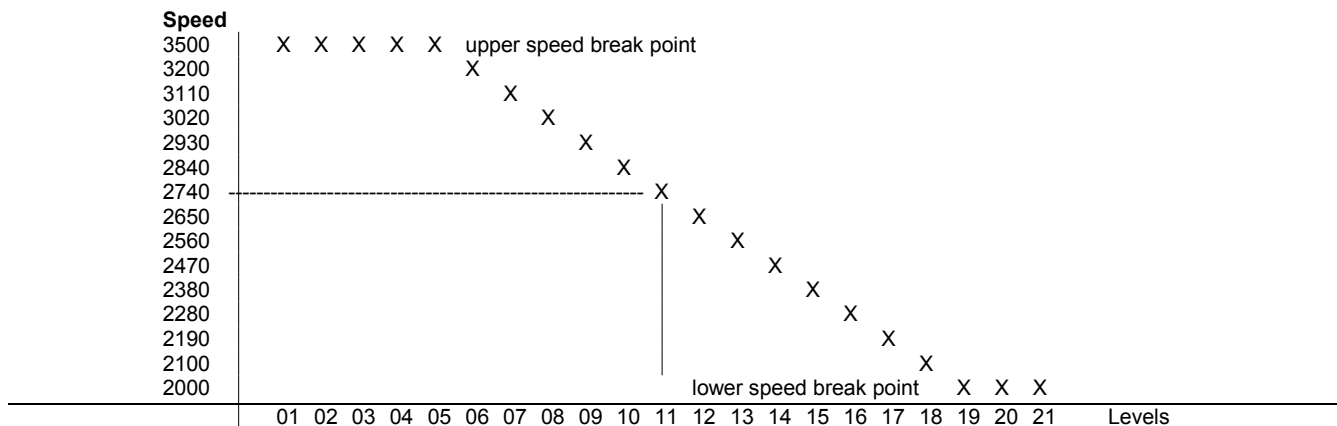
The maximum angle of rotation of the high lift shaft is 48°. Thus the setting range of the potentiometer is from 9k Ω (nmax = 4.5V on socket A/3) to 1k Ω (nlim. = 0.5V on socket A/3).

Potentiometer connections see chapter "Connection Diagram".

Function with or without control panel	Parameter
Maximum speed (n2)	111
High lift walking speed (n10)	117
Speed setting depending on high lift (hP)	188

- It is possible to program the assignment of the speed limitation to the 21 high lift levels.
- Minimum high lift = maximum speed (n2)
- Maximum high lift = minimum speed (n10)

Graduation of the examples below is as follows:



Display example of parameter 188 on the V820 control panel:



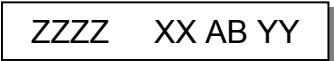
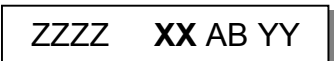
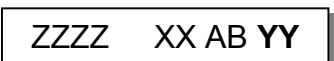
ZZZZ XX AB YY

- Signification:**
- XX** → Display of the level up to which the maximum speed is effective (upper break point).
 - YY** → Display of the level from which the maximum speed is effective (lower break point).
 - AB** → Display of the level set on the potentiometer.
 - ZZZZ** → Speed resulting from the set high lift level.
 - EEEE** → Outside of the speed range.

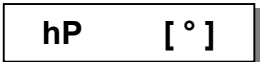
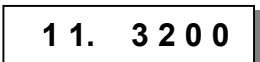
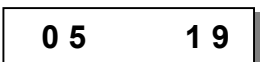
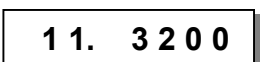
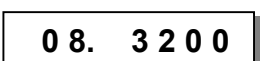
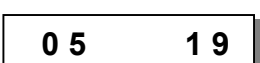
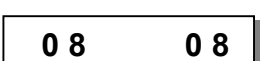
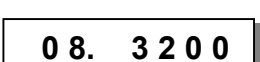
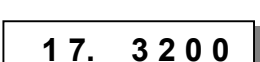
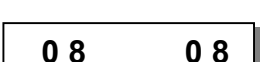
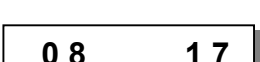
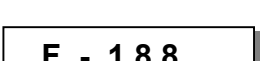
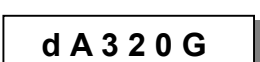
9.16.4 Setting the Speed Limitation Depending on High Lift with the V820 Control Panel

- Determine maximum speed (n2) using parameter 111.
- Determine minimum speed (n10) using parameter 117.
- Call parameter 188.

-  Press the E key.
 

-  Press the F2 key.
 

- Set high lift for walking foot (potentiometer on the machine) to the level up to which full speed is to be maintained (upper break point).
-  New value of **AB** is taken over to **XX**.
 

- Set high lift for walking foot (potentiometer on the machine) to the level from which minimum speed is to be effective (lower break point).
-  New value of **AB** is taken over to **YY**.
 

- Press **P** key once → Actual parameter is displayed. / Press **P** key twice → Exit programming.

9.16.5 Setting the Speed Limitation Depending on High Lift with the V810 Control Panel

- Call parameter 188.
 -  Press the **E** key. → 
 -  Press the **F2** key. Actual display. → 
 -  Press the **F2** key. Previous values are displayed. → 
 -  Press the **F2** key. → 
 - Set new value (level) with potentiometer on the machine. → 
 -  Press the **F2** key. → 
 -  Press the **E** key. New value 08 (upper break point) is entered. → 
 -  Press the **F2** key. → 
 - Set new value (level) with potentiometer on the machine. → 
 -  Press the **F2** key. → 
 -  Press the **E** key. New value 17 (lower break point) is entered. → 
 -  Press the **P** key once. Display of the actual parameter number. → 
- or
-   Press the **P** key twice. Exit programming. → 

These values are saved when you start sewing. They remain in effect even after turning the machine off!

Note

If you set a value on the potentiometer, which is between the actual break points, both values will be overwritten when pressing the **E** key. Only after that is it possible to program new lower and/or upper break point values.

9.17 Thread Trimming Operation

Function with or without control panel		Parameter
Thread trimmer On/Off	(FA)	013
Thread wiper On/Off	(FW)	014

Function with control panel		V820
Thread trimmer On	lefthand arrow On	5 key
Thread wiper On	right hand arrow On	
Thread trimmer and thread wiper On	both arrows On	
Thread trimmer and thread wiper Off	both arrows Off	

When a V820 control panel is connected, the functions can also be switched on and off using key 5.

Function with or without control panel	Parameter
Trimming stitch backward (FAr)	136
Thread trimmer activation angle (iFA)	190
Thread tension release switch-off delay (FSA)	191
Thread tension release switch-on delay (FSE)	192
Tread trimmer stop time (tFA)	193
Thread trimmer switch-on delay by means of increments (FAE)	194
Thread wiper time (t6)	205
Delay after thread wiping until sewing foot lifting (t7)	206

The thread trimming operation is initiated by full heelback or automatically at the end of a counted seam section or automatically by light barrier sensing after the light barrier compensating stitches. If the “trimming stitch backward” function is On (parameter 136 = 1), the backtack solenoid in the end backtack remains On until stop in position 2. When the thread trimmer is Off, the drive stops in position 2 when reaching the seam end.

9.17.1 Trimming Speed

Function with or without control panel	Parameter
Trimming speed (n7)	116

9.17.2 Thread Trimmer

The thread trimming signal is enabled when reaching the trimming speed with leading position 1 and is disabled after completion of the angle which can be adjusted (parameter 190), or at the very latest with the stop in position 2. A stop time for the thread trimmer, during which the drive is at standstill after reaching position 1, can be set with parameter 193. If position 2 is not reached due to a mechanical defect, the thread trimming signal is disabled after 10 sec. This way, the solenoid with 25% duty ratio will be protected against damage.

9.17.3 Thread Tension Release

The thread tension release signal can be enabled with a time lag relative to the thread trimmer. The time lag is an angular value that is inputted in parameter 192. The signal is disabled in position 2. It can, however, be extended for a time that can be regulated with parameter 191.

If position 2 is not reached due to a mechanical defect, the output is disabled after 10 sec. This way, the solenoid with 10% duty ratio will be protected against damage.

9.17.4 Thread Wiper

The thread wiper signal is enabled for a time that can be regulated with parameter 205 after reaching position 2. After the thread wiper has been disabled, there will be a time lag that can be regulated with 206 until the sewing foot can be lifted.

If the thread wiper is Off, the time lag phase for the sewing foot lift (parameter 206) will not occur.

9.18 Seam with Stitch Counting

Function without control panel	Parameter
Stitch counting On/Off (StS)	015

Function with control panel	V820
Stitch counting forward On Stitch counting backward On Stitch counting Off	lefthand arrow On righthand arrow On both arrows Off 2 key

9.18.1 Stitches for Stitch Counting

Function with or without control panel	Parameter
Number of stitches for a seam with stitch counting (Stc)	007

The stitch counting stitches can be programmed and varied using the above parameters directly on the control or on a connected V810/V820 control panel.

For fast operator information (HIT) when using the V820 control panel, the value of the function switched on by means of key **2** can be displayed for approx. 3 seconds. During this time, the value can be varied directly by pressing key + or -.

9.18.2 Stitch Counting Speed

Function with or without control panel	Parameter
Stitch counting speed (n12)	118
Speed mode for a seam with stitch counting (SGn)	141

Speed control for stitch counting can be selected using parameter 141.

Parameter 141 = 0 Execution at pedal controlled speed.

Parameter 141 = 1 Execution at fixed speed n12, when pressing the pedal forward (position >1).

Parameter 141 = 2 Execution at limited speed n12, when pressing the pedal forward (position >1).

Parameter 141 = 3 Automatic execution at fixed speed after having pressed the pedal once. The procedure can be interrupted by "heelback (-2)".

Parameter 141 = 4 Automatic execution at fixed speed after having pressed the pedal once. The procedure can be interrupted by "heelback (-2)".

The sewing speed is reduced in each stitch depending on the actual speed (max. 11 stitches before the end of stitch counting), in order to be able to stop exactly at the end of counting. When the light barrier is on, free sewing will be performed after stitch counting.

9.18.3 Seam with Stitch Counting When Light Barrier Is On

Function with or without control panel	Parameter
Light barrier On/Off (LS)	009
Stitch counting On/Off (StS)	015

Function with control panel	V820
Light barrier On/Off	3 key
Stitch counting On/Off	2 key

When "stitch counting and light barrier function " is set, the number of stitches will be executed first, then the light barrier will be activated.

9.19 Free Seam and Seam with Light Barrier

Function with or without control panel	Parameter
Positioning speed (n1)	110
Upper limit of maximum speed (n2)	111
Limited speed according to setting of 142 (n12)	118
Lower limit of maximum speed (n2_)	121
Speed mode free seam (SFn)	142

Speed control for the free seam and the seam with stitch counting can be selected using the speed mode.

- Parameter 142 = 0** Execution at pedal controlled speed
Parameter 142 = 1 Execution at fixed speed n12, when pressing the pedal forward (position >1)
Parameter 142 = 2 Execution at limited speed n12, when pressing the pedal forward (position >1)
Parameter 141 = 3 Only for the seam with light barrier:
 - Automatic execution at fixed speed after having pressed the pedal once.
 - The seam end is initiated by light barrier.
 - The procedure can be interrupted by heelback (-2).
 - If the light barrier is not on, speed as with parameter setting 142 = 0.

When using a control panel, the maximum speed is displayed after power on and thread trimming and can be varied directly by means of key +/- on the control panel. The setting range lies between the values of parameters 111 and 121.

9.20 Light Barrier

- Light barrier module LSM002 is provided and is connected to socket B18.
- Moreover, an external light barrier can be connected to socket A/13.
- Both light barrier inputs initiate the same function and can be enabled and disabled with the same parameters.

Function with or without control panel	Parameter
Light barrier On/Off	009

Function with control panel	V820
Light barrier covered/uncovered On Light barrier uncovered/covered On Light barrier Off	righthand arrow On lefthand arrow On both arrows Off 3 key

The light barrier function at the input of socket B18/5 is active only if parameter 239 = 0.

9.20.1 Speed after Light Barrier Sensing

Function with or without control panel	Parameter
Speed after light barrier sensing (n5)	114

9.20.2 General Light Barrier Functions

Function with or without control panel	Parameter
Light barrier compensating stitches (for long stitches) (LS)	004
Number of light barrier seams (LSn)	006
Light barrier compensating stitches (for normal stitches) (cLS)	010
Light barrier sensing uncovered/covered (LSd)	131
Start of sewing blocked/unblocked with light barrier uncovered (LSS)	132
Light barrier seam end with thread trimming On/Off (LSE)	133

- After sensing the seam end, the compensating stitches are counted at light barrier speed.
- Suspension of the procedure with pedal in pos. 0 (neutral). Interruption of the procedure with pedal in pos. -2.
- The thread trimming operation can be disabled using parameter 133, regardless of the setting of key 5 on the V820 control panel. Stop in the basic position.
- Programming of max. 15 light barrier seams depending on the setting of parameter 006 with stop in the basic position. Thread trimming after the last light barrier seam.
- Light barrier sensing uncovered or covered at the seam end can be selected using parameter 131.
- Start blockage with light barrier uncovered programmable using parameter 132.
- Speed selection pedal controlled / n5 during the light barrier compensating stitches using parameter 192.

The light barrier compensating stitches can be programmed and varied using the above parameters directly on the control or on a connected V810/V820 control panel. For fast operator information (HIT) when using the V820 control panel, the value of the function switched on by means of key 3 can be displayed for approx. 3 seconds. During this time, the value can be varied directly by pressing key + or -.

9.20.3 Reflection Light Barrier LSM002

Sensitivity setting:

Set minimum sensitivity depending on the distance between light barrier and reflection area (turn potentiometer as far as possible to the left).

- Potentiometer directly on the light barrier module

Mechanical orientation:

Orientation is facilitated by a visible light spot on the reflection area.

9.20.4 Automatic Start Controlled by Light Barrier

Function with or without control panel	Parameter
Delay of automatic start (ASd)	128
Automatic start On/Off (ALS)	129
Light barrier sensing uncovered (LSd)	131
Start of sewing blocked with light barrier uncovered (LSS)	132

This function enables an automatic start of the sewing operation as soon as the light barrier senses the insertion of fabric.

Prerequisites for the operation:

- Parameter 009 = 1 (light barrier On).
- Parameter 129 = 1 (automatic start On).
- Parameter 131 = 1 (light barrier sensing uncovered).
- Parameter 132 = 1 (no start of sewing with light barrier uncovered).
- The pedal must be kept pressed forward at the seam end.

For safety reasons this function is enabled only after a normal start of sewing. The light barrier must be covered as long as the pedal is in position 0 (neutral). Then press the pedal forward. This function is disabled when the pedal is no longer pressed forward after the seam end.

9.20.5 Light Barrier Filter for Knitted Fabrics

Function with or without control panel	Parameter
Number of stitches of the light barrier filter (LSF)	005
Light barrier filter On/Off (LSF)	130
Light barrier sensing uncovered or covered (LSd)	131

The filter prevents premature enabling of the light barrier function when sewing knitted fabrics.

- Enabling/Disabling of the filter using parameter 130
- The filter is not active if parameter 005 = 0
- Adaptation to the mesh is possible by varying the number of filter stitches.
- Knitted fabric sensing with light barrier uncovered → covered, if parameter 131 = 0
Knitted fabric sensing with light barrier covered → uncovered, of parameter 131 = 1

9.21 Needle Up/Down; Single Stitch

The needle up/down or single stitch function can be activated by a key connected to socket A/6.

Mode for the key connected to connector A/6

Function with or without control panel	Parameter
Needle up/down; single stitch (nh1)	140
1 = Needle up	
2 = Needle up/down	
3 = Single stitch	
4 = Needle up if outside position 2	

Needle up parameter 140 = 1

When the key is pressed, the drive runs from position 1 to position 2. If the drive is outside position 1, it does not move for safety reasons. If the key is pressed and the sewing foot lifted, the sewing foot will be lowered before the drive runs to position 2. The function is blocked after power On until sewing is started.

Needle up/down parameter 140 = 2

When the key is pressed, the drive runs from position 1 to position 2 or from position 2 to position 1. If the drive is outside the two positions, it runs to the next possible position. After power On, the drive runs to the next position identified.

Single stitch parameter 140 = 3

When the key is pressed, the drive performs on rotation from the basic position. If the drive is not in the basic position, it runs there when pressing the key. It performs one complete rotation each time the key is pressed again.

Needle in position 2 parameter 140 = 4

When the key is pressed, the drive runs to position 2, independently of its present position. This function is also possible after power On.

9.22 F1/F2 Function Key Assignment on the V810/V820 Control Panels

Functions	Parameter
Selection of input function on the (A) key "F1" on the V810/V820 control panels (tF1)	293
Selection of input function on the (B) key "F2" on the V810/V820 control panels (tF2)	294

The following functions are possible using parameters 293 and 294:

293/294 = 0	Input function blocked
293/294 = 1	Needle up/down: Upon pressing the key, the drive runs from position 1 to position 2 or from position 2 to position 1. If the drive is not in the stop position, it runs to the preselected basic position.
293/294 = 2	Needle up: Upon pressing the key, the drive runs from position 1 to position 2.
293/294 = 3	Single stitch (basting stitch): Upon pressing the key, the drive performs one rotation from position 1 to position 1. If the drive is in position 2, it runs to position 1 upon pressing the key and from position 1 to position 1 each time the key is pressed again.
293/294 = 4	Full stitch: Upon pressing the key, the drive performs a full rotation depending on the stop position.
293/294 = 5	Needle to position 2: If the drive is not in position 2, it runs to position 2 upon pressing the key.
293/294 = 6	Output A if parameter 250 < 0
293/294 = 7	Output B if parameter 250 < 0
293/294 = 8	Handwheel runs in the direction of rotation
293/294 = 9	Handwheel runs in the opposite direction of rotation
293/294 = 10...12	No function
293/294 = 13	High lift for walking foot operational mode not stored: The signal "high lift for walking foot" is issued as long as the key is pressed down, and the drive runs with speed limitation (n10).
293/294 = 14	High lift for walking foot operational mode stored / flip-flop 1: The signal "high lift for walking foot" is issued upon briefly pressing the key, and the drive runs with speed limitation (n10). The operation is disabled upon pressing the key again.
293/294 = 15	No function
293/294 = 16	Intermediate backtack: Upon pressing the key, the backtack will be enabled anywhere in the seam and at standstill of the drive.
293/294 = 17	Backtack suppression / recall: Upon pressing the key, the backtack will be suppressed or recalled once.
293/294 = 18	No function
293/294 = 19	Reset bobbin thread monitor: After inserting a full bobbin, the stitch counter is set to the value determined using parameter 085.

9.23 Signals A1 and A2

Function with control panel	V820
Signal A1 On Signal A2 On Signals A1 and A2 On Signals A1 and A2 Off	lefthand arrow On righthand arrow On both arrows On both arrows Off

After slide-in strip 6 has been inserted into the V820 control panel and parameter 292 set to “6”, signals A1 and A2 can be assigned to a seam using key 8. The parameters described below determine the moment in which the signals are assigned in the seam and how long these signals are active. The example below illustrates the various possibilities (if parameter 320 = 0).

Parameter												
A1	301	302	303	304	305	308	309	NA	LS	NE	FA-E	P=0
A2	311	312	313	314 [ms]	315 [ms]	318 [St]	319 [St]					
	0	1	0	0	0	0	0					
	0	1	1	100	0	0	0		100			
	0	1	2	0	0	10	0		10			
	1	1	0	0	100	0	0		100			
	1	1	1	100	100	0	0		100	100		
	3	1	0	0	0	0	10		10			
	3	1	2	0	0	10	10		10	10		
	3	1	1	100	0	0	10		100	10		
	1	1	2	0	100	10	0		10	100		
	1	2	0	0	100	0	0				100	
	1	2	1	100	100	0	0				100	100

0256/BILD4

Parameter												
A1	301	302	303	304	305	308	309	NA	LS-D	NE	FA-E	P=0
A2	311	312	313	314 [ms]	315 [ms]	318 [St]	319 [St]					
	0	0	0	0	0	0	0					1)
	0	0	0	0	0	0	0					2)
	1	0	0	0	100	0	0		100			
	1	0	1	100	100	0	0		100	100		
	3	0	0	0	0	0	10		10			
	3	0	2	0	0	10	10		10	10		
	3	0	1	100	0	0	10		100	10		
	1	0	2	0	100	10	0		10	100		
	2	0	0	0	0	0	0					1)
	2	0	0	0	0	0	0					2)
	0	0	1	100	0	0	0		100			
	0	0	2	0	0	10	0		10			
	1	3	0	0	100	0	0			100		
	1	3	1	100	100	0	0			100	100	
	3	3	0	0	0	0	10			10		
	3	3	2	0	0	10	10			10	10	
	3	3	1	100	0	0	10			100	10	
	1	3	2	0	100	10	0			10	100	
	2	3	0	0	0	0	0					
	0	3	0	0	0	0	0					
	0	3	1	100	0	0	0			100		
	0	3	2	0	0	10	0			10		
	2	3	1	100	0	0	0			100		
	2	3	2	0	0	10	0			10		

0256/BILD3

NA = Start of seam LS-D = Light barrier covered at the start of the seam P=0 = Pedal in pos. 0 (neutral)
 NE = Seam end LS = Light barrier uncovered or covered at the seam end FA-E = Thread trimming end

- 1) Seam end after stitch counting or light barrier sensing
- 2) Seam end after the pedal has been pressed to pos. -2

Different power transistors can be selected using **parameter 300** for signal A1 and **parameter 310** for signal A2.

Parameter 300/310 = 0 → No function
 1 → Signal A1 / A2 at output M1
 2 → Signal A1 / A2 at output M2
 3 → Signal A1 / A2 at output M3
 4 → Signal A1 / A2 at output M4
 5 → Signal A1 / A2 at output M5
 6 → Signal A1 / A2 at output M6
 7 → Signal A1 / A2 at output M7
 8 → Signal A1 / A2 at output M8
 9 → Signal A1 / A2 at output M9
 10 → Signal A1 / A2 at output M10
 11 → Signal A1 / A2 at output M11
 12 → Signal A1 / A2 at output VR

It is possible to select using **parameter 301** for signal A1 and **parameter 311** for signal A2, whether the signals On until the seam end or during a programmable time.

Parameter 301/311 0 → Signal A1 / A2 active until seam end
 1 → Signal A1 / A2 effective during a programmable time

It is possible to select using **parameter 302** for signal A1 and **parameter 312** for signal A2, whether the signals shall be effective at the start of the seam, after light barrier sensing or at the seam end.

Parameter 302/312 0 → Signal A1 / A2 starts at the beginning of the seam
 1 → Signal A1 / A2 starts after light barrier sensing
 2 → Signal A1 / A2 starts at the seam end

It is possible to select using **parameter 303** for signal A1 and **parameter 313** for signal A2, whether the signals shall be activated with or without delay.

Parameter 303/313 0 → Signal A1 / A2 activated without delay time
 1 → Signal A1 / A2 activated with a delay time

The delay times can be selected separately for signal A1 using **parameter 304** and for signal A2 using **parameter 314**.

The ON periods can be selected separately for signal A1 using **parameter 305** and for signal A2 using **parameter 315**.

The speed mode can be set separately for signal A1 using **parameter 306** and for signal A2 using **parameter 316**. The speed limitation is effective only when the respective signal is On.

Parameter 306/316 0 → Pedal controlled speed
 1 → Limited to speed n9 (parameter 288) when signal is issued
 2 → Limited to speed n11 (parameter 289) when signal is issued

The signals can be enabled or disabled separately for signal A1 using **parameter 307** and for signal A2 using **parameter 317**.

It is possible to select using **parameter 308** for signal A1 and **parameter 318** for signal A2, whether the signals shall be activated with or without delay stitches.

Parameter 308/318 0 → Signal A1 / A2 activated without delay stitches
 1 → Signal A1 / A2 activated with delay stitches

Separate stitch counts can be selected for signal A1 using **parameter 309** and for signal A2 using **parameter 319**.

The switch-off moment for signals A1 and A2 can be set using **parameter 320**.

Parameter 320 0 → Signals effective until seam end
 1 → Signals effective until pedal has been pressed to pos. 0 (neutral)

When using the V820 control panel, direct access by means of the function key (9 key) is possible!

Function with control panel	Parameter
Signal A1 and/or A2 On/Off with slide-in strip 1...4 (lefthand arrow = A1, righthand arrow = A2)	(-F-) 008 = 5

9.24 Signal Output Position 1

- Transistor output with open collector
- Signal whenever the needle is in the slot between position 1 and 1A
- Independent of sewing, thus also when turning the handwheel manually
- Suitable e. g. for the connection of a counter
- An inverted signal is issued at socket A/20

9.25 Signal Output Position 2

- Transistor output with open collector
- Signal whenever the needle is in the slot between position 2 and 2A
- Independent of sewing, thus also when turning the handwheel manually
- Suitable e. g. for the connection of a counter
- An inverted signal is issued at socket A/21

9.26 Signal Output 512 Impulses per Rotation

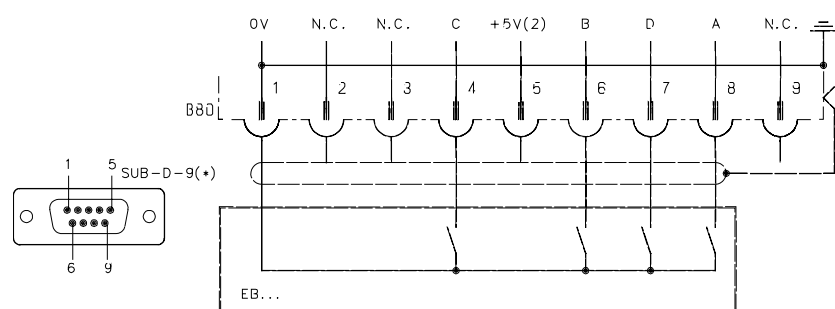
- Transistor output with open collector
- Signal whenever a generator slot of the position transmitter is sensed
- 512 impulses per rotation of the handwheel
- Independent of sewing, thus also when turning the handwheel manually
- Suitable e. g. for the connection of a counter
- An inverted signal is issued at socket A/22

9.27 Actuator

The commands for the sewing operation are input by means of the actuator, which is connected to the pedal. Instead of the built-on actuator another actuator can also be connected to socket B80.

Table: Coding of the Pedal Steps

Pedal step	D	C	B	A	
-2	H	H	L	L	Full heelback (e. g. initiating the seam end)
-1	H	H	H	L	Slight heelback (e. g. sewing foot lifting)
0	H	H	H	H	Pedal in pos. 0 (neutral)
½	H	H	L	H	Pedal slightly forward (e. g. sewing foot lowering)
1	H	L	L	H	Speed stage 1 (n1)
2	H	L	L	L	Speed stage 2
3	H	L	H	L	Speed stage 3
4	H	L	H	H	Speed stage 4
5	L	L	H	H	Speed stage 5
6	L	L	H	L	Speed stage 6
7	L	L	L	L	Speed stage 7
8	L	L	L	H	Speed stage 8
9	L	H	L	H	Speed stage 9
10	L	H	L	L	Speed stage 10
11	L	H	H	L	Speed stage 11
12	L	H	H	H	Speed stage 12 (n2) Pedal fully forward



[B11150]

EB.. Actuator
2) Nominal voltage 5V, $I_{\max} = 20 \text{ mA}$

Function with or without control panel	Parameter
Speed stage graduation (nSt)	119

The pedal characteristics (speed change from stage to stage) can be varied.

Possible characteristic curves:

- linear
- progressive
- highly progressive

9.28 Audible Signal

Function with control panel	Parameter
Audible signal On/Off (AkS)	127

An audible signal which sounds in the following cases can be enabled using parameter 127:

- When the machine run blockage is On.

9.29 Master Reset

Recovery of factory settings.

- Press the "P" key and turn power on
- Input code number "190"
- Press the "E" key
- Parameter 100 appears on the display
- Press the "E" key
- The parameter value is shown on the display
- Set to "170" using the "+" key
- Press the "P" key twice
- Turn power off
- Turn power on. All parameters, except 111, 161, 170, 171, 190...193, have been reset to their factory settings.

10 Signal Test

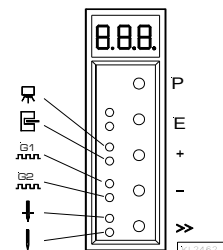
Function with or without control panel	Parameter
Input and output test (Sr4)	173

Function test of external inputs and transistor power outputs with connected actuators (e.g. solenoids and solenoid valves).

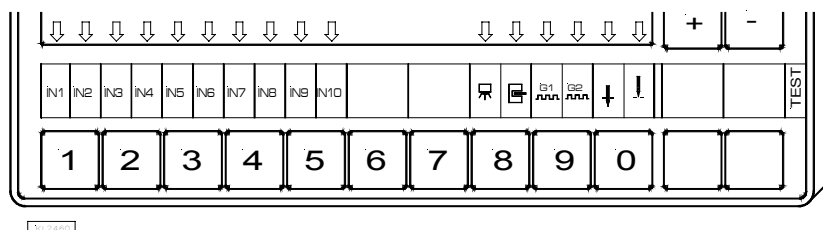
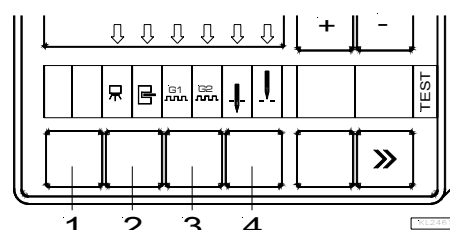
10.1 Signal Test Using the Incorporated Control Panel or the V810/V820

Input Test:

- Select parameter 173.
- **Control:** Functions of signals "light barrier, sensor (IPG... or HSM...), generator impulse 1 and 2, positions 1 and 2" can be checked directly and indicated by LEDs 3...8. Inputs in1...in10 are displayed individually. Several switches and/or keys must not be actuated at the same time. If several keys and/or switches are actuated at the same time, e.g. **in3**, **in5**, **in6**, **in7**, the least significant input will be displayed, e.g. **in3**.



- **V810 control panel:** The above signals are indicated by arrows above keys 2...4. Inputs in1...in10 appear individually on the LC display. Several switches and/or keys must not be actuated at the same time (see control).
- **V820 control panel:** Inputs in1...in10 and signals “light barrier, sensor, generator impulse 1 and 2, positions 1 and 2” are displayed by arrows above keys 1...10. Several inputs can be actuated and displayed at the same time.

V820 Control Panel**V810 Control Panel****Note**

The input is displayed if the set function includes a normally open [N. O.] or normally closed [N.C.] contact. If, for example, the input with open contact is active, the corresponding arrow lights up when the contact is open. If the input with closed contact is active, the corresponding arrow lights up when the contact is closed.

Output Test:

- Select the desired output using the +/- key
- Enable the selected output using the >> key on the V810 or the incorporated control panel
- Enable the selected output using the key at the bottom right on the V820

Display	Assignment of the outputs	
01	Backtacking	on socket ST2/34
02	Sewing foot lift	on socket ST2/35
03	Output M1	on socket ST2/37
04	Output M3	on socket ST2/27
05	Output M2	on socket ST2/28
06	Output M4	on socket ST2/36
07	Output M5	on socket ST2/32
08	Output M11	on socket ST2/31
09	Output M6	on socket ST2/30
010	Output M9	on socket ST2/25
011	Output M8	on socket ST2/24
012	Output M7	on socket ST2/23
013	Output M10	on socket ST2/29

11 Error Displays

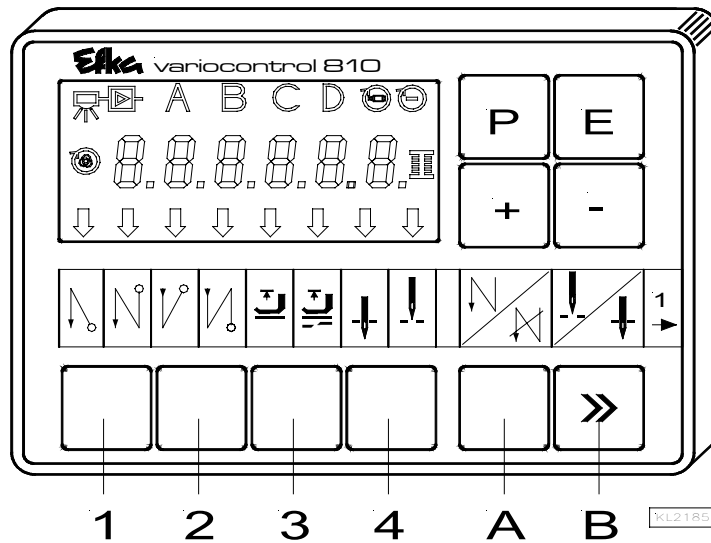
General Information			
On the control	On the V810	On the V820	Signification
A1	InF A1	InF A1	Pedal not in neutral position when turning the machine on
A2	-StoP- blinking	-StoP- blinking + symbol display	Machine run blockage
A3	InF A3	InF A3	Reference position is not set
A5	InF A5	InF A5	Emergency run, identification of an invalid machine select

Programming Functions and Values (Parameters)			
On the control	On the V810	On the V820	Signification
Returns to 000 or to last parameter number	Returns to 0000 or to last parameter number	Like V810 + display InF F1	Wrong code or parameter number input

Serious Condition			
On the control	On the V810	On the V820	Signification
E1	InF E1	InFo E1	The external pulse encoder e.g. IPG... is defective or not connected.
E2	InF E2	InF E2	Line voltage too low, or time between power Off and power On too short.
E3	InF E3	InF E3	Machine blocked or does not reach the desired speed.
E4	InF E4	InF E4	Control disturbed by deficient grounding or loose contact.
E9	InF E9	InF E9	Defective EEPROM.

Hardware Disturbance			
On the control	On the V810	On the V820	Signification
H1	InF H1	InF H1	Commutation transmitter cord or frequency converter disturbed.
H2	InF H2	InF H2	Processor disturbed

12 Operating Elements of the V810 Control Panel



The V810 control panel is supplied with the **no. 1** slide-in strip above the keys and is able to function correctly only with this strip.

Function Assignment to the Keys

P key = Call or exit of programming mode

E key = Enter key for modifications in the programming mode

+ key = Increase of the value indicated in the programming mode

- key = Decrease of the value indicated in the programming mode

1 key = Start backtack SINGLE / DOUBLE / OFF

2 key = End backtack SINGLE / DOUBLE / OFF

3 key = Automatic sewing foot lift after thread trimming ON / OFF
Automatic sewing foot lift at stop in the seam ON / OFF

4 key = Basic position needle down (POSITION 1) / needle up (POSITION 2)

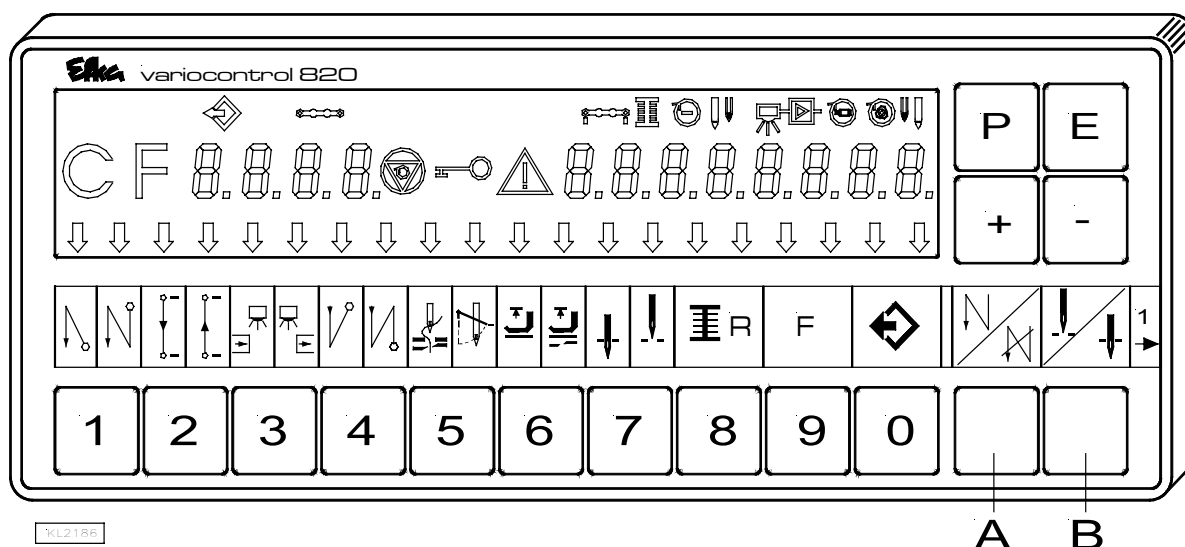
A key = Key for intermediate backtack

(Different input functions can be assigned to the A key using parameter 293)

B key = Key for needle up/down or shift key in the programming mode

(Different input functions can be assigned to the B key using parameter 294)

13 Operating Elements of the V820 Control Panel



The V820 control panel is supplied with the **no. 1** slide-in strip above the keys. For different functions the strip can be replaced with another one supplied with the control panel. Set parameter **292** in this case. See also **V810 / V820** instruction manual!

Function Assignment to the Keys

- P key = Call or exit of programming mode
- E key = Enter key for modifications in the programming mode
- + key = Increase of the value indicated in the programming mode
- key = Decrease of the value indicated in the programming mode
- 1 key = Start backtack SINGLE / DOUBLE / OFF
- 2 key = Stitch counting seam FORWARD / BACKWARD / OFF
- 3 key = Light barrier function COVERED-UNCOVERED / UNCOVERED-COVERED / OFF
- 4 key = End backtack SINGLE / DOUBLE / OFF
- 5 key = THREAD TRIMMER / THREAD TRIMMER + THREAD WIPER / OFF
- 6 key = Automatic sewing foot lift after thread trimming ON / OFF
Automatic sewing foot lift at stop in the seam ON / OFF
- 7 key = Basic position needle down (POSITION 1) / needle up (POSITION 2)
- 8 key = Bobbin thread monitor ON / OFF
- 9 key = Function key - programmable
- 0 key = Teach-in / execution of 99 possible seam sections

- A key = Key for backtack suppression/recall
(Different input functions can be assigned to the A key using parameter 293)
- B key = Key for needle up/down or shift key in the programming mode
(Different input functions can be assigned to the B key using parameter 294)

Special Key Assignment for HIT

After having pressed the 1, 2, 3, 4 or 9 key, the following can be varied using the +/- key:

- 1 key = Number of stitches of the selected start backtack
- 2 key = Number of stitches of the seam with stitch counting
- 3 key = Number of light barrier compensating stitches
- 4 key = Number of stitches of the selected end backtack
- 9 key = Number of stitches or On/Off of the programmed function



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