

Efka vario dc

CONTROL

DA82CV3201

INSTRUCTION MANUAL

No. 0402002

english

Efka
FRANKL & KIRCHNER
GMBH & CO KG

Efka
EFKA OF AMERICA INC.

Efka
EFKA ELECTRONIC MOTORS
SINGAPORE PTE. LTD.

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Parameter list - see separate brochure	

1. Safety Instructions

1. Motor, accessories and auxiliary devices can be mounted and put into operation only by an expert after taking note of the instruction manual.
2. Motor, accessories and auxiliary devices must be used only in conformity with their designed function.
3. Operation without corresponding protective devices is forbidden.
4. Motor must be completely mounted before electric connection.
5. Only skilled labour is allowed to work on the electric appliances.
6. Only especially trained staff is allowed to complete repair work.
7. Cables to be wired must be protected against expectable strain and fastened adequately.
8. Cables near moving machine parts (e.g. pulleys) must be wired at a minimum distance of 25 mm. (EN 60204-3-1; DIN VDE 0113)
9. For a safe separation it is preferred to wire the cables separately from each other. (DIN VDE 0160)
10. Connect the sewing light to the mains independently of the motor power supply.
11. Before connecting the mains line make sure that the mains voltage corresponds to the specifications on the control nameplate.
12. Machine and motor must be connected through a potential equalization conductor.
13. Before mounting and adjusting auxiliary devices and accessories, especially position transmitter, reversing device, light barrier, etc., disconnect the motor (disconnect the main switch, pull off mains plug [EN 60204-3-1; DIN VDE 0113]).
14. Electric auxiliary devices and accessories must only be connected to protective low voltage.
15. Disconnect the motor for any repair and maintenance work. (disconnect the main switch, pull off mains plug [EN 60204-3-1; DIN VDE 0113]).
16. The motor resists overvoltage according to overvoltage class 2. (DIN VDE 0160)
17. Working on parts and devices under voltage is forbidden.
- Exceptions are regulated by DIN VDE 0105
18. Observe all safety instructions before undertaking conversions and modifications.
19. For repair and maintenance use only original parts from the manufacturer.
20. Warning indications in the instruction manual point out particular risks of personal injury or risk for the machine and are marked with the symbol below wherever applicable.
Observe and follow these instructions as well as the generally valid safety instructions!



2. Range of Applications

The motor is suitable for sewing machines:

Brand	Series
Dürkopp-Adler	244, 270 chain stitch sewing machines general

2.1 Use in Accordance with Regulations

The motor is not an independently operative machine, but it is designed for being built into other machines. It can only be put into operation after it has been certified that the machine to which it will be attached meets the specifications of the EC Directive (Appendix II, paragraph B of the Directive 89/392/392/EWG and supplement 91/368/EWG).

The motor has been developed and manufactured in accordance with the respective EC standards:

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

The motor can only be operated:

- on thread processing machines
- in dry areas

3. Complete Motor Unit Consisting of

1	Direct current motor	DC....
1	Control	vario dc DA82CV3201
	- Power pack	N152 (optional N153, N155)
	- Speed controller	EB301
1	Control panel Variocontrol	V720, V730 oder V740 *1)
1	Position transmitter	P6-1
1	Mains switch	NS105
1	Set of standard accessories	B131
	consisting of:	belt guard complete set of hardware motor foot bracket 1 and 2, short documentation
1	Pulley	

*1) Light barrier control possible by using:

- V720 - Reflection light barrier module LSM001
- V730 - Reflection light barrier LS-001-006 or reflection light barrier module LSM001
- V740 - Transmitted light barrier Varioply or reflection light barrier module LSM001

3.1 Special Accessories

Storage unit Memory Box MB001	- part no. 7900052
Storage card Memory Card MC001	- part no. 1111602
Reflection light barrier module Variolux LSM001	- part no. 6100028
Reflection light barrier Variolux LS-001-006	- part no. 6100005
Transmitted light barrier Varioply - transmitter DLS-001	- part no. 6100027
- receiver DLL-...	- available versions see specification Varioply
Solenoid type EM1..(for e.g. presser foot lift, backtacking, etc.)	- available versions see specification solenoids
Extension cable for external speed controller, approx. 750 mm long, complete with plug and socket connector	- part no. 1111845
Extension cable for external speed controller, approx. 1500 mm long, complete with plug and socket connector	- part no. 1111787
5-pin plug with slide index for the connection of another external control	- part no. 0501278
Extension cable for commutation transmitter, approx. 315 mm long, complete with plug and socket connector	- part no. 1111229
Extension cable for commutation transmitter, approx. 1100 mm long, complete with plug and socket connector	- part no. 1111584
Extension cable for motor connection, approx. 400 mm long	- part no. 1111858
Extension cable for motor connection, approx. 1500 mm long	- part no. 1111857
Knee switch type KN3 (pushbutton) with cord of approx. 950 mm length without plug	- part no. 58.0013 *1)
Sewing light transformer	- please indicate line voltage and sewing light voltage (6.3V or 12V)
3-pin plug with slide index	- part no. 0500402
6-pin plug with slide index	- part no. 0500703
7-pin plug with slide index	- part no. 0502474
10-pin plug (Hirschmann Mes100)	- part no. 0500357

*1) Available colors on inquiry

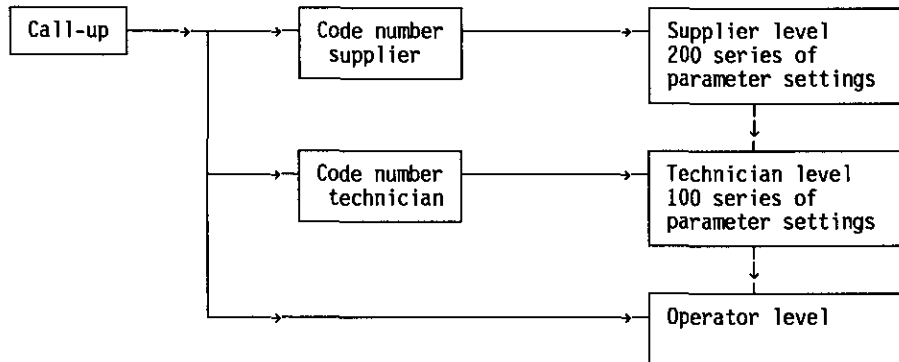
4. Operation

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 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 ==> C-0000
InFo F1
repeat input !

-> If CODE NUMBER correct ==> F-XXX

F-XXX = first parameter number in the recalled level

4.3 Direct Operation

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

Example initial backtack:

- Double initial backtack is on

top LED7 lights up

I

Push button 7 briefly

- Initial backtack is off

both LED7 off

0

Push button 7 briefly

- Single initial backtack is on

bottom LED7 lights up

0
I

4.4 Input by Parameters on the Operator Level

>> ONLY If CODE NUMBER WAS NOT INPUT <<

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

2. -> -> Display of the first parameter ==>
parameter no. does not appear !

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

3. -> -> -> Change parameter value !

4. -> -> PARAMETER VALUE is entered ==>
Display steps to next PARAMETER

OR

-> -> PARAMETER VALUE is entered !

==>

4.5 Input by Parameters on the Technician and Supplier Level

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

-> On with step 3 ! <-
 -> Call-up after termination of a seam !

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 ==> F-XXX
InFo Fl
 repeat input !

-> 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 ==> PROGRAMMING TERMINATED !
 twice

5. Operating the Motor

5.1 General Instructions

When putting the control into operation, the programming is changed in the following manner:

Adjust the sense of rotation of the motor, parameter F-161
 If necessary, adjust the reference position, parameter F-170
 If necessary, adjust the positions, parameter F-171
 If necessary, adjust the speeds, parameters F-110...F-118
 If necessary, adjust the remaining relevant parameters
 Start sewing in order to save the adjusted values
 If the power was turned off the adjustments made before starting to sew get lost.

Attention: If the sense of rotation of the motor is changed the positions must be reprogrammed.

5.2 Initial Operation (New Motor)

The instructions for initial operation are valid under the following conditions only:

- The positions must not have been reprogrammed.
 - The sense of rotation of the motor shaft must be set to "anticlockwise rotation".
- Before mounting the position transmitter the sewing machine shaft is to be set to the reference position.
 Markings on the position transmitter shaft and on the position transmitter housing have to be aligned, then mount the position transmitter on the sewing machine shaft.
 If necessary, adjust the speeds, parameter F-110...F-118.
 If necessary, adjust the remaining relevant parameters.
 Start sewing in order to save the adjusted values.
 If the power was turned off the adjustments made before starting to sew get lost.

6. Aids for Putting into Operation and for Setting

6.1 Fast Installation Routine (SIR)

SIR offers the possibility to set the most important settings for initial operation by using the menu.
For safety reasons, all selections on the menu must be addressed. Only then, correct setting of all parameters is guaranteed!

The normal parameter settings are not affected.

6.1.1 Putting into Operation by Using SIR

Example:

- | | | |
|--|-----|--------------------|
| 1. -> [P] + TURN POWER ON | ==> | C-0000 |
| 2. -> [+] -> Call-up of the possible languages (actual language blinks) | ==> | dEU USA
ESP FrA |
| 3. -> [+] -> Select the desired language | ==> | dEU USA
ESP FrA |
| 4. -> [E] -> Adjust the reference position. Turn position transmitter at least until the marker ([) has disappeared. | ==> | PoSition
0 [|

5. Adjust position 1 (lower needle position, switch-on position of thread trimmer (lock stitch))

-> -> Turn position transmitter to the desired position. ==>

PoSition
1 076

Adjust positions by turning the handwheel until the desired position is reached, but at least until the action has been completed on the display.
or

-> -> -> Set the increments
(2 increments correspond to approx. 1.4 °)

6. Adjust position 2 (switch-off position of the thread trimming solenoid (lock stitch), switch-off position of the thread trimming solenoid (chain stitch))

-> -> Turn position transmitter to the desired position. ==>

PoSition
2 456

or

-> -> -> Set the increments

7. Adjust position 1A

-> -> Turn position transmitter to the desired position. ==>

PoSition
1A 126

or

-> -> -> Set the increments

- 8.

-> -> Adjust the positioning speed ==>

Lo SPEEd
n1 0150

or

-> -> -> Change value

9. -> -> Adjust the maximum speed ==>

hi SPEEd
n2^ 3000

-> -> -> Change value

- 10.-> -> Adjust the sense of rotation ==>

rotAtion
Mot 1

-> -> -> Change value

- 11.-> -> Entry into normal operation after POWER ON. ==>

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6.1.2 Multilingual Display

dEU USA ESP FrA		Language selection			
dEU	USA	ESP	FrA		
PoSition 0]	PoSition 0]	PoSicion 0]	PoSition 0]	Reference position	
PoSition 1 076	PoSition 1 076	PoSicion 1 076	PoSition 1 076	Position 1	
PoSition 2 456	PoSition 2 456	PoSicion 2 456	PoSition 2 456	Position 2	
PoSition 1A 126	PoSition 1A 126	PoSicion 1A 126	PoSition 1A 126	Position 1A	
niEdriG n1 0150	Lo SPEED n1 0150	vEL bAJA n1 0150	vit rAPi 2A 466	Positioning speed	
hoch n2^ 3000	hi SPEED n2^ 3000	vEL ALtA n2^ 3000	vit rAPi n2^ 3000	Maximum speed	
drEhri Mot 1	rotAtion Mot 1	rotAcion Mot 1	rotAtion Mot 1	Sense of rotation	

6.2 Direct Input of Speed (DED)

Maximum speed (upper limit of the function DED)	--> F-111
Lower limit of the function DED	--> F-121

With the help of this function, the maximum speed can be changed easily from the Variocontrol without going into programming mode.

Display in the direct mode:

4300	==> Display of speed n-max
xx82xV	==> Type of control

The maximum speed n-max can be changed directly by pushbuttons +/- on the front of the Variocontrol outside of the sewing cycle. The speed will be indicated on the display. The upper limit of n-max is determined by parameter F-111 in the programming mode. The lower limit is determined by parameter F-121.

As usual, saving the value is done by the next sewing start.

6.3 Pushbuttons for Background Information (HIT)

(see table 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, 3, 7, 8 and 0, when switching on. During this time the respective value can be changed immediately by the pushbuttons + and -. 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.

6.3.1 Examples for HIT

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

If stitch counting (pushbutton 1) was turned off.

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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

3 seconds.

+

Press pushbutton +,
number of stitches increases.

Stc 025

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

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

If stitch counting (pushbutton 1) was turned on.

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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.

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

With the sewing start the new value is saved.

Function key F

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

1. SSt Softstart ON/OFF
2. SrS Ornamental backtack ON/OFF
3. Sht Full stitch ON/OFF
4. LSS Sewing start blocked by light barrier uncovered ON/OFF

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

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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.

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Setting is terminated, 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.

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

If Softstart (pushbutton 3) was 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

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DA82CV

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

With the sewing start the new value is saved.

6.4 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 initial backtack, final backtack, stitch counting, thread trimming and presser foot lifting can be assigned individually to each seam.

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

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

6.4.1 Teach-in Mode

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

Display configuration:

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

Programming:

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

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

Example: seam with stitch counting:

-> ==> Turning on the stitch counting; display of the actual stitches. ==>

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

Example stitch counting and/or light barrier:

-> ==> Turning on the light barrier; display of the actual number of compensating stitches. ==>

Only with V740!

-> ==> Turning on the transmitted light barrier; display of the sensitivity level in the bottom line. ==>

Only with V740!

-> ==> Select the desired sensitivity level. ==>

With V720/V730/V740!

-> -> Modification of the number of light barrier compensating stitches

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

After programming of the function ==>

-> ==> Enter the seam. Display of the next seam. ==>

-> The seam is entered by pressing the pushbutton E or by heeling the pedal back.

-> ==> Exit of programming! Display of the first seam section to be executed in the selected pattern. ==>

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 terminated by pushbutton P, otherwise it gets lost.

Attention!
The patterns are permanently saved only after the sewing start

Detailed Example:

A seam 1 with stitch counting and initial backtack, a seam 2 with stitch counting and a seam 3 with light barrier seam and final backtack are to be programmed under the pattern number 4.

	Display before programming	==>	<div style="border: 1px solid black; padding: 2px; display: inline-block;">xxxx XY82ZV</div>
1.	-> <div style="border: 1px solid black; padding: 2px; display: inline-block;">P</div> ==> LED pushbutton P blinks	==>	<div style="border: 1px solid black; width: 60px; height: 20px;"></div>
2.	-> <div style="border: 1px solid black; padding: 2px; display: inline-block;">E</div> ==> Display of a parameter on the operator level	==>	<div style="border: 1px solid black; padding: 2px; display: inline-block;">aaa bbb</div>
3.	-> <div style="border: 1px solid black; padding: 2px; display: inline-block;">2</div> ==> LED pushbutton 2 blinks ==> Pattern 1, seam 1	==>	<div style="border: 1px solid black; padding: 2px; display: inline-block;">1 01 ---</div>
4.	-> <div style="border: 1px solid black; padding: 2px; display: inline-block;">2</div> ==> LED pushbutton 2 blinks ==> Pattern 2, seam 1	==>	<div style="border: 1px solid black; padding: 2px; display: inline-block;">2 01 ---</div>
5.	-> <div style="border: 1px solid black; padding: 2px; display: inline-block;">2</div> ==> LED pushbutton 2 blinks ==> Pattern 3, seam 1	==>	<div style="border: 1px solid black; padding: 2px; display: inline-block;">3 01 ---</div>
6.	-> <div style="border: 1px solid black; padding: 2px; display: inline-block;">2</div> ==> LED pushbutton 2 blinks ==> Pattern 4, seam 1	==>	<div style="border: 1px solid black; padding: 2px; display: inline-block;">4 01 ---</div>
7.	-> <div style="border: 1px solid black; padding: 2px; display: inline-block;">7</div> ==> LED bottom pushbutton 7 lights up ==> Single initial backtack is on	==>	<div style="border: 1px solid black; padding: 2px; display: inline-block;">4 01 ---</div>
8.	-> <div style="border: 1px solid black; padding: 2px; display: inline-block;">6</div> ==> LED pushbutton 6 lights up ==> Foot lifting at the seam end is on	==>	<div style="border: 1px solid black; padding: 2px; display: inline-block;">4 01 ---</div>
9.	-> <div style="border: 1px solid black; padding: 2px; display: inline-block;">1</div> ==> Stitch counting is on	==>	<div style="border: 1px solid black; padding: 2px; display: inline-block;">4 01 000</div>
10.	-> <div style="border: 1px solid black; padding: 2px; display: inline-block;">+</div> -> <div style="border: 1px solid black; padding: 2px; display: inline-block;">-</div> Changing the number of stitches by pushbuttons or by using the pedal ==> Seam length of 17 stitches is adjusted		<div style="border: 1px solid black; padding: 2px; display: inline-block;">4 01 017</div>
11.	-> <div style="border: 1px solid black; padding: 2px; display: inline-block;">E</div> ==> Pattern 4, seam 2	==>	<div style="border: 1px solid black; padding: 2px; display: inline-block;">4 02 ---</div>
12.	-> <div style="border: 1px solid black; padding: 2px; display: inline-block;">1</div> ==> Stitch counting is on	==>	<div style="border: 1px solid black; padding: 2px; display: inline-block;">4 02 000</div>
13.	-> <div style="border: 1px solid black; padding: 2px; display: inline-block;">+</div> -> <div style="border: 1px solid black; padding: 2px; display: inline-block;">-</div> Changing the number of stitches by pushbuttons or by using the pedal ==> Seam with 8 stitches is adjusted		<div style="border: 1px solid black; padding: 2px; display: inline-block;">4 02 008</div>

14. ->	<input type="button" value="E"/>	==> Pattern 4, seam 3 Free seam is selected	==>	<input type="text" value="4 03 ---"/>	
15. ->	<input type="button" value="0"/>	==> Light barrier is activated	==>	<input type="text" value="4 03 ---"/> LS 000	
16. ->	<input type="button" value="+"/>	->	<input type="button" value="-"/>	Changing the stitches by pushbuttons 5 compensating stitches are adjusted	<input type="text" value="4 03 ---"/> LS 005
17. ->	<input type="button" value="8"/>	==> LED top pushbutton 8 lights up Single final backtack is on	==>	<input type="text" value="4 03 ---"/> LS 005	
18. ->	<input type="button" value="9"/>	==> LED bottom pushbutton 9 lights up Thread trimmer is on	==>	<input type="text" value="4 03 ---"/> LS 005	
19. ->	<input type="button" value="E"/>	==> Pattern 4, seam 4 By changing to the next seam the settings of the preceding seams are automatically entered.	==>	<input type="text" value="4 04 ---"/>	
20. ->	<input type="button" value="P"/>	==> Programming terminated, first seam can be executed	==>	<input type="text" value="4 01 017"/>	

6.4.2 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 terminated 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 input seams

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

-> ==> 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

-> ==> 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.

6.4.3 Execution (Pattern) Mode

1. Switch on mode by pushbutton 2
(LED lights up)

-> 2

==> X 01 ZZZ

2. Select pattern 1...8
- Seam number 01 is displayed

-> + -> -

==> X 01 030

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

-> E

==> 2 05 ZZZ

■ The pattern can now be started by pushing the pedal.

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

-> 2

7. Functions and Settings

7.1 First Stitch after Power On

Functions	Abbreviation on the display	Parameter
1 stitch in npos after POWER ON	Sn1	F-231
Positioning speed	n1	F-110

At the first start after power on, the motor runs at positioning speed (n1) for one rotation from pos. 1 to pos. 1, independent from the pedal position and set initial backtacking speed if parameter Sn1 is on.

7.2 Machine Select

Functions	Abbreviation on the display	Parameter
Display machine select	SEL	F-280
Trimming speed	n7	F-116
Number of final backtacking stitches backward	Err	F-002
Number of final backtacking stitches forward	Erv	F-003

Depending on whether the jumper for machine select is on socket connector B3 or not, certain basic settings (e.g. trimming speed and number of final backtacking stitches) are set, when switching on for the first time.

Without jumper: --> SEL=1, n7=150, Err=2, Erv=0
 With jumper: --> SEL=2, n7=200, Err=3, Erv=2

7.3 Program Identification

Functions	Abbreviation on the display	Parameter
Display program no. and date		F-179

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

Display example parameter 179:

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

7.4 Function Key (Pushbutton 3)

Functions	Abbreviation on the display	Parameter
Determine function for pushbutton 3	-F-	F-008

By the function key (pushbutton 3) a preprogrammed function can be switched on or off directly.

Programmable functions:

- F-008 = 1 - Softstart on/off
- F-008 = 2 - Ornamental backtack on/off
- F-008 = 3 - Full stitch with pushbutton for needle up/down on/off
- F-008 = 4 - Sewing start blocked with light barrier uncovered on/off

7.5 Display Actual Speed

Functions	Abbreviation on the d	Parameter
isplay		
Display actual speed	nIS	F-139

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

During machine run:

- the actual speed

Example: 2350 rotations per minute

2350

At machine standstill:

- the adjusted maximum speed and the type of control

Example: 3300 rotations per minute and control type XY82ZV

3300
XY82ZV

At stop in the seam:

- the stop indication

Example:

StoP

7.6 Sense of Rotation of the Motor

Functions	Abbreviation on the display	Parameter
Sense of rotation of the motor	Mot	F-161

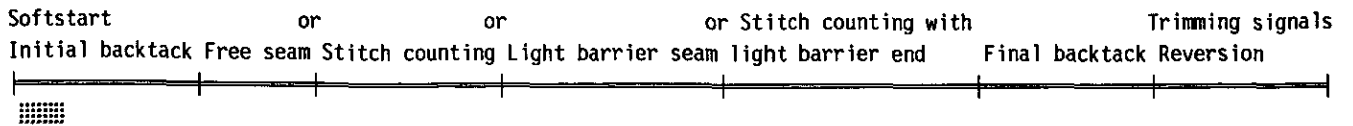
Look at the motor shaft: F-161 = 0 - clockwise rotation
 F-161 = 1 - anticlockwise rotation



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 sense of rotation.

7.7 Softstart



Functions	Abbreviation on the Display	Parameter
Sofstart number of stitches	SSc	F-100
Softstart speed	n6	F-115
Softstart on/off	SSt	F-134

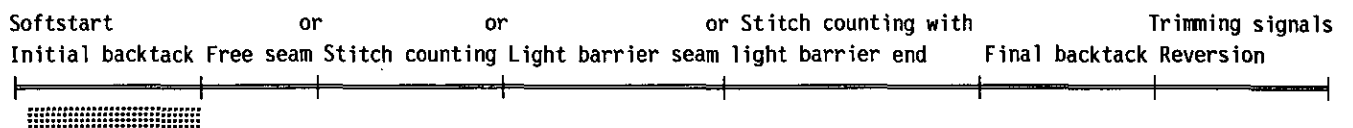
Function:

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

Direct access by function key (pushbutton 3)

Functions	Abbreviation on the display	Parameter
Softstart on/off	-F-	F-008 = 4

7.8 Initial Backtack



Functions	Abbreviation on the display	Parameter
Single/double off		Pushbutton-7
Number of stitches forward	Arv	F-000
Number of stitches backward	Arr	F-001
Speed n3	n3	F-112
Run-out time	t1	F-200
Start delay from lifted foot	F-202	
Stitch correction time	t8	F-150

The initial backtack starts by pushing the pedal forward at the beginning of the seam. The backtack is delayed by the time t_3 from lifted foot (starting delay from lifted foot).

The backtack is executed automatically at initial backtacking speed. It cannot be interrupted. With softstart running parallel, the respective lower speed predominates.

The counting as well as the switching of the stitch regulator is synchronized to position 1.

After the execution of the backward seam, the backtacking signal, and, after a delay time t_1 , the initial backtacking speed, will be turned off. Then pedal control is returned.

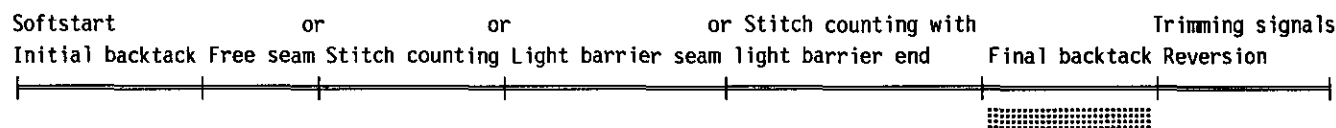
7.8.1 Double Initial Backtack

The forward section will be sewn for an adjustable number of stitches. Then, the signal for the stitch regulator will be emitted, and the backward section will be executed. For both sections the number of stitches is separately adjustable. With slow backtack mechanisms, for the double initial backtack, the stitch regulator can be delayed with a time-lag of t_8 (initial backtack stitch correction), which prolongs the backward section.

7.8.2 Single initial Backtack

The backtacking signal will be emitted for an adjustable number of stitches, and the backward section will be sewn.

7.9 Final Backtack



Functions	Abbreviation on the display	Parameter
Single/double/off		Pushbutton 8
Number of stitches backward	Err	F-002
Number of stitches forward	Erv	F-003
Final backtacking speed	n4	F-113
Last stitch backward on/off	FAr	F-136
Stitch correction time	t9	F-151
Start delay from lifted foot	t3	F-202

The final backtack starts either by heeling the pedal back, with 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 turned on immediately. From lifted foot, the switch-on point is delayed by the time t_3 (start delay from lifted foot). The first leading position 1 is counted as 0 stitch, whenever the function is started outside of position 1. The counting and the turning off of the stitch regulator is synchronized to position 1.

From full machine run, the signal will be turned on only after reaching the final backtacking speed and the synchronization to position 2. The final backtack will be performed automatically. An interruption is not possible.

7.9.1 Double Final Backtack

The backward section will be sewn for a number of stitches. Then, the stitch regulator will be turned off, and the forward section will be executed. For both sections the number of stitches is separately adjustable.

After the execution of the forward section, the trimming function will be initiated. During the entire operation the sewing speed is reduced to final backtacking speed, with the exception of the last stitch, which will be executed at positioning speed n1.

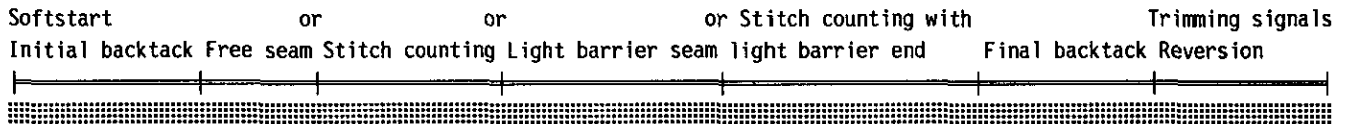
With slow backtack mechanisms, for the double final backtack, the stitch regulator can be delayed with a time lag of t9 (final backtack stitch correction).

7.9.2 Single Final Backtack

The single final backtack will be executed at final backtacking speed. During the last stitch the speed is reduced to positioning speed. Depending on parameter F-136 (Far) the stitch regulator remains on or is turned off.

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

7.10 Intermediate Backtack



The backtack solenoid can be switched on anywhere in the seam by the external pushbutton.

Attention: The external switch has a double function

- During machine run intermediate backtack
 - At machine standstill needle up/down
- Firing of the backtack solenoid at machine standstill is not possible.

Function off: F-140 = 4

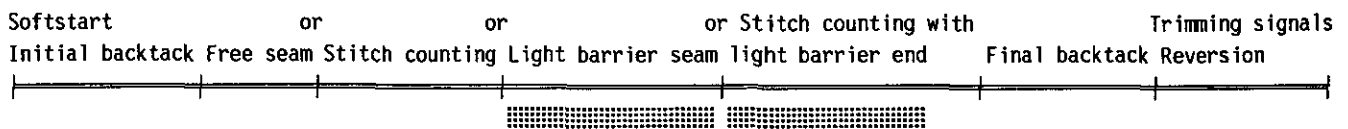
When pressing the pushbutton at stop there will be no change of position.

The function manual backtacking activated by this pushbutton during machine run is not affected.

Functions	Abbreviation on the display	Parameter
Single stitch on/off	-F-	F-008 = 3

Attention: For safety reasons this direct access is only possible when parameter F-140 is set at 2 or 3.

7.17 Light Barrier



7.17.1 General Light Barrier Functions (V720, V730, V740)

Functions	Abbreviation on the display	Parameter
Light barrier compensating stitches	LS	F-004
Number of light barrier seams	LSn	F-006
Speed after light barrier sensing	n5	F-114
Light barrier sensing uncovered	LSd	F-131
Sewing start blocked with light barrier uncovered	LSS	F-132
Light barrier seam end with thread trimming	LSE	F-133

- After sensing the seam end, counting of the compensating stitches at light barrier speed is performed.
- Stop of the motor with pedal in position -0 is possible.
- Disabling of the thread trimming operation by parameter F-133, independent of pushbutton 9 on the Variocontrol. Stop in the basic position.
- Programming of up to 15 light barrier seams with stop in the basic position. After the last light barrier seam, a thread trimming operation will be performed.
- Light barrier sensing end (uncovered) or beginning of fabric (covered), can be selected by parameter F-131.
- Blocking of machine start, when light barrier is uncovered, programmable with parameter F-132.

7.17.2 Reflection Light Barrier (V720, V730)

Functions	Abbreviation on the display	Parameter
Light barrier on/off Sensitivity adjustment when using LS001		Pushbutton 0 Potentiometer on the V730
Mechanical adjustment of the light barrier LS001	SR5	F-174

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:

- LS001 - Addressing of parameter F-174 to indicate optimal mechanical adjustment by bargraph display.
 - By orienting the light barrier over the reflection area the highest possible bargraph level must be reached, then fix light barrier in this position.
- LSM001- The orientation is facilitated through a visible light spot on the reflection area.

7.17.3 Transmitted Light Barrier (V740)

Functions	Abbreviation on the display	Parameter
Light barrier on/off Switch between fabric ply/end sensing Select sensitivity levels Sensitivity adjustment		Pushbutton 0 Pushbutton 0 Pushbutton L Pushbuttons + and -
Sensitivity adjustment Mechanical adjustment	LSI SR5	F-009 F-174

Sensitivity adjustment:

- 8 levels with parameter F-009 and pushbutton "L" programmable.
- Each level from 0-255 adjustable with pushbuttons +/-.
- Bargraph and valency indication on the display.

Select the sensitivity level:

- Level 1 - 7, when sewing with fabric ply sensing. Select by pushbutton "L" possible before each seam.
- Level 8, when sewing with seam end sensing. Automatic selection by the control.

- » L ==> When pressing pushbutton "L" once, the adjusted sensitivity level and the adjusted sensitivity will be indicated. Select the next sensitivity level with each actuation of the pushbutton.
- » + » - The sensitivity can then be changed immediately. If there is no more change of values the display changes back to the initial status. Sewing is possible again

Attention: Sensitivity level 8 can only be adjusted on the technician or supplier level.

Mechanical adjustment of the light barrier sensor

- Address parameter F-174 to indicate optimal mechanical adjustment by bargraph display.
- The transmitted light barrier sender is to be oriented such that the highest possible bargraph level is reached.
- When the upper and/or lower limit of the bargraph is exceeded, the sensitivity is adjusted automatically by pressing the pushbutton "L" such that the bar is in central position. The above adjustment can then be continued.

7.17.4 Automatic Start by Light Barrier (V730, V740)

Functions	Abbreviation on the display	Parameter
Delay of automatic start	ASd	F-128
Automatic start on/off	ALS	F-129
Sewing start blocked with light barrier uncovered	LSS	F-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:

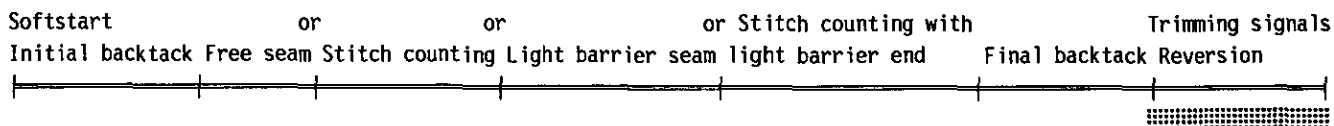
- Parameter F-132 = on (no sewing start, when light barrier uncovered).
- Parameter F-129 = on (Automatic start on).
- Light barrier switched on at the Variocontrol (pushbutton 0).
- The pedal must remain pushed forward at the seam end.

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 pedal forward.

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

- The thread trimmer can be switched on or off separately or with the thread wiper by pushbutton 9.
- If parameter F-136 is on, the backtack solenoid for the single final backtack remains connected until machine standstill.
- The thread trimmer will be switched on with position 1 and switched off with position 1A.
- Trimming speed is n7.
- Then the thread wiper will be switched on for the time t7.
- Presser foot lifting after switching off the thread wiper can be delayed by the time t7.
- The stop position after trimming is position 2.

7.20 Thread Trimmer, Thread Catcher - Chain Stitch Mode



Functions	Abbreviation on the display	Parameter
Thread trimmer on/off		Pushbutton 9
Thread trimmer and thread catcher on/off		Pushbutton 9
Trimming speed	n7	F-116
Last stitch backward	FAr	F-136
Chain stitch/lock stitch trimmer	KEt	F-185
Operating time of the thread trimmer	KFA	F-186
Operating time of the thread catcher	KFw	F-187
Activation delay of the thread catcher	dFw	F-188
Delay after thread wiping until presser foot lifting	t7	F-206

- The thread trimmer can be switched on or off separately or with the thread wiper by pushbutton 9.
- If parameter F-136 is on, the backtack solenoid for the single final backtack remains connected until machine standstill.
- The thread trimmer will be switched on for the time KFA, when reaching the stop position 2.
- The thread catcher will be switched on for the time KFw after its activation delay.
- Presser foot lifting after switching off the thread catcher can be delayed by the time t7.

7.21 Presser Foot Lifting

Functions	Abbreviation on the display	Parameter
Automatic in the seam Automatic after trimming		Pushbutton 5 Pushbutton 6
Activation delay when pedal is in position -1, half heelback	t2	F-201
Start delay from lifted foot	t3	F-202
Time of full power	t4	F-203
Operating time stage with chopping	t5	F-204
Delay after thread wiping until presser foot lifting	t7	F-206
Delay after thread trimming without thread wiping until presser foot lifting	tFL	F-211

Presser foot is lifted:

- in the seam
- after trimming
- by heeling the pedal back (position -1) or automatically (pushbutton 5)
- by heeling the pedal back (position -1 or -2) or automatically (pushbutton 6)
- 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 (F-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 F-203, the holding power at partial power by F-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 tabel below.

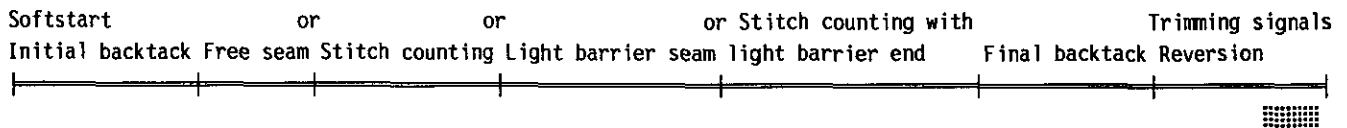
Stage	Operating time	Effect
1	12.5 %	low holding power
2	25 %	
3	37.5 %	
4	50 %	
5	62.5 %	
6	75 %	
7	87.5 %	high holding power
0	100 %	full power

Foot lowers:

- from manual foot lifting, when pedal is in position 0 (neutral) (position ≥ 0)
- from automatic foot lifting, when pedal heeled forward (position > 0)

The start is delayed until the foot has securely lowered.
 - delay time adjustable F-202

7.22 Reversion



Functions	Abbreviation on the display	Parameter
Reversion on/off		Pushbutton 9
Positioning speed	n1	F-110
Number of reversion increments	InP	F-183
Activation delay of reversion	drd	F-181
Reversion on/off	Frd	F-182

The function "reversion" is performed after trimming.
 When the stop position is reached, the motor stops for the time of the activation delay of reversion (F-182).
 Then it reverses at positioning speed for an adjustable number of increments.
 1 increment corresponds to approx. 0.7°.

7.23 Flip-Flop Functions (FF)

Functions	Abbreviation on the display	Parameter
Limited speed for flip-flop function	n9	F-183
Flip-flop mode	FFF	F-190
Number of stiches until FF1 off (mode 5)	cF1	F-191
Number of stiches until FF1 on (mode 6)	cF2	F-192
Number of stiches until FF1 off (mode 6)	cF3	F-193
FF1 off after thread trimming (mode 6)	FFE	F-194

Depending on the mode selected by F-190 various operations are triggered by an external pushbutton.
 Output FF1, display LED FF1, seam execution, backtacking and speed limitation etc. are affected.

Flip-Flop-Mode 1

After POWER ON the output FF1 is switched on. The display LED FF1 remains off.
 By pressing the external pushbutton FF1 the output FF1 is switched off and the LED FF1 is switched on. Speed limitation (n9) is activated, initial and final backtack are suppressed.
 By pressing the pushbutton again or after trimming the machine returns to the same setting following POWER ON.

Flip-Flop-Mode 2

After POWER ON the output FF1 and the LED FF1 are switched off.

By pressing the external pushbutton FF1 the output FF1 and the LED FF1 can be switched on.

If FF1 is on the intermediate backtack will be suppressed. During the initial and final backtack the output FF1 is deactivated. The LED FF1 remains on.

With the exception of the double initial backtack a stop occurs, when switching the backtacking or the ornamental backtack on.

The output and the LED FF1 will be switched off by pressing the pushbutton Ff1 again or at the seam end.

Flip-Flop-Mode 3

The function FF1 is used here as a machine run signal.

At machine standstill the output and the LED FF1 can be switched on by the external pushbutton FF1.

During the final backtack the output will be switched off.

Flip-Flop-Mode 4

When pressing the external pushbutton FF1 at stop, there will be a change of position. The output FF1 will be switched on and the LED FF1 will be switched off.

If the external pushbutton is pressed during machine run the partial stitch signal (output FF1) will be switched on and the LED FF1 lights up.

After trimming or by pressing the pushbutton again the output and the LED will be switched off.

If the machine stops, when the pushbutton is pressed, there will be a change of position with output FF1 switched on.

Renewed sewing with the pushbutton pressed switches the output and the LED FF1 on.

In this mode, the light barrier function causes the motor to stop in the selected basic position after the execution of the compensating stitches.

The seam end can only be initiated by heeling the pedal back (-2).

Flip-Flop-Mode 5

Puller activation by output FF1:

After POWER ON the output FF1 (puller up) and the LED FF1 are switched on.

When pressing the pushbutton, the output FF1 and the LED FF1 will be switched off (lower puller).

When pressing the pushbutton again, the output and the LED FF1 will be switched on again (lift puller).

After the initial backtack the puller lowers after an adjustable number of stitches (output and LED FF1 off), unless it has already been switched off.

At the beginning of the final backtack or of thread trimming the puller is always lifted (signal FF1 and LED FF1 are switched on).

If the puller is lowered and the presser foot is lifted the puller is also immediately lifted. After lowering of the presser foot the puller is lowered after an adjustable number of stitches (cF1).

If an intermediate backtack is activated with lowered puller the puller is immediately lifted. After the execution of the backtack the puller is immediately lowered. If the puller is lifted when activating the intermediate backtack it remains lifted after the execution of the backtack.

Flip-Flop-Mode 6

Edge trimmer, center cutter activation by output FF1:

If parameter FFE is on then after thread trimming the output FF1 and the LED FF1 are switched off during manual or automatic operation.

Manual operation:

Manual operation is programmed by setting the number of stitches of the parameters cF2 and cF3 = 0 stitches.

After POWER ON the output and the LED Ff1 are switched off.

By the external pushbutton FF1 the output and the LED FF1 can be switched on and off anywhere in the seam.

Automatic operation:

Automatic operation is programmed by setting the number of stitches of at least one of the parameters cF2 and cF3 $cF3 \geq 0$ stitches.

The external pushbutton FF1 is always effective.

The cF2 counting begins with the sewing start.

Parameter cF2 > 0 and cF3 = 0

After the stitch counting (cF2) the output and the LED FF1 will be switched on, unless they had already been switched on by pushbutton FF1. By the pushbutton they can be switched off.

Parameter cF2 > 0 and cF3 > 0

After the stitch counting (cF2) the output and the LED FF1 will be switched on and will be switched off after the stitch counting (cF3).

The pushbutton FF1 is always effective.

7.24 Signal Output - POS1

- Transistor output with open collector
- Switches whenever the needle is in the slot between position 1 and 1A
- Independent of sewing, thus also when turning the handwheel manually
- Suitable e.g. for the connection of a counter

7.25 External Speed Controller

With the help of the external speed controller connected with the pedal the commands for the sewing operation are inputted.

Instead of the external speed controller connected to the socket connector B80 (table 2) another external controller can be connected.

Table: Coding of the pedal stages

Speed stage	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)
$\frac{1}{2}$	H	H	L	H	Pedal slightly forward (e.g. presser foot lowering)
1	H	L	L	H	Speed stage 1 (n_{pos})
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 (n_{max}) (Pedal fully forward)

Functions	Abbreviation on the display	Parameter
Speed stage distribution	nSt	F-119

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

- Possible characteristic curves:**
- linear
 - progressive
 - highly progressive

8. Machine Functions

8.1 Braking Behavior

Functions	Abbreviation on the display	Parameter
Speed reduction < 400 min ⁻¹	br1	F-207
Speed reduction > 400 min ⁻¹	br2	F-208

The braking effect of the motor can be adjusted.
 The following applies to all adjustment values:
 The higher the value the more aggressive the braking reaction!

8.2 Braking Power at Standstill

Functions	Abbreviation on the display	Parameter
Braking power at standstill	brt	F-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 trimming
- The effect is adjustable
- The higher the adjusted value, the higher the braking power
- It does not work after power on, unless sewing has not been started

8.3 Start Behavior

Functions	Abbreviation on the display	Parameter
Starting edge	ALF	F-220

The motor accelerating dynamics can be adapted to the characteristic of the sewing machine (light, heavy).
 - High adjustment value = high acceleration

With a high starting edge adjustment value 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 adjustments.

Incorrect adjustment can cause the motor to lock or not to reach the set speed. In this case, the motor stops and the display shows an error message.

INFO E3

8.4 Adjustment of the Positions

Functions	Abbreviation on the display	Parameter
Adjustment of the reference position (position 0) (neutral)	F-170	
Adjustment of the signal and stop positions	SR2	F-171
Display of the signal and stop positions	SR3	F-172

8.4.1 Reference Position

The angular positions necessary on the machine, e.g. for needle down position or thread lever up position are stored in the control as numerical or angular values.

In order to establish a relationship between the electric position transmitter information and actual mechanical position a reference position is needed.

POSITION 0

The reference position must be adjusted:

- for initial operation
- after changing the position transmitter
- after changing the EPROM or the microprocessor

Correct adjustment of the reference position:

- Needle point at the same level of the needle plate
- Bottom dead center of the needle bar

Programming:

- 1.) Address F-170. ==> LED pushbutton-3 blinks
- 2.) Press pushbutton 3 briefly ==>

PoSiTion
0]
- 3.) Turn handwheel until desired refernce position is reached
 Note: Turn at least until marker (]) has disappeared
- 4.) Press pushbutton E ==> Position 0 (neutral) is read by the control

If the reference position was not stored there will be an error message on the display:

INFO A3

- Repeat operation from step 3 onwards

8.4.2 Signal and Stop Positions

Functions	Display
Position 1 (lower needle position, switch-on position for thread trimmer (lock stitch))	Pos1
Position 2 (upper needle position, switch-off position of thread trimming solenoid (lock stitch), switch-on position of thread trimming solenoid (chain stitch))	Pos2
Position 1A	Pos1A
Position 2A	Pos2A
Position 3	Pos3
Position 3A	Pos3A

Programming:

1. Address F-171 ==> LED pushbutton 3 blinks!
2. Press pushbutton 3
Adjust position 1 ==>

Position 1 xxx

 Value xxx can be modified by pushbutton +/- or by turning the handwheel!
4. Press pushbutton E
Adjust position 2 ==>

Position 2 xxx

3. Press pushbutton E
Adjust position 1A ==>

Position 1A xxx

5. Press pushbutton E
Adjust position 2A ==>

Position 2A xxx

6. Press pushbutton E
Position does not have to be adjusted ! ==>

Position 3 000

7. Press pushbutton E
Position does not have to be adjusted ! ==>

Position 3A 000

8. Press pushbutton E ==> Back to step 2!
9. Press pushbutton P ==> Positions will be read by the control

Note: When adjusting the positions by the handwheel, make sure that the numerical value indicated on the display changes.

The adjustment values are programmed in the factory. After adjusting the reference position the machine is ready for use. The adjustments only need to be changed on non-standard machines and/or for fine tuning.

The display unit of the adjusted positions is increments.

One rotation of the handwheel corresponds to 512 increments.

The change on the display is shown in increments of 2.

A change from one to the next value thus corresponds to approx. 1.4 angular degrees.

8.4.3 Display of the Signal and Stop Positions

The adjustment of the positions can easily be tested by parameter F-172.

- Address parameter F-172
- Turn handwheel corresponding to the sense of rotation of the motor
 - LED Taste-1 on - corresponds to position 1
 - LED Taste-1 turns off - corresponds to position 1A
 - LED Taste-2 on - corresponds to position 2
 - LED Taste-2 turns off - corresponds to position 2A

Position 3, 3A and the reference position are not displayed.

8.5 Memory Box

Functions	Abbreviation on the display	Parameter
Language selection		F-178
Memory Box operation on/off	FMb	F-197
Memory Card formatting on/off	Foc	F-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 can be stored, each with the total program contents of the control (see chapter Programming Seams - Teach-in)

8.5.1 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 by parameter F-197

8.5.2 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 F-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.

8.5.3 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

Remark: All adjustable parameters and sewing data are stored with the exception of the sense of rotation and the needle positions.

- Push pedal twice in short intervals, after end of seam, and put back to position 0 (neutral) SAvE
0--9
- Input any address between 0 and 9 for the data record.
 - The yellow BUSY-LED on the Memory Box lights up.
 - In case a data record already exists under the selected reference number, it will be overwritten. SAvE
|||||
- Display after the storing is terminated 3000
DA82CV

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

Possibility no. 1:

- Push pedal forward (stage 12), then turn power on rEAd
0--9
- Input address under which the desired data record is stored.

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

Possibility no. 2:

- Push pedal twice in short intervals, after end of seam. 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. 3000
DA82CV

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

5. » Operation without Variocontrol

- Writing and reading is done by pushing the pedal as described in step 3 and 4.
- Program 1 is always automatically selected.
- Reading-in is only possible if power is turned on with pedal fully forward.
- Alternating between writing and reading:
 - Pedal backward twice in short intervals = writing
 - Pedal fully forward and POWER ON = reading

6. » Exit

- **Interruption:**
 - Press one of the green pushbuttons (P 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!

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

```

dEU  USA
ESP  FrA
  
```

9. Error Messages

General Information

Display	Signification
Info A1	Pedal not in neutral position, when switching the machine on
Info A2	Blocking of machine run (safety switch)
Info A3	The reference position (position 0) has not been stored
Info A4	Control panel not clearly selected
Info A5	Emergency run, identification of a non-valid machine select

Programming of Functions and Values (Parameters)

Display	Signification
Info F1	Wrong code number or parameter number input
Info F2	Input not activated because function not active
Info F3	Access level according to code number always open (stored after sewing start)

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 E3	Machine locks, or does not reach the desired speed
Info E4	Control disturbed by deficient grounding or loose contact

Hardware Disturbance

Display	Signification
Info H1	Commutation transmitter cord or frequency converter disturbed
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

10. Signal Test

Functions	Abbreviation on the display	Parameter
Test of inputs and outputs	SR4	F-173

Outputs:

- Function test of the transistor power outputs and actuators connected to them (e.g. solenoids and solenoid valves)
- Test is initiated by pressing pushbuttons 0..9 on the Variocontrol

Table: Assignment of the pushbuttons to the outputs

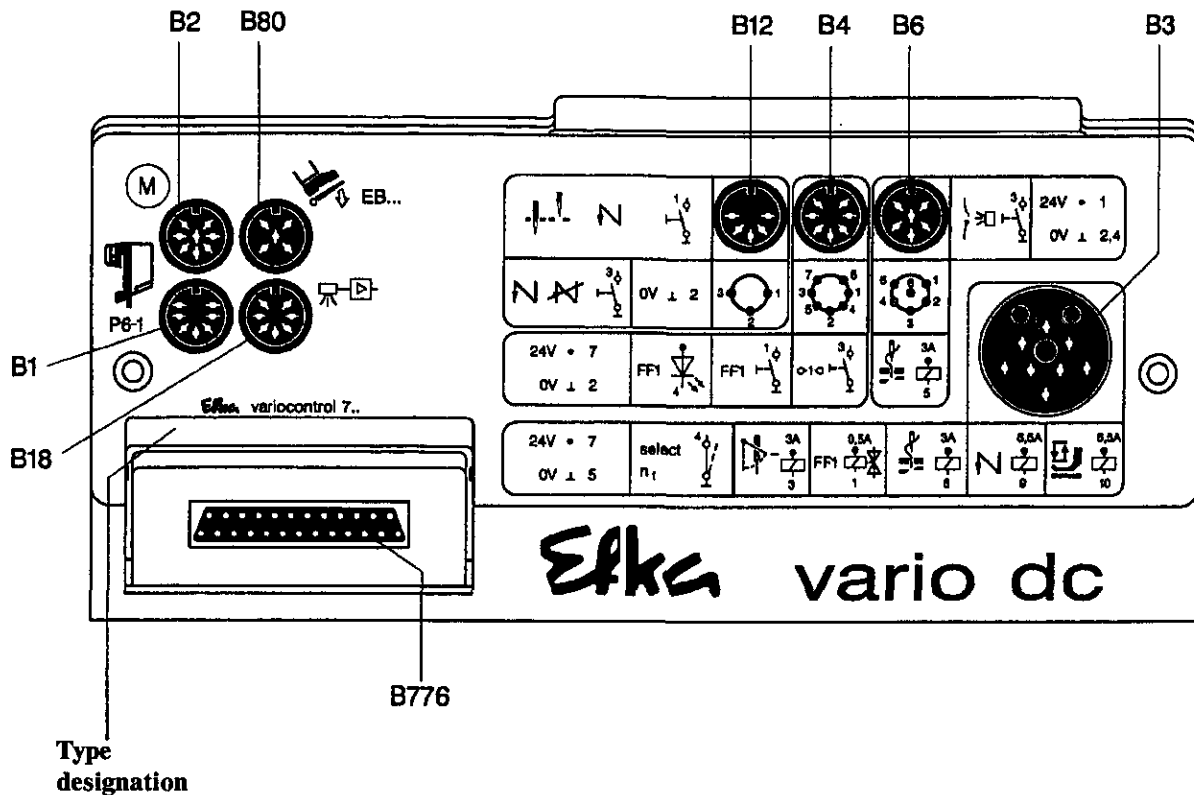
Pushbutton	Output
1	Backtacking
2	Presser foot lifting
3	Thread trimmer
4	Thread wiper
5	Flip-flop signal
6	free
7	free
8	free
9	free
0	free

Inputs:

- 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.
- Please note: switch for blocking of machine run (safety switch) must not be closed during the test.

11. Socket Connectors

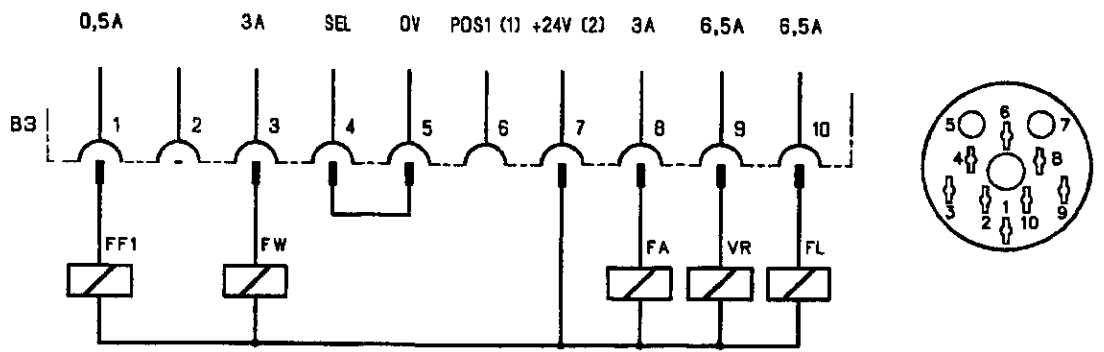
11.1 Position in the Control



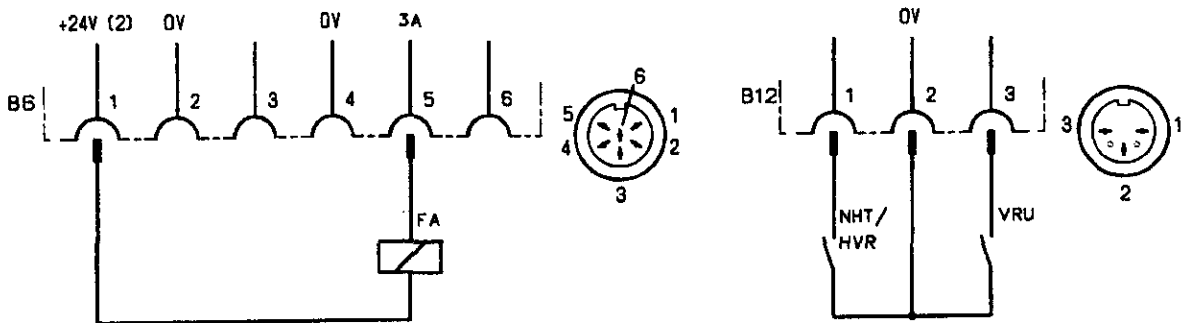
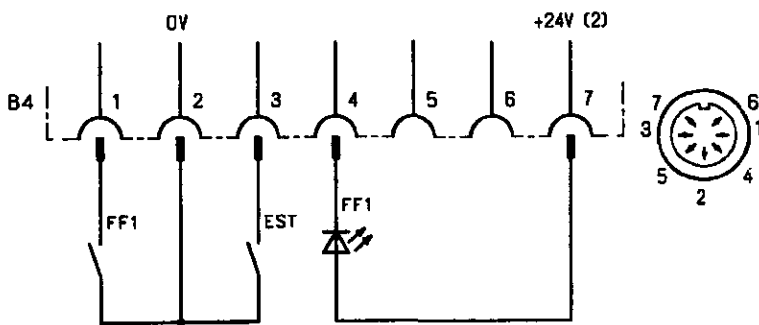
KL 1969

- B1 - Positions transmitter
- B2 - Commutation transmitter for DC motor
- B3 - Machine
- B4 - Pushbuttons and display
- B6 - Machine
- B12 - Pushbuttons
- B18 - Light barrier module
- B80 - External speed controller
- B776 - Control panel Variocontrol

11.2 Connection Diagram



B11028



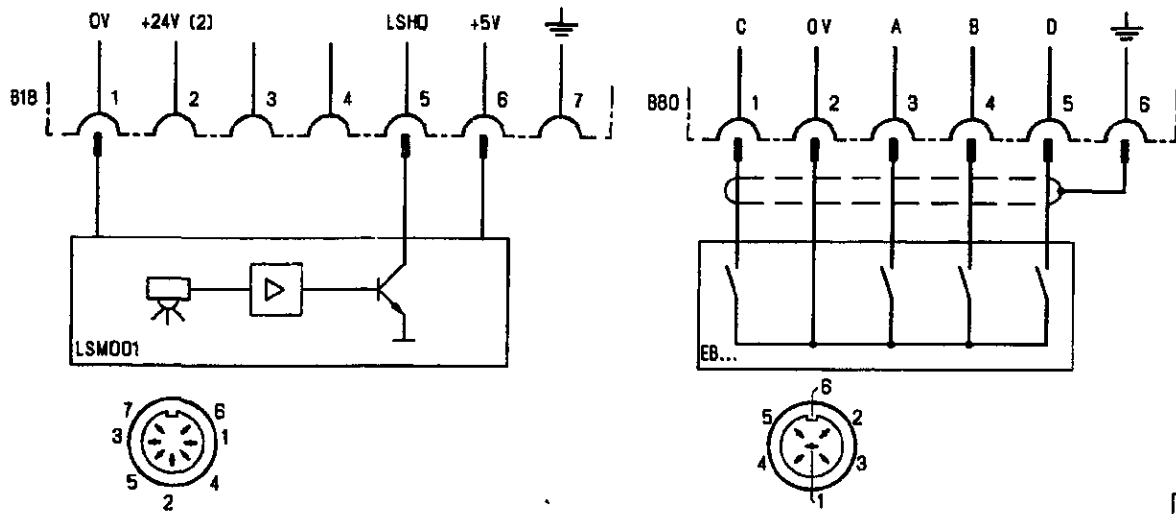
B11029

- FA - Thread trimmer
- FF1 - Flip-flop function
- FL - Presser foot lifting
- FW - Thread wiper
- HP - High lift walking
- NK - Needle cooling
- VR - Backtacking (stitch condensation)

- EST - Single stitch
- HVR - Intermediate backtack (intermediate stitch condensation)
- NHT - Needle up/down
- VRU - Suppression/recall of backtack or stitch condensation

- SEL - Machine select
- R-SELEKT- Resistor for machine select

1) Transistor output with open collector (max. 40V, 500mA)
 2) Nominal voltage 24V, no-load voltage max. 36V



B11027

LSHQ - Light barrier command (identified if switched to 0V)

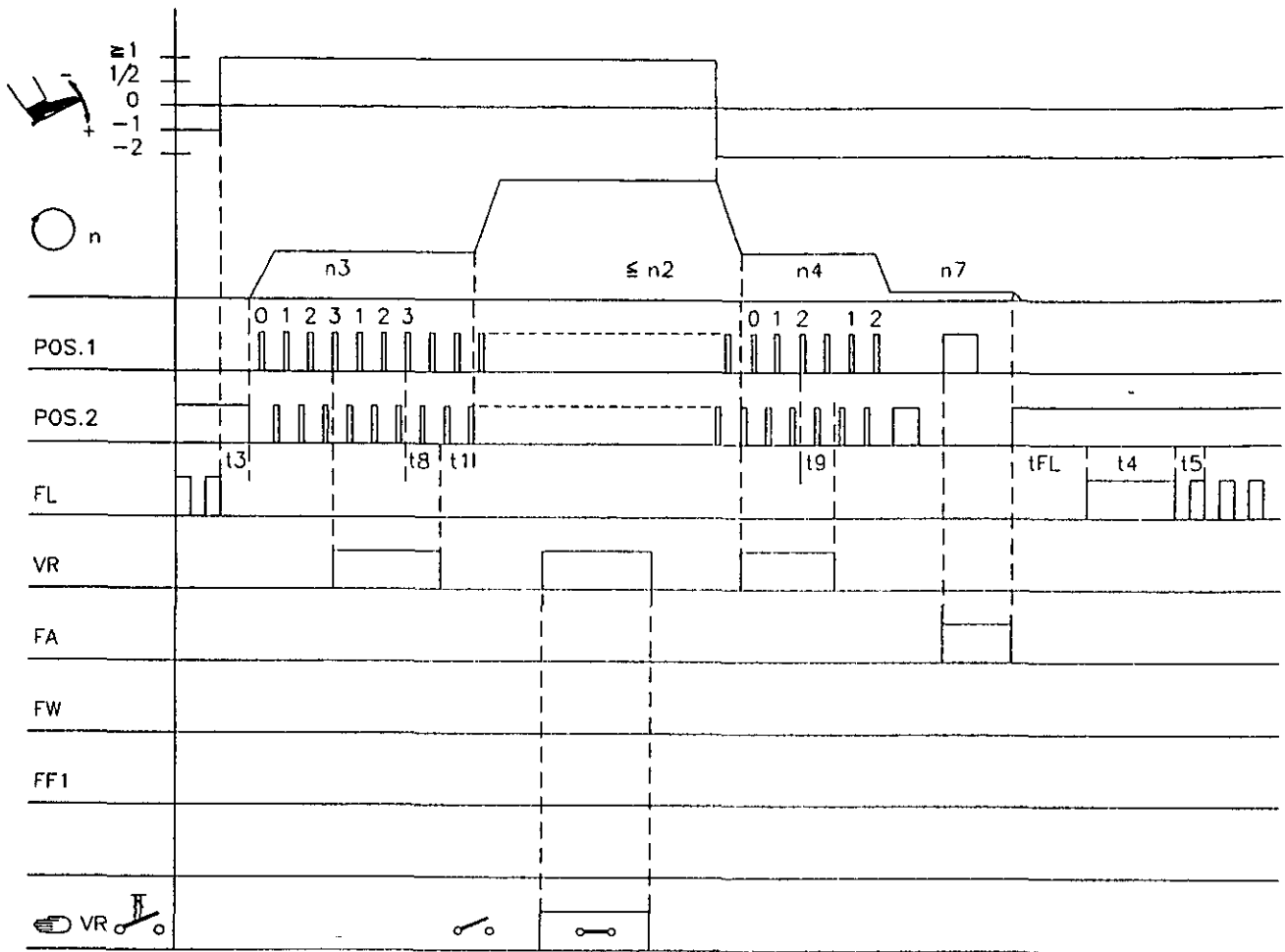
LSM001 - Reflection light barrier module

EB... - External speed controller

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

12. Function Diagrams

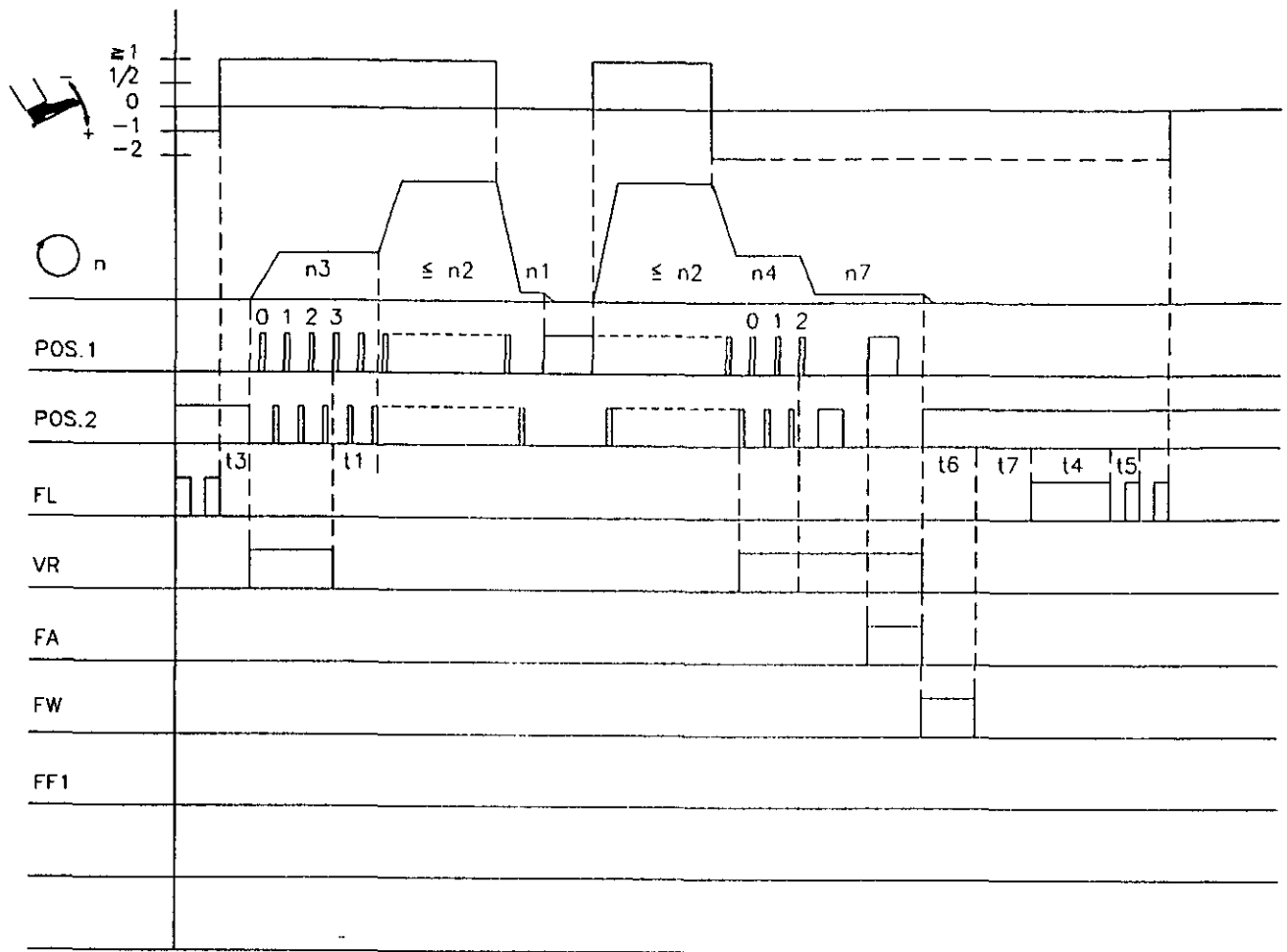
Trimming from full run (lock stitch)



0192/FALAUF

Abbreviation	Function	Parameter/Pushbutton
	Lock stitch trimmer	on F-185
	Double initial backtack with stitch correction	on Pushbutton 7
	Double final backtack with stitch correction	on Pushbutton 8
	Thread wiper	off Pushbutton 9
n2	Maximum speed	F-111
n3	Initial backtacking speed	F-112
n4	Final backtacking speed	F-113
n7	Trimming speed	F-116
t1	Delay from end of initial backtack to speed release	F-200
t3	Start delay from lifted foot	F-202
t4	Full power of presser foot lifting	F-203
t5	Presser foot lift pulsing	F-204
t6	Time of thread wiper	F-205
tFL	Delay time of presser foot lifting, when thread wiper off	F-211
t8	Initial backtack stitch correction	F-150
t9	Final backtack stitch correction	F-151

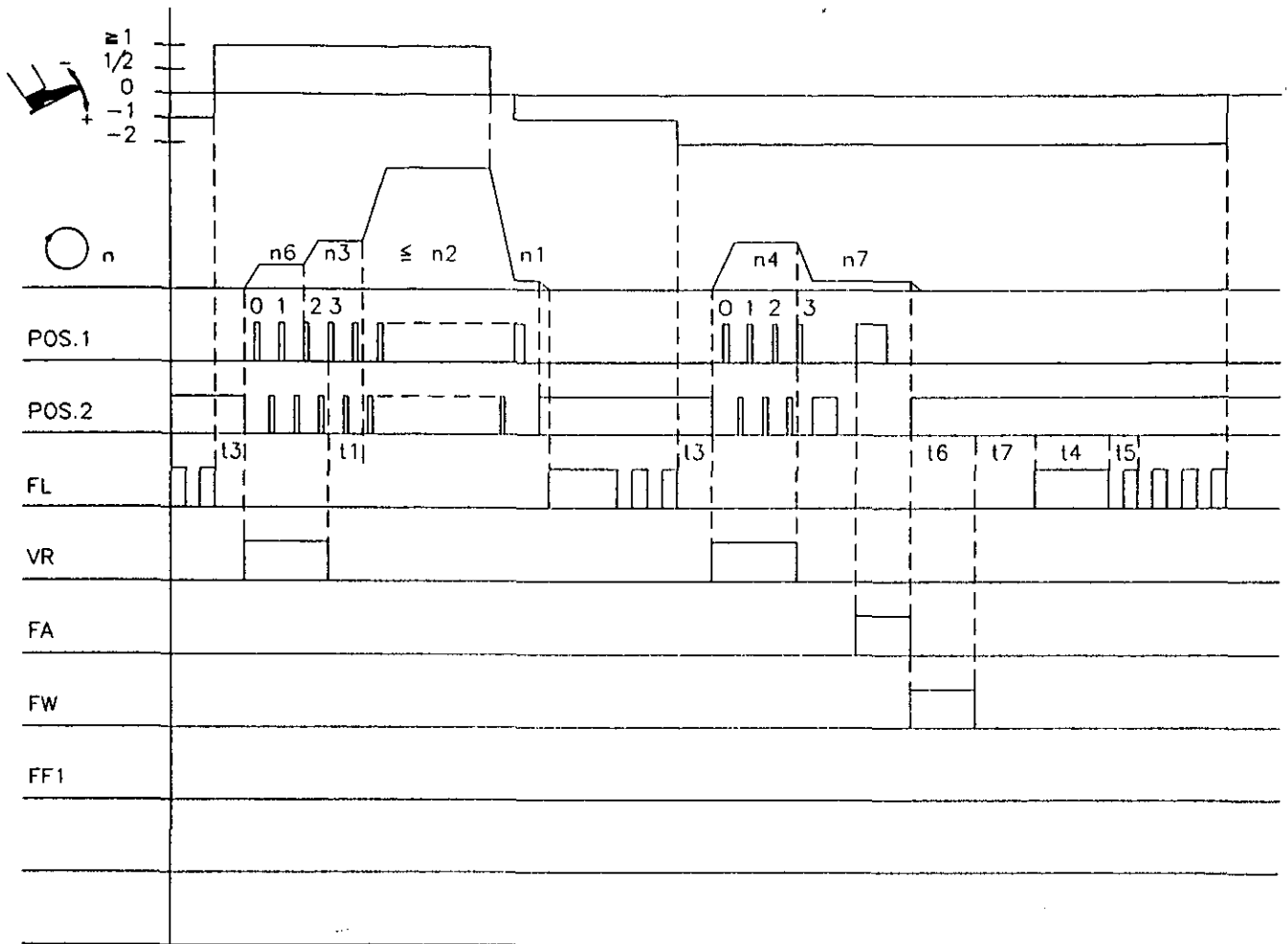
Run with intermediate stop (lock stitch)



0192/LAUFZW

Abbreviation	Function	Parameter/Pushbutton
FAr	Lock stitch trimmer on Single initial backtack on Single final backtack on Basic position needle down on Last stitch backward on	F-185 Pushbutton 7 Pushbutton 8 Pushbutton 4 F-136
n1	Positioning speed	F-110
n2	Maximum speed	F-111
n3	Initial backtacking speed	F-112
n4	Final backtacking speed	F-113
n7	Trimming speed	F-116
t1	Delay from end of initial backtack to speed release	F-200
t3	Start delay from lifted foot	F-202
t4	Full power of presser foot lifting	F-203
t5	Presser foot lift pulsing	F-204
t6	Time of thread wiper	F-205
t7	Delay time of presser foot lifting after thread wiping	F-206

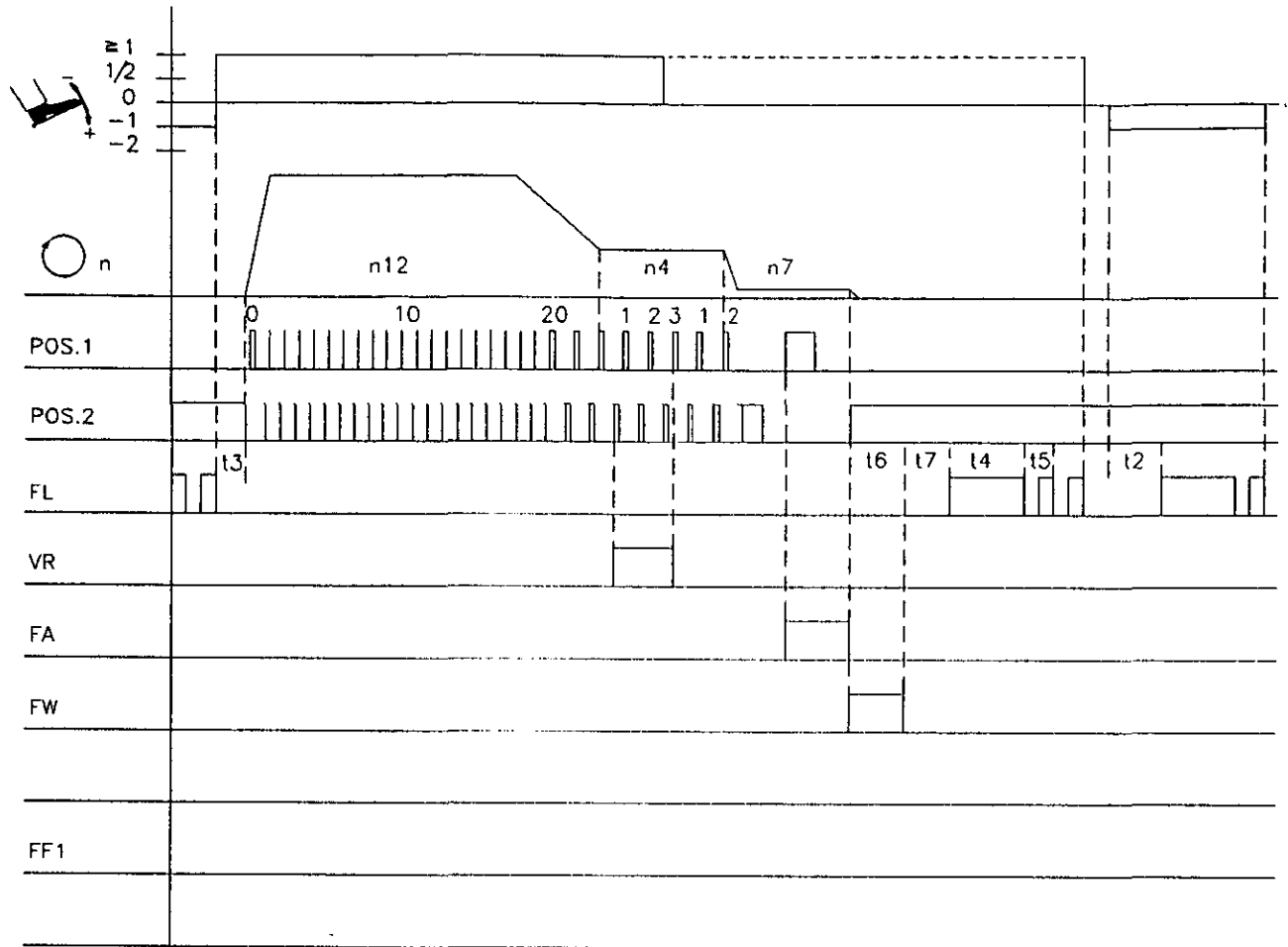
Trimming from intermediate stop (lock stitch)



0192/FAZW

Abbreviation	Function	Parameter/Pushbutton
FAr	Lock stitch trimmer	on F-185
	Softstart	on F-134
	Single initial backtack	on Pushbutton 7
	Single final backtack	on Pushbutton 8
	Basic position needle up	on Pushbutton 4
	Last stitch backward	on F-136
n1	Positioning speed	F-110
n2	Maximum speed	F-111
n3	Initial backtacking speed	F-112
n4	Final backtacking speed	F-113
n6	Softstart speed	F-115
n7	Trimming speed	F-116
t1	Delay from end of initial backtack to speed release	F-200
t2	Delay of presser foot lifting with pedal in position -1	F-201
t3	Start delay from lifted foot	F-202
t4	Full power of presser foot lifting	F-203
t5	Presser foot lift pulsing	F-204
t6	Time of thread wiper	F-205
t7	Delay time of presser foot lifting after thread wiping	F-206

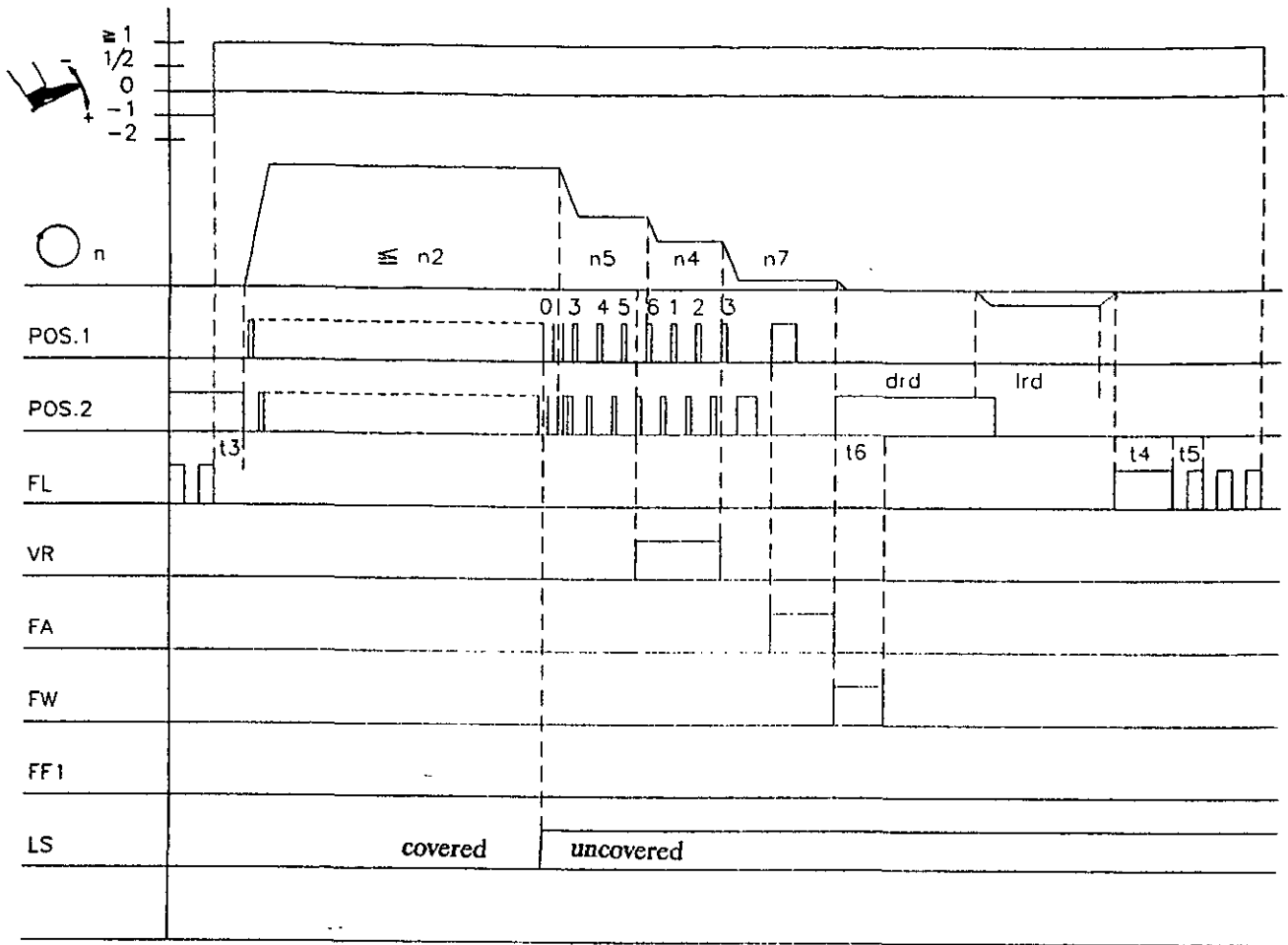
Seam end by stitch counting (lock stitch)



0192/ENDEZAE

Abbreviation	Function	Parameter/Pushbutton
	Lock stitch trimmer Initial backtack Stitch counting Double final backtack	on off on on F-185 Pushbutton 7 Pushbutton 1 Pushbutton 8
n4 n7 n12	Final backtacking speed Trimming speed Stitch counting speed	F-113 F-116 F-118
t2 t3 t4 t5 t6 t7	Delay of presser foot lifting with pedal in position -1 Start delay from lifted foot Full power of presser foot lifting Presser foot lift pulsing Time of thread wiper Delay time of presser foot lifting after thread wiping	F-201 F-202 F-203 F-204 F-205 F-206

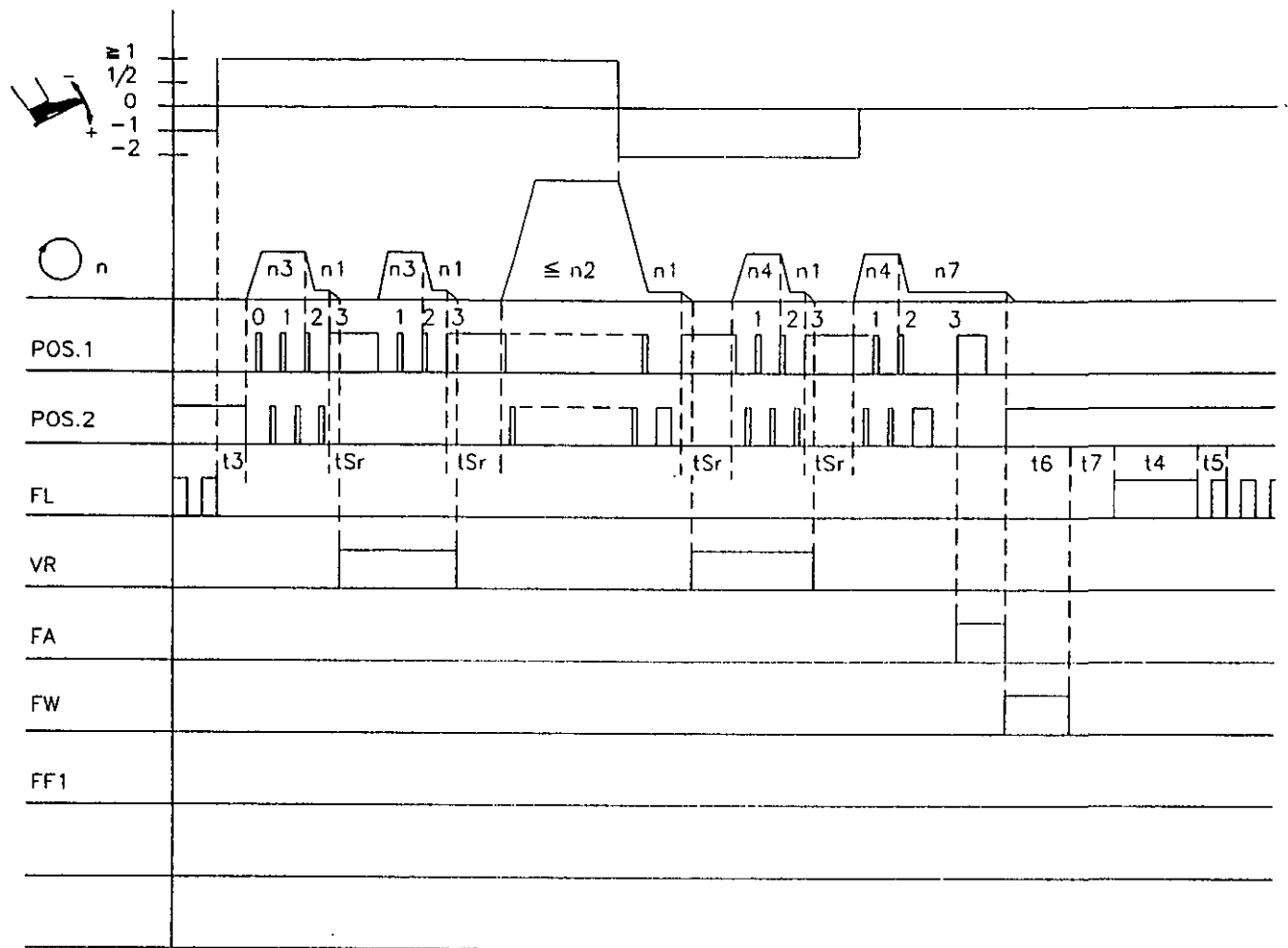
Seam end by light barrier (lock stitch)



0192/ENDELS

Abbreviation	Function	Parameter/Pushbutton
	Lock stitch trimmer Initial backtack Light barrier covered/uncovered Single final backtack Reversion Light barrier	on F-185 off Pushbutton 7 on F-131 on Pushbutton 8 on Pushbutton 9 on Pushbutton 0
n2 n4 n5 n7	Maximum speed Final backtacking speed Speed after light barrier sensing Trimming speed	F-111 F-113 F-114 F-116
t3 t4 t5 t6 drd Ird	Start delay from lifted foot Full power of presser foot lifting Presser foot lift pulsing Time of thread wiper Delay of reversion Increments of reversion	F-202 F-203 F-204 F-205 F-181 F-180

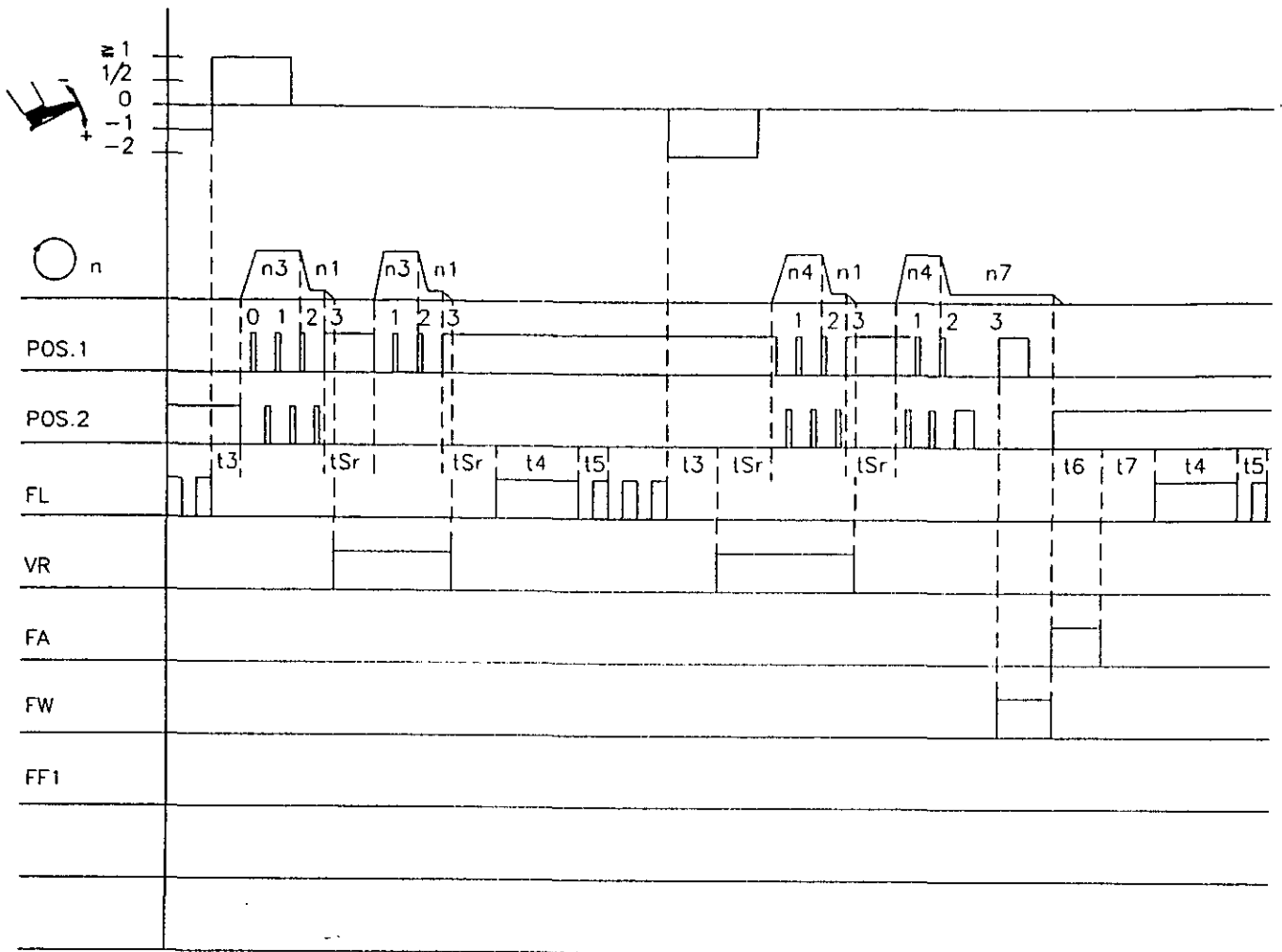
Run with ornamental backtack (lock stitch)



0192/LAUFZVR

Abbreviation	Function	Parameter/Pushbutton
	Lock stitch trimmer Ornamental backtack Presser foot lifting saved after trimming	on on on F-185 F-135 Pushbutton 6
n1 n2 n3 n4 n7	Positioning speed Maximum speed Initial backtacking speed Final backtacking speed Trimming speed	F-110 F-111 F-112 F-113 F-116
t3 t4 t5 t6 t7 tSr	Start delay from lifted foot Full power of presser foot lifting Presser foot lift pulsing Time of thread wiper Delay time of presser foot lifting after thread wiping Stop time for ornamental backtack	F-202 F-203 F-204 F-205 F-206 F-210

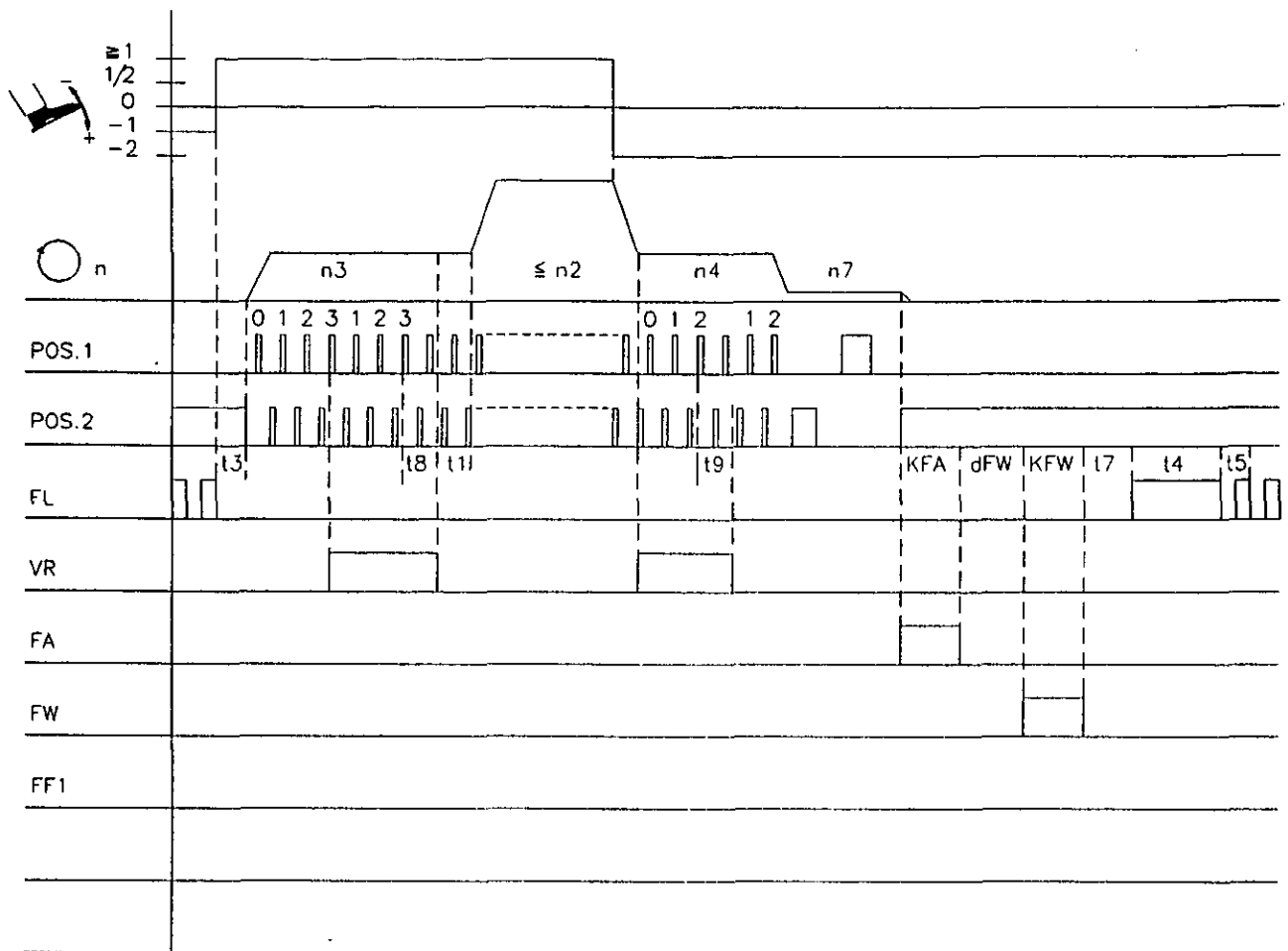
Short run with ornamental backtack (lock stitch)



0192/LAUFZVR1

Abbreviation	Function	Parameter/Pushbutton
	Lock stitch trimmer Ornamental backtack Presser foot lifting saved after thread trimming Presser foot lifting saved at stop in the seam	on F-185 on F-135 on Pushbutton 6 on Pushbutton 5
n1 n3 n4 n7	Positioning speed Initial backtacking speed Final backtacking speed Trimming speed	F-110 F-112 F-113 F-116
t3 t4 t5 t6 t7 tSr	Start delay from lifted foot Full power of presser foot lifting Presser foot lift pulsing Time of thread wiper Delay time of presser foot lifting after thread wiping Stop time for ornamental backtack	F-202 F-203 F-204 F-205 F-206 F-210

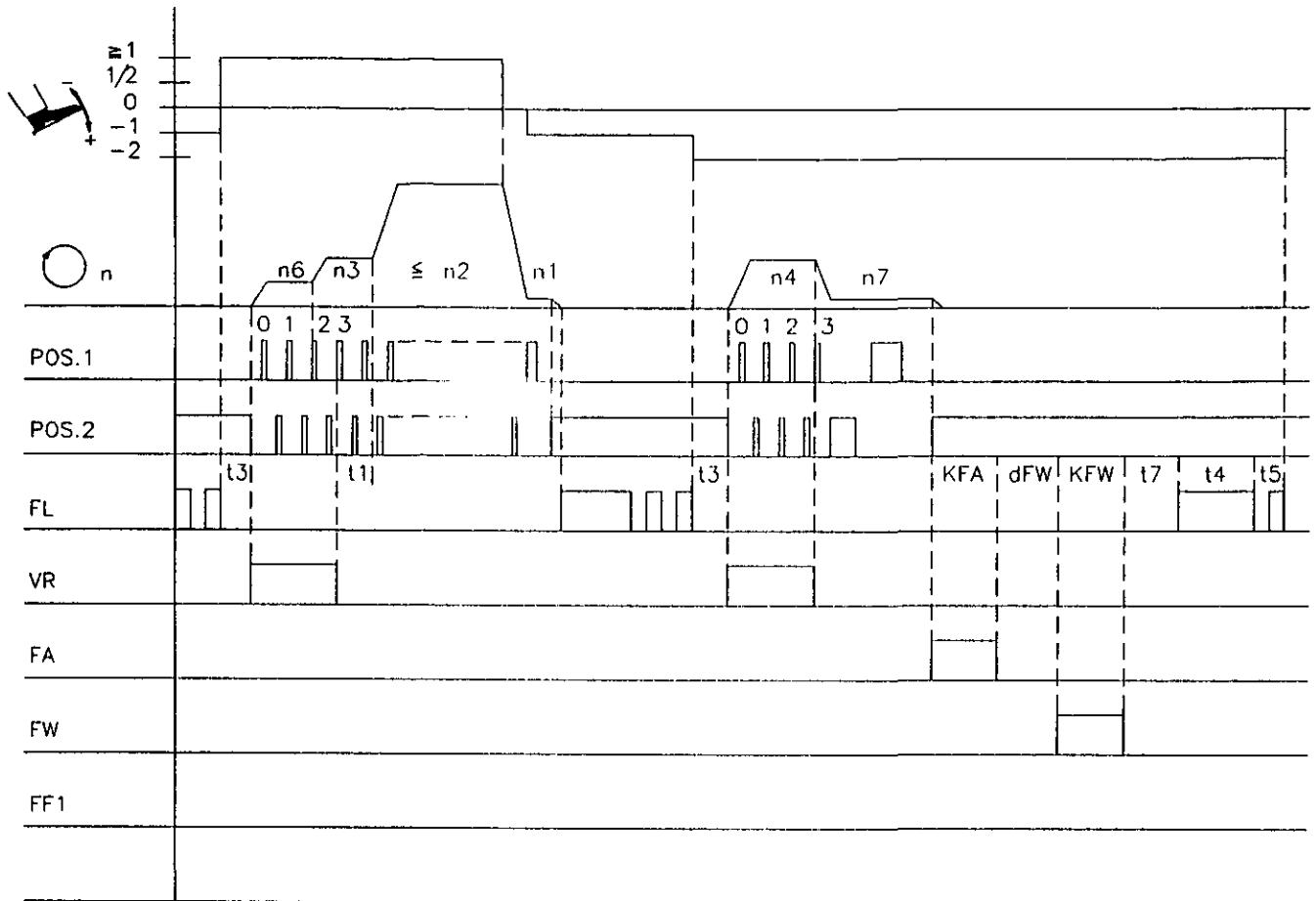
Trimming from full run (chain stitch)



0192/FALAUFK

Abbreviation	Function	Parameter/Pushbutton
	Chain stitch trimmer	on F-185
	Double initial backtack with stitch correction	on Pushbutton 7
	Double final backtack with stitch correction	on Pushbutton 8
n2	Maximum speed	F-111
n3	Initial backtacking speed	F-112
n4	Final backtacking speed	F-113
n7	Trimming speed	F-116
t1	Delay from end of initial backtack to speed release	F-200
t3	Start delay from lifted foot	F-202
t4	Full power of presser foot lifting	F-203
t5	Presser foot lift pulsing	F-204
t7	Delay time of presser foot lifting after thread catching	F-206
t8	Initial backtack stitch correction	F-150
t9	Final backtack stitch correction	F-151
KFA	Triggering time of chain stitch trimmer	F-186
dFW	Delay until thread catching	F-187
KFW	Triggering time of the thread catcher	F-188

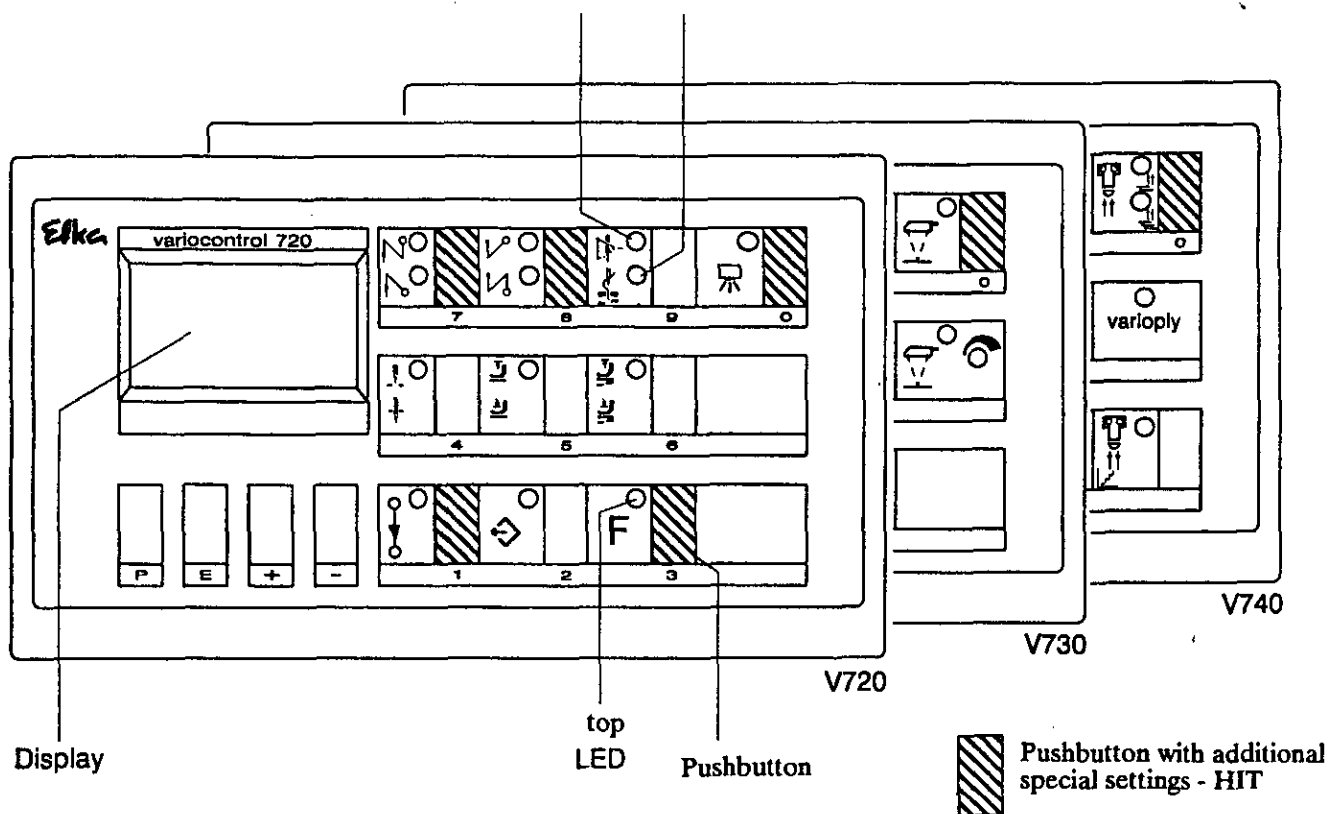
Trimming from intermediate stop (chain stitch)



0192/FAZWK

Abbreviation	Function	Parameter/Pushbutton
	Chain stitch trimmer Softstart Single initial backtack Single final backtack Basic position needle up	on F-185 on F-134 on Pushbutton 7 on Pushbutton 8 on Pushbutton 4
n1 n2 n3 n4 n6 n7	Positioning speed Maximum speed Initial backtacking speed Final backtacking speed Softstart speed Trimming speed	F-110 F-111 F-112 F-113 F-115 F-116
t1 t3 t4 t5 t7 KFA dFW KFW	Delay from end of initial backtack to speed release Start delay from lifted foot Full power of presser foot lifting Presser foot lift pulsing Delay time of presser foot lifting after thread catching Triggering time of chain stitch trimmer Delay until thread catching Triggering time of the thread catcher	F-200 F-202 F-203 F-204 F-206 F-186 F-187 F-188

top bottom
LED LED



Functional Setting of the Pushbuttons

KL 1961

- 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 - programmable
- Pushbutton 4 = Basic position of the needle (bottom/upper dead center) POSITION 1 / POSITION 2
- Pushbutton 5 = Automatic foot lift at stop in the seam ON / OFF
- Pushbutton 6 = Automatic foot lift after thread trimming ON / OFF
- Pushbutton 7 = Initial backtack SINGLE / DOUBLE / OFF
- Pushbutton 8 = Final backtack SINGLE / DOUBLE / OFF
- Pushbutton 9 = THREAD TRIMMER / THREAD TRIMMER + REVERSION / OFF
- Pushbutton 0 = Light barrier function:
V720/V730: ON / OFF
V740: EDGE SENSING / FABRIC PLY SENSING/OFF
- Pushbutton L = Sensitivity adjustment for fabric ply sensing (see chapter "Light Barrier")

Special Setting of the Pushbuttons for HIT

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

- Pushbutton 1 = Number of stitches of the seam with stitch counting
- Pushbutton 3 = Number of stitches or switching on/off the programmed function
- Pushbutton 7 = Number of stitches of the selected initial backtacking section
- Pushbutton 8 = Number of stitches of the selected final backtacking section
- Pushbutton 0 = Number of light barrier compensating stitches

Efka

FRANKL & KIRCHNER GMBH & CO KG
SCHEFFELSTRASSE 73 - D-68723 SCHWETZINGEN
TEL.: (06202)2020 - TELEFAX: (06202)202115 - TELEX: 466314

Efka

OF AMERICA INC.
3715 NORTHCREST ROAD - SUITE 10 - ATLANTA - GEORGIA 30340
PHONE: (404)457-7006 - TELEFAX: (404)458-3899 - TELEX: EFKA AMERICA 804494

Efka

ELECTRONIC MOTORS SINGAPORE PTE. LTD.
67, AYER RAJAH CRESCENT 05-03 - SINGAPORE 0513
PHONE: 7772459 or 7789836 - TELEFAX: 7771048

1(1)-221195(402002EN)