Efka variostop

CONTROL

6F82AV2232

Replaces 6F62AV

INSTRUCTION MANUAL

WITH PARAMETER LIST

No. 402233 **english**

Efka
FRANKL & KIRCHNER
GMBH & CO KG

Efka
EFKA OF AMERICA INC.

Efka
EFKA ELECTRONIC MOTORS
SINGAPORE PTE. LTD.

Contents Page

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 industrial sewing machines.

Brand	Series
DÜRKOPP-ADLER	211, 212, 219, 238, 243 244, 250, 265, 267, 271, 272, 380, 541

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 Electrical equipment of industrial machines:
Particular 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 6F82AV2232
	- Power pack	N30
1	Position transmitter	P5-2
1	Set of standard accessories consisting of:	B10
		belt guard, complete (for pulleys up to 132 mm ϕ)
		set of hardware
		motor mounting foot
		bracket 1 and 2, short
		documentation

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 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. presser foot lift, backtacking, 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 FB301 with one pedal for standing operation with approx. 1400 mm connecting cable and plug	- part no. 4160013
Foot control type FB302 with three pedals for standing operation with approx. 1400 mm connecting cable and plug	- part no. 4160018
Potential equalization cord 700 mm long, LIY 2.5 mm², 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
6-pin plug (Hirschmann Mes60)	- part no. 0500457
7-pin plug with locking screw	- part no. 0502474
10-pin plug (Hirschmann Mes100)	- part no. 0500357

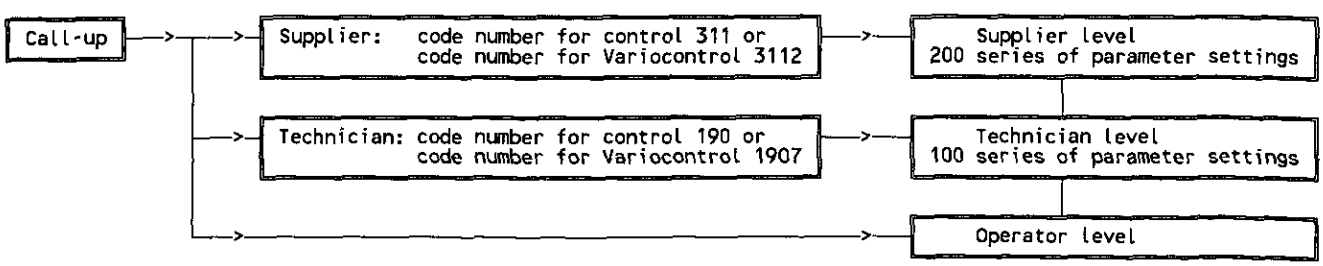
4. Operating the Control without Variocontrol

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:

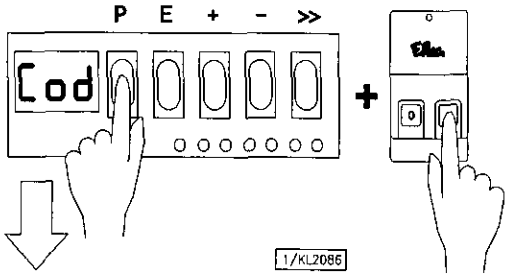
- the supplier to the highest and all subordinate levels by a code number
- the technician to the next lower and all subordinate levels by a code number
- the operator to the lowest level without code number



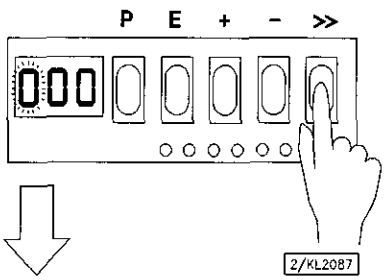
4.2 Programming the Code Number

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

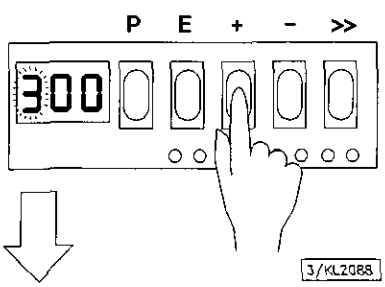
1. Press pushbutton **P** and turn power on



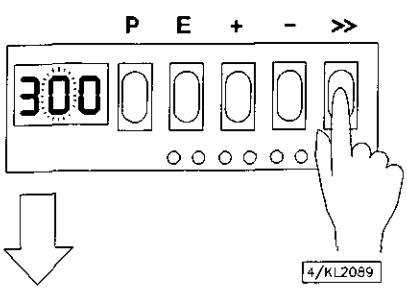
2. Press pushbutton > > (first digit blinks)



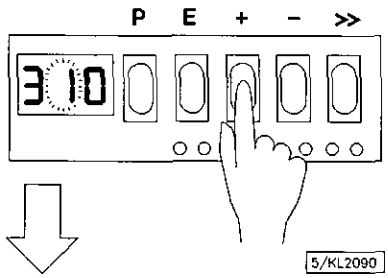
3. Press pushbutton + and/or - to select the first digit
Technician level = = > Code no. 190
Supplier level = = > Code no. 311



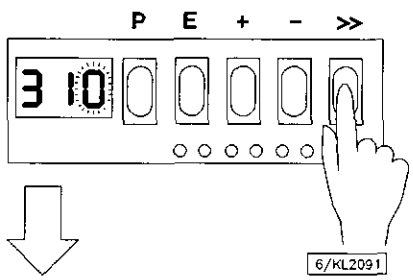
4. Press pushbutton > > (second digit blinks)



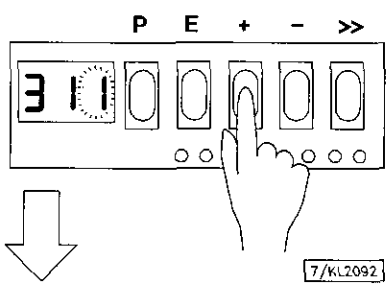
5. Press pushbutton + and/or - to select the second digit



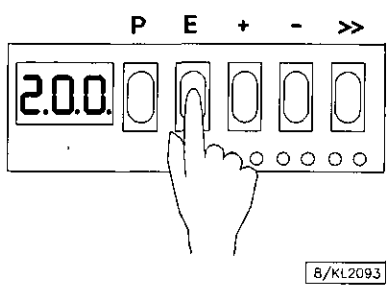
6. Press pushbutton > > (third digit blinks)



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



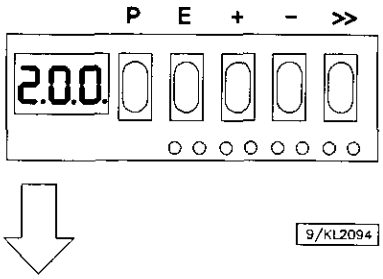
8. Press pushbutton E; the parameter number is displayed, which is indicated by points between the digits.



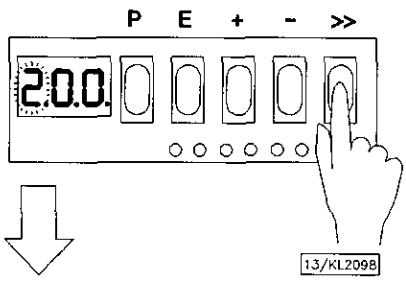
4.3 Selection of the Parameters

4.3.1 Direct Selection

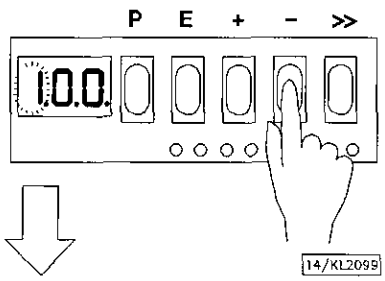
1. After inputting the code number on the programming level



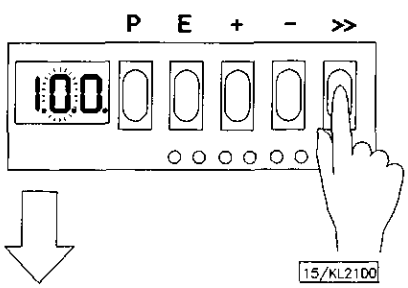
2. Press pushbutton > > (first digit blinks)



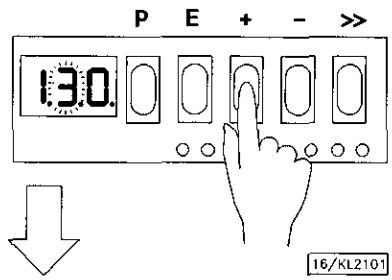
3. Press pushbutton + and/or - to select the first digit



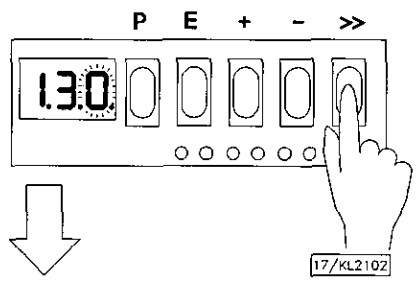
4. Press pushbutton > > (second digit blinks)



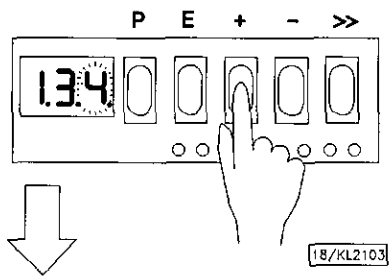
5. Press pushbutton + and/or - to select the second digit



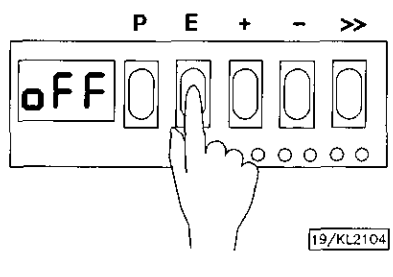
6. Press pushbutton > > (third digit blinks)



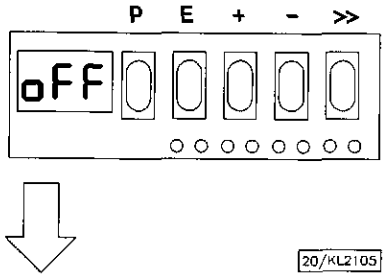
7. Press pushbutton + and/or - to select the third digit



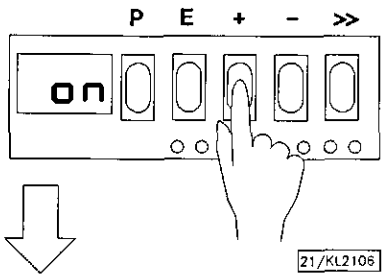
8. Press pushbutton E; parameter value is displayed. There are no points between the digits.



4.3.2 Changing Parameter Values



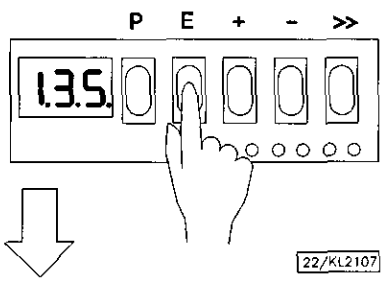
Display after selecting the parameter value



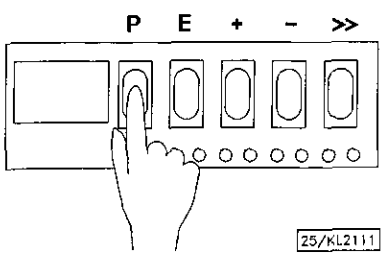
Change parameter value by pressing pushbutton + and/or -

Possibility n° 1:

Press pushbutton **E**. The next parameter number is displayed.

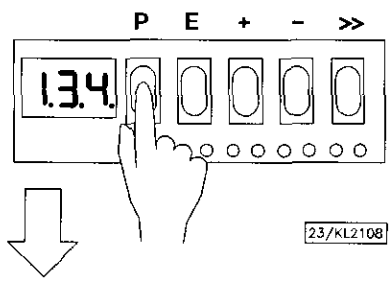


Press pushbutton **P**. Exit programming. The changed parameter values will only be saved by starting to sew again!

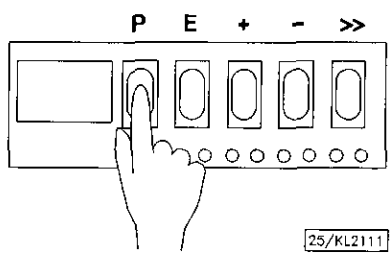


Possibility n° 2:

Press pushbutton **P**. The same parameter number is displayed.

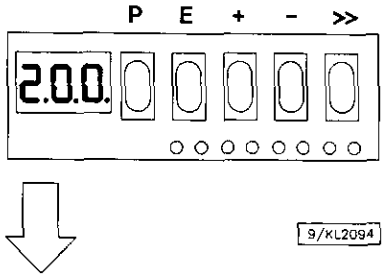


Press pushbutton **P**. Exit programming. The changed parameter values will only be saved by starting to sew again!

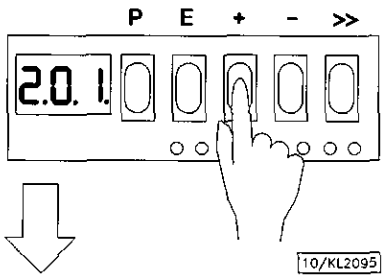


4.3.3 Selection by Using the +/- Pushbuttons

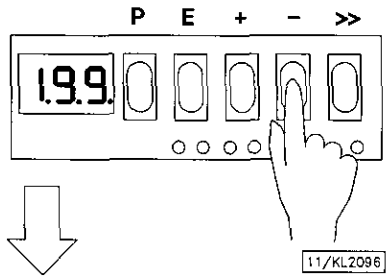
1. After inputting the code number on the programming level



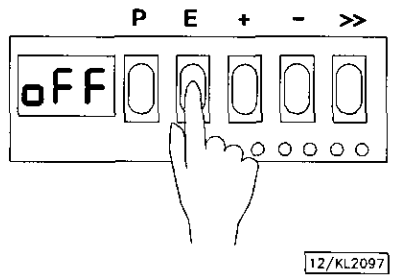
2. Select the next parameter by pressing the + pushbutton



3. Select previous parameter by pressing the - pushbutton



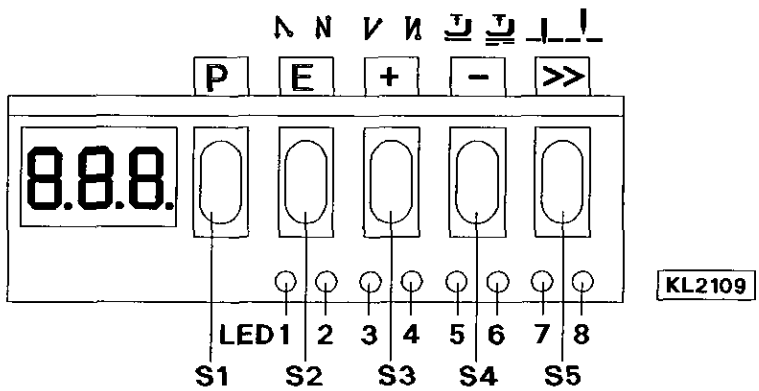
4. After pressing pushbutton E, the parameter value is displayed



4.4 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.



4.5 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

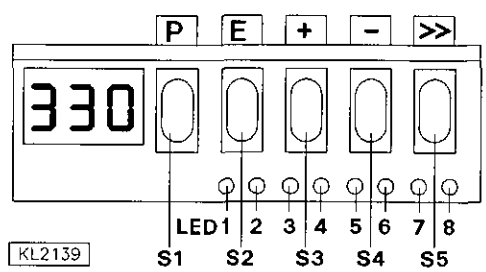
Function	Pushbutton		LED number	
Single start backtack	E	(S2)	1 = on	2 = off
Double start backtack	E		1 = off	2 = on
Start backtack off	E		1 = off	2 = off
Single end backtack	+	(S3)	3 = on	4 = off
Double end backtack	+		3 = off	4 = on
End backtack off	+		3 = off	4 = off
Presser foot lifting at stop in the seam (automatic)	-	(S4)	5 = on	6 = off
Presser foot lifting at the seam end (automatic)	-		5 = off	6 = on
Presser foot lifting at stop in the seam and at the seam end (automatic)	-		5 = on	6 = on
Presser 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

4.6 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 the seam end. 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



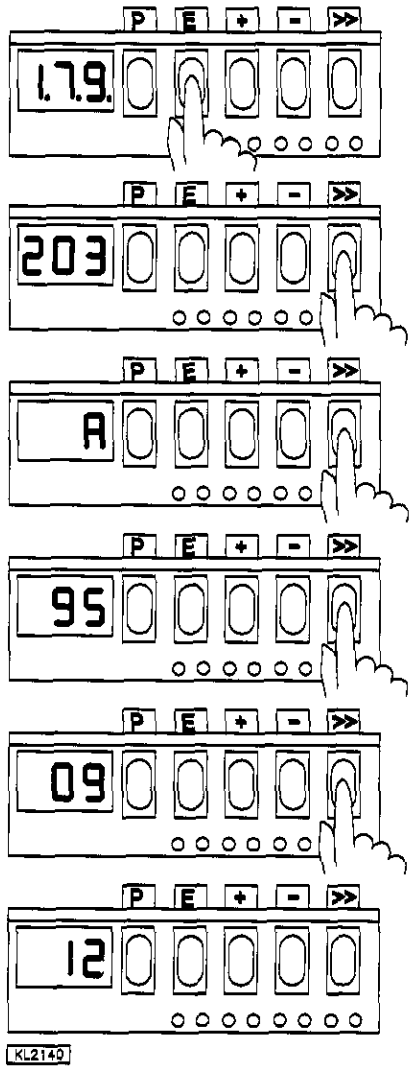
4.7 Program Identification on the Control

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: Start backtack

- Double start backtack is on	top LED next to pushbutton 7 lights up	I / 0 [7]
Push button 7 briefly - Start backtack is off	both LEDs next to pushbutton 7 off	0 / 0 [7]
Push button 7 briefly - Single start backtack is on	bottom LED next to pushbutton 7 lights up	0 / I [7]

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 ==> F-XXX
Display of the first PARAMETER NO.

1. => [P] => The most significant digit ==> F-XXX
on the display blinks!

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 ==> F-XXX aaa bbb
Display steps to next PARAMETER

OR

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

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 with parameter 111 (upper limit) and parameter 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

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

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.

4000 6F82AV	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.
4000 6F82AV	Display after approx. 3 seconds: => Maximum speed => Type designation

If stitch counting (pushbutton 1) is turned on.

4000 6F82AV	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.
4000 6F82AV	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 of parameter 008:

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

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

4000 6F82AV	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 (ornamental backtack on/off)
[-]	Press pushbutton -. (+ increases, - decreases the display value)
-F- 1	Display: New status (softstart ON/OFF)
[P]	Press pushbutton P.
4000 6F82AV	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) was 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.
4000 6F82AV	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
4000 6F82AV	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:

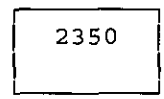
PrG3212A 92031211	<== <==	Program number: 3212 / Index: A Identification number: 92031211

5.8 Display Actual Speed

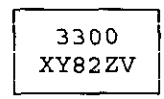
Functions **with** Variocontrol		Parameter
Display actual speed	nIS	139

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

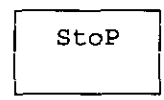
During machine run:
- The actual speed
- **Example:** 2350 rotations per minute



At machine standstill after trimming:
- The set maximum speed and the type of control
- **Example:** 3300 rotations per minute and control type XY82ZV



At stop in the seam:
- The stop indication



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

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 and by the following settings:

- Set the maximum speed by using parameter 111 (n2).
- Set the limitation of the maximum speed to the specific level according to the application as described in chapter "Direct Input of 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 mutliplied 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 !

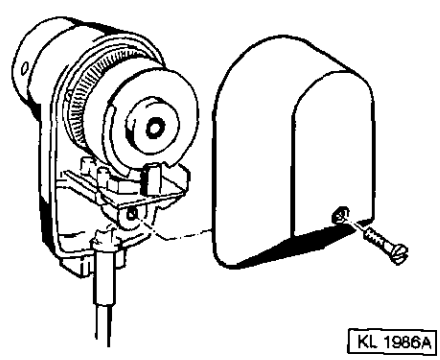
Attention!
If the motor is mounted differently, e.g at a different angle or with gear, make sure that the parameter value is assigned correctly to the direction of rotation.
Set positions if necessary.

Attention!
Turn power off before adjusting the positioning discs.

Attention!
Be very careful when adjusting the positioning discs.
Risk of injury.
Please ensure that positioning discs and generator disc (inner disc) are not damaged.

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.



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

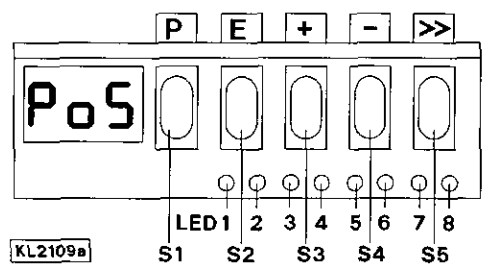
Function **with** or **without** Variocontrol		Parameter
Display of positions 1 and 2	(Sr3)	172

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

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

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: n1 = 180 RPM + value 100 = 280 RPM.

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

8. Functions without Variocontrol

8.1 First Stitch After Power On

Functions **with** or **without** Variocontrol		Parameter
1 stitch at positioning speed 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 backtack, 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 mutliplied 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.

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

8.3 Presser Foot Lifting

Functions **without** Variocontrol	Pushbutton on the control
Automatic in the seam	Pushbutton S4
Automatic after thread trimmming	Pushbutton S4

Functions **with** Variocontrol		Pushbutton on the Variocontrol
Automatic in the seam	LED on pushbutton 5 lights up	Pushbutton 5
Automatic after thread trimmming	LED on pushbutton 6 lights up	Pushbutton 6

Functions **with** or **without** Variocontrol		Parameter
Activation delay when pedal is in position -1, half heelback	(t2)	201
Start delay from lifted foot	(t3)	202
Time of full power	(t4)	203
Operating time with pulsing	(t5)	204
Delay after thread wiping until presser foot lifting	(t7)	206
Delay after thread trimming without thread wiper until presser foot lifting	(tFL)	211

Presser foot is lifted:

- in the seam
  - by heeling the pedal back (position -1)
    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 B18/1-5 if parameter 242 = 12
- after thread trimming
  - by heeling the pedal back (position -1 or -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 B18/1-5 if parameter 242 = 12
  - by light barrier, automatically
  - by stitch counting, automatically
  - activation delay after thread wiping (t7)
  - activation delay without thread wiping (tFL)

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 presser foot is 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.

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

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
0	100%	full 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.

See also chapter "Timing Diagrams"!

8.4 Start Backtack

Functions **without** Variocontrol		Pushbutton on the control
Single start backtack	LED 1 lights up	Pushbutton S2
Double start backtack	LED 2 lights up	
Start backtack Off	both LEDs off	

Functions **with** Variocontrol		Pushbutton on the Variocontrol
Single start backtack	bottom LED lights up	Pushbutton 7
Double start backtack	top LED lights up	
Start backtack Off	both LEDs off	

The start backtack starts by pushing the pedal forward at the beginning of the seam. The backtack is delayed by the time t3 from lifted foot (start delay from lifted foot).
The backtack is executed automatically at start backtacking speed. It cannot be interrupted. With softstart running parallel, the respective lower speed predominates.
Switching on the start backtack is synchronized to position 1.
After the execution of the backward seam, the stitch regulator, and, after a delay time t1, the start backtacking speed, will be switched off. Then pedal control is returned.
The counting is synchronized to position 1.

8.4.1 Start Backtacking Speed

Functions **with** or **without** Variocontrol		Parameter
Start backtacking 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 mutliplied by 10.

8.4.2 Start Backtack Stitches

Functions **with** or **without** Variocontrol		Parameter
Number of stitches forward	(Arv)	000
Number of stitches backward	(Arr)	001

The stitches for start backtack forward and backward can be programmed by the above parameters in the control or on a connected Variocontrol.
The start backtack stitches can also 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 Stitch Correction and Speed Release

Functions **with** or **without** Variocontrol		Parameter
Stitch correction time	(t8)	150
Stitches until speed release after start backtack	(t1)	200

The speed release after the single and double start backtack can be influenced by parameter 200.

For slow backtack mechanisms in the double start backtack the stitch regulator can be disabled with a time-lag of t8 (start backtack stitch correction), which prolongs the backward section. This time-lag can be selected by parameter 150.

8.4.4 Double Start Backtack

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

8.4.5 Single Start Backtack

The stitch regulator signal will be emitted for a number of stitches that can be set, and the backward section will be executed.

8.5 End Backtack

Functions **without** Variocontrol		Pushbutton on the control
Single end backtack	LED 3 lights up	Pushbutton S2
Double end backtack	LED 4 lights up	
End backtack Off	both LEDs off	

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

Functions **with** Variocontrol		Pushbutton on the Variocontrol
Single end backtack	top LED lights up	Pushbutton 8
Double end backtack	bottom LED lights up	
End backtack Off	both LEDs off	

The end backtack 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 backtacking speed and the synchronization to position 2. The end backtack is performed automatically. An interruption is not possible.

8.5.1 End Backtacking Speed

Functions **with** or **without** Variocontrol		Parameter
End backtacking 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 mutliplied by 10.

8.5.2 End Backtack Stitches

Functions **with** or **without** Variocontrol		Parameter
Number of stitches backward	(Err)	002
Number of stitches forward	(Erv)	003

The stitches for end backtack forward and backward can be programmed by the above parameters in the control or on a connected Variocontrol.
The end backtack stitches can also 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)".

8.5.3 Stitch Correction and Last Stitch Backward

Functions **with** or **without** Variocontrol		Parameter
Last stitch backward On/Off	(FAr)	136
Stitch correction time	(t9)	151

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

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

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

8.5.4 Double End Backtack

The backward section will be sewn for a number of stitches. Then, the stitch regulator will be disabled, and the forward section will be executed. For both sections the number of stitches can be set seperately.
After the execution of the forward section, the trimming function will be initiated. During the entire operation the sewing speed is reduced to end backtacking speed, with the exception of the last stitch, which will be executed at positioning speed n1.
For slow backtack mechanisms in the double end backtack the stitch regulator can be disabled with a time-lag of t9 (end backtack stitch correction).

8.5.5 Single End Backtack

The single end backtack will be executed at end backtacking speed. During the last stitch the speed is reduced to positioning speed. Depending on parameter 136 the stitch regulator remains on or is switched off.

- Parameter 136 = ON last stitch backward
- Parameter 136 = OFF last stitch forward

8.6 Start Ornamental Backtack

Functions **without** Variocontrol		Pushbutton on the control
Function ornamental backtack On/Off		135
Single start ornamental backtack	LED 1 lights up	Pushbutton S2
Double start ornamental backtack	LED 2 lights up	
Start ornamental backtack Off	both LEDs off	

Functions **with** Variocontrol		Pushbutton on the Variocontrol
Function ornamental backtack On/Off	(SrS)	135
Single start ornamental backtack	bottom LED lights up	Pushbutton 7
Double start ornamental backtack	top LED lights up	
Start ornamental backtack Off	both LEDs off	

The parameters of the start backtacking speed and of the backtacking stitches forward and backward are identical with the standard start backtack.

Functions **with** or **without** Variocontrol		Parameter
Ornamental backtack stop time	(tSr)	210

Differences from the standard start backtack:
- The drive stops for the switching of the stitch regulator
- The stop time can be set

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

Functions **with** Variocontrol		Parameter
Ornamental backtack On/Off	(-F-)	F-008 = 2

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

8.7 End Ornamental Backtack

Functions **without** Variocontrol		Pushbutton on the control
Function ornamental backtack On/Off		135
Single end ornamental backtack	LED 3 lights up	Pushbutton S3
Double end ornamental backtack	LED 4 lights up	
End ornamental backtack Off	both LEDs off	

Functions **with** Variocontrol		Pushbutton on the Variocontrol
Function ornamental backtack On/Off	(SrS)	135
Single end ornamental backtack	top LED lights up	Pushbutton 8
Double end ornamental backtack	bottom LED lights up	
End ornamental backtack Off	both LEDs off	

The parameters of the end backtacking speed and of the backtacking stitches backward and forward are identical with the standard end backtack.

Functions **with** or **without** Variocontrol		Parameter
Ornamental backtack stop time	(tSr)	210

Differences from the standard start backtack:

- The drive stops for the switching of the stitch regulator
- The stop time can be set

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

Functions **with** Variocontrol		Parameter
Ornamental backtack On/Off	(-F-)	F-008 = 2

8.8 Intermediate Backtack

The backtack solenoid can be switched on anywhere in the seam by the external pushbutton on socket B4/2-5 and/or B12/1-2.

See chapter "**Connection Diagram**" !

8.9 Backtack Suppression/Recall

Effective in standard and ornamental backtack

The next backtacking operation can be suppressed or recalled once by pressing the external pushbutton on socket B4/2-3.

When pressing	Start back-tack On	Start back-tack Off	End back-tack On	End back-tack Off
Before start of seam	no backtack	backtack	---	---
In the seam	---	---	no backtack	backtack

The double backtack is performed in the above cases.

See chapter "**Connection Diagram**" !

8.10 Holding Power of Backtacking

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

The backtack solenoid 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 with 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 %	
0	100%	high holding power

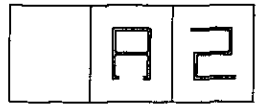
8.11 Blocking of Machine Run (Safety Switch)

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 B12/2-3.

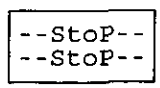
Functions **with** or **without** Variocontrol		Parameter
Blocking of machine run (safety switch) 0 = Blocking of machine run active when switch is closed 1 = Blocking of machine run active when switch is open	(LSP)	185

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 start backtack, in the seam with stitch counting and in the light barrier seam:

By opening and/or closing the switch the start backtack and/or the seam is interrupted.
- Stop in the basic position
- Presser foot lifting is possible with pedal in position -1
- Thread trimming without end backtack is possible with activated blocking of machine run (safety switch)
- After trimming with activated blocking of machine run (safety switch) the sewing is restarted
- After the deactivation of the blocking of machine run (safety switch) the start backtack or the stitch counting will be continued with pedal forward, or the seam end (end backtack and thread trimmer) will be performed with pedal in position -2

Blocking of machine run in the free seam:

By opening and/or closing the switch the seam is interrupted.
- Stop in the basic position
- Presser foot lifting is possible with pedal in position -1
- Thread trimming without end backtack is possible with activated blocking of machine run (safety switch)
- After trimming with activated blocking of machine run (safety switch) the sewing is restarted
- After the deactivation of the blocking of machine run (safety switch) the seam will be continued with pedal forward, or the seam end (end backtack and thread trimmer) will be performed with pedal in position -2

Blocking of machine run in the end backtack:

By opening and/or closing the switch the end backtack and the trimming are completed.
- The start of the next seam is blocked until the blocking of machine run (safety switch) is deactivated

Blocking of machine run in the thread trimming

By opening and/or closing the switch the trimming is completed.
- The start of the next seam is blocked until the blocking of machine run (safety switch) is deactivated

New start after blocking of machine run

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

8.12 Thread Trimmer

Function **without** Variocontrol	Parameter
Thread trimmer On/Off	013

Function **with** Variocontrol	Pushbutton
Thread trimmer On/Off	Pushbutton 9

8.12.1 Trimming Speed

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

The thread trimming is performed at trimming speed.
The drive stops in position 2 at the seam end, when thread trimming is off; it stops in position 1 at the end of programmed seams.

8.13 Thread Wiper

Function **without** Variocontrol	Parameter
Thread wiper On/Off	014

Function **with** Variocontrol	Pushbutton
Thread wiper On/Off	Pushbutton 9

Function **with** or **without** Variocontrol		Parameter
Activation time of thread wiper	(t6)	205
Delay thread wiper end until presser foot lifting	(t7)	206
Delay of presser foot lifting when thread wiper off	(tFL)	211

The thread wiper can only be switched on if the thread trimmer is on as well.
The operating time (t6) is set by parameter 205.
The return time (t7), which can be set by parameter 206, prevents presser foot lifting before the thread wiper is in its basic position.
If a thread wiper is not connected there will be a time lag tFL (parameter 211) after thread trimming until the presser foot is lifted.

8.14 Functions of the Pushbutton Needle up / down

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

140 = 1; needle up-down
When pressing the pushbutton on socket B4/1-2, 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 B4/1-2, 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 B4/1-2, 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.
If the drive is outside of the stop position it runs to position 1.

140 = 4; full stitch
When pressing the pushbutton on socket B4/1-2, 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.

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

8.15 Functions of the Pushbutton Single Stitch

When pressing the separate pushbutton on socket B4/2-6, the machine performs one rotation from position 1 to position 1, as was described in the previous chapter.
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.

8.16 Seam with Stitch Counting

Functions **without** Variocontrol		Parameter
Stitch counting On/Off	(Stc)	015

Functions **with** Variocontrol		Pushbutton
Stitch counting On/Off	(Stc)	Pushbutton 1

8.16.1 Stitches for Stitch Counting

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

8.16.2 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.

8.16.3 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 Stitch counting On/Off	Pushbutton 0 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.

8.17 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 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.

8.18 Light Barrier

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

8.18.1 Speed after Light Barrier Sensing

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

8.18.2 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 with 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 the 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 = 3

8.18.3 Reflection Light Barrier

Functions **with** or **without** Variocontrol	Parameter / Pushbutton
Light barrier On/Off	Pushbutton = 0
Light barrier On/Off	009
Sensitivity adjustment when using LS001	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.

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

8.18.4 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.

8.18.5 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

8.18.6 Functional Variations of the Light Barrier Input

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

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 abbreviations in parentheses ( ) are visible only if a Variocontrol is 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 next position possible.

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.

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.

242 = 7 **Blocking of machine run effective with closed contact**
When closing the switch the drive stops in the preselected basic position.

242 = 8 **Blocking of machine run effective with open contact (unpositioned)**
When opening the switch the drive stops immediately unpositioned

242 = 9 **Blocking of machine run effective with closed contact (unpositioned)**
When closing the switch the drive stops immediately unpositioned

242 = 10 **Run at automatic speed (n12)**
When pressing the pushbutton the drive runs at automatic speed. The pedal is not used.

242 = 11 **Run at limited speed (n12)**
When pressing the pushbutton the drive runs at limited speed. The pedal must be pushed forward.

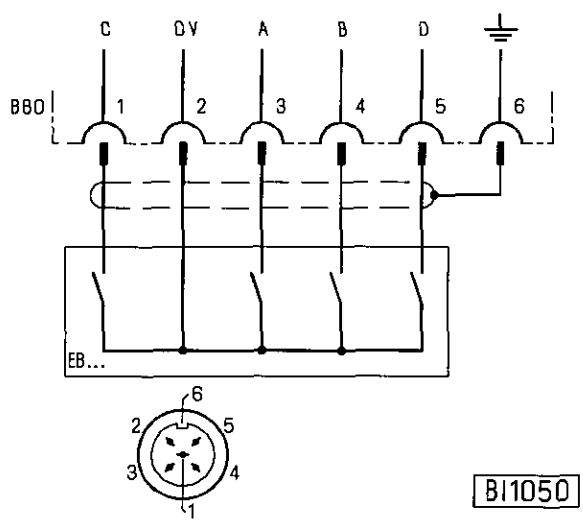
242 = 12 **Presser foot lifting with pedal in position 0 (neutral)**

8.19 Actuator

With the help of the actuator connected with the pedal the commands for the sewing operation are inputted.
Instead of the built-in actuator another external actuator can be connected to socket B80.

Table: Coding of the pedal steps

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



EB... - Actuator

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

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

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 backtack, end backtack, stitch counting, thread trimming and presser foot lifting can be assigned individually to each seam.
- **Backward sewing** by reversing the feeding direction can only be programmed in the teach-in mode.

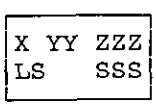
Example 1:	Pattern 1	40 seams
	Pattern 2-8	0 seams
Example 2:	Pattern 1	4 seams
	Pattern 2	5 seams
	Pattern 3	6 seams
	Pattern 4	25 seams
	Pattern 5-8	0 seams
Example 3:	Pattern 1	10 seams
	Pattern 2	15 seams
	Pattern 3-8	0 seams

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

9.2.1 Teach-in Mode

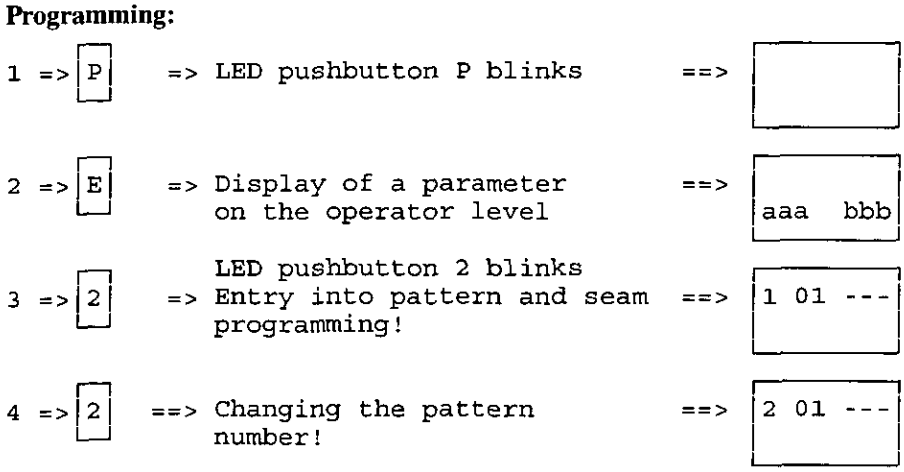
- Each seam pattern is programmed and stored separately.
- After input of the pattern the teach-in mode must be exited.
- Saving is done by sewing start.

Display configuration:



X Pattern number (1...8)
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:



The seam functions can be programmed by the pushbuttons on the Variocontrol (e.g. presser foot lifting, start backtack, etc.).

9.2.1.1 Seam with Stitch Counting

=> [1] ==> Turning on the stitch counting; display of the actual number of stitches. ==> [2 01 004]

9.2.1.2 Backward Seam with Stitch Counting

=> [1] ==> Turning on backward sewing (display "-" in front of the number of stitches). Switching to forward sewing by pressing the pushbutton again. ==> [2 01-004]

When sewing backwards, all sewing operations including backtack are executed in reversed feeding direction. The functions "light barrier seam" and "backward seam" block each other, i.e. the light barrier cannot be switched on if the backward seam was selected, or, backward sewing is not possible, when the light barrier is switched on.

=> [+] => [-] Changing the stitches by pushbuttons +/- or sewing the seam by using the pedal.

9.2.1.3 Stitch Counting and/or Light Barrier

=> [0] => Turning on the light barrier; display of the actual number of compensating stitches. ==> [2 01 004 / LS 007]

With V720/V730!

=> [+] => [-] 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 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 of 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 backtack, a seam 2 with stitch counting and a seam 3 with light barrier seam and end backtack 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] Bottom LED pushbutton 7 lights up => Single start backtack is on ==> | 4 01 --- |

8. => [6] LED pushbutton 6 lights up => Foot lifting at the seam end is on ==> | 4 01 --- |

9. => [1] => Stitch counting is on ==> | 4 01 000 |

10. => [+] => [-] Changing the number of stitches by pushbuttons or by using the pedal | 4 01 017 |

=> Seam length of 17 stitches is set

11. => [E] => **Pattern 4, seam 2** ==> | 4 02 --- |

12. => [1] => Stitch counting is on ==> | 4 02 000 |

13. => [+] => [-] Changing the number of stitches by pushbuttons or by using the pedal | 4 02 008 |

=> Seam with 8 stitches is set

14. => [E] => **Pattern 4, seam 3** Free seam is selected ==> | 4 03 --- |

15. => [0] => Light barrier is activated ==> [4 03 ---
LS 000]

16. => [+] => [-] Changing the stitches by pushbuttons / 5 compensating stitches are set [4 03 ---
LS 005]

17. => [8] => Top LED pushbutton 8 lights up Single end backtack is on ==> [4 03 ---
LS 005]

18. => [9] => Bottom LED pushbutton 9 lights up Thread trimmer is on ==> [4 03 ---
LS 005]

19. => [E] => **Pattern 4, seam 4** By changing to the next seam the settings of the preceding seams are automatically entered. ==> [4 04 ---]

20. => [P] => Exit programming, first seam can be executed ==> [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 pressing 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

Caution! - Turn power off

- Unplug Variocontrol from the control
- Plug Memory Box into control
- Plug Variocontrol into Memory Box
- Turn power on
- Activate Memory Box with 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

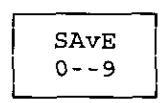
1. » Insert Memory Card with the labelled side up into the slot of the Memory Box.
   If the Memory Card is correctly inserted the green LED on the Memory Box lights up..

2. » Turn "Programming Seams (Teach-in)" off ==> pushbutton 2

3. » Save data

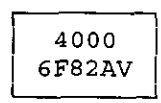
> **Note:**
> All parameters of the sewing data that can be set are stored with the exception of the direction of rotation and the needle positions.

- Push pedal twice in short intervals, after end of seam, and put back to position 0 (neutral)



- 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.

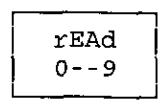
- Display after the storing is completed



4. » Reading data from the Memory Card into the control (2 possibilities)

Possibility:

- Push pedal forward (step 12), then turn power on



- 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.

```
4000
6F82BV
```

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

- Plug Memory Box into control.
- Turn power on.
- Activate Memory Box with parameter 197.
- 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.

```
--------
InFo Cxx
```

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

```
dEU  USA
ESP  FrA
```

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	Backtacking
2	Presser foot lifting
3	Thread trimmer
4	Thread wiper
5	free
6	free
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	Backtacking
02	Presser foot lifting
03	Thread trimmer
04	Thread wiper
05	free
06	free
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

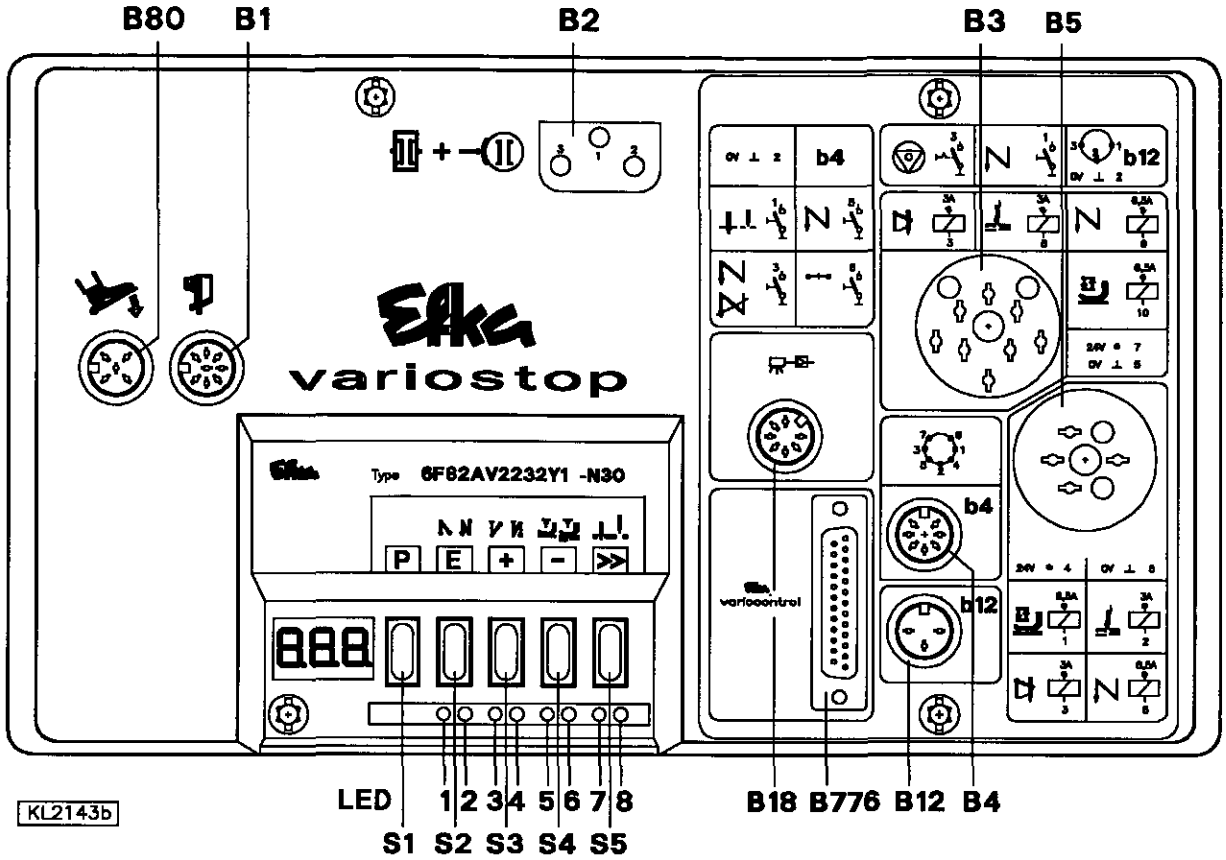
Display	Signification
Info H2	Processor disturbed

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

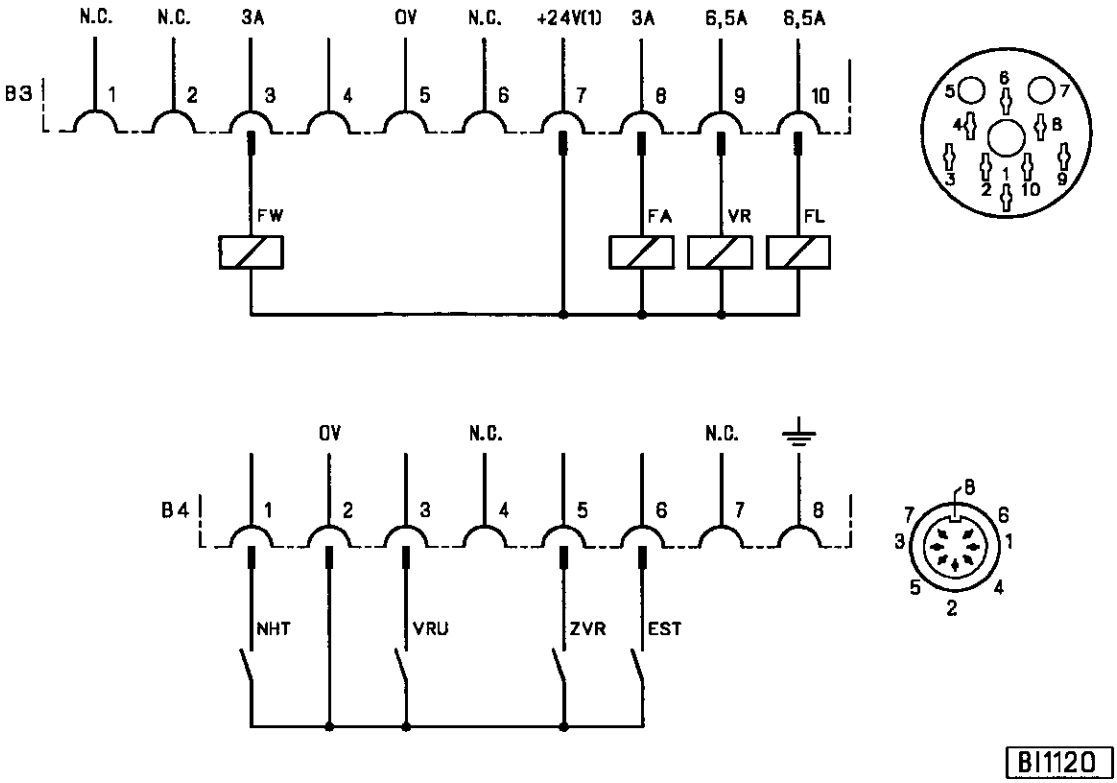


B1 - Position transmitter
B2 - Clutch/brake of the motor
B3 - Output presser foot lift, backtacking, thread trimmer, thread wiper
B4 - Input needle up-down, backtack suppression/recall, intermediate backtack, single stitch
B5 - Output presser foot lift, backtacking, thread trimmer, thread wiper
B12 - Input intermediate backtack, blocking of machine run (safety switch)
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



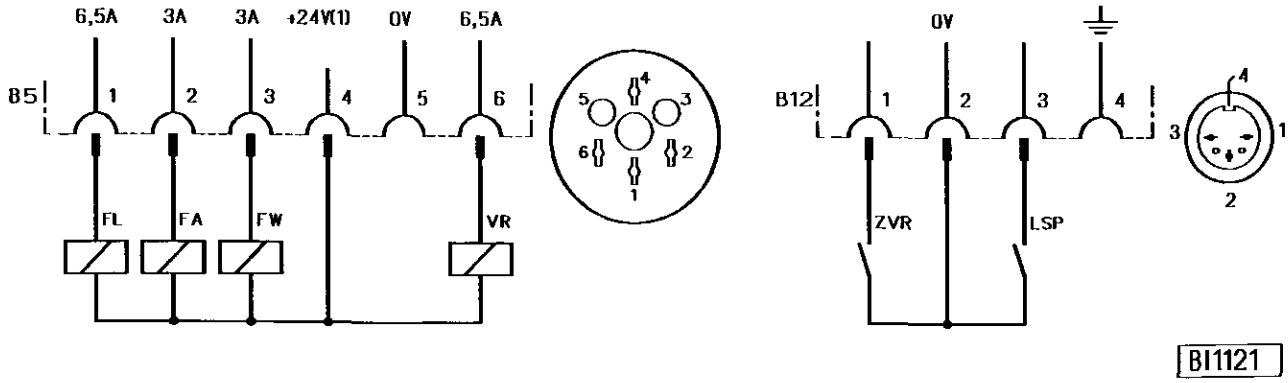
Attention!
When connecting the outputs, ensure that a total power of 96VA constant load will not be exceeded !

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

FL - Presser foot lifting
VR - Backtacking
FA - Thread trimmer
FW - Thread wiper

NHT - Needle up/down
EST - Single stitch
ZVR - Intermediate backtack
VRU - Backtack suppression/recall

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



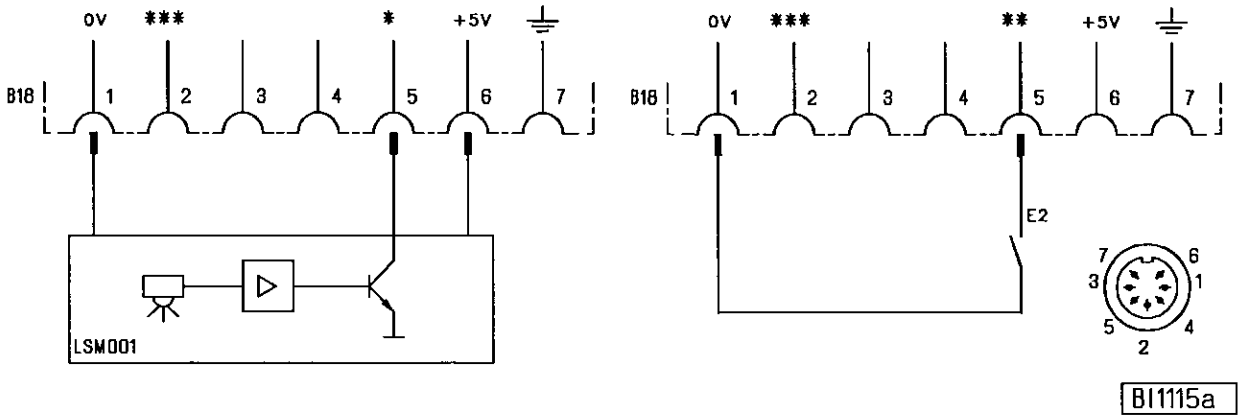
Attention!
When connecting the outputs, ensure that a total power of 96VA constant load will not be exceeded !

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

FL - Presser foot lifting
VR - Backtacking
FA - Thread trimmer
FW - Thread wiper

ZVR - Intermediate backtack
LSP - Blocking of machine run

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



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

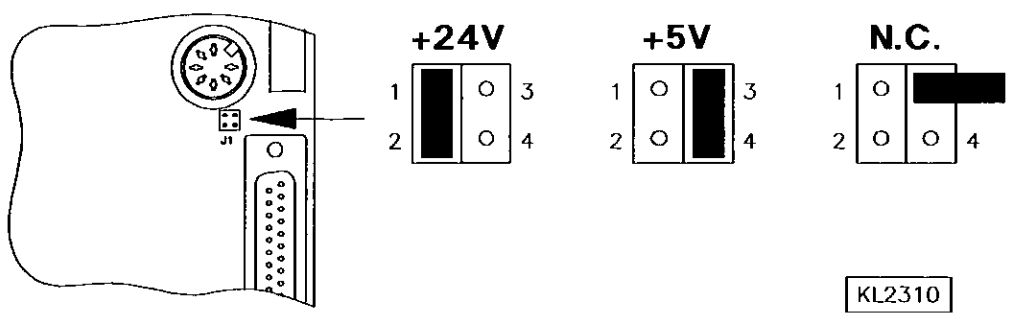
Attention!

Please ensure that pushbuttons or switches are connected according to the top right connection diagram. In the case of a short circuit with current-carrying sockets the electronic control may be permanently damaged !

*** +24V => Connect left pins 1 and 2 with jumper.

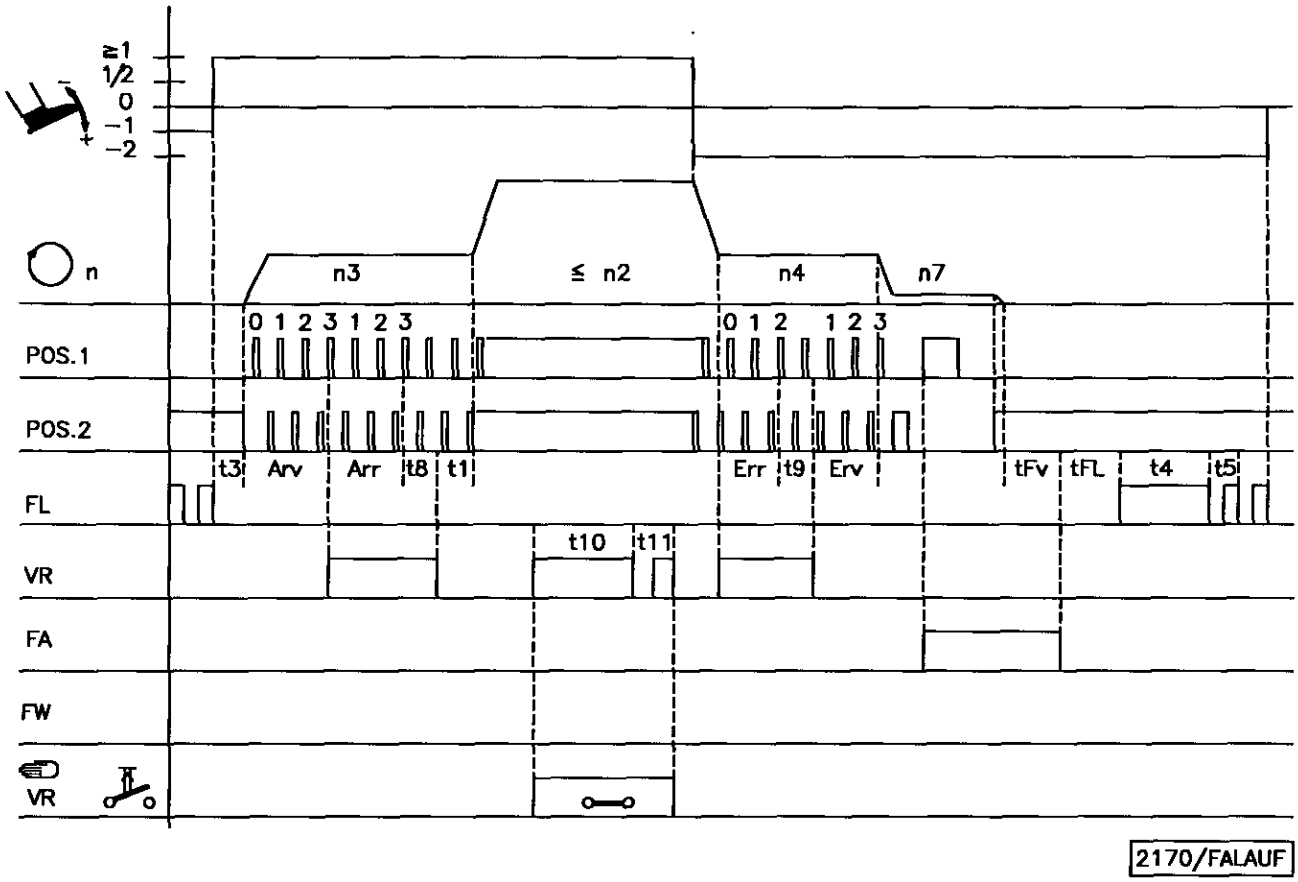
+5V => Connect right pins 3 and 4 with jumper.

N.C. => Connect jumper with only one pin **(factory setting)** or remove completely.



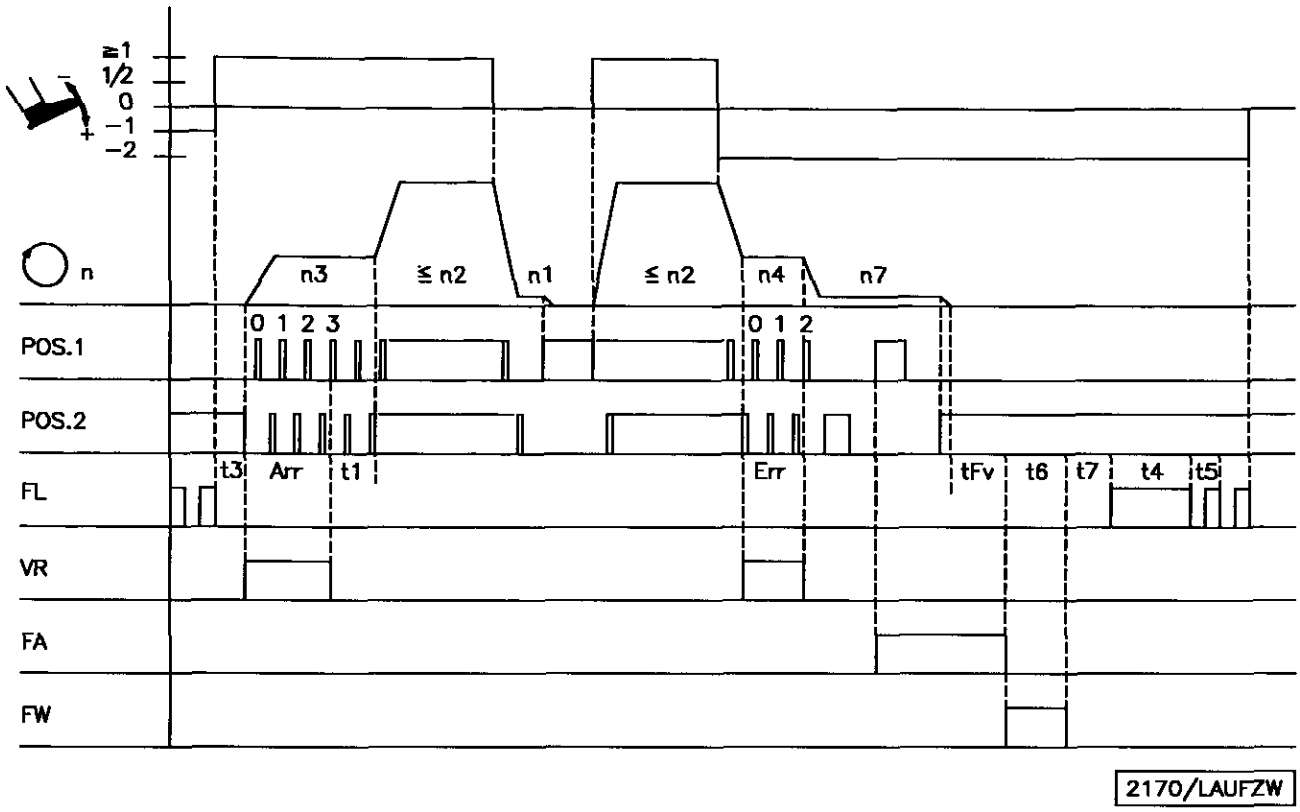
14. Timing Diagrams

Trimming from full run



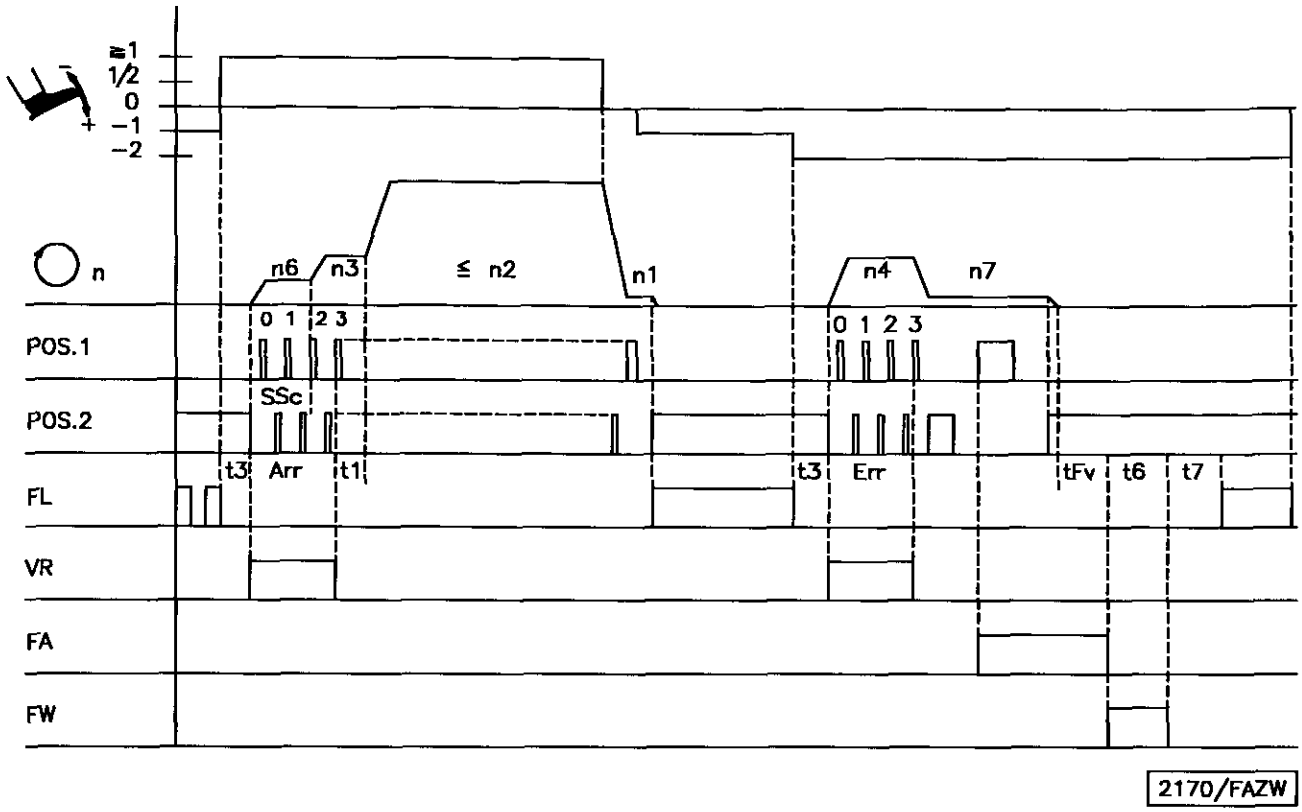
Abbreviation	Function	Parameter	Pushbutton Control	Pushbutton Variocontrol
	Double start backtack with stitch correction on Double end backtack with stitch correction on		Pushbutton S2 Pushbutton S3	Pushbutton 7 Pushbutton 8
n2	Maximum speed	111		
n3	Start backtacking speed	112		
n4	End backtacking speed	113		
n7	Trimming speed	116		
t1	Delay until speed release after start backtack	200		
t3	Start delay from lifted foot	202		
t4	Full power of presser foot lifting	203		
t5	Pulsing of presser foot lifting	204		
t8	Start backtack stitch correction	150		
t9	End backtack stitch correction	151		
t10	Full power of backtacking	212		
t11	Pulsing of backtacking	213		
tFL	Activation delay presser foot without thread wiper	211		
tFv	Switch-off delay of thread trimmer after the standstill	214		
Arv	Start backtack stitches forward	000		
Arr	Start backtack stitches backward	001		
Err	End backtack stitches backward	002		
Erv	End backtack stitches forward	003		

Run with intermediate stop



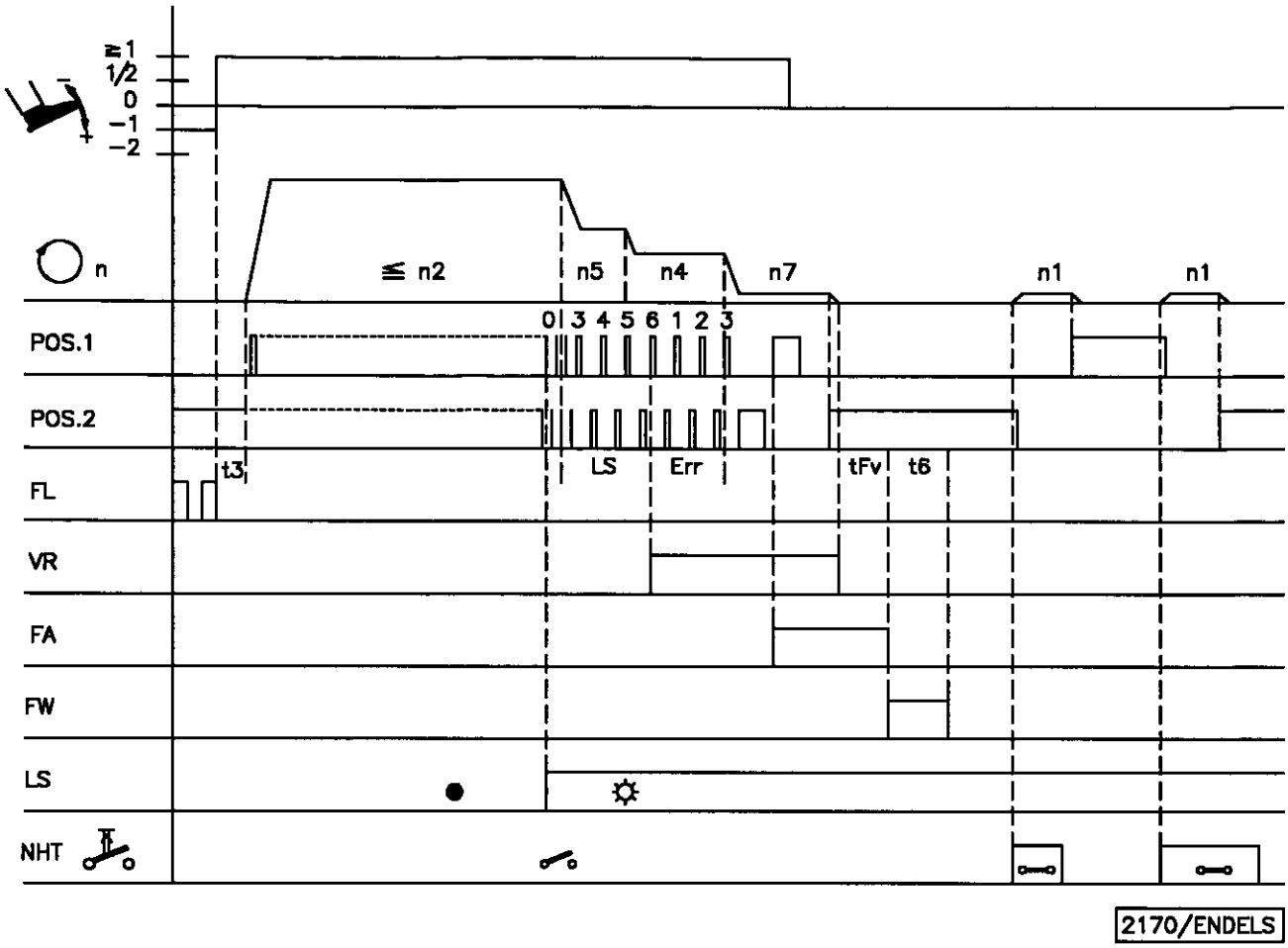
Abbreviation	Function		Parameter	Pushbutton Control	Pushbutton Variocontrol
	Single start backtack	on		Pushbutton S2	Pushbutton 7
	Single end backtack	on		Pushbutton S3	Pushbutton 8
n1	Positioning speed		110		
n2	Maximum speed		111		
n3	Start backtacking speed		112		
n4	End backtacking speed		113		
n7	Trimming speed		116		
t1	Delay until speed release after start backtack		200		
t3	Start delay from lifted foot		202		
t4	Full power of presser foot lifting		203		
t5	Pulsing of presser foot lifting		204		
t6	Activation time thread wiper		205		
t7	Delay of presser foot lifting after thread wiper		206		
tFv	Switch-off delay of thread trimmer after the standstill		214		
Arr	Start backtack stitches backward		001		
Err	End backtack stitches backward		002		

Trimming from intermediate stop



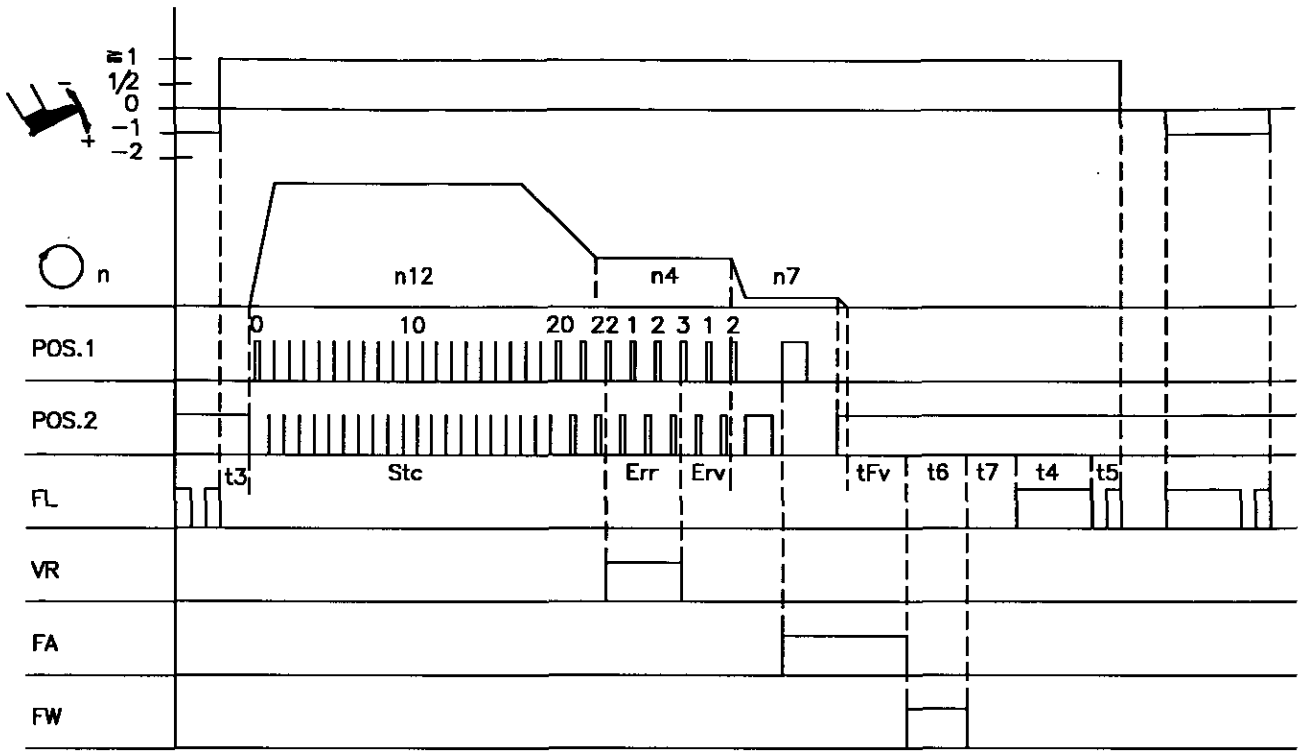
Abbreviation	Function		Parameter	Pushbutton Control	Pushbutton Variocontrol
	Softstart	on	134		
	Single start backtack	on		Pushbutton S2	Pushbutton 7
	Single end backtack	on		Pushbutton S3	Pushbutton 8
n1	Positioning speed		110		
n2	Maximum speed		111		
n3	Start backtacking speed		112		
n4	End backtacking speed		113		
n6	Softstart speed		115		
n7	Trimming speed		116		
t1	Delay until speed release after start backtack		200		
t3	Start delay from lifted foot		202		
t4	Full power of presser foot lifting		203		
t5	Pulsing of presser foot lifting		204		
t6	Activation time thread wiper		205		
t7	Delay end thread wiper until presser foot lifting		206		
tFv	Switch-off delay of thread trimmer after the standstill		214		
SSc	Softstart stitches		100		
Arr	Start backtack stitches backward		001		
Err	End backtack stitches backward		002		

End sensing by light barrier



Abbreviation	Function		Parameter	Pushbutton Control	Pushbutton Variocontrol
	Start backtack	off		Pushbutton S2	Pushbutton 7
	Single end backtack	on		Pushbutton S3	Pushbutton 8
	Light barrier	on	009		Pushbutton 0
	Light barrier covered/uncovered		131		
	Trimming stitch backward		136		
n1	Positioning speed		110		
n2	Maximum speed		111		
n4	End backtacking speed		113		
n5	Speed after light barrier sensing		114		
n7	Trimming speed		116		
t3	Start delay from lifted foot		202		
t6	Activation time thread wiper		205		
tFv	Switch-off delay of thread trimmer after the standstill		214		
LS	Stitches after light barrier sensing		004		
Err	End backtack stitches backward		002		

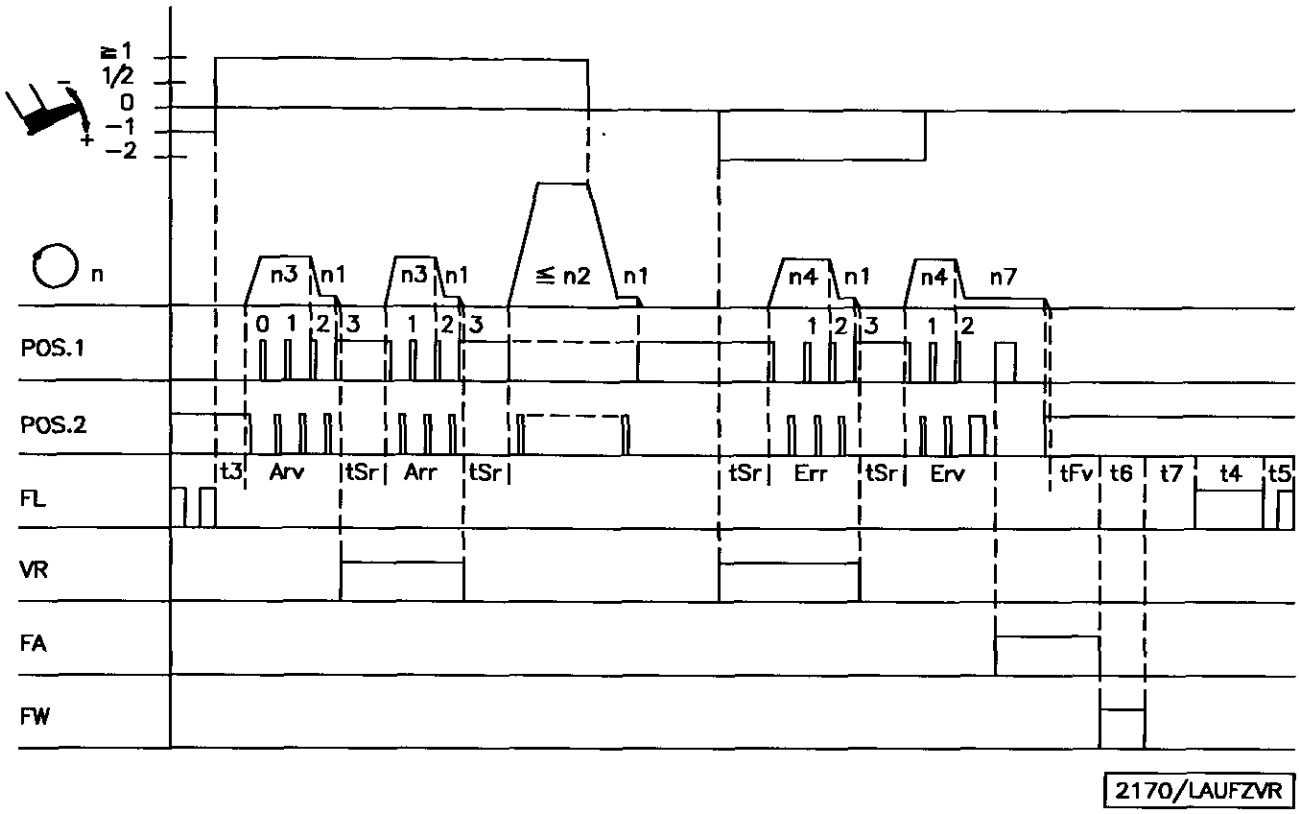
Seam end by stitch counting



2170/ENDEZAE

Abbreviation	Function		Parameter	Pushbutton Control	Pushbutton Variocontrol
	Start backtack	off		Pushbutton S2	Pushbutton 7
	Double end backtack	on		Pushbutton S3	Pushbutton 8
	Stitch counting	on			Pushbutton 1
	Speed mode stitch counting (limited speed)		141 = 2		
n4	End backtacking speed		113		
n7	Trimming speed		116		
n12	Automatic speed for stitch counting		118		
t3	Start delay from lifted foot		202		
t4	Full power of presser foot lifting		203		
t5	Pulsing of presser foot lifting		204		
t6	Activation time thread wiper		205		
t7	Delay end thread wiper until presser foot lifting		206		
tFv	Switch-off delay of thread trimmer after the standstill		214		
Err	End backtack stitches backward		002		
Erv	End backtack stitches forward		003		
Stc	Stitches for seam with stitch counting		007		

Run with ornamental backtack



Abbreviation	Function		Parameter	Pushbutton Control	Pushbutton Variocontrol
	Double start backtack	on		Pushbutton S2	Pushbutton 7
	Double end backtack	on		Pushbutton S3	Pushbutton 8
	Ornamental backtack	on	135		
	Presser foot stored after thread trimmer	on		Pushbutton S4	Pushbutton 6
n1	Positioning speed		110		
n2	Maximum speed		111		
n3	Start backtacking speed		112		
n4	End backtacking speed		113		
n7	Trimming speed		116		
t3	Start delay from lifted foot		202		
t4	Full power of presser foot lifting		203		
t5	Pulsing of presser foot lifting		204		
t6	Activation time thread wiper		205		
t7	Delay end thread wiper until presser foot lifting		206		
tFv	Switch-off delay of thread trimmer after the standstill		214		
tSr	Stop time for ornamental backtack		210		
Arv	Start backtack stitches forward		000		
Arr	Start backtack stitches backward		001		
Err	End backtack stitches backward		002		
Erv	End backtack stitches forward		003		

15. Parameter List

15.1 OPERATOR LEVEL

Parameter		Designation	Unit	max	min	Preset	Ind. Prg. No.
000	Arv	Start backtacking stitches forward		254	0	2	A
001	Arr	Start backtacking stitches backward		254	0	4	A
002	Err	End backtacking stitches backward		254	0	2	A
003	Erv	Final backtacking stitches forward		254	0	2	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 = Ornamental backtack ON/OFF 3 = Sewing start blocked with light barrier uncovered ON/OFF		3	1	1	A
009	LS	Light barrier	ON/OFF			OFF	A
013	FA	Thread trimmer ON/OFF	ON/OFF			ON	A
014	FW	Thread wiper ON/OFF	ON/OFF			ON	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	0	A
Group 1	**Speeds**					
110 n1	Positioning speed	RPM	390 *)	70	150	A
111 n2-	Upper limit setting range n-max	RPM	9900 *)	n2_	4000	A
112 n3	Start backtacking speed	RPM	6500 *)	200	1500	A
113 n4	End backtacking speed	RPM	6500 *)	200	1500	A
114 n5	Speed after light barrier sensing	RPM	6500 *)	200	1200	A
115 n6	Softstart speed	RPM	1500 *)	70	800	A
116 n7	Trimming speed	RPM	500 *)	70	150	A
118 n12	Automatic speed for stitch counting	RPM	6500 *)	400	3000	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

*) When programming the 3-digit and/or 4-digit control parameter values, 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**					
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
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
135	SrS	Ornamental backtack	ON/OFF			OFF	A
136	FAr	Trimming stitch backward	ON/OFF			OFF	A
139	nIS	Display of machine speed	ON/OFF			OFF	A
Group 4		**Switching functions**					
140	Sht	Function of the 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	1	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 4	**Switching functions**					
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
Group 5	**Time functions**					
150 t8	Stitch correction of the double start backtack (prolongation of the operating time of the stitch regulator / not effective with ornamental backtack)	ms	500	0	0	A
151 t9	Stitch correction of the double end backtack (prolongation of the operating time of the stitch regulator / not effective with ornamental backtack)	ms	500	0	0	A
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 Variocontrol:** Pos. 1 to 1A (LED next to pushbutton 1 lights up) Pos. 2 to 2A (LED next to pushbutton 2 lights up)					

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**					
173 Sr4	Checking of the signal outputs and inputs **with** Variocontrol Pushbutton 1 = Backtacking Pushbutton 2 = Presser foot lifting Pushbutton 3 = Thread trimmer Pushbutton 4 = Thread wiper Pushbutton 5 = free Pushbutton 6 = free Pushbutton 7 = free Pushbutton 8 = free Pushbutton 9 = free Pushbutton 0 = free By actuating the switches connected to the control the function of these switches is checked and displayed with "ON/OFF".					A
173	Checking of the signal outputs and inputs **without** Variocontrol 01 = Backtacking 02 = Presser foot lifting 03 = Thread trimmer 04 = Thread wiper 05 = free 06 = free 07 = free 08 = free 09 free 10 = free ON/OFF = By actuating the switches connected to the control the function of these switches is checked and displayed with "ON/OFF".					A
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

TECHNICIAN LEVEL

Code no. 190 with control operation
Code no. 1907 with Variocontrol operation

Parameter	Designation	Unit	max	min	Preset	Ind. Prg. No.
Group 8	**Functions of specific types**					
185 LSP	Blocking of machine run input function 0 = Blocking of machine run active, when switch closed 1 = Blocking of machine run active, when switch open		1	0	0	A
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 Variocontrol operation

Parameter	Designation	Unit	max	min	Preset	Ind. Prg. No.
Group 0	**Time functions**					
200 t1	Delay until speed release after start backtack		500	0	100	A
201 t2	Activation delay of presser foot lifting with half heelback	ms	500	20	80	A
202 t3	Start delay after presser foot lifting	ms	500	0	80	A
203 t4	Time of full power of presser foot lifting	ms	600	0	240	A
204 t5	Holding power for presser 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
205 t6	Thread wiper time	ms	500	0	120	A
206 t7	Delay end of thread wiping until presser foot lifting ON (parameter 190 = 0)	ms	800	40	40	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**					
210 tSr	Stop time for switching the stitch regulator in the ornamental backtack	ms	500	0	80	A
211 tFL	Activation delay of presser foot lifting with thread wiper off	ms	500	0	0	A
212 t10	Time of full power of backtacking	ms	600	0	240	A
213 t11	Holding power for backtacking 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	4	A

SUPPLIER LEVEL

Code no. 311 with control operation
Code no. 3112 with Variocontrol operation

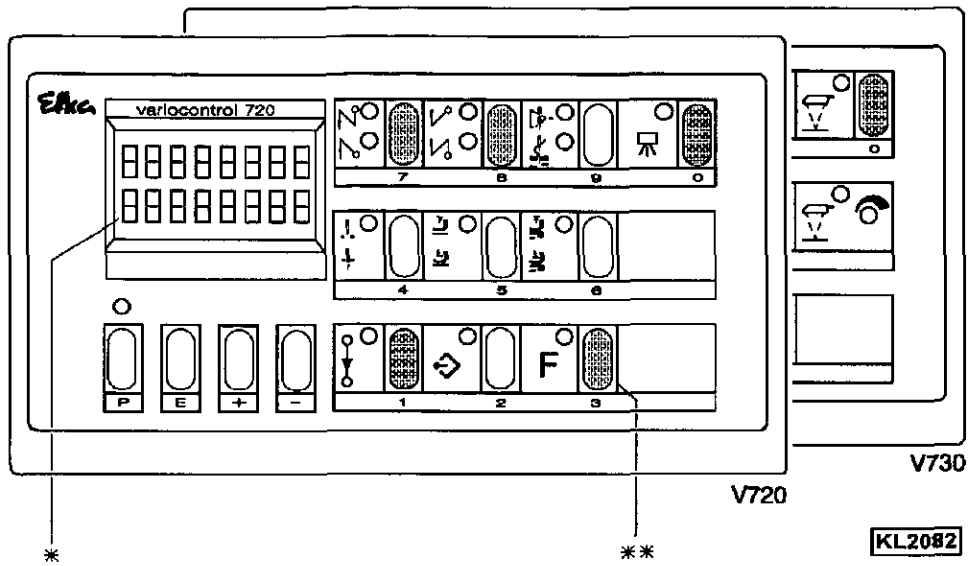
Parameter	Designation	Unit	max	min	Preset	Ind. Prg. No.
Group 1	**Time functions**					
214 tFv	Switch-off delay of thread trimmer after stop of the drive	ms	250	0	50	A
Group 2	**Speeds**					
220 ALF	Accelerating power of the drive		255	1	40	A
221 dGn	Speed gate		990	0	100	A
222 tGn	Speed gate damping period	ms	500	20	120	A
Group 3	**Switching functions**					
231 Sn1	Execution of the first stitch after power ON at positioning speed	ON/OFF			OFF	A
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 = Presser foot lifting with pedal in position 0 (neutral)		12	0	0	A

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

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 backtack SINGLE / DOUBLE / OFF
Pushbutton 8 = End backtack SINGLE / DOUBLE / OFF
Pushbutton 9 = THREAD TRIMMER / THREAD TRIMMER + THREAD WIPER / 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 backtack
Pushbutton 8 = Number of stitches of the selected end backtack
Pushbutton 0 = Number of light barrier compensating stitches

Efka

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