

Efka variostop

CONTROL

2F82AV2210

Replaces 2F62AV

INSTRUCTION MANUAL

WITH PARAMETER LIST

No. 402176

english

Contents	Page
1. Important Safety Instructions	1
2. Range of Applications	2
2.1 Use in Accordance with Regulations	2
3. Complete Drive Unit Consisting of	2
3.1 Special Accessories	3
4. Operating the Control without Variocontrol	4
4.1 Access to Programming on Command Input	4
4.2 Programming the Code Number	4
4.3 Selection of the Parameters	6
4.3.1 Selection by Using the +/- Pushbuttons	6
4.3.2 Direct Selection	7
4.4 Changing Parameter Values	8
4.5 Changing All Parameter Values of the Operator Level	10
4.6 Switchable Functions	10
4.7 Direct Input of Maximum Speed Limitation (DED)	11
4.8 Program Identification on the Control	11
5. Operating the Control with Variocontrol	12
5.1 Code Number Input	12
5.2 Direct Operation	12
5.3 Input by Parameters on the Operator Level	12
5.4 Input by Parameters on the Technician and Supplier Level	13
5.5 Maximum Speed Limitation by Direct Input (DED)	13
5.6 Pushbuttons for Background Information (HIT)	14
5.6.1 Examples for HIT	14
5.7 Program Identification	17
5.8 Display Actual Speed	17
6. Starting Service	18
7. Setting the Basic Functions	18
7.1 Positioning Speed	18
7.2 Maximum Speed Compatible with the Sewing Machine	18
7.3 Maximum Speed	18
7.4 Positions	19
7.5 Display of the Signal and Stop Positions	20
7.6 Braking Behavior	20
7.7 Braking Power at Standstill	20
7.8 Start Behavior	21
7.9 Speed Gate	21
7.10 Supply Voltage 5V and/or 12V	21
8. Functions without Variocontrol	22
8.1 First Stitch After Power On	22
8.2 Softstart	22
8.2.1 Softstart Speed	22
8.2.2 Softstart Stitches	22
8.3 Sewing Foot Lifting	23
8.4 Start Stitch Condensing	24
8.4.1 Start Stitch Condensing Speed	24
8.4.2 Number of Stitches of the Start Stitch Condensing	25
8.4.3 Delay until Speed Release	25

8.5 End Stitch Condensing	25
8.5.1 End Stitch Condensing Speed	25
8.5.2 Number of Stitches of the End Stitch Condensing	26
8.6 Intermediate Stitch Condensing	26
8.7 Stitch Condensing Suppression/Recall	26
8.8 Holding Power of Stitch Condensing	26
8.9 Blocking of Machine Run (Safety Switch)	27
8.10 Thread Monitor	28
8.11 Thread Trimming Operation	28
8.11.1 Trimming Speed	28
8.11.2 Times of the Trimming Signals	29
8.12 Needle Up / Needle Up-Down	29
8.13 Single Stitch	29
8.14 Seam with Stitch Counting	30
8.14.1 Stitches for Stitch Counting	30
8.14.2 Stitch Counting Speed	30
8.14.3 Seam with Stitch Counting When Light Barrier Is On	30
8.15 Free Seam and Seam with Light Barrier	31
8.16 Light Barrier	31
8.16.1 Speed after Light Barrier Sensing	31
8.16.2 General Light Barrier Functions	31
8.16.3 Reflection Light Barrier	32
8.16.4 Automatic Start by Light Barrier	32
8.16.5 Operation with Two Light Barriers	33
8.16.6 Light Barrier Filter for Knitted Fabrics	33
8.16.7 Functional Variations of the Light Barrier Input	33
8.17 Actuator	34
9. Additional Functions by Using a Variocontrol	35
9.1 Operation with Two Light Barriers	35
9.2 Programming Seams (Teach-in)	35
9.2.1 Teach-in Mode	35
9.2.1.1 Seam with Stitch Counting	36
9.2.1.2 Stitch Counting with Activated Stitch Regulator	36
9.2.1.3 Stitch Counting and/or Light Barrier	36
9.2.1.4 Detailed Example	37
9.2.2 Max. Number of Seams Exceeded	38
9.2.3 Execution (Pattern) Mode	39
10. Memory Box	40
10.1 Preparation for Memory Box Operation	40
10.2 Formatting of the Memory Card	40
10.3 Operating the Memory Box	41
11. Signal Test	43
11.1 Signal Test with Variocontrol	43
11.2 Signal Test without Variocontrol	43
12. Error Messages	44
13. Socket Connectors	45
13.1 Position in the Control	45
13.2 Connection Diagram	46
14. Timing Diagrams	49
15. Parameter List	54
15.1 OPERATOR LEVEL	54
15.2 TECHNICIAN LEVEL	55
15.3 SUPPLIER LEVEL	59
15.4 Masterreset	61
16. Operating Elements of the Variocontrol	65

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 sewing machines:

Brand	Series
UNION SPECIAL	Chainstitch machines classes 34000 and 57000

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 respective EC standards:

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

The drive can only be operated:

- on thread processing machines
- in dry areas

3. Complete Drive Unit Consisting of

1	Induction motor with electromagnetic clutch	V....
1	Electronic control	variostop 2F82AV2210
	- Power pack	N30
1	Position transmitter	P5-2
1	Set of standard accessories	B10
	consisting of:	belt guard, complete (for pulleys up to 132 mm ϕ) set of hardware motor mounting foot bracket 1 and 2, short documentation
1	Set of accessories	Z3
	consisting of	pitman rod, complete
1	Pulley	

3.1 Special Accessories

Variocontrol V720	- part no. 5900124
Variocontrol V730	- part no. 5900125
Belt guard (for pulleys up to 180 mm ϕ)	- part no. 7960012
Storage unit Memory Box MB001	- part no. 7900052
Storage card Memory Card MC001	- part no. 1111602
Reflection light barrier module Variolux LSM001	- part no. 6100028
Reflection light barrier Variolux LS-001-004 (only in conjunction with V730)	- part no. 6100007
Solenoid type EM1.. (for e.g. sewing foot lift, stitch condensing, etc.)	- available versions see specification "solenoids"
Extension cable for external actuator, approx. 750 mm long, complete with plug and socket connector	- part no. 1111845
Extension cable for external actuator, approx. 1500 mm long, complete with plug and socket connector	- part no. 1111787
5-pin plug with locking screw for the connection of another external actuator	- part no. 0501278
External actuator type EB301 with approx. 250 mm connecting cable and 5-pin plug with locking screw	- part no. 41.0011
External actuator type EB302 (softer spring) approx. 250 mm connecting cable and 5-pin plug with locking screw	- part no. 41.0012
Foot control type FB302 for standing operation with approx. 1400 mm connecting cable and plug	- part no. 4160018
Potential equalization cord 700 mm long, LIY 2.5 mm ² , grey, with forked cable brackets on both sides	- part no. 1100313
Extension cable for position transmitter P5-..., approx. 1100 mm long, complete with plug and socket connector	- part no. 1111584
Extension cable for position transmitter P5-..., approx. 315 mm long, complete with plug and socket connector	- part no. 1111229
Knee switch type KN3 (pushbutton) with cord of approx. 950 mm length without plug	- part no. 58.0013
Sewing light transformer	- please indicate line voltage and sewing light voltage (6.3V or 12V)
3-pin plug with locking screw	- part no. 0500402
4-pin plug with locking screw	- part no. 0501431
6-pin plug with locking screw	- part no. 0500703
6-pin plug (Hirschmann Mes60)	- part no. 0500457
10-pin plug (Hirschmann Mes100)	- part no. 0500357

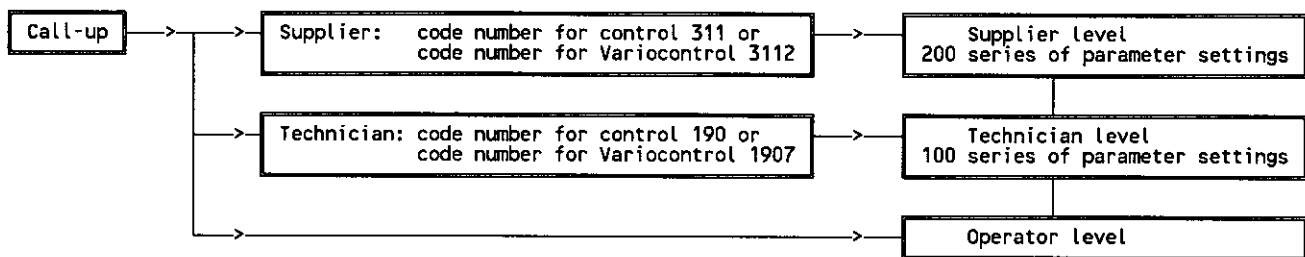
4. Operating the Control without Variocontrol

4.1 Access to Programming on Command Input

In order to prevent the unintentional modification of preset functions the input commands are distributed at various levels.

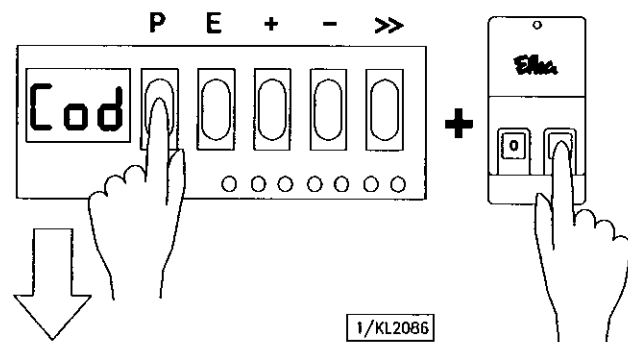
The following persons have access:

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

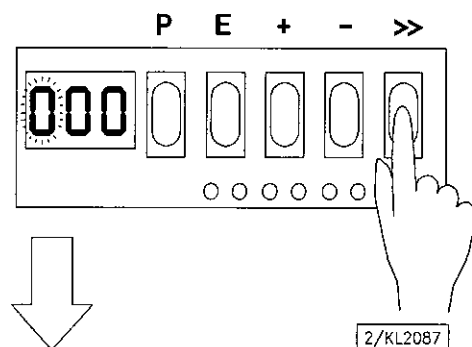


4.2 Programming the Code Number

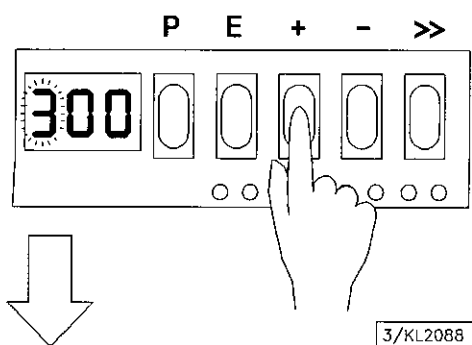
The programming levels can be selected by inputting a preset code number, as the following example shows:



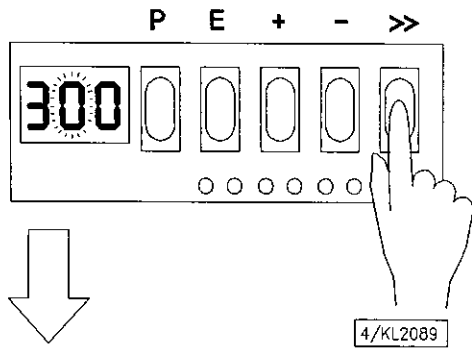
Press pushbutton P and turn power on



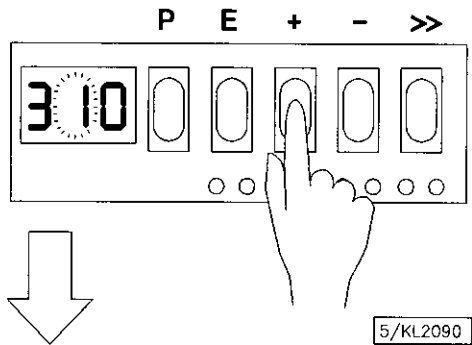
Press pushbutton >> (first digit blinks)



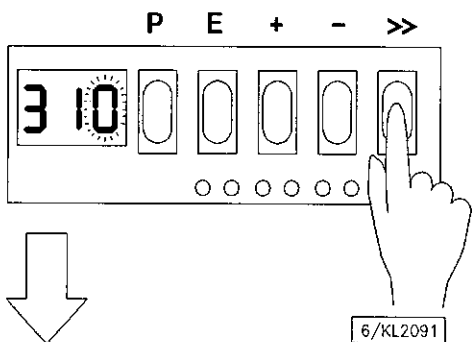
Press pushbutton + and/or - to select the first digit



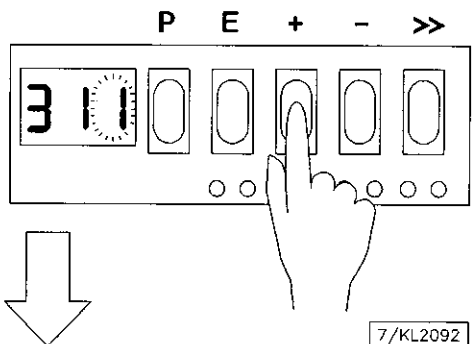
Press pushbutton >> (second digit blinks)



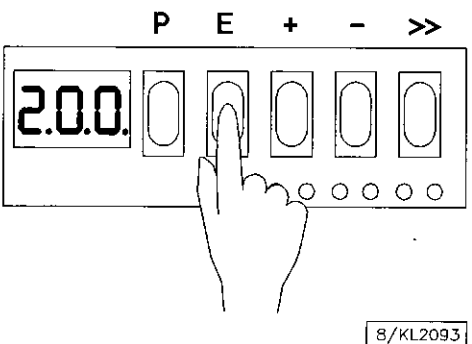
Press pushbutton + and/or - to select the second digit



Press pushbutton >> (third digit blinks)



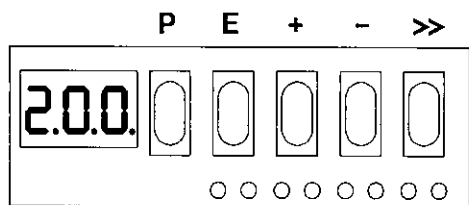
Press pushbutton + and/or - to select the third digit



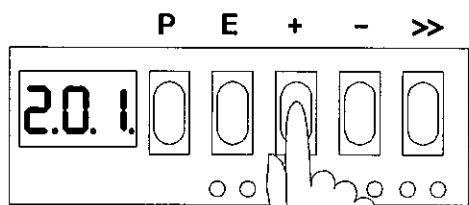
Press pushbutton E; the parameter number is displayed. This is indicated by points between the digits.

4.3 Selection of the Parameters

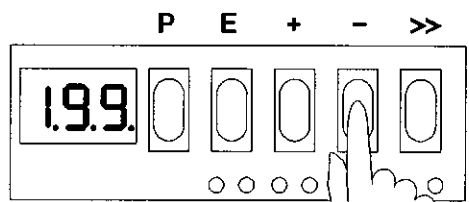
4.3.1 Selection by Using the +/- Pushbuttons



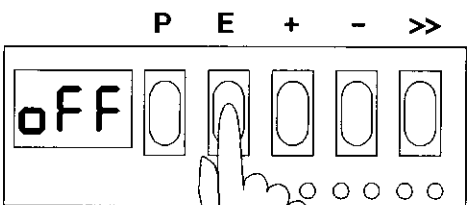
After inputting the code number on the programming level



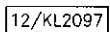
Select next parameter by pressing the + pushbutton



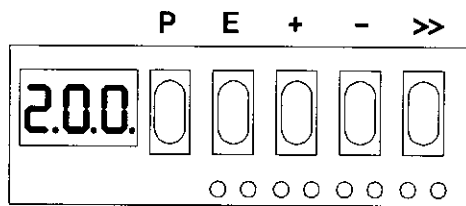
Select previous parameter by pressing the - pushbutton.



Press pushbutton E; the parameter value is displayed



4.3.2 Direct Selection



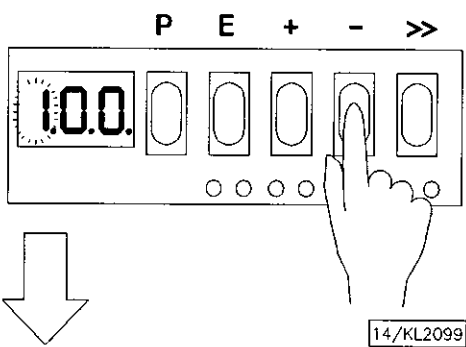
After inputting the code number: programming level



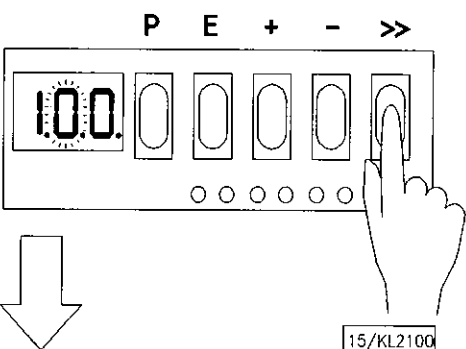
Press pushbutton >> (first digit blinks)



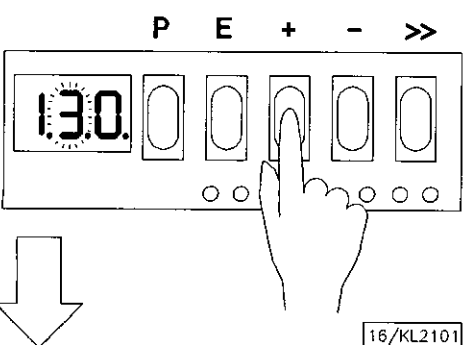
Press pushbutton + and/or - to select the first digit

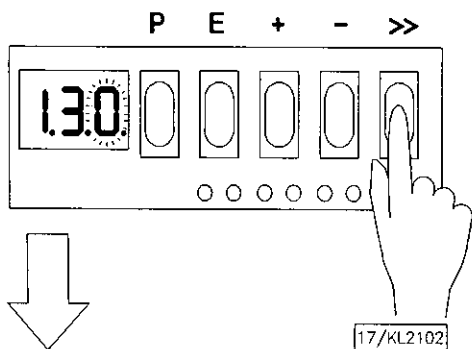


Press pushbutton >> (second digit blinks)

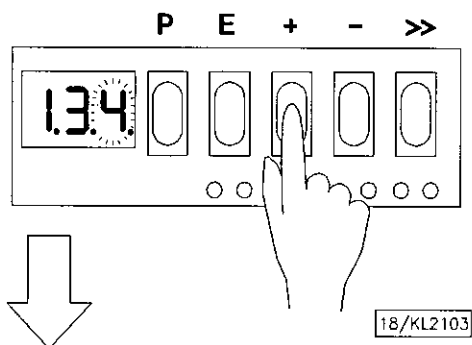


Press pushbutton + and/or - to select the second digit

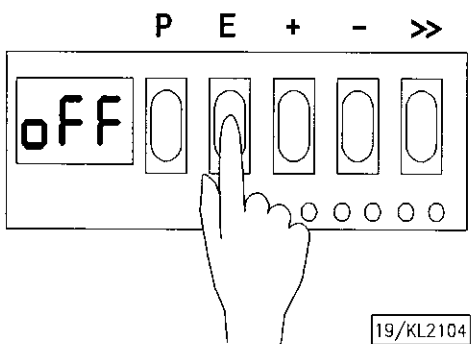




Press pushbutton >> (third digit blinks)

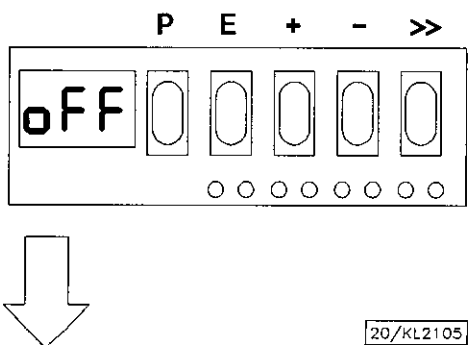


Press pushbutton + and/or - to select the third digit

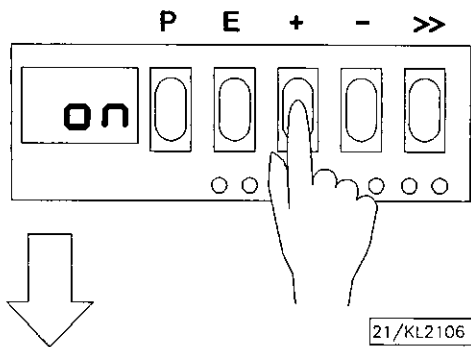


Press pushbutton E; the parameter value is displayed. There are no points between the digits.

4.4 Changing Parameter Values

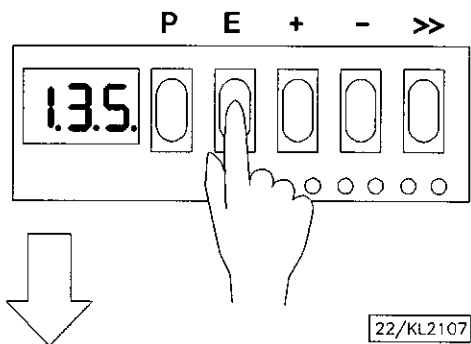


Display after selecting the parameter value

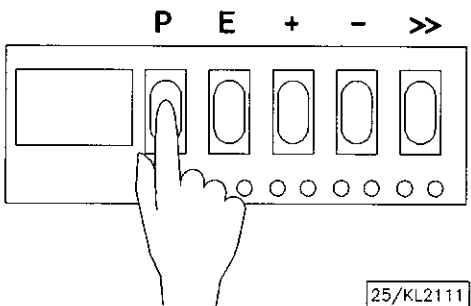


Press pushbutton + and/or - to change the parameter value

Possibility # 1:



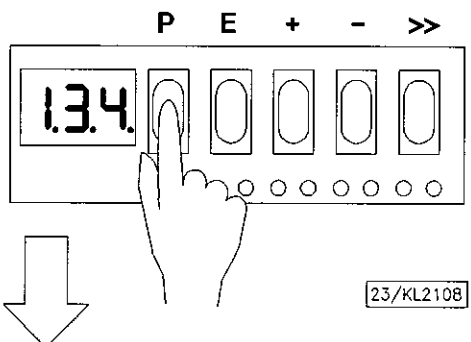
Press pushbutton E. The next parameter number is displayed.



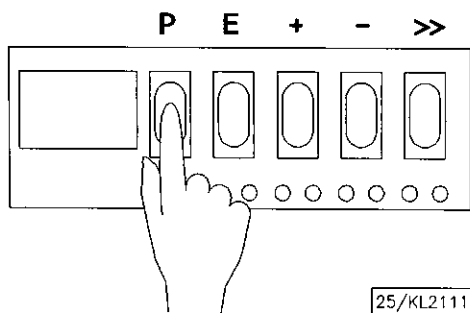
Press pushbutton P. Exit programming.

The changed parameter values will be saved only after the next sewing start!

Possibility # 2:



Press pushbutton P. The same parameter number is displayed.



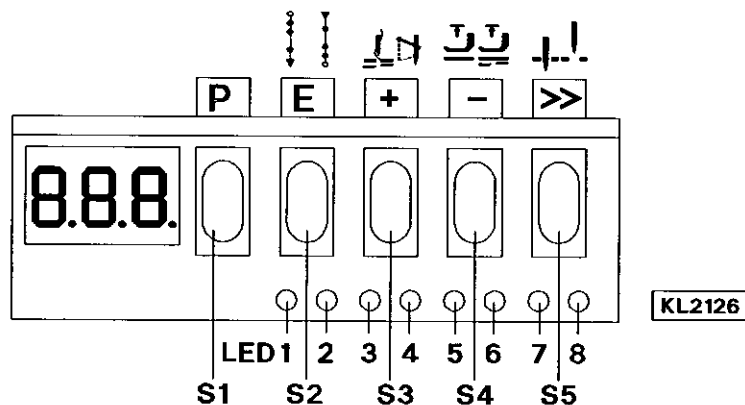
Press pushbutton P. Exit programming.

The changed parameter values will be saved only after the next sewing start!

4.5 Changing All Parameter Values of the Operator Level

All parameter values of the operator level (see Parameter List) can be changed without inputting a code number.

- Press pushbutton P ==> First parameter number will be displayed.
- Press pushbutton E ==> Parameter value will be displayed.
- Press pushbuttons +/- ==> Parameter value will be changed.
- Press pushbutton E ==> Next parameter will be displayed.
- Press pushbutton E ==> Parameter value will be displayed.
- Press pushbuttons +/- ==> Parameter value will be changed.
- etc.
- Press pushbutton P 2x ==> Exit programming on the operator level.



4.6 Switchable Functions

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

Table: Allocation of functions for pushbuttons and LEDs

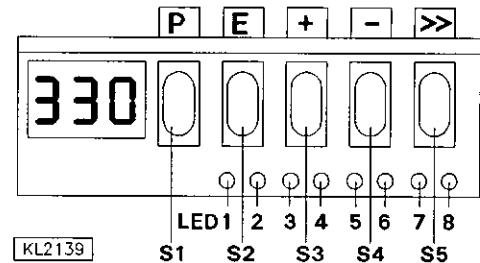
Function	Pushbutton	LED number	
Start stitch condensing On	E (S2)	1 = on	2 = off
End stitch condensing On		1 = off	2 = on
Start and end stitch condensing On		1 = on	2 = on
Start and end stitch condensing Off		1 = off	2 = off
Thread trimming operation M1 / M2 On	+ (S3)	3 = on	4 = off
Thread trimming operation M3 On		3 = off	4 = on
Thread trimming operation M1 / M2 / M3 On		3 = on	4 = on
Thread trimming operation M3 Off		3 = off	4 = off
Sewing foot lifting at stop in the seam (automatic)	- (S4)	5 = on	6 = off
Sewing foot lifting at the seam end (automatic)		5 = off	6 = on
Sewing foot lifting at stop in the seam and at the seam end (automatic)		5 = on	6 = on
Sewing foot lifting (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

4.7 Direct Input of Maximum Speed Limitation (DED)

The maximum speed of the machine can be limited to the specific level according to the application directly by using pushbuttons +/- on the Variocontrol during machine run or during intermediate stop. This function is blocked at the start of the seam and/or after trimming. The actual value is shown on the display and must be multiplied by 10.

Example:

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



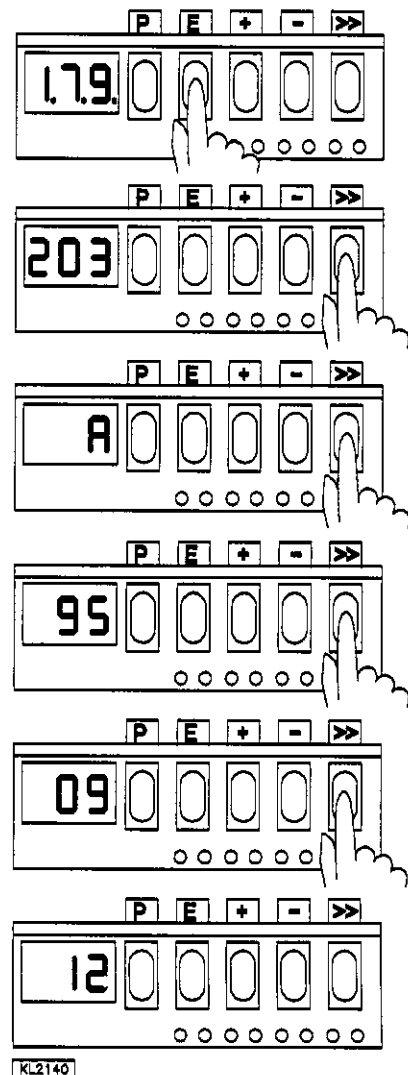
4.8 Program Identification on the Control

Functions without Variocontrol	Parameter
Display of program number, modification index and identification number	179

After having selected parameter 179, the display shows the following information in succession:

Example:

- Select parameter 179 and press pushbutton E!
- On the display the program number (2203) is shortened by one digit! Continue by pressing pushbutton >> !
- The display shows the modification index (A) of the program! Continue by pressing pushbutton >> !
- Identification number digit 1 and 2!
Continue by pressing pushbutton >> !
- Identification number digit 3 and 4!
Continue by pressing pushbutton >> !
- Identification number digit 5 and 6!



The routine is exited by pressing pushbutton P twice. The drive is again ready for sewing. When pressing pushbutton E, the routine is as well exited, and the next parameter number is displayed.

5. Operating the Control with Variocontrol

5.1 Code Number Input

1. TURN POWER OFF
2. => **P** + TURN POWER ON ==> C-0000
3. => **1** => **2** => **3** =>.. Input CODE NUMBER !
(Example)
4. => **E** => If CODE NUMBER wrong repeat input ! ==> C-0000
InFo F1
- => If CODE NUMBER correct ==> F-XXX

F-XXX = first parameter number in the recalled level

5.2 Direct Operation

By pushing the numeral buttons and some symbol buttons on the Variocontrol it is possible to turn functions on or off.

Example: End stitch condensing

- | | | | |
|---|--|---|---|
| - End stitch condensing on | top LED next to pushbutton 8 lights up | I | 8 |
| | | 0 | |
| | | 0 | |
| Push button 8 briefly | bottom LED next to | I | 8 |
| - End stitch condensing and long stitches afterwards ON | pushbutton 8 lights up | 0 | |
| Push button 8 briefly | both LEDs | I | 8 |
| - Both countings OFF | on pushbutton 8 OFF | 0 | |

5.3 Input by Parameters on the Operator Level

>> ONLY IF CODE NUMBER HAS NOT BEEN INPUTTED <<

1. => **P** => LED pushbutton P blinks ! ==>

2. => **E** => Display of the first parameter parameter no. does not appear ! ==> aaa bbb

aaa = abbreviation of the parameter
bbb = value of the parameter

3. => **+** => **-** => Change parameter value !

4. => **E** => PARAMETER VALUE is entered Display steps to next PARAMETER ==> aaa bbb

OR

- => **P** => PARAMETER VALUE is entered ! ==> EXIT PROGRAMMING !

5.4 Input by Parameters on the Technician and Supplier Level

- => After input of the CODE NUMBER
Display of the first PARAMETER NO. ==>

F-XXX

1. =>

P

 => The most significant digit
on the display blinks! ==>

F-XXX

2. =>

1

 =>

2

 =>

3

 =>.. Input desired PARAMETER NO.
(Example)
3. =>

E

 => If PARAMETER NUMBER wrong
repeat input ! ==>

F-XXX
InFo F1
- => If PARAMETER NUMBER correct ==>

F-XXX
aaa bbb

F-XXX = recalled parameter number
aaa = abbreviation of the parameter
bbb = value of the parameter

4. =>

+

 =>

-

 => Change parameter value !
5. =>

E

 => PARAMETER VALUE is entered
Display steps to next PARAMETER ==>

F-XXX
aaa bbb
- OR
- =>

P

 => PARAMETER VALUE is entered
Call-up of a new PARAMETER NO.
as under step 1 possible ! ==>

F-XXX

- OR
- =>

P

 =>

P

 => Press button twice ==>

EXIT PROGRAMMING !

5.5 Maximum Speed Limitation by Direct Input (DED)

Upper limit of the maximum speed (nmaxmax)	-->	111
Lower limit of the maximum speed (nmaxmin)	-->	121

The maximum speed of the machine can be limited to the specific level according to the application directly by using pushbuttons +/- on the Variocontrol at each seam end.

The actual value is shown on the display.

The setting range is between the speeds programmed by 111 (upper limit) and 121 (lower limit).

Actual value on the display in the direct mode:

4300	==>	Display of speed nmax
xx82xV	==>	Type of control

=> + => - ==> Change value

New value on the display after pressing e.g. pushbutton - 8 times

3500 xx82xV	==> Display of speed nmax ==> Type of control
----------------	--

5.6 Pushbuttons for Background Information (HIT)

(setting of the pushbuttons see figure on the last page)

For fast operator information the values of the functions are indicated on the display of the Variocontrol for approx. 3 seconds by pressing the pushbuttons 1, 2, 3, 7, 8 and 0, when switching on. During this time the respective value can be changed immediately by the + and - pushbuttons. The display remains the same during set-up.

If the value of an activated function is to be changed the respective function key must be pressed somewhat longer. The function will thus be turned off and/or commutated briefly. Subsequently, the function with the respective value is shown on the display again.

5.6.1 Examples for HIT

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

If stitch counting (pushbutton 1) is turned off.

6000 2F82AV	Display after power on: => Maximum speed => Type designation
----------------	--

1	Press pushbutton 1 briefly. LED beside pushbutton 1 lights up, stitch counting is turned on.
---	--

Stc 020	Display: 20 stitches are set
---------	---------------------------------

+	Press pushbutton +, number of stitches increases.
---	--

Stc 025	Display: 25 stitches are set Changes are automatically entered after 3 seconds.
---------	--

6000 2F82AV	Display after approx. 3 seconds: => Maximum speed => Type designation
----------------	---

If stitch counting (pushbutton 1) is turned on.

6000
2F82AV

Display after power on:
=> Maximum speed
=> Type designation

1

Press pushbutton 1 for at least 1 second,
LED beside pushbutton 1 goes off
momentarily, function stitch counting
remains on.

Stc 020

Display:
20 stitches are set

+

Press pushbutton +,
number of stitches increases.

Stc 025

Display:
25 stitches are set .
Changes are automatically entered after
3 seconds.

6000
2F82AV

Display after approx. 3 seconds:
=> Maximum speed
=> Type designation

With the sewing start the new value is saved.

Function key F

By the function key (pushbutton 3) various parameters, also from a higher level, can be switched on or off.
This pushbutton can be set to the following functions:

1. SSt Softstart ON/OFF
2. LSS Sewing start blocked with light barrier uncovered ON/OFF

The setting of the F pushbutton can be changed as follows:

6000
2F82AV

Display after power on.
=> Maximum speed
=> Type designation

P

Press pushbutton P.

E

Press pushbutton E.

3

Press pushbutton 3 (function key F),
corresponding LED blinks.

-F- 2

Display:
Actual status (sewing start blocked with
light barrier uncovered)

-

Press pushbutton -.
(+ increases, - decreases the display value)

-F-	1
-----	---

Display:
New status (Softstart ON/OFF)

P

Press pushbutton P.

6000	2F82AV
------	--------

Setting is completed, display:
=> Maximum speed
=> Type designation

The number of Softstart stitches can be changed as follows:

Example: change number of stitches from 1 to 3 (function Softstart (pushbutton 3) is turned off).

3

Press pushbutton 3 briefly.
LED beside pushbutton 3 lights up,
function Softstart is turned on.

SSc 001

Display:
1 stitch is set

+

Press pushbutton +,
number of stitches increases.

SSc 003

Display:
3 stitches are set
Changes are automatically entered after
3 seconds.

6000	2F82AV
------	--------

Display after approx. 3 seconds:
=> Maximum speed
=> Type designation

If Softstart (pushbutton 3) is turned on.

F

Press pushbutton F at least for 1 second,
LED beside pushbutton F goes off
momentarily, function Softstart remains on.

SSc 001

Display:
1 stitch is set

+

Press pushbutton +,
number of stitches increases.

SSc 003

Display:
3 stitches are set

6000	2F82AV
------	--------

Display after approx. 3 seconds:
=> Maximum speed
=> Type designation

With the sewing start the new value is saved.

5.7 Program Identification

Functions with Variocontrol	Parameter
Display of program number, modification index and identification number	179

The program number with index is shown in the top line on the display, and an 8-digit identification number in the bottom line .

Display example parameter 179:

PrG3212A	<== Program number: 3212 / Index: A
92031211	<== Identification number: 92031211

5.8 Display Actual Speed

Functions with Variocontrol	Parameter
Display actual speed (n/s)	139

If parameter F-139 is switched ON the following information is shown on the display:

During machine run:

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

2350

At machine standstill after the trimming operation:

- The set maximum speed and the type of control
- **Example:** 3300 rotations per minute and control type XY82ZV

3300
XY82ZV

At stop in the seam:

- The stop indication

STOP

6. Starting Service

The machine is ready for operation immediately after:

- mounting the drive and the position transmitter
- adapting the control to the sewing machine
- setting the needle positions on the position transmitter
- if a sensor for blocking of machine run is not connected, parameter 185 must be set at "0"

7. Setting the Basic Functions

7.1 Positioning Speed

Functions with or without Variocontrol	Parameter
Positioning speed (n1)	110

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

7.2 Maximum Speed Compatible with the Sewing Machine

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

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

7.3 Maximum Speed

Functions with or without Variocontrol	Parameter
Maximum Speed (n2)	111

Note:

For the maximum speed of the sewing machine see instruction manual of the sewing machine manufacturer.

Note:

Select the pulley such that the maximum speed of the machine corresponds to the speed indicated on the motor nameplate.

When programming 3-digit and/or 4-digit parameter values in the control without Variocontrol), the 2-digit and/or 3-digit values displayed must be multiplied by 10.

The abbreviations in parentheses () are visible only if a Variocontrol is connected!

7.4 Positions

Before setting the position transmitter ensure that the direction of rotation of the motor shaft is correctly set !



Attention!

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



Attention!

Turn power off before adjusting the positioning discs.

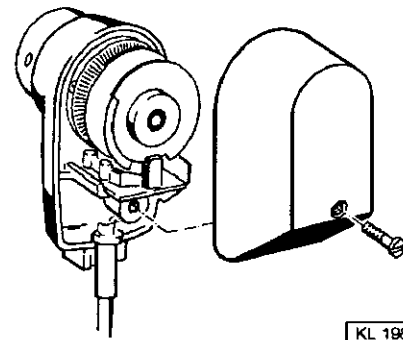


Attention!

Be very careful when adjusting the positioning discs.
Risk of injury.

The positions are set as follows:

- Remove position transmitter cover after loosening the screw.
- Select basic position **needle down** (LED 7 on the control lights up) by pushbutton S5.
- Adjust central disc for position 1 in the desired direction.
- Push pedal briefly forward.
- Check stop position.
- Push pedal backward (trimming).
- Select basic position **needle up** (LED 8 on the control lights up) by pushbutton S5.
- Adjust outer disc for position 2 in the desired direction.
- Push pedal briefly forward.
- Check stop position.
- Repeat procedure if necessary.
- Select the desired basic position by pushbutton S5.
- Put cover on again and tighten screw.



KL 1986A

The same sequence can be performed by using pushbutton 4 on the Variocontrol.

Note:

For functional sequences that are controlled by the slot width, set slot width if necessary according to the above. The desired functional sequence is to be activated in order to check the setting. The opening angle of position transmitters with adjustable slot width must not be below 20°.

Note:

To ensure a correct trimming operation, the positions 1 and 2 must not overlap.

7.5 Display of the Signal and Stop Positions

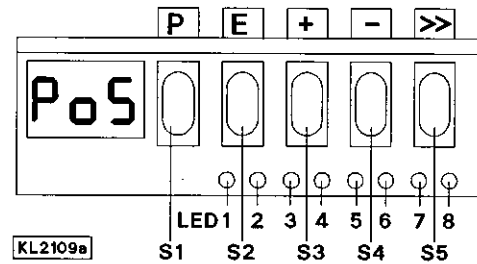
Function with or without Variocontrol	Parameter
Display of positions 1 and 2 (Sr3)	172

The setting of the positions can easily be tested by parameter 172.

- Address parameter F-172
- Without Variocontrol, "PoS" appears on the control display
- With Variocontrol "Sr3" appears on the display of the control panel
- Turn handwheel corresponding to the direction of rotation of the motor

Control display without Variocontrol

- 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



Display on the Variocontrol

- LED pushbutton 1 on corresponds to position 1
- LED pushbutton 1 turns off corresponds to position 1A
- LED pushbutton 2 on corresponds to position 2
- LED pushbutton 2 turns off corresponds to position 2A

7.6 Braking Behavior

Function with or without Variocontrol	Parameter
Braking effect with speeds > 800 RPM (br1)	207
Braking effect with speeds < 800 RPM (br2)	208

The braking effect of the drive can be set.
 The following applies to all setting values:
 The higher the value the stronger the braking reaction!

7.7 Braking Power at Standstill

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

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

- The braking power works at standstill
 - at stop in the seam
 - after the seam end
- The effect can be set
- The higher the set value, the higher the braking power
- It works immediately after power on

7.8 Start Behavior

Function with or without Variocontrol	Parameter
Starting edge (ALF)	220

The drive accelerating dynamics can be adapted to the characteristic of the sewing machine (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 behavior may appear coarse. In this case, one should try to optimize the settings.

7.9 Speed Gate

Function with or without Variocontrol	Parameter
Speed gate (dGn)	221
Speed gate damping period (tdG)	222

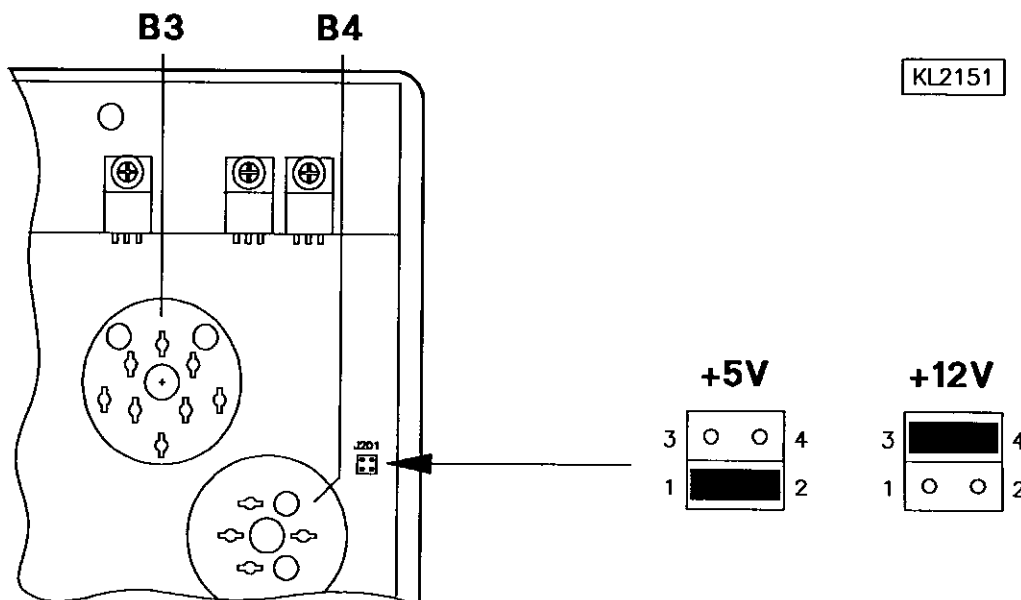
The speed gate setting and the setting of the speed gate damping period are important for exact positioning. The switching point of the speed gate is determined by positioning speed + value in parameter 221; example: $n_1 = 180$ RPM + value 100 = 280 RPM.

The abbreviations in parentheses () are visible only if a Variocontrol is connected!

7.10 Supply Voltage 5V and/or 12V

For external devices as for ex. blocking of machine run, there is a supply voltage of +12V on socket B3/5 and B3/9. After opening the cover, this voltage can be changed to +5V by moving a jumper on the printed circuit board to a different position.

- +5V = Connect bottom pins 1 and 2 with jumper
- +12V = Connect top pins 3 and 4 with jumper (factory setting)



8. Functions without Variocontrol

8.1 First Stitch After Power On

Functions with or without Variocontrol	Parameter
1 stitch at npos after POWER ON (Sn1)	231

For the protection of the sewing machine and when parameter 231 is on, the first stitch after power on will be performed at positioning speed, independently of the pedal position and the function Softstart.

8.2 Softstart

Functions with or without Variocontrol	Parameter
Softstart on/off (SSt)	134

Function:

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

When using a Variocontrol, direct access by function key (pushbutton 3) is possible!

Functions with Variocontrol	Parameter
Softstart on/off (-F-)	F-008 = 1

8.2.1 Softstart Speed

Functions with or without Variocontrol	Parameter
Softstart speed (n6)	115

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

8.2.2 Softstart Stitches

Functions with or without Variocontrol	Parameter
Softstart stitches (SSc)	100

If the function "slow stitch after power on" has been selected by parameter 231, the first stitch after power on will be performed at positioning speed, independently of the Softstart setting.

8.3 Sewing Foot Lifting

Functions without Variocontrol		Pushbutton on the control
Automatic in the seam	LED 5 lights up	Pushbutton S4
Automatic after thread trimming	LED 6 lights up	Pushbutton S4
Functions with Variocontrol		Pushbutton on the Variocontrol
Automatic in the seam	LED on pushbutton 5 lights up	
Automatic after thread trimming	LED 6 lights up	
Functions with or without Variocontrol		Parameter
Activation delay when pedal is 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
Holding current of sewing footlifting	(t5)	204
Delay during thread trimming until sewing foot lifting	(kDF)	286

The abbreviations in parentheses () are visible only if a Variocontrol is connected!

Sewing footis lifted:

- in the seam
 - by heelback (position -1); only if parameter 184 = OFF
or automatically (by pushbutton S4 on the control, LED 5 lights up)
or automatically (by pushbutton 5 on the Variocontrol)
 - by pressing the pushbutton on socket B6/1-3 and/or B7/1-3
- after thread trimming
 - by pressing the pushbutton on socket B18/1-5 if parameter 242 = 12
 - by heelback (position -1); only if parameter 184 = OFF
 - by heelback (position -2)
or automatically (by pushbutton S4 on the control, LED 6 lights up)
or automatically (by pushbutton 6 on the Variocontrol)
 - by pressing the pushbutton on socket B6/1-3 and/or B7/1-3
 - by pressing the pushbutton on socket B18/1-5 if parameter 242 = 12
 - by light barrier or by stitch counting, automatically, when pedal ≥ 1

Unintentional foot lifting before thread trimming, when changing from pedal position 0 (neutral) to position -2, can be prevented by setting an activation delay (t2) by parameter 201.

Holding power of the lifted foot:

The sewing footis lifted by full power. Then the solenoid is switched to partial power in order to reduce the load for the control and for the connected solenoid.

The duration of full power is set by parameter 203, the holding power at partial power by parameter 204.



Caution!

If the holding power is set too high the solenoid and the control may be permanently damaged. Please observe the allowed operating time of the solenoid and set the appropriate value according to the table below.

Stage	Operating time	Effect
1	12.5 %	low holding power
2	25 %	
3	37.5 %	
4	50 %	
5	62.5 %	
6	75 %	
7	87.5 %	
0	100%	high holding power

Foot lowers:

- from manual foot lifting: push pedal to position 0 (neutral)
- from automatic foot lifting: push pedal to position 1/2 (slightly forward)

When pushing the pedal forward from lifted presser foot, the start delay (t3) that can be set by parameter 202 becomes effective.

8.4 Start Stitch Condensing

Functions without Variocontrol	Pushbutton on the control
Start stitch condensing On (counting parameter 000 and 0019 Start stitch condensing Off	LED 1 lights up LED 1 off Pushbutton S2

Functions with Variocontrol	Pushbutton on the Variocontrol
Start stitch condensing On (counting parameter 001) Start stitch condensing On (counting parameter 000 and 001) Start stitch condensing Off	bottom LED lights up top LED lights up both LEDs off Pushbutton 7 Pushbutton 7

The start stitch condensing starts by pushing the pedal forward at the beginning of the seam. The stitch condensing is delayed by the time t3 from lifted foot (start delay from lifted foot).

The stitch condensing is executed automatically at start stitch condensing speed. It cannot be interrupted. With softstart running parallel, the respective lower speed predominates.

Switching on the start stitch condensing is synchronized to position 1.

After the execution of the stitches, the stitch regulator, and, after a delay time t1, the start stitch condensing speed, will be switched off. Then pedal control is returned.

The counting is synchronized to position 1.

If the Variocontrol is not used, both counting sections of parameters 000 and 001 are switched on by pushbutton S2. If only stitch condensing (short stitches) is to be performed at the start of the seam, the value of parameter 000 must be programmed at "0".

8.4.1 Start Stitch Condensing Speed

Functions with or without Variocontrol	Parameter
Start stitch condensing speed (n3)	112

When programming 3-digit and/or 4-digit parameter values in the control (without Variocontrol), the 2-digit and/or 3-digit values displayed must be multiplied by 10.

8.4.2 Number of Stitches of the Start Stitch Condensing

Functions with or without Variocontrol	Parameter
Number of stitches without stitch regulator (Arv)	000
Number of stitches with stitch regulator (Arr)	001

The stitches for stitch condensing at the start of the seam can be varied directly on the control, as described in chapter "Changing All Parameter Values of the Operator Level".

When using a Variocontrol, the stitches can be varied by pushbuttons 7 and +/- . See chapter "Pushbuttons for Background Information (HIT)".

8.4.3 Delay until Speed Release

Functions with or without Variocontrol	Parameter
Delay time until speed release after start stitch condensing (t1)	200

The speed release after the start stitch condensing can be influenced by selecting parameter 200.

8.5 End Stitch Condensing

Functions without Variocontrol	Pushbutton on the control
End stitch condensing On (counting parameter 002 and 003) End stitch condensing Off	LED 2 lights up LED 2 off Pushbutton S2

Functions with Variocontrol	Pushbutton on the Variocontrol
End stitch condensing On (counting parameter 002) End stitch condensing On (counting parameter 002 and 003) End stitch condensing Off	top LED lights up bottom LED lights up both LEDs off Pushbutton 8 Pushbutton 8

The end stitch condensing starts either by heelback, in seams with stitch counting at the end of the counting, or from the light barrier seam at the end of the light barrier compensating stitches. From machine standstill, the stitch regulator will be switched on immediately. From lifted foot, the switch-on point is delayed by the time t3 (start delay from lifted presser foot). The first leading position 1 is counted as 0 stitch, whenever the function is started outside of position 1. The counting and disabling of the stitch regulator is synchronized to position 1.

From full machine run, the signal will be switched on only after reaching the end stitch condensing speed and the synchronization to position 2. The end stitch condensing is performed automatically. An interruption is not possible.

If the Variocontrol is not used, both counting sections of parameters 002 and 003 are switched on by pushbutton S2. If only stitch condensing (short stitches) is to be performed at the start of the seam, the value of parameter 003 must be programmed at "0".

8.5.1 End Stitch Condensing Speed

Functions with or without Variocontrol	Parameter
End stitch condensing speed (n4)	113

When programming 3-digit and/or 4-digit parameter values in the control (without Variocontrol), the 2-digit and/or 3-digit values displayed must be multiplied by 10.

8.5.2 Number of Stitches of the End Stitch Condensing

Functions with or without Variocontrol	Parameter
Number of stitches with stitch regulator (Err)	002
Number of stitches without stitch regulator (Erv)	003

The end stitch condensing stitches can be varied directly on the control, as described in chapter "Changing All Parameter Values of the Operator Level".

When using a Variocontrol, the stitches can be varied by pushbuttons 8 and +/- . See chapter "Pushbuttons for Background Information (HIT)".

8.6 Intermediate Stitch Condensing

The stitch regulator can be switched on anywhere in the seam by the external pushbutton on socket B17/1-6. See chapter "Connection Diagram" !

8.7 Stitch Condensing Suppression/Recall

The next stitch condensing operation can be suppressed or recalled once by pressing the external pushbutton on socket B17/5-6.

See chapter "Connection Diagram" !

When pressing	Stitch condensing at the start On	Stitch condensing at the start Off	Stitch condensing at the end On	Stitch condensing at the end Off
Before start of seam In the seam	no stitch condensing ---	stitch condensing ---	--- no stitch condensing	--- stitch condensing

8.8 Holding Power of Stitch Condensing

Functions with Variocontrol	Parameter
Time of full power (t10)	212
Holding current of stitch condensing (t11)	213

The abbreviations in parentheses () are visible only if a Variocontrol is connected!

The stitch regulator is activated by full power. Then the solenoid is switched to partial power in order to reduce the load for the control and for the connected solenoid.

The duration of full power is set by parameter 212, the holding power at partial power by parameter 213.



Caution!

If the holding power is set too high the solenoid and the control may be permanently damaged. Please observe the allowed operating time of the solenoid and set the appropriate value according to the table below.

Stage	Operating time	Effect
1	12.5 %	low holding power
2	25 %	
3	37.5 %	
4	50 %	
5	62.5 %	
6	75 %	
7	87.5 %	high holding power full power
0	100 %	

8.9 Blocking of Machine Run (Safety Switch)



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

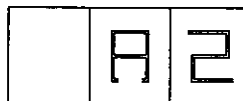
The function "blocking of machine run" is possible by connecting a switch to socket B3/6.

Functions with or without Variocontrol	Parameter
Blocking of machine run (safety switch) (LSP) 0 = Blocking of machine run activated when switch is closed 1 = Blocking of machine run activated when switch is open	185

Display after the activation of the blocking of machine run without Variocontrol:

Display on the control !

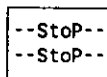
==>



Display after the activation of the blocking of machine run with Variocontrol:

Display on the Variocontrol !
Symbol blinking alternately !

==>



Blocking of machine run in the free seam, in the seam with stitch counting and in the light barrier seam:

By opening and/or closing the switch the seam is interrupted

- Stop in the basic position
- Needle up is not possible
- Sewing foot lifting is possible

Blocking of machine run in the start stitch condensing:

By opening and/or closing the switch the start stitch condensing is interrupted.

- Stop in the basic position
- Needle up is not possible
- Sewing foot lifting is possible
- After the deactivation of the blocking of machine run the seam will be continued with the seam section following the start stitch condensing

Blocking of machine run in the end stitch condensing:

By opening and/or closing the switch the end stitch condensing is interrupted and the seam is finished.

- Sewing foot lifting is possible

New start after blocking of machine run

A new start after closing and/or opening the switch is only possible if the pedal has been in position 0 (neutral).

8.10 Thread Monitor

The electronic control is provided with a socket B9 for the connection of a thread monitor (see chapter "Connection Diagram").

When the thread monitor emits a signal, the drive stops immediately. A started stitch condensing will not be completed. After eliminating the problem, the drive is ready for operation again.

8.11 Thread Trimming Operation

Function without Variocontrol	Pushbutton on the control
Thread trimming operation M1/M2 On	Pushbutton S3
Thread trimming operation M3 On	
Thread trimming operation M1/M2/M3 On	
Thread trimming operation Off	

Function with Variocontrol	Pushbutton on the Variocontrol
Thread trimming operation M1/M2 On	Pushbutton 9
Thread trimming operation M3 On	
Thread trimming operation M1/M2/M3 On	
Thread trimming operation Off	

The thread trimming operation can be switched on and off on the control by pressing pushbutton S3 and/or when using a Variocontrol by pressing pushbutton 9. The thread trimming is performed at standstill in position 2.

When the thread trimming is off, the drive stops in position 2 at the seam end, in position 1 at the end of programmed seams.

8.11.1 Trimming Speed

Function with or without Variocontrol	Parameter
Trimming speed (n7)	116

8.11.2 Times of the Trimming Signals

The delay times and activation times of the signals can be set by the following parameters.

Function with or without Variocontrol		Parameter
Delay time output M1	(kd1)	280
Activation time output M1	(kt1)	281
Delay time output M2	(kd2)	282
Activation time output M2	(kt2)	283
Delay time output M3	(kd3)	284
Activation time output M3	(kt3)	285
Delay time until sewing foot On	(kdF)	286
Holding power output M2 (thread trimmer backward)	(tAM)	287

8.12 Needle Up / Needle Up-Down

Function with or without Variocontrol		Parameter
Functions	(Sht)	140
0 = No function		
1 = Needle up-down		
2 = Needle up		
3 = Single stitch		
4 = Full stitch		

140 = 1; needle up-down

When pressing the pushbutton on socket B6/1-2 and/or B7/1-2, the drive runs from position 1 to position 2 and/or from position 2 to position 1. If the drive is outside of the stop position, it runs to the preselected basic position.

140 = 2; needle up

When pressing the pushbutton on socket B6/1-2 and/or B7/1-2, the drive runs from position 1 to position 2. If the drive is outside of position 1 it will not move for safety reasons.

140 = 3; single stitch

When pressing the pushbutton on socket B6/1-2 and/or B7/1-2, the drive performs one rotation from position 1 to position 1.

If the drive is in position 2, it runs to position 1, when pressing the pushbutton, and from position 1 to position 1 each time, when pressing the pushbutton again.

140 = 4; full stitch

When pressing the pushbutton on socket B6/1-2 and/or B7/1-2, the drive performs one rotation from the stop position. If the drive is outside of the stop position, it runs to the preselected basic position.

8.13 Single Stitch

When pressing the pushbutton on socket B17/2-6, the drive performs one rotation from position 1 to position 1.

If the drive is in position 2, it runs to position 1, when pressing the pushbutton, and from position 1 to position 1 each time when pressing the pushbutton again.

If the drive is outside of the stop position, it runs to position 1.

8.14 Seam with Stitch Counting

Functions without Variocontrol	Parameter
Stitch counting On/Off	015

Functions with Variocontrol	Pushbutton
Stitch counting On/Off	Pushbutton 1

8.14.1 Stitches for Stitch Counting

Functions with or without Variocontrol	Parameter
Number of stitches for a seam with stitch counting (Stc)	007

8.14.2 Stitch Counting Speed

Functions with or without Variocontrol	Parameter
Stitch counting speed (n12)	118
Speed mode for a seam with stitch counting (SGn)	141

Speed control for the stitch counting can be selected by parameter 141.

- 141 = 0:** Execution at pedal controlled speed.
- 141 = 1:** Execution at fixed speed n12, when pedal is forward.
- 141 = 2:** Execution at limited speed n12, when pedal is forward.
- 141 = 3:** Automatic execution at fixed speed as soon as the pedal has been pushed once. Interruption by "heelback (-2)" is possible.

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

8.14.3 Seam with Stitch Counting When Light Barrier Is On

Functions without Variocontrol	Parameter
Light barrier On/Off (LS)	009
Stitch counting On/Off (StS)	015

Functions with Variocontrol	Pushbutton
Light barrier On/Off	Pushbutton 0
Stitch counting On/Off	Pushbutton 1

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

8.15 Free Seam and Seam with Light Barrier

Functions with or without Variocontrol		Parameter
Positioning speed	(n1)	110
Upper limit of the maximum speed	(n2)	111
Limited speed according to setting of parameter 142	(n12)	118
Lower limit of the maximum speed	(n2_)	121
Speed mode Free seam	(SFn)	142

Speed control for the free seam and for the seam with light barrier can be selected by the speed mode.

- 142 = 0: Execution at pedal controlled speed from n1 to n2.
 142 = 1: Execution at fixed speed n12, when pedal is forward (position >=1).
 142 = 2: Execution at limited speed n12, when pedal is forward (position >=1)
 142 = 3: Only for the seam with light barrier:
 - Automatic execution at fixed speed as soon as the pedal has been pushed once.
 - The seam end is initiated by the light barrier.
 - Interruption by heelback (-2) is possible.
 - If the light barrier is not on, speed as with parameter setting 142 = 0.

When using a Variocontrol, the preset maximum speed will be indicated on the display after power on and after thread trimming and can be changed directly by pushbuttons +/- on the Variocontrol. The setting range is limited by the set values of the parameters 111 and 121.

8.16 Light Barrier

Functions with or without Variocontrol	Parameter / Pushbutton
Light barrier On/Off without Variocontrol	009
Light barrier On/Off with Variocontrol	Pushbutton 0

8.16.1 Speed after Light Barrier Sensing

Functions with or without Variocontrol		Parameter
Speed after light barrier sensing	(n5)	114

8.16.2 General Light Barrier Functions

Functions with or without Variocontrol		Parameter
Light barrier compensating stitches	(LS)	004
Number of light barrier seams	(LSn)	006
Light barrier sensing uncovered	(LSd)	131
Sewing start blocked with light barrier uncovered	(LSS)	132
Light barrier seam end with thread trimming	(LSE)	133

- After sensing the seam end, counting of the compensating stitches at light barrier speed is performed.
- Interruption with pedal in position 0. Cessation by pedal in position -2.
- Disabling of the thread trimming operation by parameter 133, independently of the setting by pushbutton 9 on the Variocontrol. Stop in the basic position.
- Programming of up to 15 light barrier seams according to setting of parameter 006 with stop in the basic position. After the last light barrier seam, a thread trimming operation will be performed.
- Light barrier sensing uncovered or covered at the seam end can be selected by parameter 131.
- Blocking of machine start, when light barrier is uncovered, can be programmed by parameter 132.

When using a Variocontrol, direct access by function key (pushbutton 3) is possible!

Functions with Variocontrol	Parameter
Sewing start blocked with light barrier uncovered On/Off (-F-)	008 = 2

The abbreviations in parentheses () are visible only if a Variocontrol is connected!

8.16.3 Reflection Light Barrier

Functions with or without Variocontrol	Parameter / Pushbutton
Light barrier On/Off Light barrier On/Off Sensitivity adjustment when using LS001	Pushbutton = 0 009 Potentiometer on the V730

Adjustments

Sensitivity:

Depending on the distance of the light barrier to the reflection area, adjust sensitivity to a minimum. (Turn potentiometer as far as possible to the left).

- LS001 - Potentiometer on the Variocontrol
- LSM001 - Potentiometer directly on the light barrier module

Mechanical Adjustment:

- LSM001- The orientation is facilitated through a visible light spot on the reflection area.

8.16.4 Automatic Start by Light Barrier

Functions with or without Variocontrol	Parameter
Delay of automatic start (ASd)	128
Automatic start on/off (ALS)	129
Light barrier sensing "uncovered" (LSd)	131
Sewing start blocked with light barrier uncovered (LSS)	132

The function allows the automatic start of sewing as soon as the light barrier has sensed the insertion of fabric.

The following conditions must be met:

- Parameter 132 = on (no sewing start, when light barrier uncovered).
- Parameter 131 = on (light barrier sensing "uncovered").
- Parameter 129 = on (automatic start on).
- Light barrier switched on.
- The pedal must remain pushed forward at the seam end.

For safety reasons, this function becomes active only after a normal sewing start in the first seam. The light barrier must be covered, when the pedal is in neutral position; then the pedal can be pushed forward.

This safety function is reset, when the pedal does not remain pushed forward after the end of the seam.

8.16.5 Operation with Two Light Barriers

When operating 2 light barriers (LSM001 on the control and LS-001 on the Variocontrol, these are linked at the start of the seam by AND and at the seam end by OR; i.e. at the start of the seam both light barriers and at the seam end only one of the two light barriers must be switched in order to initiate another function.

If the light barrier input of socket B18 on the control is switched to another function by parameter 242, the light barrier on the Variocontrol remains on.

8.16.6 Light Barrier Filter for Knitted Fabrics

Functions with or without Variocontrol	Parameter
Number of stitches of the light barrier filter (LSF)	005
Light barrier filter On/Off (LSF)	130

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

- The filter can be switched on or off by parameter 130
- The filter is not active if parameter 005 = 0
- By changing the number of filter stitches the mesh will be adapted
- Knitted fabric sensing will only be activated if the light barrier is uncovered

8.16.7 Functional Variations of the Light Barrier Input

Function	Parameter
Selection of the input function on socket B18/5 FEL	242

The abbreviations in parentheses () are visible only if a Variocontrol is connected!

If the light barrier function is not used, a different function can be selected for the input on socket B18/5, and a pushbutton can be connected.

The following input functions are possible by parameter 242:

- 242 = 0 Light barrier function**
The input is prepared for a light barrier function.
- 242 = 1 Needle up/down**
When pressing the pushbutton the drive runs from position 1 to position 2 and/or from position 2 to position 1. If the drive is outside of the stop position it runs to the preselected basic position.
- 242 = 2 Needle up**
When pressing the pushbutton the drive runs from position 1 to position 2.
- 242 = 3 Single stitch (basting stitch)**
When pressing the pushbutton the drive performs one rotation from position 1 to position 1. If the drive is in position 2, it runs to position 1 when pressing the pushbutton and from position 1 to position 1 each time when pressing the pushbutton again.
- 242 = 4 Full stitch**
When pressing the pushbutton the drive performs one entire rotation depending upon the stop position. If the drive is outside of the positions it runs to the preselected basic position.
- 242 = 5 Needle to position 2**
If the drive is outside of position 2 it runs to position 2 when pressing the pushbutton.
- 242 = 6 Blocking of machine run effective with open contact**
When opening the switch the drive stops in the preselected basic position.

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

The characteristic curves of the pedal (speed change from stage to stage) can be adjusted by this parameter.

Possible characteristic curves:

- linear
- progressive
- highly progressive

9. Additional Functions by Using a Variocontrol

9.1 Operation with Two Light Barriers

When operating 2 light barriers (LSM001 on the control and LS-001 on the Variocontrol, these are linked at the start of the seam by AND and at the seam end by OR; i.e. at the start of the seam both light barriers and at the seam end only one of the two light barriers must be switched in order to initiate another function.

If the light barrier input of socket B18 on the control is switched to another function by parameter 242, the light barrier on the Variocontrol remains on.

9.2 Programming Seams (Teach-in)

- A maximum of 8 patterns with a total of 40 seams can be established.
- Programming is possible only if no code number was input after switching on!
- The functions start stitch condensing, end stitch condensing, stitch counting, thread trimming and sewing foot lifting can be assigned individually to each seam.

Example 1:	Pattern 1	40 seams
	Pattern 2-8	0 seams
Example 2:	Pattern 1	4 seams
	Pattern 2	5 seams
	Pattern 3	6 seams
	Pattern 4	25 seams
	Pattern 5-8	0 seams
Example 3:	Pattern 1	10 seams
	Pattern 2	15 seams
	Pattern 3-8	0 seams

Examples 1 and 2 show that optimal utilization of the storage capacity is possible.

9.2.1 Teach-in Mode

- Each seam pattern is programmed and stored separately.
- After input of the pattern the teach-in mode must be exited.
- Saving is done by sewing start.

Display configuration:

X	YY	ZZZ	X	Pattern number (1...8)
LS	SSS		YY	Seam number (0...40)
			ZZZ	Stitches for the seam with stitch counting (0...254)
			LS	appears when light barrier function on
			SSS	Stitches after light barrier sensing (0...254)

Programming:

1 =>	<input type="text" value="P"/>	=> LED pushbutton P blinks on the operator level	==>	<input type="text" value=""/>
2 =>	<input type="text" value="E"/>	=> Display of a parameter	==>	<input type="text" value="aaa bbb"/>
3 =>	<input type="text" value="2"/>	=> LED pushbutton 2 blinks Entry into pattern and seam programming!	==>	<input type="text" value="1 01 ---"/>
4 =>	<input type="text" value="2"/>	=> Changing the pattern number!	==>	<input type="text" value="2 01 ---"/>

The seam functions can be programmed by the pushbuttons on the Variocontrol (e.g. sewing footlifting, start stitch condensing, etc.).

9.2.1.1 Seam with Stitch Counting

=>	<input type="text" value="1"/>	==> Turning on the stitch counting; display of the actual number of stitches.	==>	<input type="text" value="2 01 004"/>
----	--------------------------------	---	-----	---------------------------------------

9.2.1.2 Stitch Counting with Activated Stitch Regulator

=>	<input type="text" value="1"/>	==> Turning on the sewing process with stitch regulator (display "-" in front of the number of stitches). Press button again to switch the stitch regulator off.	==>	<input type="text" value="2 01-004"/>
----	--------------------------------	--	-----	---------------------------------------

In the sewing process with activated stitch regulator all sewing operations including stitch condensing are executed in reverse order. The functions "light barrier seam" and "stitch counting with activated stitch regulator" block each other, i.e. the light barrier cannot be switched on if the seam "stitch counting with activated stitch regulator" has been selected.

=>	<input type="text" value="+"/>	=>	<input type="text" value="-"/>	Changing the stitches by pushbuttons +/- or sewing the seam by using the pedal.
----	--------------------------------	----	--------------------------------	---

9.2.1.3 Stitch Counting and/or Light Barrier

=>	<input type="text" value="0"/>	=> Turning on the light barrier; display of the actual number of compensating stitches.	==>	<input type="text" value="2 01 004"/> <input type="text" value="LS 007"/>
----	--------------------------------	---	-----	--

With V720/V730!

=>	<input type="text" value="+"/>	=>	<input type="text" value="-"/>	Modification of the number of light barrier compensating stitches
----	--------------------------------	----	--------------------------------	---

If stitch counting and light barrier are turned on at the same time the stitches for stitch counting have to be programmed before the light barrier compensating stitches.

After programming of the functions

=> E => Enter the seam.
 Display of the next seam. ==> 2 02 ---

==> The seam is entered by pressing the pushbutton E or by heelback.

=> P => Exit programming!
 Display of the first seam
 section to be executed in
 the selected pattern. ==> 2 01 004
 LS 007

After all seams have been programmed, each seam can be recalled individually by pushbutton E for checking.

Note

Several seam patterns cannot successively be programmed without interruption. Each pattern must be completed by pushbutton P, otherwise it gets lost.

Note

The patterns are permanently saved only after the sewing start.

9.2.1.4 Detailed Example

A seam 1 with stitch counting and start stitch condensing, a seam 2 with stitch counting and a seam 3 with light barrier seam and end stitch condensing are to be programmed under pattern number 4.

	Display before programming		
		==>	xxxx XY82ZV
1.	=> P => LED pushbutton P blinks	==>	
2.	=> E => Display of a parameter on the operator level	==>	aaa bbb
3.	=> 2 LED pushbutton 2 blinks => Pattern 1, seam 1	==>	1 01 ---
4.	=> 2 LED pushbutton 2 blinks => Pattern 2, seam 1	==>	2 01 ---
5.	=> 2 LED pushbutton 2 blinks => Pattern 3, seam 1	==>	3 01 ---
6.	=> 2 LED pushbutton 2 blinks => Pattern 4, seam 1	==>	4 01 ---
7.	=> 7 LED bottom pushbutton 7 lights up => Start stitch condensing is on	==>	4 01 ---

8.	=>	<input type="text" value="6"/>	LED pushbutton 6 lights up => Foot lifting at the seam end is on	==>	<input type="text" value="4 01 ---"/>
9.	=>	<input type="text" value="1"/>	=> Stitch counting is on	==>	<input type="text" value="4 01 000"/>
10.	=>	<input type="text" value="+"/>	=> <input type="text" value="-"/> Changing the number of stitches by pushbuttons or by using the pedal	==>	<input type="text" value="4 01 017"/>
			=> Seam length of 17 stitches is set		
11.	=>	<input type="text" value="E"/>	=> Pattern 4, seam 2	==>	<input type="text" value="4 02 ---"/>
12.	=>	<input type="text" value="1"/>	=> Stitch counting is on	==>	<input type="text" value="4 02 000"/>
13.	=>	<input type="text" value="+"/>	=> <input type="text" value="-"/> Changing the number of stitches by pushbuttons or by using the pedal	==>	<input type="text" value="4 02 008"/>
			=> Seam with 8 stitches is set		
14.	=>	<input type="text" value="E"/>	=> Pattern 4, seam 3 Free seam is selected	==>	<input type="text" value="4 03 ---"/>
15.	=>	<input type="text" value="0"/>	=> Light barrier is activated	==>	<input type="text" value="4 03 ---"/> LS 000
16.	=>	<input type="text" value="+"/>	=> <input type="text" value="-"/> Changing the stitches by pushbuttons 5 compensating stitches are set	==>	<input type="text" value="4 03 ---"/> LS 005
17.	=>	<input type="text" value="8"/>	=> LED top pushbutton 8 lights up End stitch condensing is on	==>	<input type="text" value="4 03 ---"/> LS 005
18.	=>	<input type="text" value="9"/>	=> LED bottom pushbutton 9 lights up Thread trimmer is on	==>	<input type="text" value="4 03 ---"/> LS 005
19.	=>	<input type="text" value="E"/>	=> Pattern 4, seam 4 By changing to the next seam the settings of the preceding seams are automatically entered.	==>	<input type="text" value="4 04 ---"/>
20.	=>	<input type="text" value="P"/>	=> Exit programming, first seam can be executed	==>	<input type="text" value="4 01 017"/>

9.2.2 Max. Number of Seams Exceeded

If the total number of 40 seams is exceeded by inputting a program, for the time being, the teach-in mode cannot be completed by pushbutton P.

A further sewing start is impaired.

The display shows the warning below.

Pressing pushbutton P again causes the deletion of the pattern indicated on the display. The teach-in mode is exited if the total number of 40 seams is not exceeded. Otherwise a new warning will be indicated.

Display:

DELETE
X YY NN

X: Last input and/or recalled pattern number (1...8)
 YY: Number of programmed seams of the recalled pattern (0...40)
 NN: Total number of inputted seams

The operator must now decide which pattern is to be deleted!

=>

2

 => Call-up of the pattern to be deleted

DELEtE
X YY NN

X: Pattern number
 YY: Number of seams of this pattern
 NN: Total number of input seams

=>

P

 => Deletion of the pattern

DELEtE
X YY NN

X: Pattern number of the deleted pattern
 YY: 00 = no more seam is programmed
 NN: Total number of input seams if more than 40

When 40 seams are exceeded, the teach-in mode is exited, and the last input seam will be indicated.

9.2.3 Execution (Pattern) Mode

1. =>

2

 Switch on mode by pushbutton 2 (LED lights up) ==>

X 01 ZZZ

 2. =>

+

 =>

-

 Select pattern 1...8 - Seam number 01 is displayed ==>

X 01 030

 3. =>

E

 If one should not start with seam 1 select different seam number - Push button E several times until desired seam number is displayed ==>

2 05 ZZZ

- The pattern can now be started by pushing the pedal.
4. =>

2

 Exit the execution (pattern) mode - Switch off by pushbutton 2

10. Memory Box

Functions with Variocontrol	Parameter
Language selection	178
Memory Box operation On/Off (FMb)	197
Memory Card formatting On/Off (Foc)	198

With the help of the Memory Box available as a special accessory it is possible to permanently store programs inputted on the Variocontrol with a Memory Card and to recall them whenever necessary. This avoids having to reprogram for recurring sewing operations.

▪ A maximum of 10 different programs (data records) can be stored, each with the total program contents of the control (see chapter Programming Seams - Teach-in).

10.1 Preparation for Memory Box Operation



Attention! - Turn power off

- Unplug Variocontrol from the control
- Plug Memory Box into control
- Plug Variocontrol into Memory Box
- Turn power on
- Activate Memory Box by parameter 197

10.2 Formatting of the Memory Card

The Memory Card is the storage medium for the programs.

Before using each Memory Card for the first time it must be prepared for receiving data by "formatting".

Note:

Original EFKA Memory Cards, with EFKA label, have been formatted and tested in the factory.

- Insert Memory Card with the labelled side up into the slot of the Memory Box.
 - If the Memory Card is correctly inserted the green LED on the Memory Box lights up.
 - If LED does not light up repeat operation or use different card.
- Switch parameter 198 on.
- Press pushbutton P or E.
 - The display on the Variocontrol shows a growing series of lines from left to right.
 - When the series reaches its full length, the formatting is finished.
 - The formatting can also be used to erase all data on the Memory Card.

10.3 Operating the Memory Box

1. » Insert Memory Card with the labelled side up into the slot of the Memory Box.
 If the Memory Card is correctly inserted the green LED on the Memory Box lights up.
2. » Turn "Programming Seams (Teach-in)" off ==> pushbutton 2
3. » Save data

Note:

All parameters of the sewing data that can be set are stored with the exception of the direction of rotation and the needle positions.

- Push pedal twice in short intervals, after end of seam, and put back to position 0 (neutral) SAvE
0--9
 - Input any address between 0 and 9 for the data record.
 - The yellow BUSY-LED on the Memory Box lights up.
 - In case a data record already exists under the selected reference number, it will be overwritten.SAvE
|||||
 - Display after the storing is completed 6000
2F82AV
4. » Reading data from the Memory Card into the control (2 possibilities)
- Possibility:**
- Push pedal forward (step 12), then turn power on rEAd
0--9
 - Input address under which the desired data record is stored.

Note:

For storing data permanently start sewing once before turning the power off!

Possibility:

- Push pedal twice in short intervals, after the seam end. SAvE
0--9
- Push pedal fully forward and put back to position 0 (neutral) rEAd
0--9
- Input address under which the desired data record is stored.
 - The yellow BUSY-LED on the Memory Box lights up.rEAd
|||||
- Display after saving the program. 6000
2F82AV

Note:

For storing data permanently start sewing once before turning the power off!

5. » Exit

Interruption:

- Press one of the green pushbuttons (P or E) on the Variocontrol
- The Variocontrol display shows the values of normal operation

If data are not to be saved:

- Turn power off and on again

If data are to be saved:

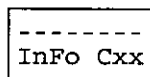
- For storing data permanently start sewing once before turning the power off!

6. » Operation without Variocontrol

- Writing and reading is done by pushing the pedal as described in step 3 and 4.
- Data record 1 is always automatically selected.
- Reading-in is only possible if power is turned on with pedal fully forward.

7. » Error messages

An error message is shown on the display, when the disturbances indicated below occur. The red LED on the Memory Box signals disturbances.

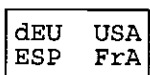


"xx" stands for a number in the following table:

INFO No	Display
C01	Memory Card not inserted
C02	Memory Card cannot be written on
C03	Memory Card formatting
C04	Memory Card writing or reading error
C05	Connection interrupted
C06	Data are not found
C07	No more space for data

Language selection:

A language can be selected by parameter 178. All additional information is then shown in the corresponding language.



11. Signal Test

Functions with or without Variocontrol	Parameter
Test of inputs and outputs (SR4)	173

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

11.1 Signal Test with Variocontrol

Output test:

- Address parameter 173
- Test is triggered by pressing pushbuttons 0...9 on the Variocontrol

Pushbutton	Output
1	Stitch condensing
2	Sewing foot lifting
3	Thread trimmer forward
4	Thread trimmer backward
5	Thread wiper
6	Motor running
7	free
8	free
9	free
0	free

Input test:

- Actuation of the external switches or pushbuttons will be indicated by alternating the switching state (ON/OFF) on the display.
- Several switches must not be closed at the same time.

11.2 Signal Test without Variocontrol

Output test:

- Address parameter 173
- Select the desired output by the +/- pushbuttons
- Actuate the selected output by pushbutton > >

Pushbutton	Output
ON/OFF	Input test
01	Stitch condensing
02	Sewing foot lifting
03	Thread trimmer forward
04	Thread trimmer backward
05	Thread wiper
06	Motor running
07	free
08	free
09	free
10	free

Input test:

- Press the (-) pushbutton several times until "OFF" or "ON" appears on the control display.
- Actuation of the external switches or pushbuttons will be indicated by alternating the switching state (ON/OFF) on the display.
- Several switches must not be closed at the same time.

12. Error Messages

General Information

Display	Signification
Info A1	Pedal not in neutral position, when switching the machine on
Info A2	Blocking of machine run
Info A4	Variocontrol not clearly selected

Programming of Functions and Values (Parameters)

Display	Signification
Info F1	Wrong code number or parameter number input

Serious Situation

Display	Signification
Info E1	Position transmitter not connected or defective
Info E2	Line voltage too low, or time between power off and power on too short
Info E4	Control disturbed by deficient grounding or loose contact

Hardware Disturbance

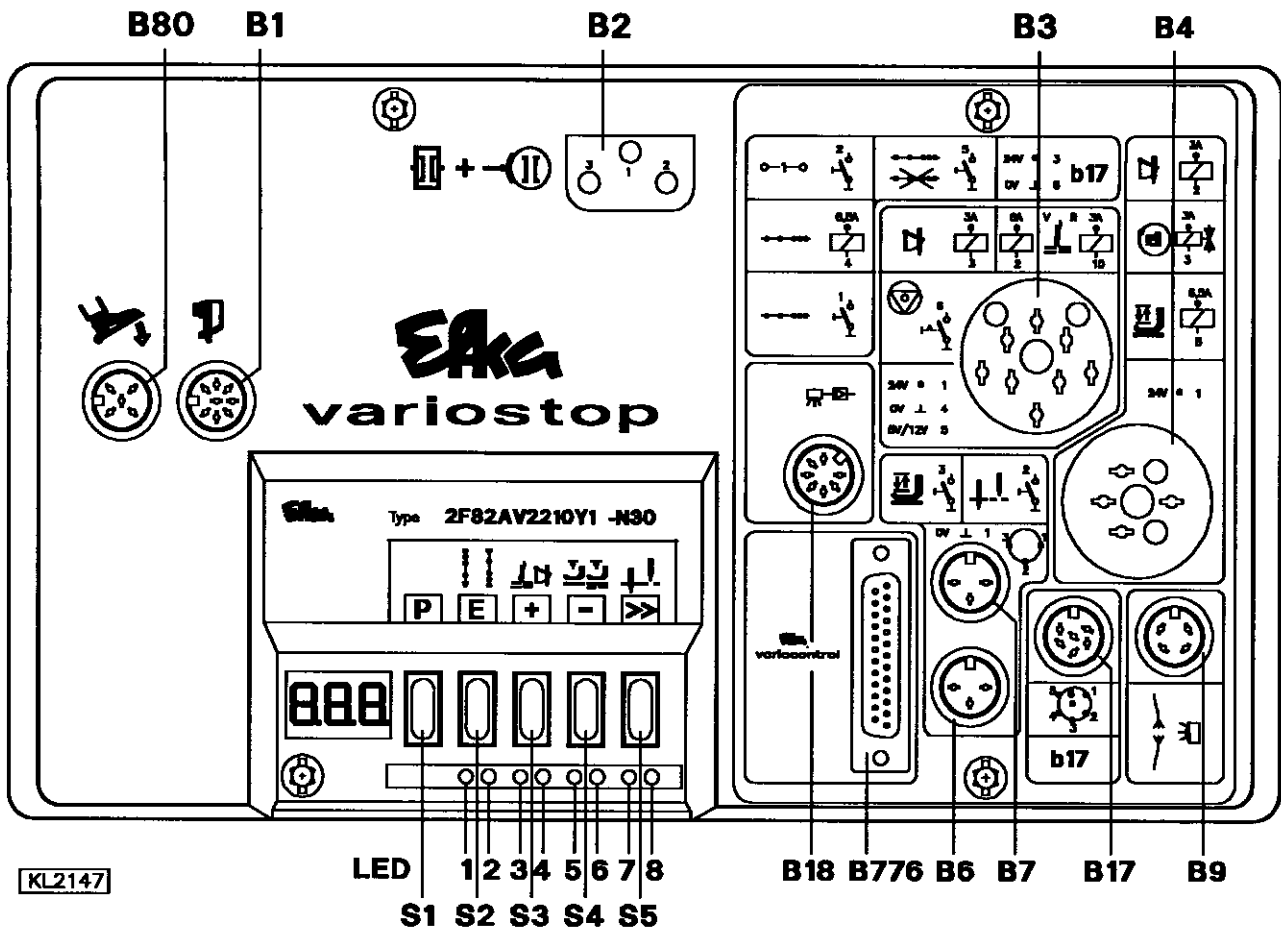
Display	Signification
Info H2	Processor disturbed

Memory Card Information

Display	Signification
Info C01	Memory Card not inserted
Info C02	Memory Card cannot be written on
Info C03	Memory Card formatting
Info C04	Memory Card writing or reading error
Info C05	Connection interrupted
Info C06	Cannot find data on Memory Card
Info C07	Storage space on Memory Card occupied

13. Socket Connectors

13.1 Position in the Control

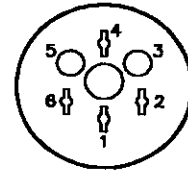
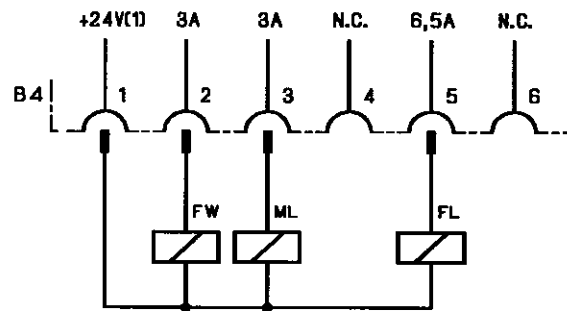
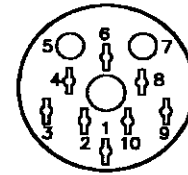
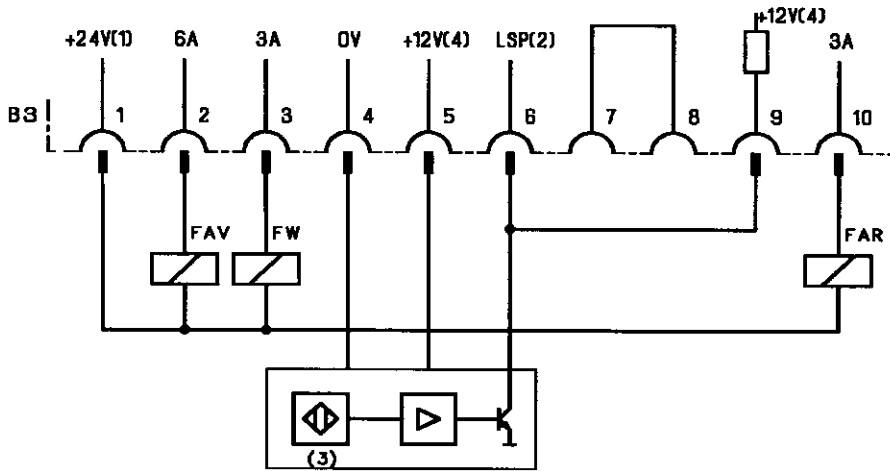


- B1 - Position transmitter
- B2 - Clutch/brake of the motor
- B3 - Machine
- B4 - Machine
- B6 - Pushbuttons
- B7 - Machine
- B32 - Machine
- B18 - Light barrier module
- B80 - Actuator
- B776 - Control panel Variocontrol

S1..S5 - Pushbuttons for programming and selection of functions

LED 1..8- Indicators for switched on functions

13.2 Connection Diagram



B1122



Attention!

When connecting the outputs, ensure that a total power of 96VA constant load will not be exceeded !

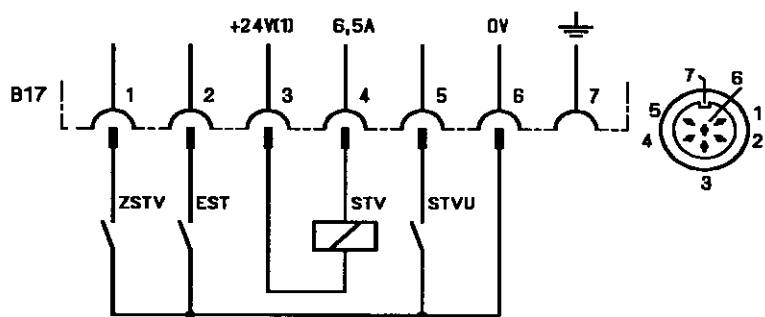
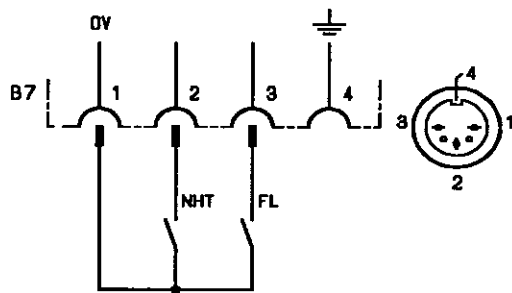
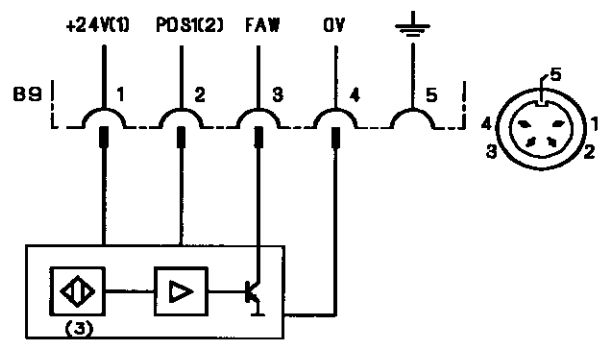
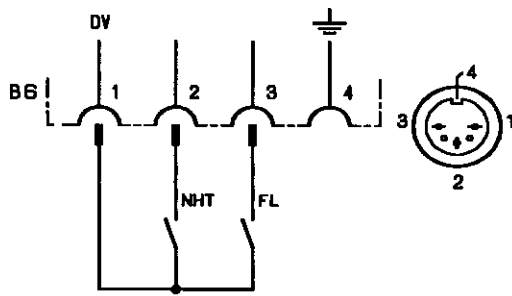


Attention!

Several outputs of the same sign must not be loaded with the indicated rated load more than one time!

- FL - Sewing foot lifting
- FAV - Thread trimmer forward
- FAR - Thread trimmer backward
- FW - Thread wiper
- MI - Motor running

- 1) Nominal voltage 24V, no-load voltage max. 36V
- 2) Instead of a sensor, a switch can be connected to socket B3/4-6
- 3) Sensor for blocking of machine run or connection of a switch is possible
- 4) Nominal voltage +12V, 250 mA (can be changed to 5V, 250 mA after opening the cover)
This voltage is applied to socket B3/9 with a resistor of 10kΩ.



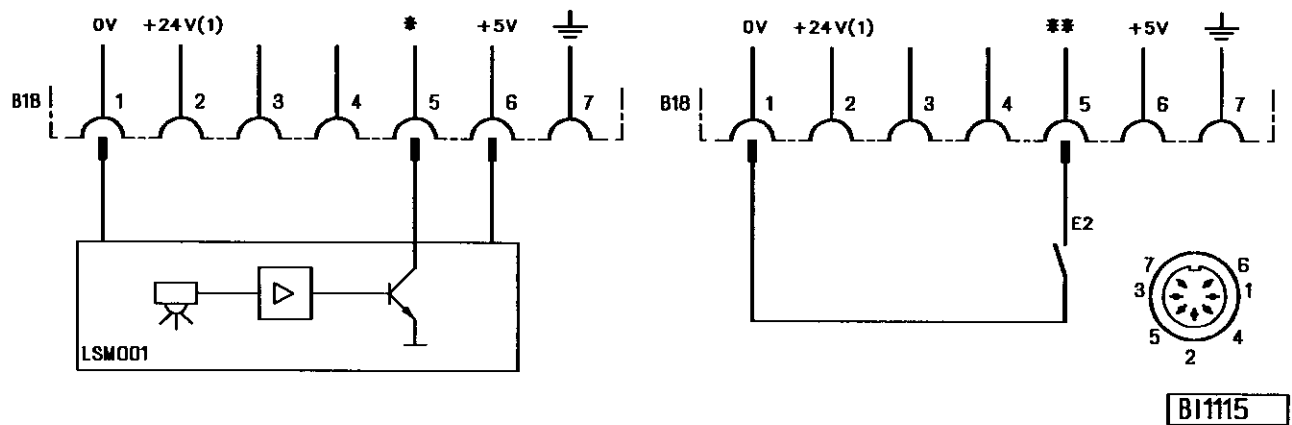
B11092a

**Attention!**

When connecting the outputs, ensure that a total power of 96VA constant load will not be exceeded !

STV	- Stitch condensing
NHT	- Needle up-down
FL	- Sewing foot lifting with pedal in position 0 (neutral)
EST	- Single stitch
ZSTV	- Intermediate stitch condensing
VRU	- Suppression/recall of stitch condensing
FAW	- Thread monitor

- 1) Nominal voltage 24V, no-load voltage max. 36V
- 2) Transistor output with open collector (max. 40V, 30mA)



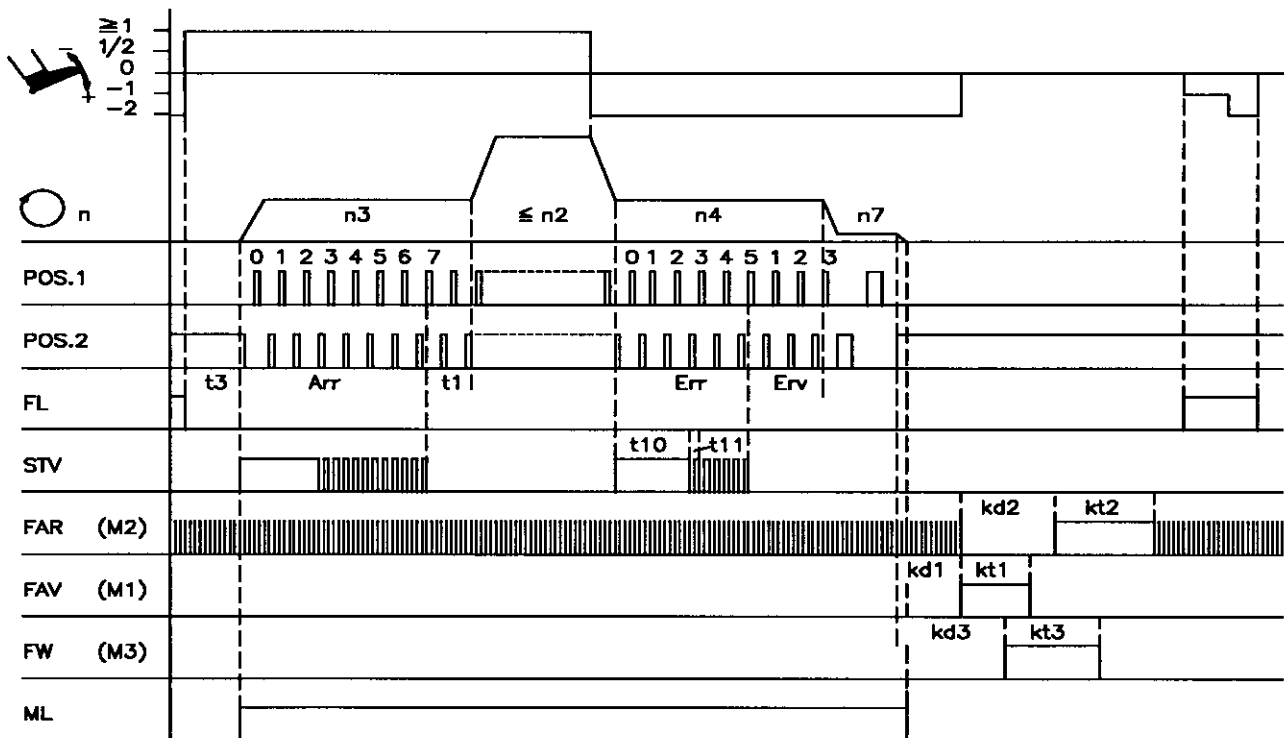
LSM001 - Reflection light barrier module

- * - Parameter 242 = 0 => Light barrier function is selected (identified when switched to 0V)
- ** - Parameter 242 = 1...12 => Various input functions are possible on socket B18/5

1) Nominal voltage 24V, no-load voltage max. 36V

14. Timing Diagrams

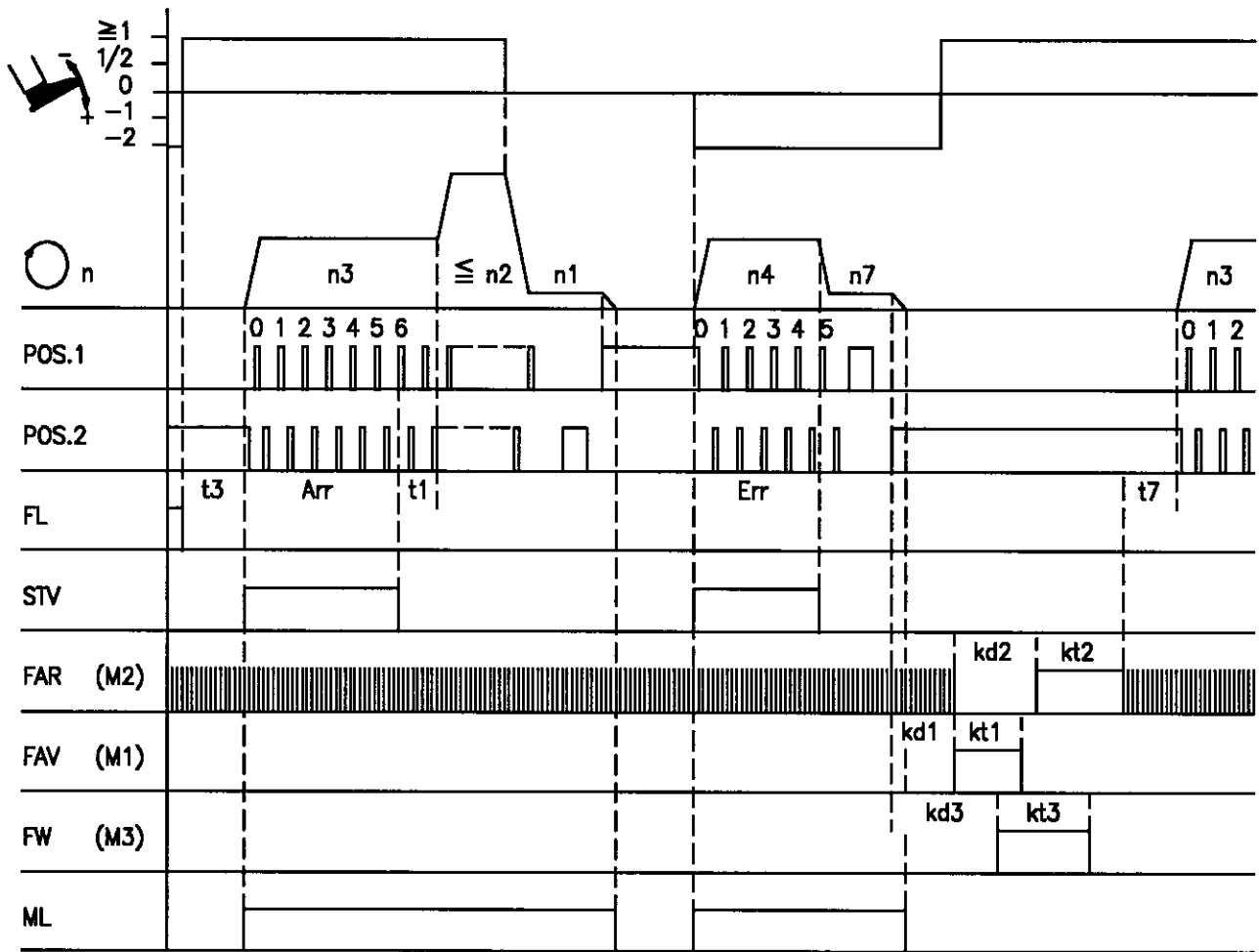
Trimming from Full Run



2168/FALAUF

Abbreviation	Function	Parameter	Pushbutton Control	Pushbutton Variocontrol
	Start stitches without stitch regulator Start stitch condensing (counting 001) on End stitch condensing (counting 002 and 003) on	000 = 0	Pushbutton S2 Pushbutton S2	Pushbutton 7 Pushbutton 8
n2	Maximum speed	111		
n3	Start stitch condensing speed	112		
n4	End stitch condensing speed	113		
n7	Trimming speed	116		
t1	Delay of speed release after stitch condensing	200		
t3	Start delay after switching off the sewing foot lift signal	202		
t10	Full power of stitch condensing	212		
t11	Pulsing of stitch condensing	213		
kd1	Delay time output M1	280		
kt1	Activation time output M1	281		
kd2	Delay time output M2	282		
kt2	Activation time output M2	283		
kd3	Delay time output M3	284		
kt3	Activation time output M3	285		
Arr	Stitches for start stitch condensing	001		
Err	Stitches for end stitch condensing	002		
Erv	Stitches after end stitch condensing	003		

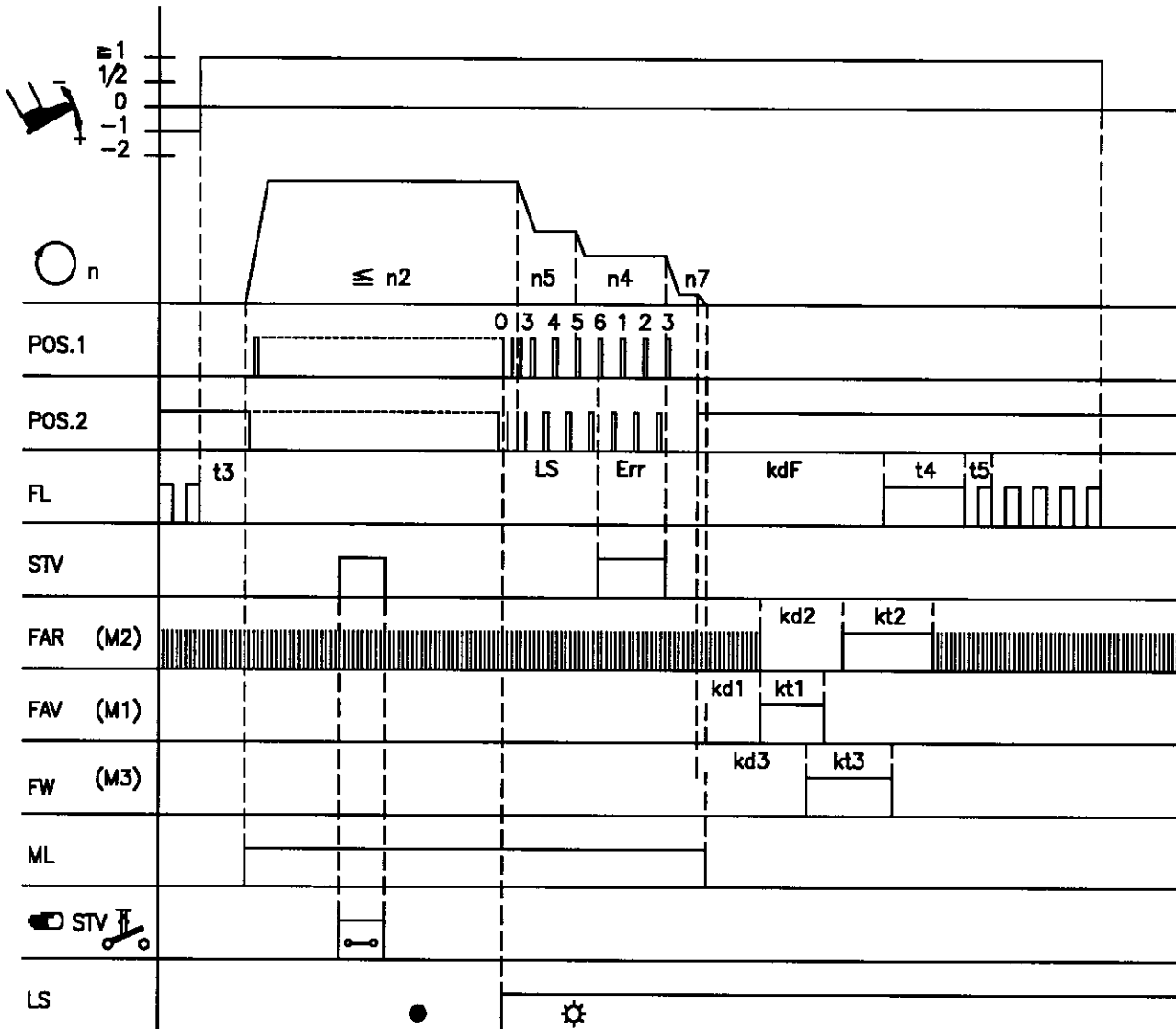
Run with Intermediate Stop



216B/LAUFZW

Abbreviation	Function	Parameter	Pushbutton Control	Pushbutton Variocontrol
	Start stitches without stitch regulator Start stitch condensing (counting 001) End stitch condensing (counting 002)	000 = 0	Pushbutton S2 Pushbutton S2	Pushbutton 7 Pushbutton 8
n1	Positioning speed	110		
n2	Maximum speed	111		
n3	Start stitch condensing speed	112		
n4	End stitch condensing speed	113		
n7	Trimming speed	116		
t1	Delay of speed release after stitch condensing	200		
t3	Start delay after switching off the sewing foot lift signal	202		
t7	Start delay after trimming	206		
kd1	Delay time output M1	280		
kt1	Activation time output M1	281		
kd2	Delay time output M2	282		
kt2	Activation time output M2	283		
kd3	Delay time output M3	284		
kt3	Activation time output M3	285		
Arr	Stitches for start stitch condensing	001		
Err	Stitches for end stitch condensing	002		

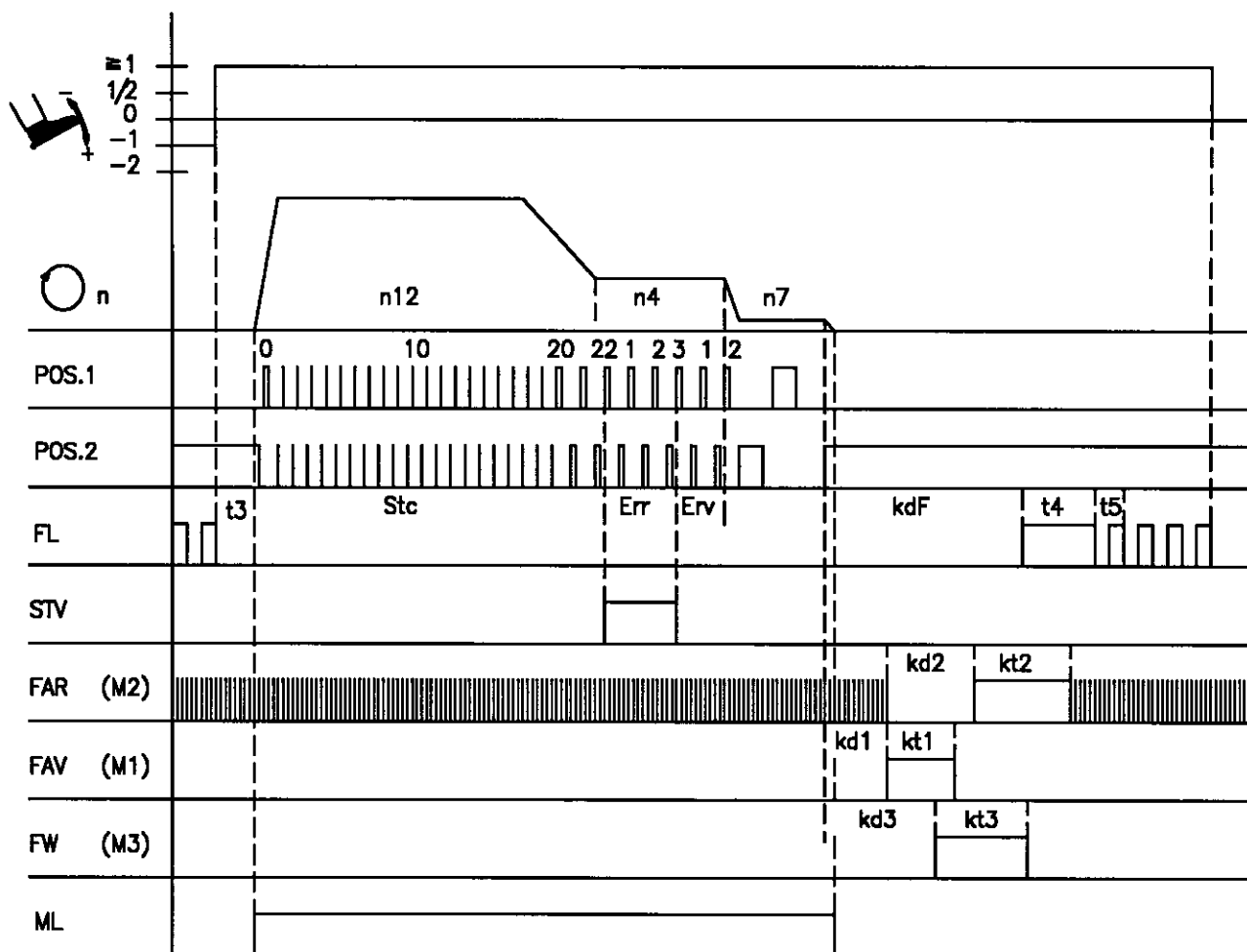
End Sensing by Light Barrier



2168/ENDELS

Abbreviation	Function	Parameter	Pushbutton Control	Pushbutton Variocontrol
	Light barrier End stitch condensing (counting 002)	on on	009	Pushbutton S2 Pushbutton 0 Pushbutton 8
n_2 n_4 n_5 n_7	Maximum speed End stitch condensing speed Speed after light barrier sensing Trimming speed	111 113 114 116		
t_3 t_4 t_5 kd_1 kt_1 kd_2 kt_2 kd_3 kt_3 kd_F LS Err	Start delay after switching off the sewing foot lift signal Full power of sewing foot lifting Pulsing of sewing foot lifting Delay time output M1 Activation time output M1 Delay time output M2 Activation time output M2 Delay time output M3 Activation time output M3 Delay time until sewing foot on Light barrier compensating stitches Stitches for end stitch condensing	202 203 204 280 281 282 283 284 285 286 004 002		

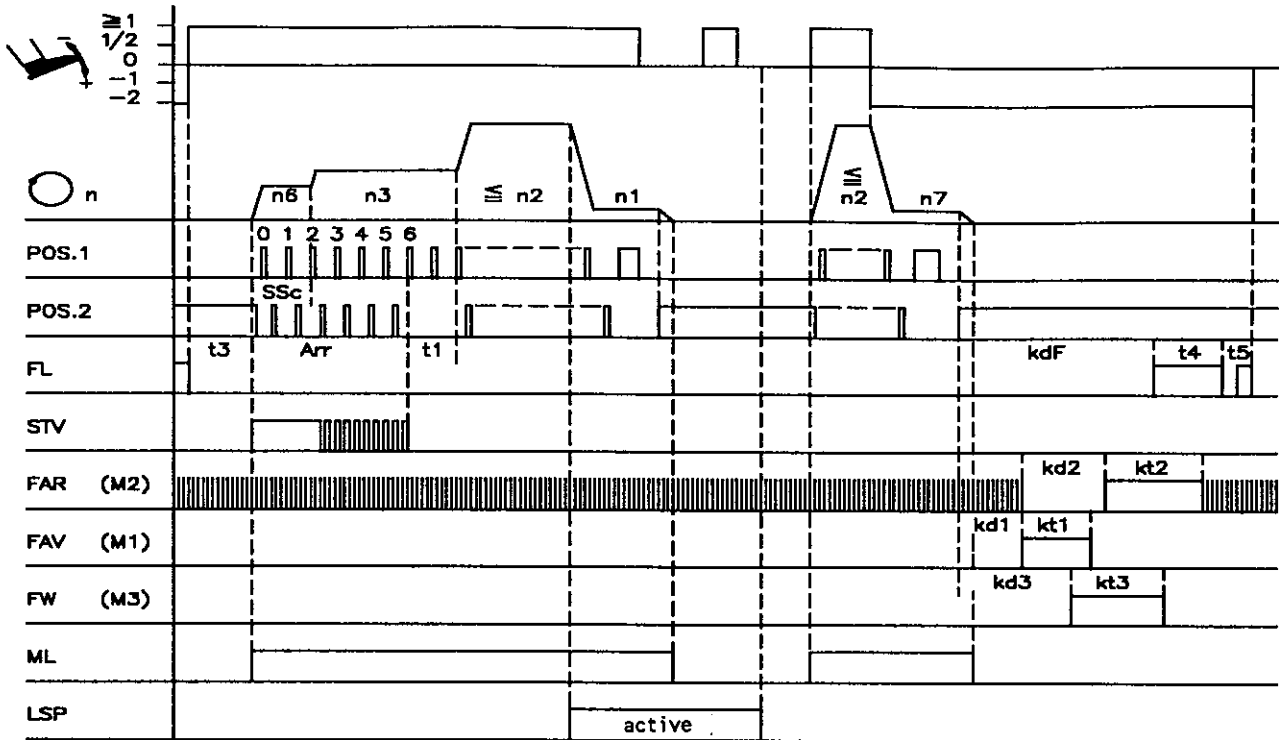
Seam End by Stitch Counting



2168/ENDEZAE

Abbreviation	Function	Parameter	Pushbutton Control	Pushbutton Variocontrol
	Stitch counting on End stitch condensing (counting 002 and 003) on		Pushbutton S2	Pushbutton 1 Pushbutton 8
n4 n7 n12	End stitch condensing speed Trimming speed Automatic speed for stitch counting	113 116 118		
t3 t4 t5 kd1 kt1 kd2 kt2 kd3 kt3 kdF Err Erv Stc	Start delay after switching off the sewing foot lift signal Full power of sewing foot lifting Pulsing of sewing foot lifting Delay time output M1 Activation time output M1 Delay time output M2 Activation time output M2 Delay time output M3 Activation time output M3 Delay time until sewing foot on Stitches for end stitch condensing Stitches after end stitch condensing Stitches of the seam with stitch counting	202 203 204 280 281 282 283 284 285 286 002 003 007		

Function "Blocking of Machine Run"



2168/LAUFSP

Abbreviation	Function	Parameter	Pushbutton Control	Pushbutton Variocontrol
	Start stitches without stitch regulator Start stitch condensing (counting 001) on	000 = 0	Pushbutton S2	Pushbutton 7
n1	Positioning speed	110		
n2	Maximum speed	111		
n3	Start stitch condensing speed	112		
n6	Softstart speed	115		
n7	Trimming speed	116		
t1	Delay of speed release after stitch condensing	200		
t3	Start delay after switching off the sewing foot lift signal	202		
t4	Full power of sewing foot lifting	203		
t5	Pulsing of sewing foot lifting	204		
kd1	Delay time output M1	280		
kt1	Activation time output M1	281		
kd2	Delay time output M2	282		
kt2	Activation time output M2	283		
kd3	Delay time output M3	284		
kt3	Activation time output M3	285		
kdF	Delay time until sewing foot on	286		
Arr	Stitches for start stitch condensing	001		
SSc	Stitches for softstart	100		

15. Parameter List

15.1 OPERATOR LEVEL

Parameter	Designation	Unit	max	min	Preset	Ind. Prg. No.
000 Arv	Number of stitches before start stitch condensing (without stitch regulator)		254	0	0	A
001 Arr	Number of stitches of start stitch condensing (with stitch regulator)		254	0	3	A
002 Err	Number of stitches of end stitch condensing (with stitch regulator)		254	0	3	A
003 Erv	Number of stitches after end stitch condensing (without stitch regulator)		254	0	0	A
004 LS	Light barrier compensating stitches		254	0	7	A
005 LSF	Number of stitches of the light barrier filter for knitted fabrics		254	0	0	A
006 LSn	Number of light barrier seams		15	1	1	A
007 Stc	Number of stitches for the seam with stitch counting		254	0	20	A
008 -F-	Setting of pushbutton 3 with a parameter from the technician level 1 = Softstart ON/OFF 2 = Sewing start blocked with light barrier uncovered ON/OFF		2	1	1	A
009 LS	Light barrier	ON/OFF			OFF	A
015 StS	Stitch counting	ON/OFF			OFF	A

15.2 TECHNICIAN LEVEL

Code no. 190 with control operation

Code no. 1907 with Variocontrol operation

Parameter	Designation	Unit	max	min	Preset	Ind. Prg. No.	
Group 0 Stitches/Countings							
100	SSc	Number of softstart stitches	20	0	2	A	
Group 1 Speeds							
110	n1	Positioning speed	RPM	390 *)	70	180	A
111	n2-	Upper limit setting range nmax	RPM	9900 *)	n2_	6000	A
112	n3	Speed for start stitch condensing	RPM	6500 *)	200	1500	A
113	n4	Speed for end stitch condensing	RPM	6500 *)	200	1500	A
114	n5	Speed after light barrier sensing	RPM	6500 *)	200	1200	A
115	n6	Softstart speed	RPM	1500 *)	70	500	A
116	n7	Trimming speed	RPM	500 *)	70	180	A
118	n12	Automatic speed for stitch counting	RPM	6500 *)	400	3500	A
119	nSt	Speed stage graduation 1 = linear 2 = slightly prograssive 3 = highly progressive		3	1	2	A
Group 2 Speeds							
121	n2_	Lower limit setting range n-max	RPM	n2- *)	400	400	A
128	ASd	Start delay, when starting command is given by covering the light barrier (see parameter 129)	ms	2000 *)	0	0	A
129	ALS	Machine start by covering the light barrier (only in conjunction with parameter 132 = ON)	ON/OFF			OFF	A
Group 3 Switching functions							
130	LSF	Light barrier filter for knitted fabrics	ON/OFF			OFF	A
131	LSd	ON = Light barrier sensing "uncovered" OFF = Light barrier sensing "covered"	ON/OFF			ON	A

*) When programming the 3-digit and/or 4-digit control parameter values (without Variocontrol), the 2-digit and/or 3-digit value displayed must be multiplied by 10.

TECHNICIAN LEVEL

Code no. 190 with control operation

Code no. 1907 with Variocontrol operation

Parameter	Designation	Unit	max	min	Preset	Ind. Prg. No.	
Group 3 Switching functions							
132	LSS	Blocking of machine start, when light barrier "uncovered"	ON/OFF		ON	A	
133	LSE	Thread trimmer, when completing the seam after light barrier sensing	ON/OFF		ON	A	
134	SSt	Softstart	ON/OFF		OFF	A	
139	nIS	Display of machine speed	ON/OFF		OFF	A	
Group 4 Switching functions							
140	Sht	Function of pushbutton 0 = No function 1 = Needle up/down 2 = Needle up 3 = Single stitch 4 = Full stitch		4	0	1	A
141	SGn	Speed status for a seam with stitch counting 0 = speed controllable by the pedal up to the set maximum speed (parameter 111) 1 = fixed speed (parameter 118) without influence by the pedal (machine stop by pushing the pedal to the basic position) 2 = limited speed controllable by the pedal up to the set limit (parameter 118) 3 = at fixed speed (parameter 118), can be interrupted by full heelback		3	0	0	A
142	SFn	Speed status for the free seam and for the seam with light barrier 0 = speed controllable by the pedal up to the set maximum speed (parameter 111) 1 = fixed speed (parameter 118) without influence by the pedal (machine stop by pushing the pedal to the basic position) 2 = limited speed controllable by the pedal up to the set limit (parameter 118) 3 = at fixed speed (parameter 118), can be interrupted by full heelback		3	0	0	A

TECHNICIAN LEVEL

Code no. 190 with control operation

Code no. 1907 with Varioccontrol operation

Parameter	Designation	Unit	max	min	Preset	Ind. Prg. No.
Group 5 Time functions						
153 brt	Braking power at machine standstill		50	0	0	A
Group 7 Service functions						
172	Display on the control: Pos. 1 to 1A (LED 7 lights up) Pos. 2 to 2A (LED 8 lights up)					A
172 Sr3	Display on the Varioccontrol: Pos. 1 to 1A (LED next to pushbutton 1 lights up) Pos. 2 to 2A (LED next to pushbutton 2 lights up)					
173 Sr4	<p>Checking of the signal outputs and inputs with Varioccontrol</p> <p>Pushbutton 1 = Stitch condensing Pushbutton 2 = Sewing footlifting Pushbutton 3 = Thread trimmer forward Pushbutton 4 = Thread trimmer backward Pushbutton 5 = Thread wiper Pushbutton 6 = Motor running Pushbutton 7 = free Pushbutton 8 = free Pushbutton 9 = free Pushbutton 0 = free</p> <p>By actuating the switches connected to the control the function of these switches is checked and displayed with "ON/OFF".</p>					A
173	<p>Checking of the signal outputs and inputs without Varioccontrol</p> <p>01 = Stitch condensing 02 = Sewing footlifting 03 = Thread trimmer forward 04 = Thread trimmer backward 05 = Thread wiper 06 = Motor running 07 = free 08 = free 09 = free 10 = free</p> <p>OFF/ON = By actuating the switches connected to the control the function of these switches is checked and displayed with "ON/OFF".</p>					A

TECHNICIAN LEVEL

Code no. 190 with control operation

Code no. 1907 with Variocontrol operation

Parameter	Designation	Unit	max	min	Preset	Ind. Prg. No.
Group 7 Service functions						
178	Language selection				dEU--USA ESP--FrA	A
179	Display on the Variocontrol: control program number with index (top line) and identification number (bottom line) Display on the control: When pressing the button, the data will be displayed in succession					A
Group 8 Switching functions						
184	FLS Sewing foot blocked with pedal in pos. -1 ON = Sewing foot lifting blocked with pedal in position -1 OFF = Sewing foot lifting unblocked with pedal in position -1	ON/OFF			ON	B
185	LSP Blocking of machine run input function 0 = Blocking of machine run activated when switch is closed 1 = Blocking of machine run activated when switch is open		1	0	1	B
Group 9 Functions of specific types						
197	FMB Function Membox	ON/OFF			OFF	A
198	Foc Format Memory Card	ON/OFF			OFF	A

15.3 SUPPLIER LEVEL

Code no. 311 with control operation

Code no. 3112 with Varioccontrol operation

Parameter	Designation	Unit	max	min	Preset	Ind. Prg. No.
Group 0 Time functions						
200 t1	Delay until speed release after start stitch condensing		500	0	100	A
201 t2	Activation delay of sewing foot lifting with half heelback	ms	500	20	50	A
202 t3	Start delay after switching off the sewing foot lift signal	ms	500	0	50	A
203 t4	Time of full power of sewing foot lifting	ms	600	0	400	A
204 t5	Holding power for sewing foot lifting Stages 0...7 Stage 1 = 12.5% Stage 7 = 87.5% Stage 0 = 100% Stage 1 = low holding power Stage 0 = high holding power		7	0	3	A
206 t7	Start delay after thread trimming	ms	800	0	100	A
207 br1	Braking effect with speeds > 800 RPM		255	1	80	A
208 br2	Braking effect with speeds < 800 RPM		255	1	50	A
Group 1 Time functions						
212 t10	Time of full power of stitch condensing	ms	600	0	400	A
213 t11	Holding power of stitch condensing Stages 0...7 Stage 1 = 12.5% Stage 7 = 87.5% Stage 0 = 100% Stage 1 = low holding power Stage 0 = high holding power		7	0	3	A
Group 2 Speeds						
220 ALF	Accelerating power of the drive		255	1	40	A
221 dGn	Speed gate	RPM	990 *)	50	100	A
222 tGn	Speed gate damping period	ms	990	0	120	A
Group 3 Switching functions						
231 Sn1	Execution of the 1st stitch after power ON at positioning speed	ON/OFF			ON	A

SUPPLIER LEVEL

Code no. 311 with control operation

Code no. 3112 with Variocontrol operation

Parameter	Designation	Unit	max	min	Preset	Ind. Prg. No.	
Group 4 Switching functions							
242	Selection of the input function on socket B18/5 0 = Light barrier function, if 009 = ON 1 = Needle up/down 2 = Needle up 3 = Single stitch (basting stitch) 4 = Full stitch 5 = Needle to position 2 6 = Blocking of machine run effective with open contact 7 = Blocking of machine run effective with closed contact 8 = Blocking of machine run (unpositioned) effective with open contact 9 = Blocking of machine run (unpositioned) effective with closed contact 10 = Automatic speed without pedal (n12) 11 = Limited speed with pedal (n12) 12 = Sewing footlifting with pedal in position 0 (neutral)		12	0	0	A	
Group 8 Time functions							
280	kd1	Delay time output M1	ms	2550 *)	0	0	A
281	kt1	Activation time output M1	ms	2550 *)	0	90	A
282	kd2	Delay time output M2	ms	2550 *)	0	110	A
283	kt2	Activation time output M2	ms	2550 *)	0	280	A
284	kd3	Delay time output M3	ms	2550 *)	0	90	A
285	kt3	Activation time output M3	ms	2550 *)	0	110	A
286	kdF	Delay time until sewing footon	ms	2550 *)	0	270	A
287	tAM	Holding power output M2 (thread trimmer backward) Stages 0...4 Stage 0 = holding power off Stage 1 = 6.25% Stage 2 = 12.5% Stage 3 = 18.75% Stage 4 = 25%		4	0	2	A

*) When programming the 3-digit and/or 4-digit control parameter values (without Variocontrol), the 2-digit and/or 3-digit value displayed must be multiplied by 10.

15.4 Masterreset

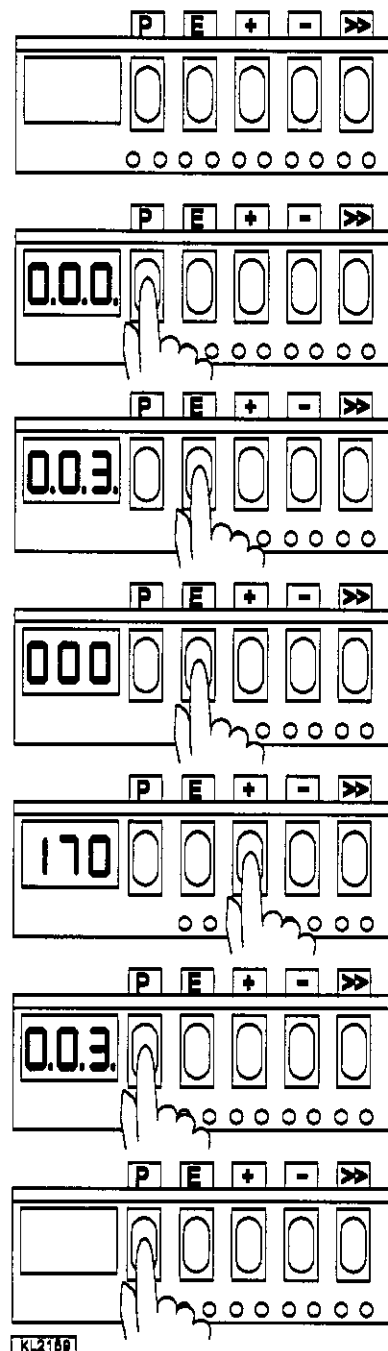
This function is possible only after Power On and without input of a code number!

Factory setting with Variocontrol!

- Turn power on.
- Press pushbutton "P".
- Press pushbutton "E" several times until **ErV** appears on the Variocontrol display.
- Set at **170** by using pushbutton "+" on the Variocontrol.
- Press pushbutton "P".
- Turn power off.
- Turn power on. All parameters are reset to the preset values.

Factory settings without Variocontrol!

- Turn power on!
- Press pushbutton "P"! Parameter "000" is displayed.
- Press pushbutton "E" 6 times! Parameter "003" is displayed.
- Press pushbutton "E" again! The preset value is displayed, e.g. "000".
- Press pushbutton "+" until "170" is displayed! If necessary, correct by using pushbutton "-".
- Press pushbutton "P"! Parameter "003" is displayed again.
- Press pushbutton "P" again!
- Turn power off
- Turn power on. All parameters are reset to the preset values.

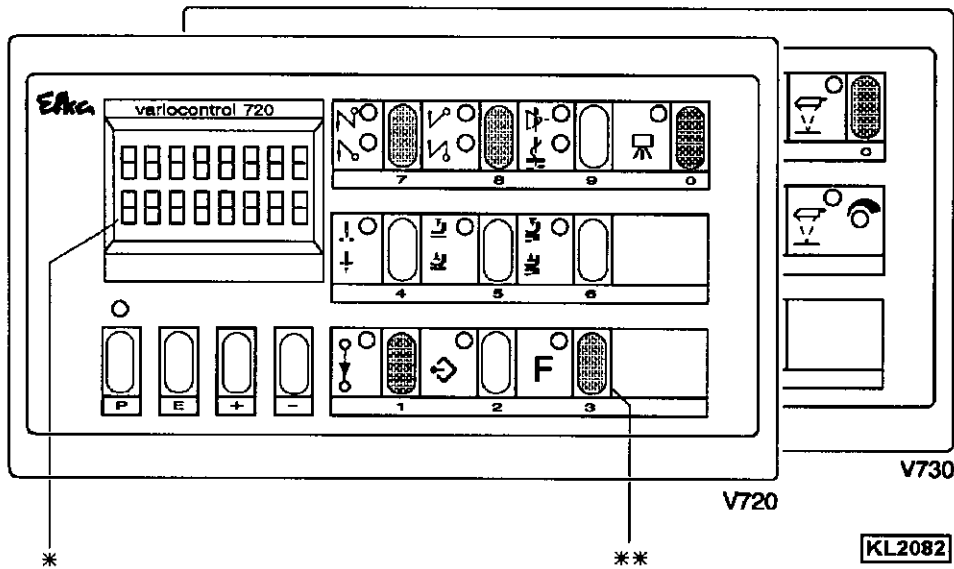


For your notes:

For your notes:

For your notes:

16. Operating Elements of the Variocontrol



- *) Display
 **) Pushbuttons with hatching: special setting for HIT

Functional Setting of the Pushbuttons

- Pushbutton P = Recall or exit of programming mode
 Pushbutton E = Enter button for modifications in the programming mode
 Pushbutton + = Increase of the value indicated in the programming mode
 Pushbutton - = Decrease of the value indicated in the programming mode
 Pushbutton 1 = Stitch counting ON / OFF
 Pushbutton 2 = Teach-in / execution of 40 possible seam sections
 Pushbutton 3 = Function key - can be programmed
 Pushbutton 4 = Basic position of the needle (bottom/upper dead center)
 POSITION 1 / POSITION 2A
 Pushbutton 5 = Automatic foot lifting at stop in the seam ON / OFF
 Pushbutton 6 = Automatic foot lift after thread trimming ON / OFF
 Pushbutton 7 = Start stitch condensing ON / OFF
 Pushbutton 8 = End stitch condensing ON / OFF
 Pushbutton 9 = Outputs M1, M2 ON / output M3 ON / outputs M1-M3 ON / OFF
 Pushbutton 0 = Light barrier function:
 V720/V730: ON / OFF

Special Setting of the Pushbuttons for HIT

The following can be changed by pushbuttons +/- after pressing pushbuttons 1, 3, 7, 8 or 0:

- Pushbutton 1 = Number of stitches of the seam with stitch counting
 Pushbutton 3 = Number of stitches or switching the programmed function on/off
 Pushbutton 7 = Number of stitches of the selected start stitch condensing
 Pushbutton 8 = Number of stitches of the selected end stitch condensing
 Pushbutton 0 = Number of light barrier compensating stitches

EFKA

FRANKL & KIRCHNER GMBH & CO KG

SCHEFFELSTRASSE 73 - D-68723 SCHWETZINGEN
TEL.: (06202)2020 - TELEFAX: (06202)202115

EFKA

OF AMERICA INC.

3715 NORTHCREST ROAD - SUITE 10 - ATLANTA - GEORGIA 30340
PHONE: (770)457-7006 - TELEFAX: (770)458-3899

EFKA

ELECTRONIC MOTORS SINGAPORE PTE. LTD.

67, AYER RAJAH CRESCENT 05-03 - SINGAPORE 0513
PHONE: 7772459 or 7789836 - TELEFAX: 7771048

1(2)-150896-B(402176EN)