

Efka vario dc

CONTROL

PF82AV3216

INSTRUCTION MANUAL

Nr. 0402081

english

Efka
FRANKL & KIRCHNER
GMBH & CO KG

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1. Important Safety Instructions

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

- Read all instructions thoroughly before using this drive.
- Drive and accompanying appliances 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 appliances, i.e. positioner, 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 appliances, positioner 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 appliances and accessories must only be connected to safety low voltage.
- EFKA DC drives are protected according to overvoltage class 2 (DIN VDE 0160 § 5.3.1).
- Observe all safety guidelines before undertaking conversions or modifications.
- For repair and maintenance use only original replacement parts.



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



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

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

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

Save these instructions for future reference.

2. Range of Applications

The drive is suitable for sewing machines:

Brand	Series
PFAFF	all - with: 900/51 or 900/71 909/03 910/03 or 910/02 911/74 or 911/70

2.1 Use in Accordance with Regulations

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

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

The drive can only be operated:

- on thread processing machines
- in dry areas

3. Complete Drive Unit Consisting of

1	Direct current motor	DC....
1	Control	vario dc PF82AV3203
	- Power pack	N152 (optional N153, N155)
	- Speed controller	EB301 (optional EB302, reduced actuating force)
1	Control panel Variocontrol	V720, V730 oder V740 *1)
1	Positioner	P6-1
1	Mains switch	NS105
1	Set of standard accessories	B141
	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
Foot control type FB302 for standing operation with approx. 1400 mm connecting cable and plug	- part no. 4160018
Potential equalization cord 700 mm long, LIY 2.5 mm ² , grey, with forked cable brackets on both sides	- part no. 1100313
Extension cable for positioner P6-..., approx. 315 mm long, complete with plug and socket connector	- part no. 1100409
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
4-pin plug with slide index	- part no. 0500615
5-pin plug with slide index	- part no. 0501431
6-pin plug with slide index	- part no. 0500703
6-pole connector with slide index	- part no. 0501162
6-pin plug (Hirschmann Mes60)	- part no. 0500457
7-pin plug with slide index	- part no. 0502474
8-pin plug with slide index	- part no. 0502865

*1) Available colors on inquiry

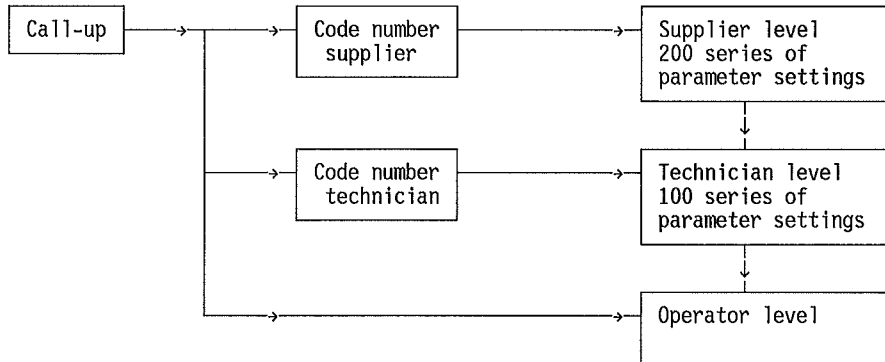
4. Operation

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 repeat input ! ==> C-0000
InFo F1

-> 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	<input type="text" value="7"/>
		0	
Push button 7 briefly	both LED7 off	0	<input type="text" value="7"/>
- Initial backtack is off		0	
Push button 7 briefly	bottom LED7 lights up	0	<input type="text" value="7"/>
- Single initial backtack is on		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 F1
 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 direction 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.

Note

If the direction 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 direction of rotation of the motor shaft must be set to "anticlockwise rotation".

Before mounting the positioner the sewing machine shaft is to be set to the reference position.

Note

Reference position = needle point at the height of the needle plate, from downward movement of the needle in the direction of rotation of the motor shaft.

Markings on the positioner shaft and on the positioner housing have to be aligned, then mount the positioner 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. -> + TURN POWER ON ==>
2. -> -> Call-up of the possible languages (actual language blinks) ==>
3. -> -> Select the desired language ==>
4. -> -> Adjust the reference position. Turn positioner at least until the marker ([) has disappeared. ==>

Note

Reference position = needle point at the height of the needle plate, from downward movement of the needle in the direction of rotation of the motor shaft.

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

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

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 pneumatic thread trimmer)

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

or

-> -> -> Set the increments

7. Adjust position 1A (switch-off position of the magnetic, switch-on position of the pneumatic thread trimmer)

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

or

-> -> -> Set the increments

8. -> -> Adjust the positioning speed ==>
- or
- > -> -> Change value
9. -> -> Adjust the maximum speed ==>
- > -> -> Change value
- 10.-> -> Adjust the direction of rotation ==>
- > -> -> Change value
- 11.-> -> Entry into normal operation after POWER ON. ==>

6.1.2 Multilingual Display

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 drE 1	rotAtion drE 1	rotAcion drE 1	rotAtion drE 1	Direction 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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PF82AV

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.

1500
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Display after approx. 3 seconds:
-> Maximum speed
-> Type designation

If stitch counting (pushbutton 1) was turned on.

1500
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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. hP High lift walking ON/OFF
4. Sht Single stitch with pushbutton for needle up/down ON/OFF
5. LSS Sewing start blocked with light barrier uncovered ON/OFF
6. rd Reversion 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- 6

Display:
Actual status (reversion 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.

1500
PF82AV

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

1500
PF82AV

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.
- 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.

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

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

Example: seam with stitch counting:

-> 1 ==> Turning on the stitch counting; display of the actual stitches. ==>

2 01 004

-> 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.

Example 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

Only with V740!

-> 0 ==> Turning on the transmitted light barrier; display of the sensitivity level in the bottom line. ==>

2 01 004
LS 3 007

Only with V740!

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

2 01 004
LS 4 007

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 ==>

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

2 02 ---

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

-> 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 terminated by pushbutton P, otherwise it gets lost.

Note
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	==>	XXXX XY82ZV
1. ->	P ==> LED pushbutton P blinks	==>	
2. ->	E ==> Display of a parameter on the operator level	==>	aaa bbb
3. ->	2 ==> LED pushbutton 2 blinks Pattern 1, seam 1	==>	1 01 ---
4. ->	2 ==> LED pushbutton 2 blinks Pattern 2, seam 1	==>	2 01 ---
5. ->	2 ==> LED pushbutton 2 blinks Pattern 3, seam 1	==>	3 01 ---
6. ->	2 ==> LED pushbutton 2 blinks Pattern 4, seam 1	==>	4 01 ---
7. ->	7 ==> LED bottom pushbutton 7 lights up Single initial 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 adjusted		

11.	->	<input type="button" value="E"/>	==>	Pattern 4, seam 2	==>	<input type="text" value="4 02 ---"/>
12.	->	<input type="button" value="1"/>	==>	Stitch counting is on	==>	<input type="text" value="4 02 000"/>
13.	->	<input type="button" value="+"/>	->	<input type="button" value="-"/>	Changing the number of stitches by pushbuttons or by using the pedal	<input type="text" value="4 02 008"/>
			==>	Seam with 8 stitches is adjusted		
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 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.

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 Positioning speed	Sn1 n1	F-231 F-110

At the first start after power on, the drive 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 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

7.3 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.

Functions that can be programmed:

- F-008 = 1 - Softstart on/off
- F-008 = 2 - Ornamental backtack on/off
- F-008 = 3 - High lift walking on/off
- F-008 = 4 - Single stitch with pushbutton needle up on/off
- F-008 = 5 - Sewing start blocked with light barrier uncovered on/off
- F-008 = 6 - Reversion on/off

7.4 Display Actual Speed

Functions	Abbreviation on the display	Parameter
Display		
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

7.5 Direction of Rotation of the Motor

Functions	Abbreviation on the display	Parameter
Direction of rotation of the motor	drE	F-161

Look at the motor shaft:

F-161 = 0 - clockwise rotation

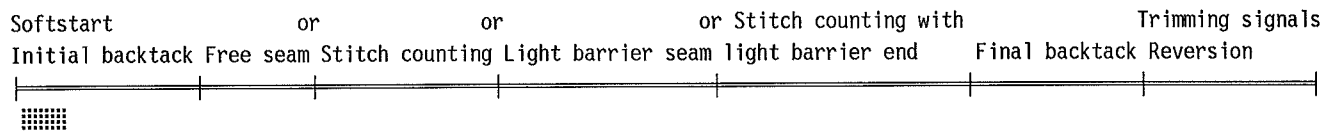
F-161 = 1 - anticlockwise rotation



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 direction of rotation.

7.6 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

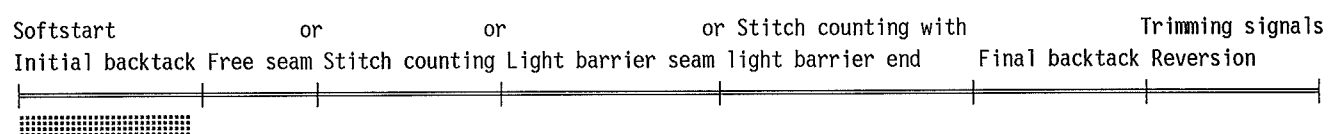
Function:

- 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

7.7 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.

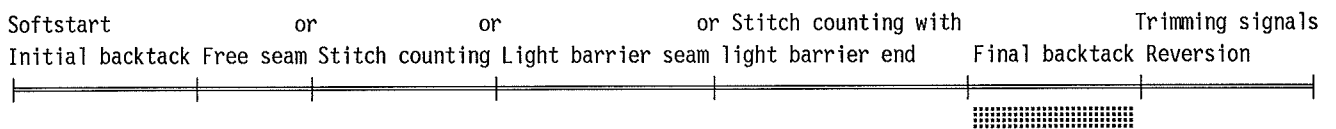
7.7.1 Double Initial Backtack

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.

7.7.2 Single Initial Backtack

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

7.8 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
Trimming 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.

7.8.1 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 n_1 .

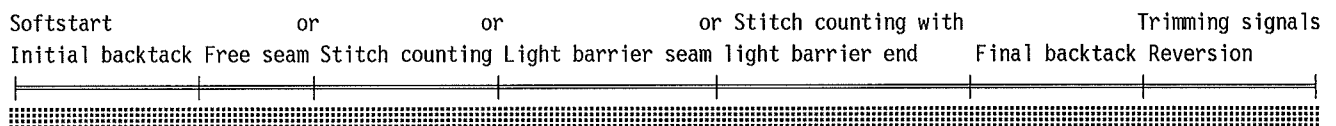
With slow backtack mechanisms, for the double final backtack, the stitch regulator can be delayed with a time lag of t_9 (final backtack stitch correction).

7.8.2 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

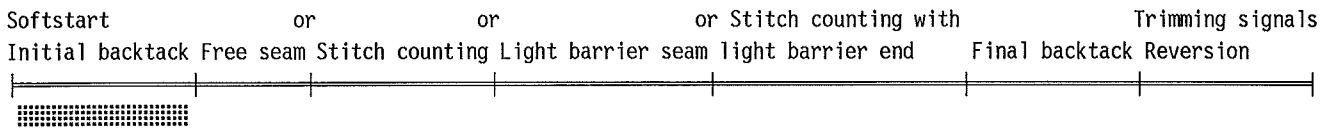
7.9 Intermediate Backtack



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

- Firing of the backtack solenoid at machine standstill is not possible.

7.10 Initial Ornamental Backtack



Functions	Abbreviation on the display	Parameter
Single/double/off		Pushbutton-7
Number of ornamental backtacking stitches forward	Arv	F-000
Number of ornamental backtacking stitches backward	Arr	F-001
Initial backtacking speed	n3	F-112
Ornamental backtack on/off	SrS	F-135
Start delay from lifted foot	t3	F-202
Ornamental backtack stop time	tSr	F-210

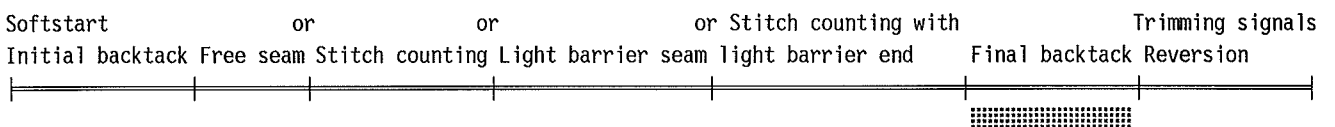
Differences from the standard initial backtack:

- The drive stops for the switching of the stitch regulator
- The stop time can be adjusted
- After the backtacking section backward follows a backtacking section forward with the same number of stitches as the backward section

Direct access by function key (pushbutton 3)

Functions	Abbreviation on the display	Parameter
Ornamental backtack on/off	-F-	F-008 = 2

7.11 Final Ornamental Backtack



Functions	Abbreviation on the display	Parameter
Single/double/off		Pushbutton-8
Number of ornamental backtacking stitches backward	SEv	F-083
Number of ornamental backtacking stitches forward	n3	F-113
Final backtacking speed	SrS	F-135
Ornamental backtack on/off	t3	F-202
Start delay from lifted foot	tSr	F-210
Ornamental backtack stop time		

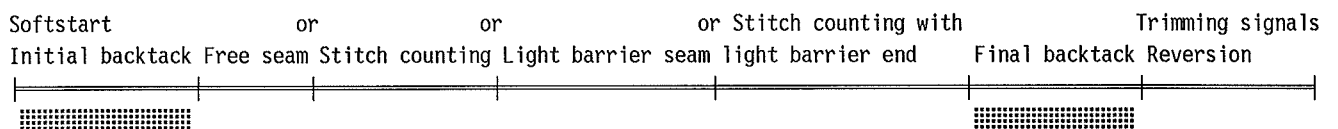
It corresponds to the normal final backtack. Between the various seam sections the drive stops in position 1 for the ornamental backtack stop time (tSr). The number of stitches of the forward and backward section can be set separately.

Direct access by function key pushbutton 3)

Functions	Abbreviation on the display	Parameter
Ornamental backtack on/off	-F-	F-008 = 2

7.12 Suppression/Recall of Backtack

■ Effective in standard and ornamental backtack

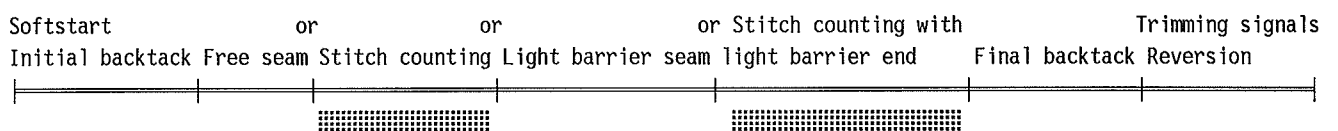


The subsequent backtacking operation can be suppressed or recalled once by the external pushbutton.

When pressing	Initial backtack On	Initial backtack Off	Final backtack On	Final backtack Off
Before start of seam	no backtack	backtack	---	---
In the seam	---	---	no backtack	backtack

The double backtack is performed in the above cases.

7.13 Seam with Stitch Counting



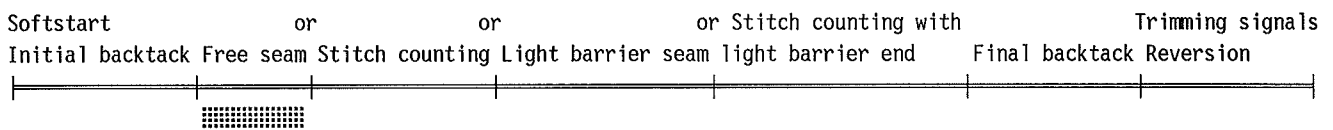
Functions	Abbreviation on the display	Parameter
Stitch counting on/off		Pushbutton-1
Number of stitches	Stc	F-007
Stitch counting speed	n12	F-118
Speed mode for a seam with stitch counting	SGn	F-141

Speed control for the stitch counting can be selected by the speed mode.

- Mode 0: Execution at pedal controlled speed.
- Mode 1: Execution at fixed speed n12 as long as pedal is pushed.
- Mode 2: Execution at limited speed n12 as long as pedal is pushed.
- Mode 3: Automatic execution at fixed speed as soon as the pedal has been pushed once. Termination is possible by "heeling the pedal back (-2)".

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.

7.14 Free Seam and Seam with Light Barrier



Functions	Abbreviation on the display	Parameter
Positioning speed	n1	F-110
Upper limit of the maximum speed	n2 ⁻	F-111
Maximum speed		see display
Lower limit of the maximum speed	n2 ₋	F-121
Limited speed	n12	F-118
Speed mode Free seam	SFn	F-142

Speed control for the free seam can be selected by the speed mode.

- Mode 0: Execution at pedal controlled speed from n1 to n2.
 Mode 1: Execution at fixed speed n12, when pedal is forward (position > = 1).
 Mode 2: Execution at limited speed n12, when pedal is forward (position > = 1)
 Mode 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. Termination by heeling the pedal back (-2) is possible.

If the light barrier is not active the speed is pedal controlled up to nmax corresponding to the adjustment of parameter F-111.

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

7.15 Speed Limitation 1 and 2

Functions	Abbreviation on the display	Parameter
Speed limitation 1	n11	F-187
Speed limitation 2	n9	F-188

Speed limitation is activated by pressing one of the external pushbuttons (N-B1, N-B2). The maximum speed is limited to the level set by parameter F-187 or F-188. It continues to be pedal controlled. Limitation to the lower speed is caused by pressing both pushbuttons at the same time.

7.16 Function Variants of the External Pushbutton Needle Up

Functions	Abbreviation on the display	Parameter
Mode for pushbutton needle up	Fnt	

By parameter F-186 the function of the pushbutton connected to the input "needle up" can be programmed.

Functions:

- F-186 = 1 - Needle up / Single stitch
- F-186 = 2 - Single stitch with blocking solenoid
- F-186 = 3 - Speed limitation

7.16.1 Needle up / Single Stitch

Functions	Abbreviation on the display	Parameter
Switching between needle up / single stitch	Sht	F-140

F-186 = 1

Needle up

When pressing the pushbutton, the drive runs from position 1 to position 2.
If the drive is outside of position 1 it will not move for safety reasons.

Single stitch

When pressing the pushbutton, the machine 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 the preselected basic position.

Direct access by function key (pushbutton 3)

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

7.16.2 Single Stitch with Blocking Solenoid

F-186 = 2

When pressing the pushbutton at stop in the seam, the machine performs one rotation from position 1 to position 1.
The presser foot will be lifted, blocking and backtack solenoid will be switched on.
After trimming this function will be blocked.

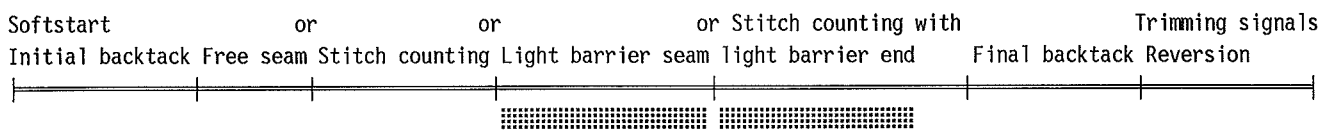
7.16.3 Speed Limitation 1

Functions	Abbreviation on the display	Parameter
Speed limitation 1	n11	F-187

F-186 = 3

By pressing the pushbutton speed limitation 1 is activated.
The maximum speed is limited to the level set by parameter F-187. It continues to be pedal controlled.

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 drive 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, can be programmed 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 can be programmed with parameter F-009 and pushbutton "L".
- 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

Note

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.

7.17.5 Light Barrier Filter for Knitted Fabrics

Functions	Abbreviation on the display	Parameter
Number of filter stitches	LSF	F-005
Light barrier filter on/off	LSF	F-130

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

- By parameter F-130 the filter can be switched on or off.
- By changing the number of filter stitches the mesh will be adapted.

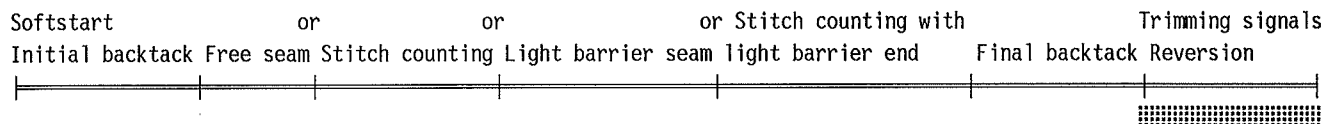
7.17.6 Heelback Blocked

Functions	Abbreviation on the display	Parameter
Heelback blocked (-1, -2) on/off	EPd	F-281

By switching parameter F-281 on it is possible to prevent the activation of the functions initiated by heeling the pedal back (presser foot lifting, thread trimming).

This function is only effective, when light barrier is on.

7.18 Thread Trimmer



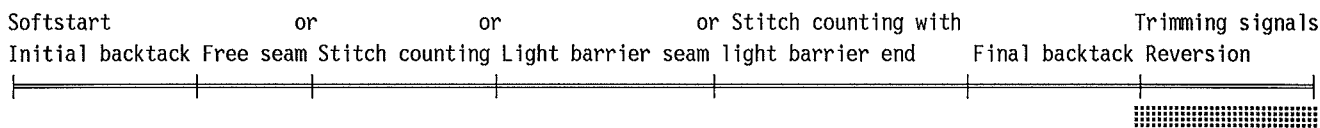
Functions	Abbreviation on the display	Parameter
Thread trimmer on/off		Pushbutton 9
Trimming speed	n7	F-116

It is possible to switch thread trimming at the seam end on or off.

The thread is trimmed 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.

7.19 Thread Wiper



Functions	Abbreviation on the display	Parameter
Thread wiper on/off		Pushbutton 9
Activation time of thread wiper	t6	F-205
Return time of thread wiper	t7	F-206

The thread wiper can only be switched on if the thread trimmer is on as well.
 The operating time (t6) is set by parameter F-205.
 The return time (t7, F-206) prevents presser foot lifting before the thread wiper is in its basic position.

7.20 Thread Monitor

The control is suitable for the connection of a thread monitor module which recognizes the end of the bobbin and/or needle thread.
 The functional sequence at the thread end can be programmed for the adaptation to various thread trimming systems.

Functions	Abbreviation on the display	Parameter
Thread monitor ON/OFF	SSF	F-080
Thread monitor status	SSF	F-182
Activation time of thread monitor in the case of a thread error	tFA	F-183
Number of backtacking stitches in the case of a thread error	SFr	F-184
Number of stitches until stop in the case of a thread error	cSP	F-189

Status thread monitor 0 = thread monitor off
 1 = version for magnetic thread trimmer
 2 = version for bobbin thread monitor 926/01
 3 = version for bobbin supply monitor 926/04



Attention
 Turn power off before changing the thread or the bobbins.

7.20.1 Bobbin Thread Monitor for Magnetic Thread Trimmer

In each seam section, trimming is initiated and the final backtack is suppressed by the thread monitor module after recognition of the empty bobbin (ERRS). The bobbin can be changed after the power has been turned off.

Initial backtack:

After recognition of an empty bobbin, the initial backtack is finished, and trimming without final backtack is initiated. The bobbin can be changed after the power has been turned off.

When starting to sew, the initial backtack is suppressed, the reset signal is emitted and the started seam is continued.

Seam with stitch counting:

After recognition of an empty bobbin in a seam with stitch counting >6 stitches, trimming is initiated and the final backtack is suppressed.

The bobbin can be changed after the power has been turned off.

When starting to sew again, the reset signal for the thread monitor module is emitted and a correction seam (pedal controlled) is executed, which can be terminated by pedal in position -2.

Outside of the teach-in, this correction seam can be switched off by pushbutton 1 on the Variocontrol.

After recognition of an empty bobbin, the seam with stitch counting <6 stitches is finished, and the drive stops in needle down position (pos 1). This is an indication that the bobbin has to be changed.

The thread can be trimmed by heelback (-2), while sewing or presser foot lifting are blocked.

The bobbin can be changed after the power has been turned off.

By starting to sew again, a new seam is started, and the reset signal is emitted.

If stitch counting without thread trimmer is programmed and the empty bobbin with <6 stitches is recognized, stitch counting is terminated. After the first stitch of the following seam, thread trimming and the stop for changing the bobbin are performed.

Free seam:

After recognition of an empty bobbin in the free seam, trimming is initiated and the final backtack is suppressed.

The bobbin can be changed after the power has been turned off.

When starting to sew again, the reset signal is emitted and the started seam is continued.

Light barrier compensating stitch counting:

After recognition of an empty bobbin, the light barrier compensating stitch counting is finished, and the drive stops in needle down position (pos 1). This is an indication that the bobbin has to be changed.

The thread can be trimmed by heelback (-2), while sewing or presser foot lifting are blocked.

The bobbin can be changed after the power has been turned off.

By starting to sew again, a new seam is started, and the reset signal is emitted.

Final backtack:

After recognition of an empty bobbin, the final backtack is finished, and the drive stops in needle down position (pos 1). This is an indication that the bobbin has to be changed.

The thread can be trimmed by heelback (-2), while sewing or presser foot lifting are blocked.

The bobbin can be changed after the power has been turned off.

By starting to sew again, a new seam is started, and the reset signal is emitted.

Thread trimmer:

After recognition of an empty bobbin, the thread trimming is finished. The sewing start for the next seam is blocked once. This is an indication that the bobbin has to be changed.

The thread can be trimmed by heelback (-2), while sewing or presser foot lifting are blocked.

The bobbin can be changed after the power has been turned off.

By starting to sew again, a new seam is started, and the reset signal is emitted.

7.20.2 Bobbin Thread Monitor 926/01

In each seam section, a special backtack is initiated and the final backtack is suppressed by the thread monitor module after recognition of the empty bobbin (the needle stitches the same hole twice). The drive stops in position 2, and the pneumatic thread trimmer (FAP) is switched on over time (F-183). eingeschaltet. In the following, this procedure is referred to as knotting stitches.

The bobbin can be changed after the power has been turned off.

When starting to sew, the same special backtack is performed. However, the number of holes (1 or 2) can be selected by parameter F-184.

Initial backtack:

After recognition of an empty bobbin, the initial backtack is finished. Then, knotting stitches and thread trimming (FAP) are performed.

The bobbin can be changed after the power has been turned off.

When starting to sew, knotting stitches are performed again, the reset signal is emitted and the started seam is continued.

Seam with stitch counting:

After recognition of an empty bobbin in a counted seam >6 stitches, knotting stitches and thread trimming (FAP) are performed.

The bobbin can be changed after the power has been turned off.

When starting to sew again, knotting stitches are performed again, the reset signal is emitted, and the remaining stitches of the same counted seam are executed.

After recognition of the empty bobbin in a counted seam <6 stitches, the stitch counting is finished, and the drive stops in position 1. This is an indication that the bobbin has to be changed.

The thread can be trimmed by heelback (-2), while sewing or presser foot lifting are blocked.

The bobbin can be changed after the power has been turned off.

By starting to sew again, a new seam is started, and the reset signal is emitted.

If stitch counting without thread trimmer is programmed and the empty bobbin with <6 stitches is recognized, stitch counting is terminated. After the first stitch of the following seam, thread trimming and the stop for changing the bobbin are performed.

Free seam:

After recognition of an empty bobbin in a counted seam >6 stitches, knotting stitches and thread trimming (FAP) are performed.

The bobbin can be changed after the power has been turned off.

When starting to sew again, knotting stitches are performed again, the reset signal is emitted, and the remaining stitches of the same counted seam are executed.

After recognition of an empty bobbin in a free seam, knotting stitches and thread trimming (FAP) are performed.

The bobbin can be changed after the power has been turned off.

When starting to sew again, knotting stitches are performed again, the reset signal is emitted, and the remaining stitches of the same counted seam are executed.

Light barrier compensating stitches:

Sequence as described for bobbin thread monitor for magnetic thread trimmer!

Final backtack:

Sequence as described for bobbin thread monitor for magnetic thread trimmer!

Thread trimmer:

Sequence as described for bobbin thread monitor for magnetic thread trimmer!

7.20.3 Bobbin Supply Monitor 926/04

In each seam section, after recognition of the empty bobbin, the thread monitor module activates a counting (F-189), at the end of which a stop in the basic position is initiated.

Sewing can be continued by the pedal in position 0 (neutral) and then pushing the pedal forward.

If the counting is activated a reset signal is **not** emitted at the start of the seam.

Automatic sequences as initial and final backtack are only executed after a stop in the basic position has been initiated.

7.20.4 Needle Thread Monitor

The sequence in the case of a needle thread error (ERRN) is identical with the sequence of a bobbin thread error for the magnetic thread trimmer.

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 table below.

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

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

7.23 High Lift Walking

Softstart Initial backtack or Free seam or Stitch counting Light barrier seam or Stitch counting with light barrier end or Final backtack Trimming signals Reversion



Functions	Abbreviation on the display	Parameter
High lift walking speed	n10	F-117
High lift walking speed run-out time	thP	F-152
Minimum number of stitches	chP	F-185
High lift walking stitches on/off	ShP	F-187

Limitation to high lift walking speed is caused by pressing the external pushbutton. The high lift walking solenoid is switched on, when the speed \leq high lift walking speed.

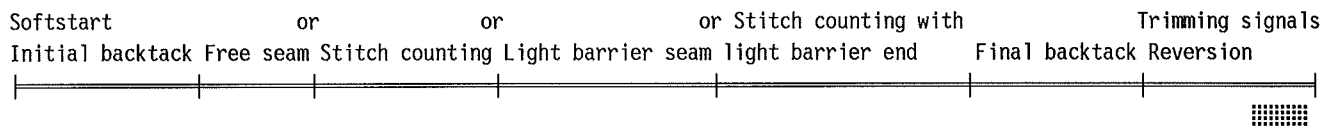
When function high lift walking stored is activated, high lift walking remains on until the pushbutton is pressed again. When it is not activated, high lift walking is effective only while the pushbutton is pressed. Run-out stitches can be programmed by parameter F-185. This way, high lift walking remains on until the stitch counting is finished. After switching off the high lift walking solenoid, the speed limitation remains effective during the run-out time (thP).

Note
If the function "single stitch with blocking solenoid" is on (F-186 = 2) high lift walking has no function.

Direct access by function key (pushbutton 3)

Functions	Abbreviation on the display	Parameter
High lift walking on/off	-F-	F-008 = 3

7.24 Reversion



Functions	Abbreviation on the display	Parameter
Positioning speed	n1	F-110
Number of reversion increments	InP	F-180
Activation delay of reversion	drd	F-181

The function "reversion" is performed after trimming.

When the stop position is reached, the drive 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°.

Direct access by function key (pushbutton 3)

Functions	Abbreviation on the display	Parameter
Reversion on/off	-F-	F-008 = 6

7.25 Stop in Reverse Position

Functions	Abbreviation on the display	Parameter
Stop in reverse position on/off	rdP	F-190
Number of reversion increments	InP	F-180

When this function is on and when "stop in the seam" is triggered with preselected basic position 2, the drive stops in the position which corresponds to the stop position after trimming with reversion.

Raising the needle by pushbutton needle up with stop in the above mentioned position is possible if the reverse position is at least 20 increments away from position 1. Otherwise the drive stops in position 2.

7.26 External Speed Controller EB301 and EB302

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.

The external speed controller EB302 differs from EB301 by softer springs. Lower actuating forces are thus needed.

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)
½	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 (Pedal fully forward) (n _{max})

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 drive 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 drive 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 drive to lock or not to reach the set speed. In this case, the drive stops and the display shows an error message.

8.4 Adjustment of the Positions

Functions	Abbreviation on the display	Parameter
Adjustment of the reference position (position 0) (neutral)	Sr1	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 positioner information and actual mechanical position a reference position is needed.

POSITION 0

The reference position must be adjusted:

- for initial operation
- after changing the positioner
- after changing the EPROM or the microprocessor

Reference position = needle point at the height of the needle plate

Note

If another needle position (other than reference position) is adjusted the values of the signal and stop positions (pos1 and pos2) preset by the manufacturer are no longer valid and **must** be reset.

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 magnetic thread trimmer	Pos1
Position 2 stop position after trimming, switch-off position of pneumatic thread trimming solenoid	Pos2
Position 1A switch-off position of the magnetic thread trimming solenoid switch-on position of the pneumatic thread trimming solenoid	Pos1A
Position 2A	Pos2A
Position 3	Pos3
Position 3A	Pos3A

Programming:

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

Position 1 xxx

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

Position 2 xxx

 Adjust position 2
3. Press pushbutton E ==>

Position 1A xxx

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

Position 2A xxx

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

Position 3 000

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

Position 3A 000

 Position does not have to be adjusted !
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 direction 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 (data records) 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 direction of rotation and the needle positions.

- Push pedal twice in short intervals, after end of seam, and put back to position 0 (neutral) SAvE
0--9
- Input any address between 0 and 9 for the data record.
 - The yellow BUSY-LED on the Memory Box lights up. SAvE
||||||
 - In case a data record already exists under the selected reference number, it will be overwritten.
- Display after the storing is terminated 1500
PF82AV

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.

Note

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. 1500
PF82AV

Note

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

5. » Operation without Variocontrol

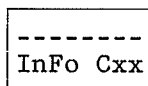
- Writing and reading is done by pushing the pedal as described in step 3 and 4.
- Program 1 is always automatically selected.
- Reading-in is only possible if power is turned on with pedal fully forward.
- Alternating between writing and reading:
 - Pedal backward twice in short intervals = writing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



"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

Programming of Functions and Values (Parameters)

Display	Signification
Info F1	Wrong code number or parameter number input

Serious Situation

Display	Signification
Info E1	Positioner 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 - and 0...9 on the Variocontrol

Table: Assignment of the pushbuttons to the outputs

Pushbutton	Output
1	Backtacking
2	Presser foot lifting
3	Magnetic thread trimmer
4	Pneumatic thread trimmer
5	Thread wiper
6	Motor running
7	Signal "motor running" + "photocell uncovered"
8	Reversion signal*
9	High lift walking
0	Reset thread monitor

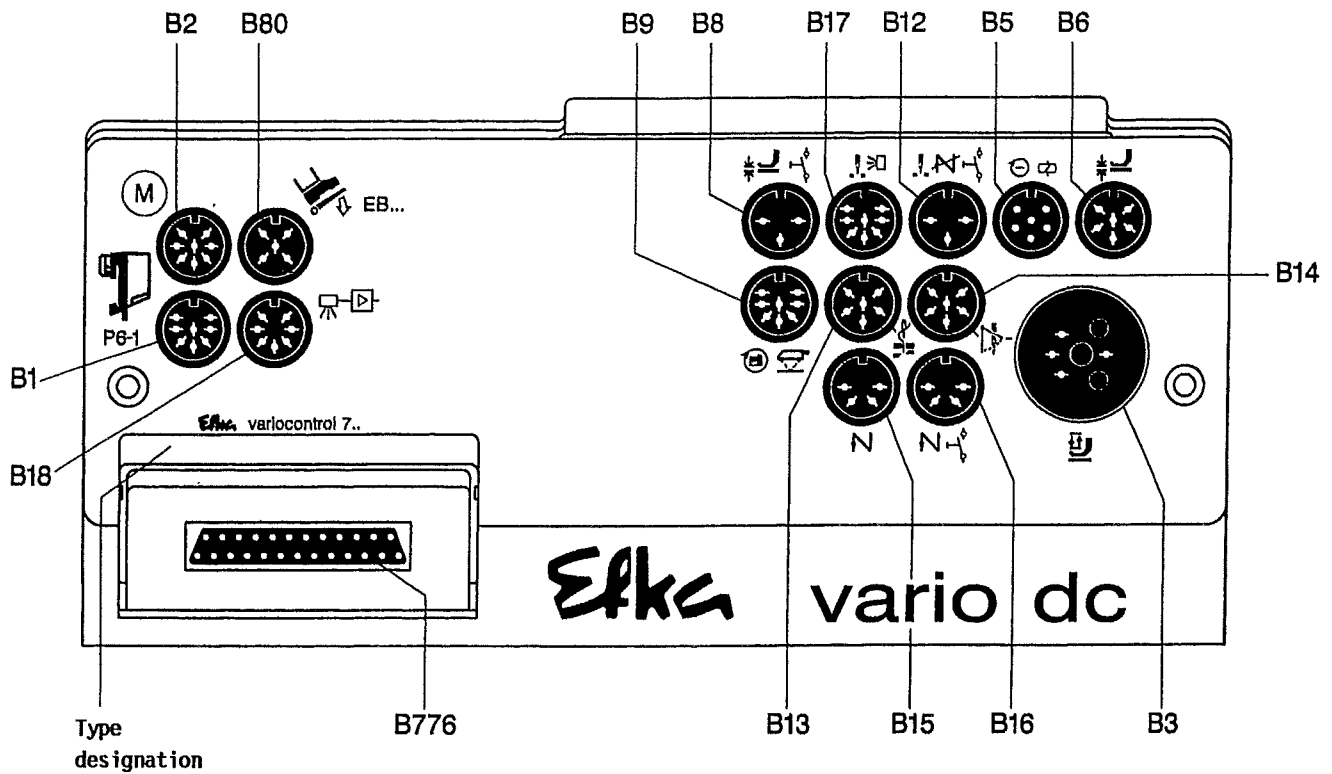
* Automatically performed by DC motors.

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

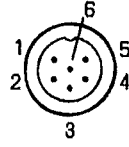
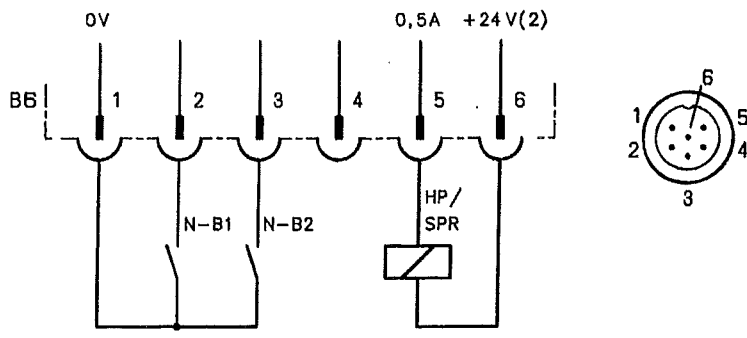
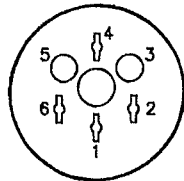
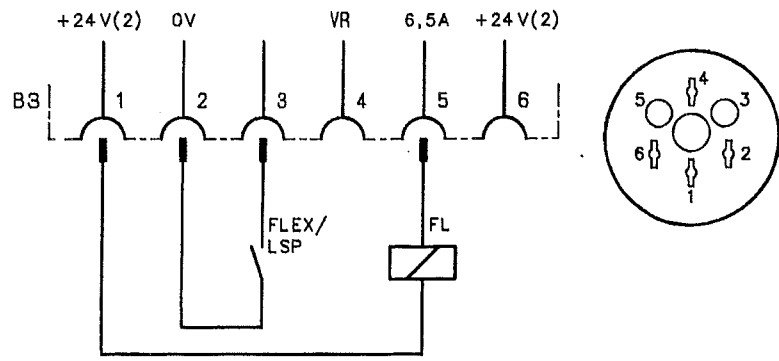
11.1 Position in the Control



KL 1970

- B1 - Positions transmitter
- B2 - Commutation transmitter for DC motor
- B3 - Machine
- B5 - Machine
- B6 - Machine
- B8 - Pushbuttons
- B9 - Machine
- B12 - Pushbuttons
- B13 - Machine
- B14 - Machine
- B15 - Machine
- B16 - Machine
- B17 - Thread monitor
- B18 - Light barrier module
- B80 - External speed controller
- B776 - Control panel Variocontrol

11.2 Connection Diagram

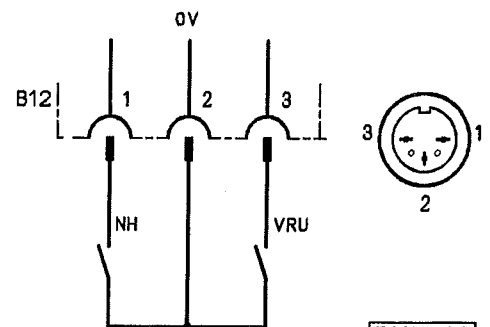
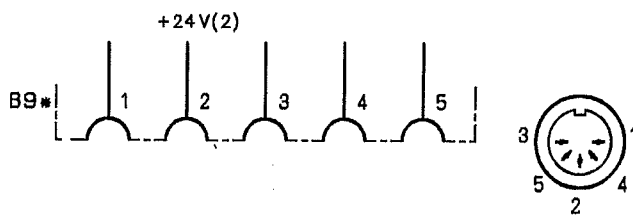
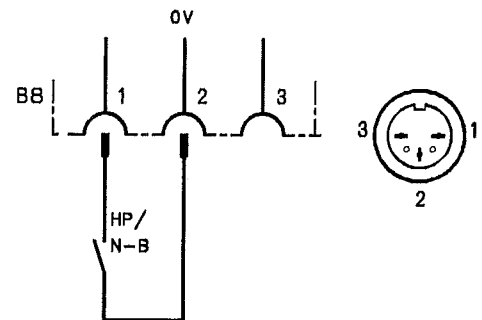
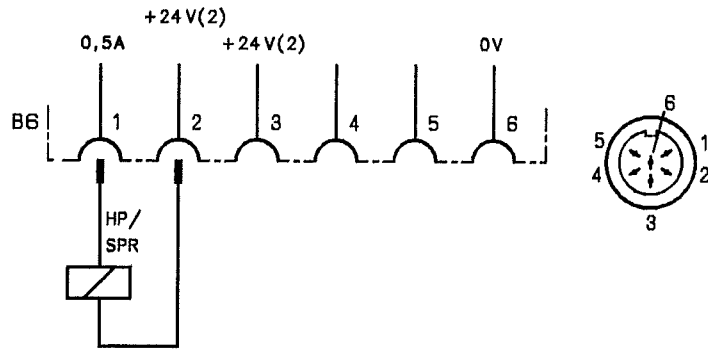


B11030

- FL - Presser foot lifting
- HP - High lift walking
- VR - Backtacking (stitch condensation)
- SPR - Blocking solenoid

- FLEX - External presser foot lifting
- LSP - Blocking of machine run
- N-B1 - Speed limitation 1
- N-B2 - Speed limitation 2

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



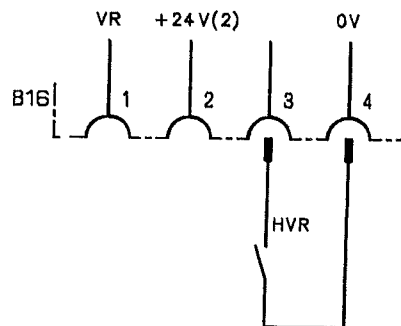
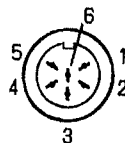
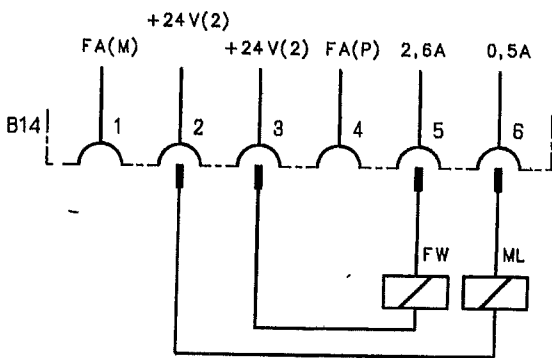
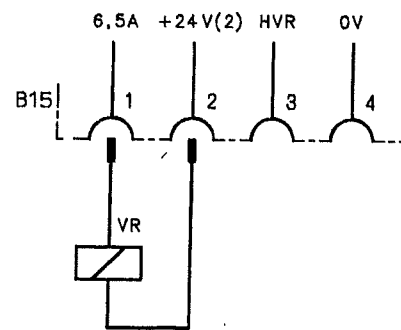
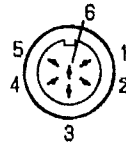
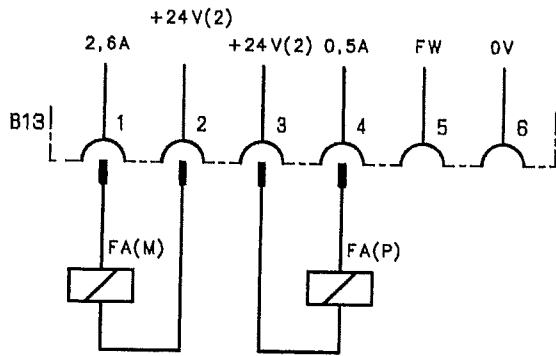
BI1031A

HP - High lift walking
 SPR - Blocking solenoid

N-B - Speed limitation
 NH - Needle up
 VRU - Backtack suppression/recall

*) Prepared for future functions

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

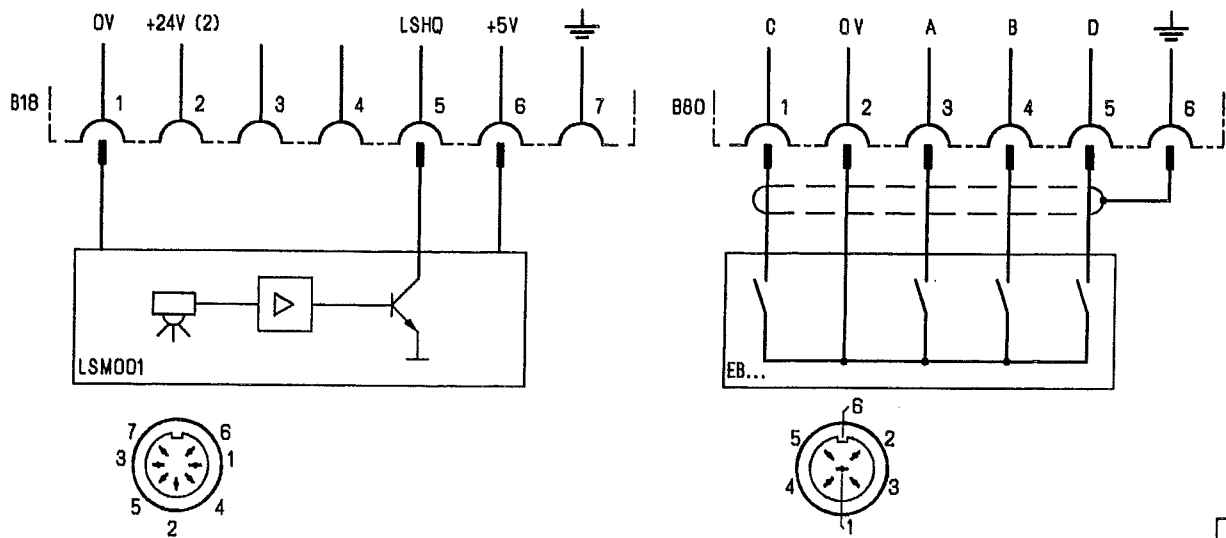


B11032

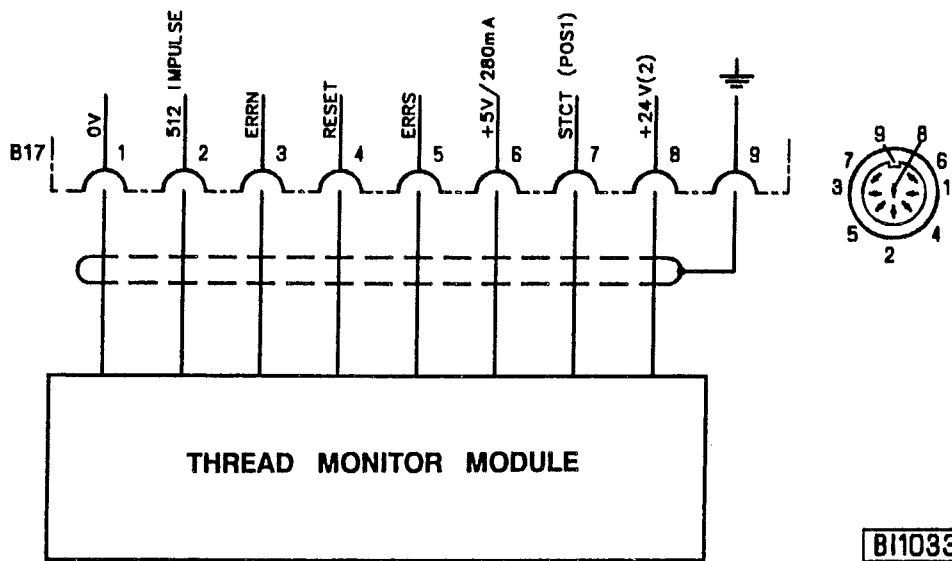
- FA(M) - Thread trimmer (magnetic)
- FA(P) - Thread trimmer (pneumatic)
- FL - Presser foot lifting
- ML - Machine running
- VR - Backtacking

HVR - Intermediate backtack (intermediate stitch condensation)

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



B11027



B11033

- 512 IMPULSE - 512 impulses / rotation
- ERRN - Needle thread monitor
- ERRS - Bobbin thread monitor
- STCT - Stitch counting (POS1)
- LSHQ - Light barrier command (identified when switched to 0V)

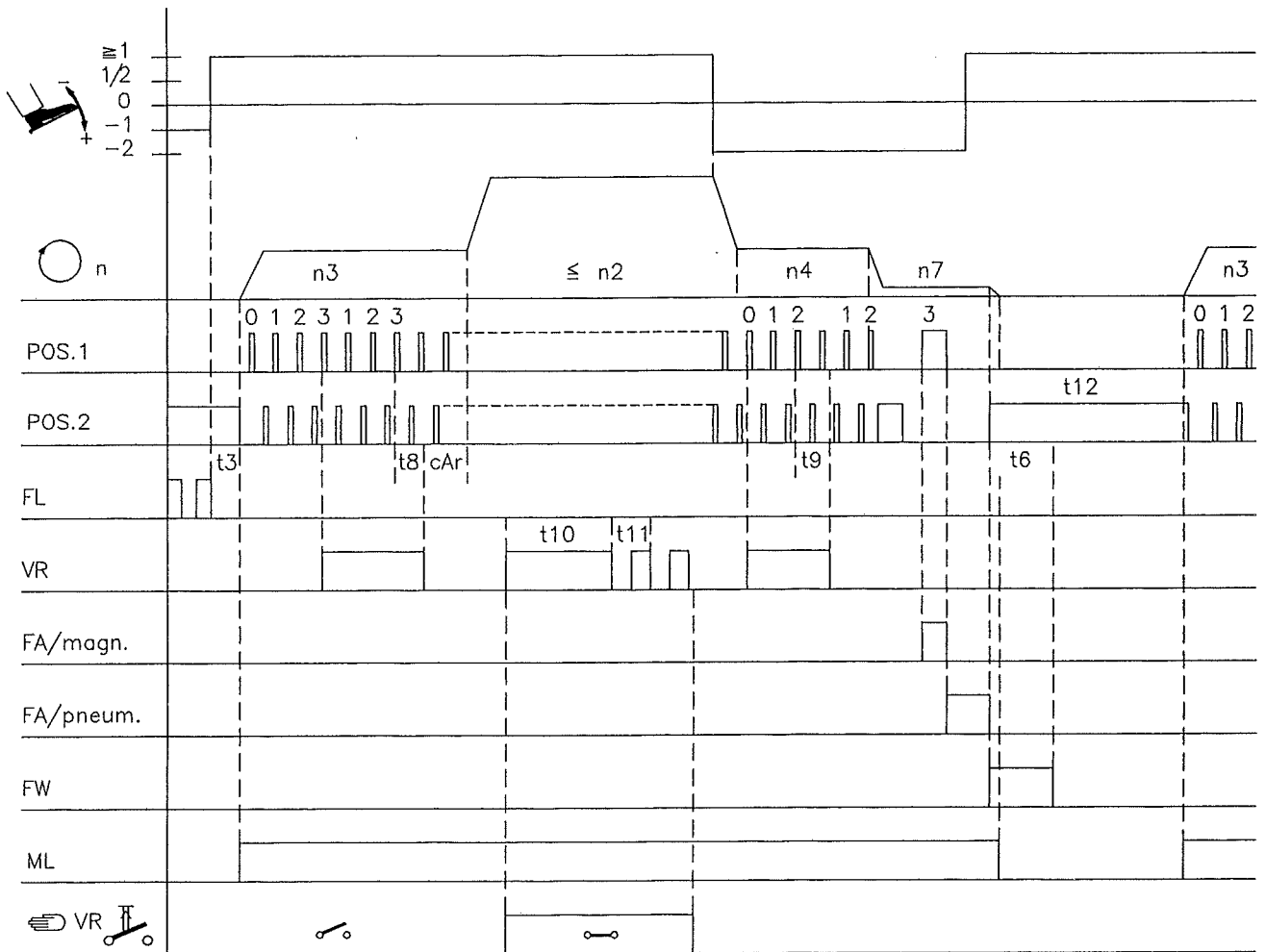
- LSM001 - Reflection light barrier module
- EB... - External speed controller

FWÄ - Thread monitor

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

12. Function Diagrams

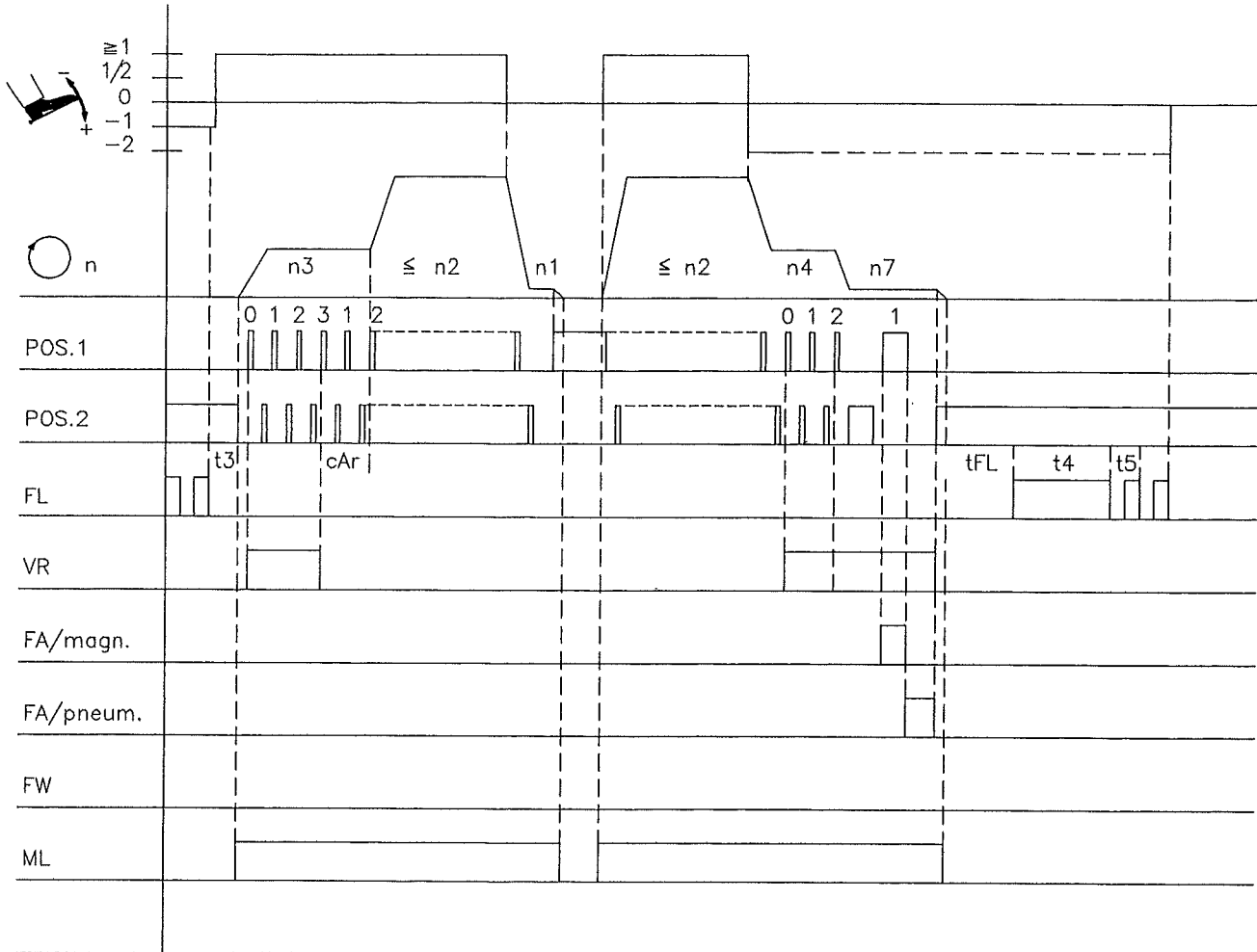
Trimming from full run



0201/FALAUF

Abbreviation	Function	Parameter/Pushbutton
	Double initial backtack Double final backtack	on on Pushbutton 7 Pushbutton 8
n2	Maximum speed	F-111
n3	Initial backtacking speed	F-112
n4	Final backtacking speed	F-113
n7	Trimming speed	F-116
t3	Start delay from lifted foot	F-202
t6	Time of thread wiper	F-205
t8	Initial backtack stitch correction	F-150
t9	Final backtack stitch correction	F-151
t10	Full power of backtacking	fixed
t11	Pulsing of backtacking	fixed
t12	Start delay after thread trimming	fixed
cAr	Stitch counting until speed release after initial backtack	F-200

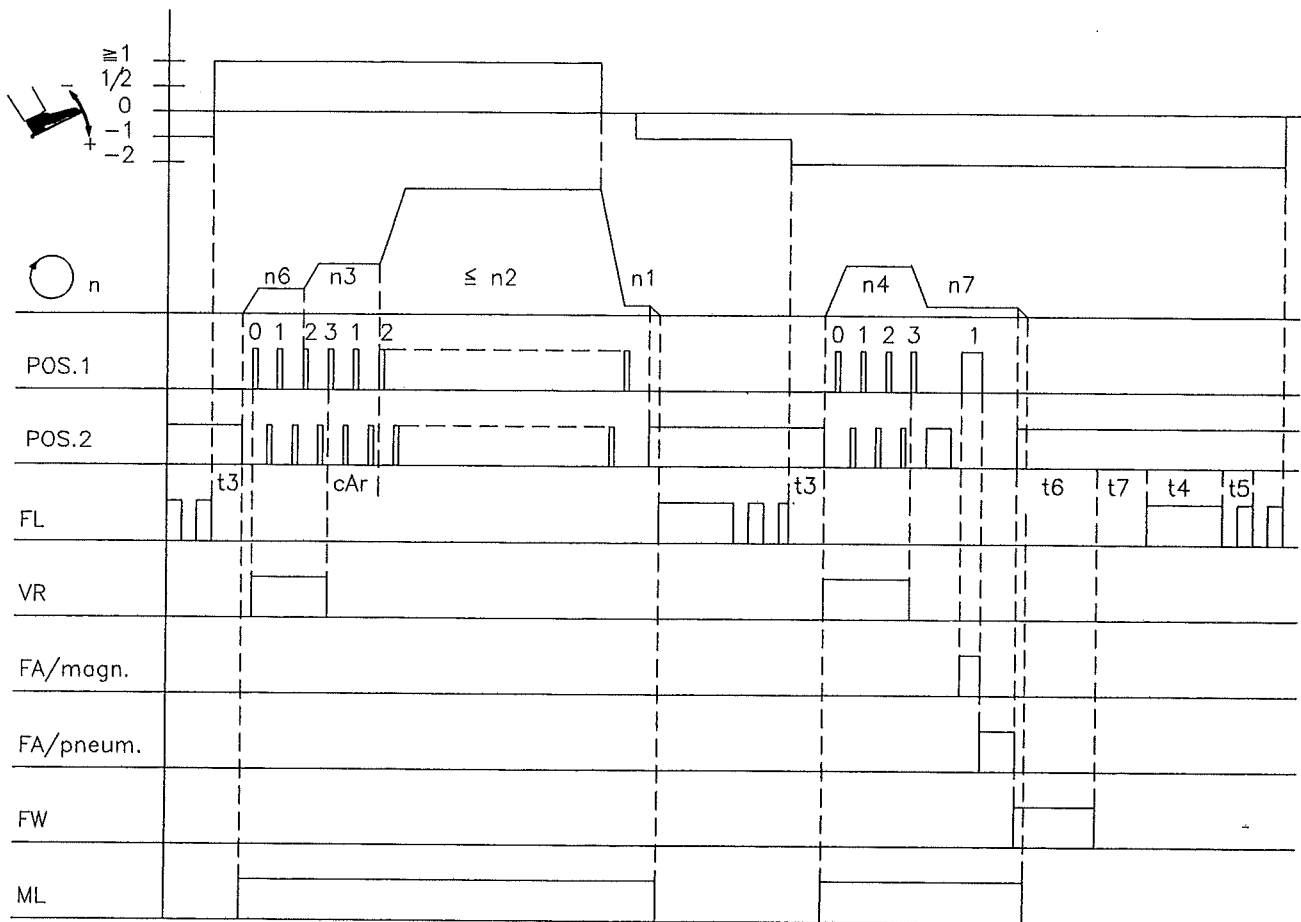
Run with intermediate stop



0201/LAUFZW

Abbreviation	Function	Parameter/Pushbutton
FAr	Single initial backtack	on Pushbutton 7
	Single final backtack	on Pushbutton 8
	Thread wiper	on Pushbutton 9
	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
n7	Trimming speed	F-116
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 when thread wiper is off	F-211
cAr	Stitch counting until speed release after initial backtack	F-200

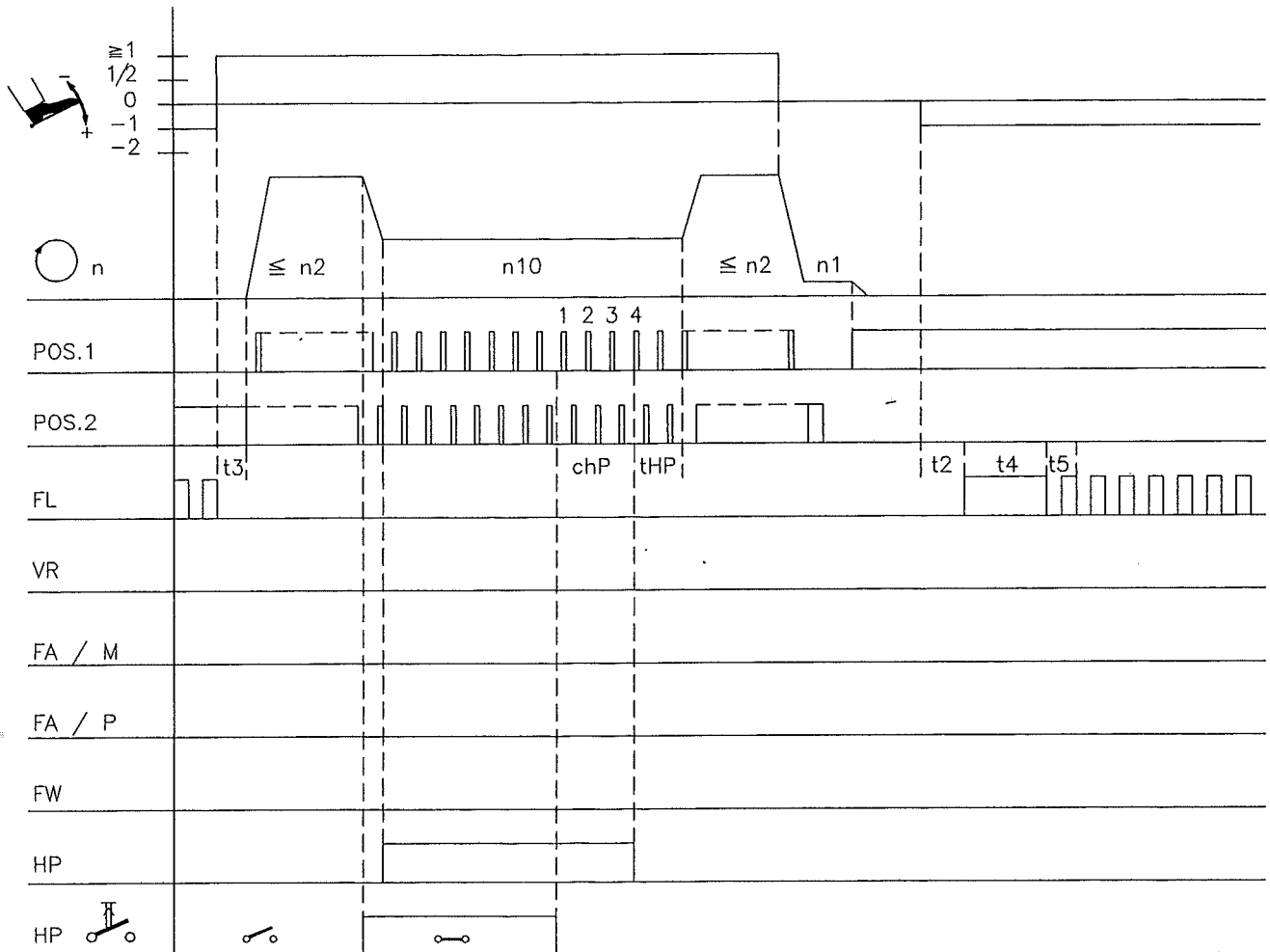
Trimming from intermediate stop



0201/FAZW

Abbreviation	Function	Parameter/Pushbutton
FAr	Softstart on Single initial backtack on Single final backtack on Basic position needle up on Last stitch backward on	F-134 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
n6	Softstart speed	F-115
n7	Trimming speed	F-116
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
cAr	Stitch counting until speed release after initial backtack	F-200

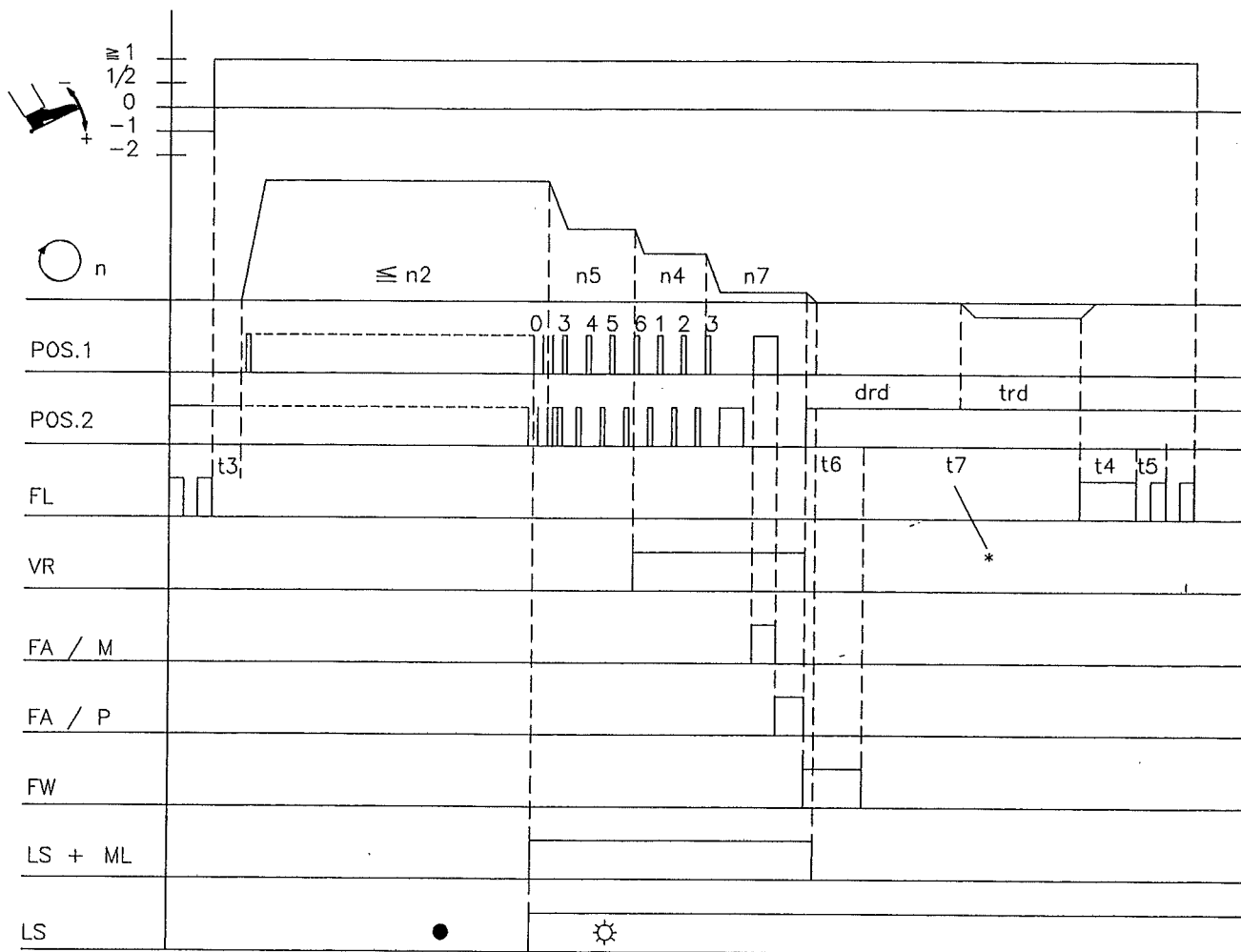
Machine run with high lift walking



0201/LAUFHUB

Abbreviation	Function	Parameter/Pushbutton
	High lift walking operating mode not stored Initial backtack Final backtack	on F-137 off Pushbutton 7 off Pushbutton 8
n1 n2 n10	Positioning speed Maximum speed High lift walking speed	F-110 F-111 F-117
t2 t3 t4 t5 thP chP	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 Run-out time of high lift walking speed Number of stitches high lift walking	F-201 F-202 F-203 F-204 F-152 F-185

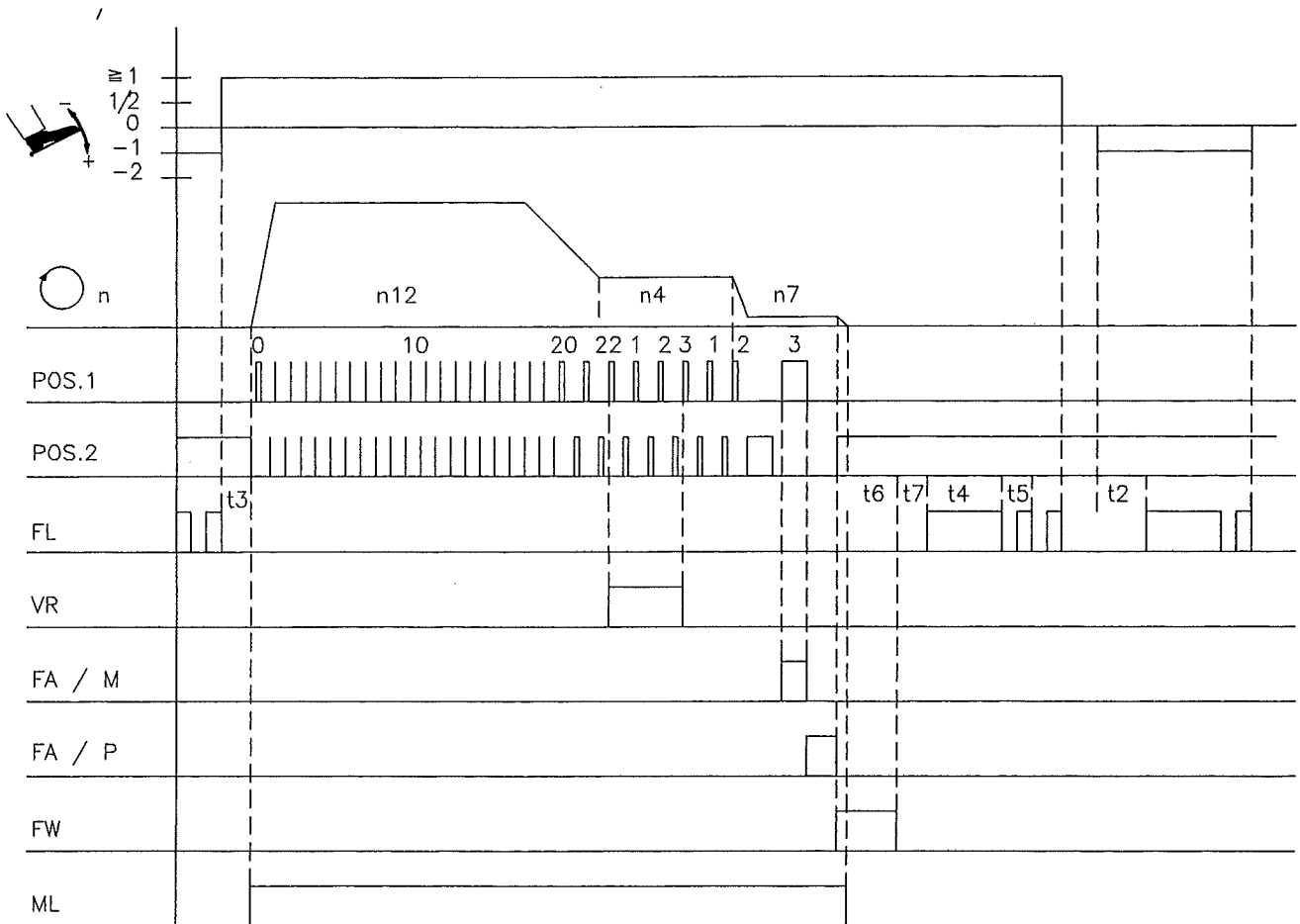
Seam end by light barrier



0201/ENDELS

Abbreviation	Function	Parameter/Pushbutton
FAr	Initial backtack	off Pushbutton 7
	Single final backtack	on Pushbutton 8
	Reversion	on Pushbutton 9
	Light barrier	on Pushbutton 0
	Light barrier covered/uncovered	on F-131
	Last stitch backward	on F-136
n2	Maximum speed	F-111
n4	Final backtacking speed	F-113
n5	Speed after light barrier sensing	F-114
n7	Trimming speed	F-116
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
drd	Delay of reversion	F-181
Ird	Increments of reversion	F-180

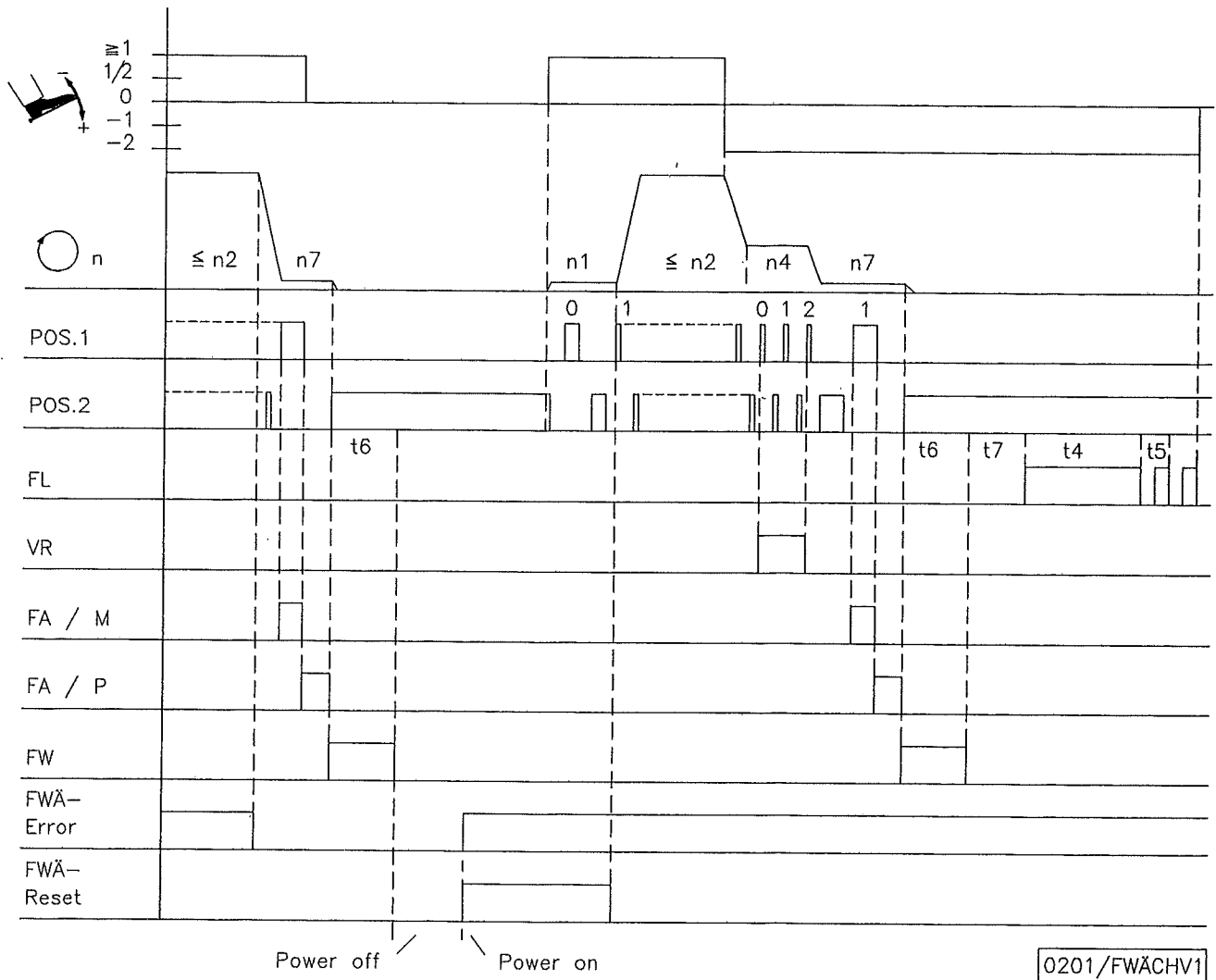
Seam end by stitch counting



0201/ENDEZAE

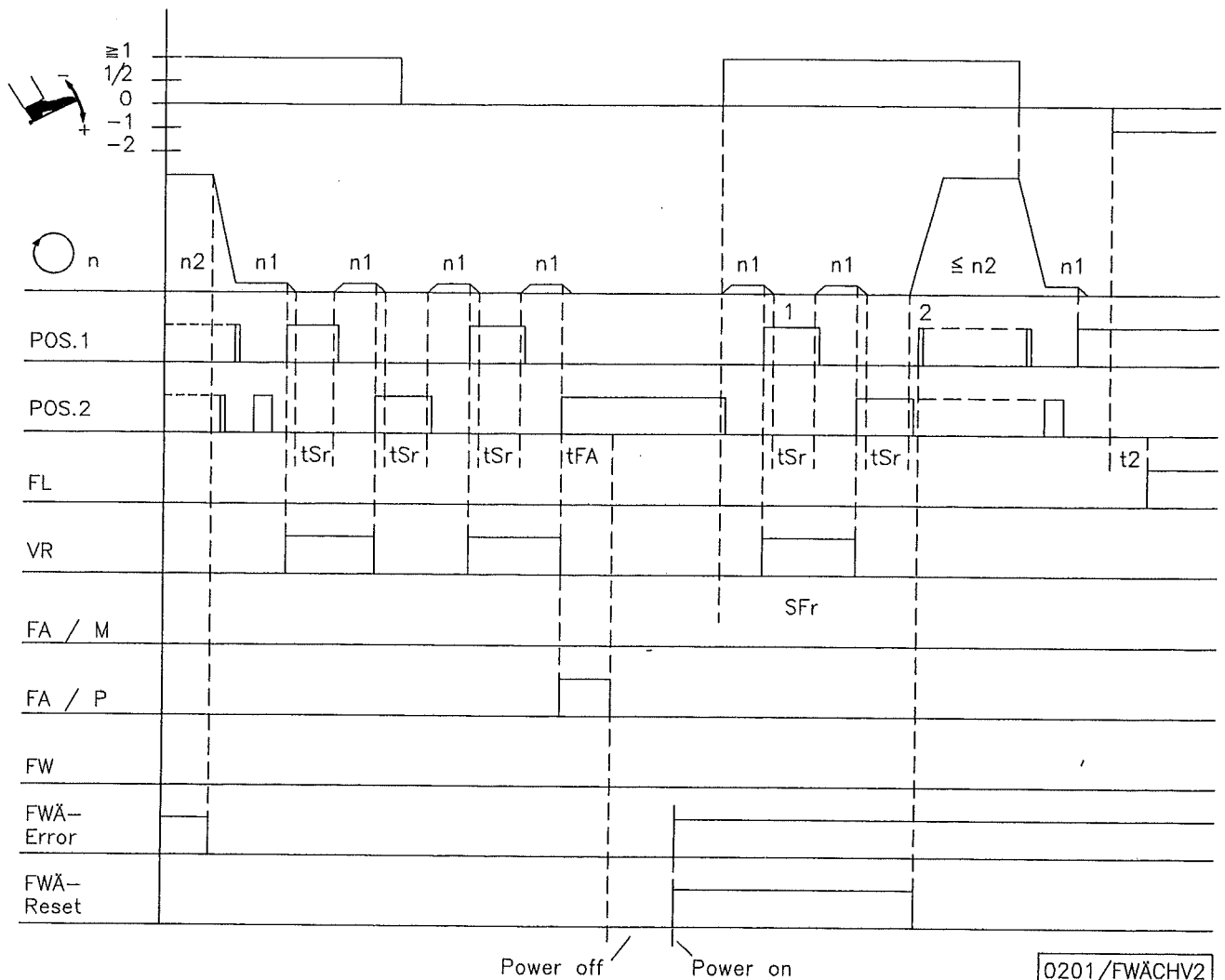
Abbreviation	Function		Parameter/Pushbutton
SGn	Initial backtack Double final backtack Stitch counting Speed mode Stitch counting (limited speed)	off on on	Pushbutton 7 Pushbutton 8 Pushbutton 1 F-141 = 2
n4 n7 n12	Final backtacking speed Trimming speed Stitch counting speed		F-113 F-116 F-118
t3 t4 t5 t6 t7	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-202 F-203 F-204 F-205 F-206

Bobbin thread monitor for magnetic thread trimmer



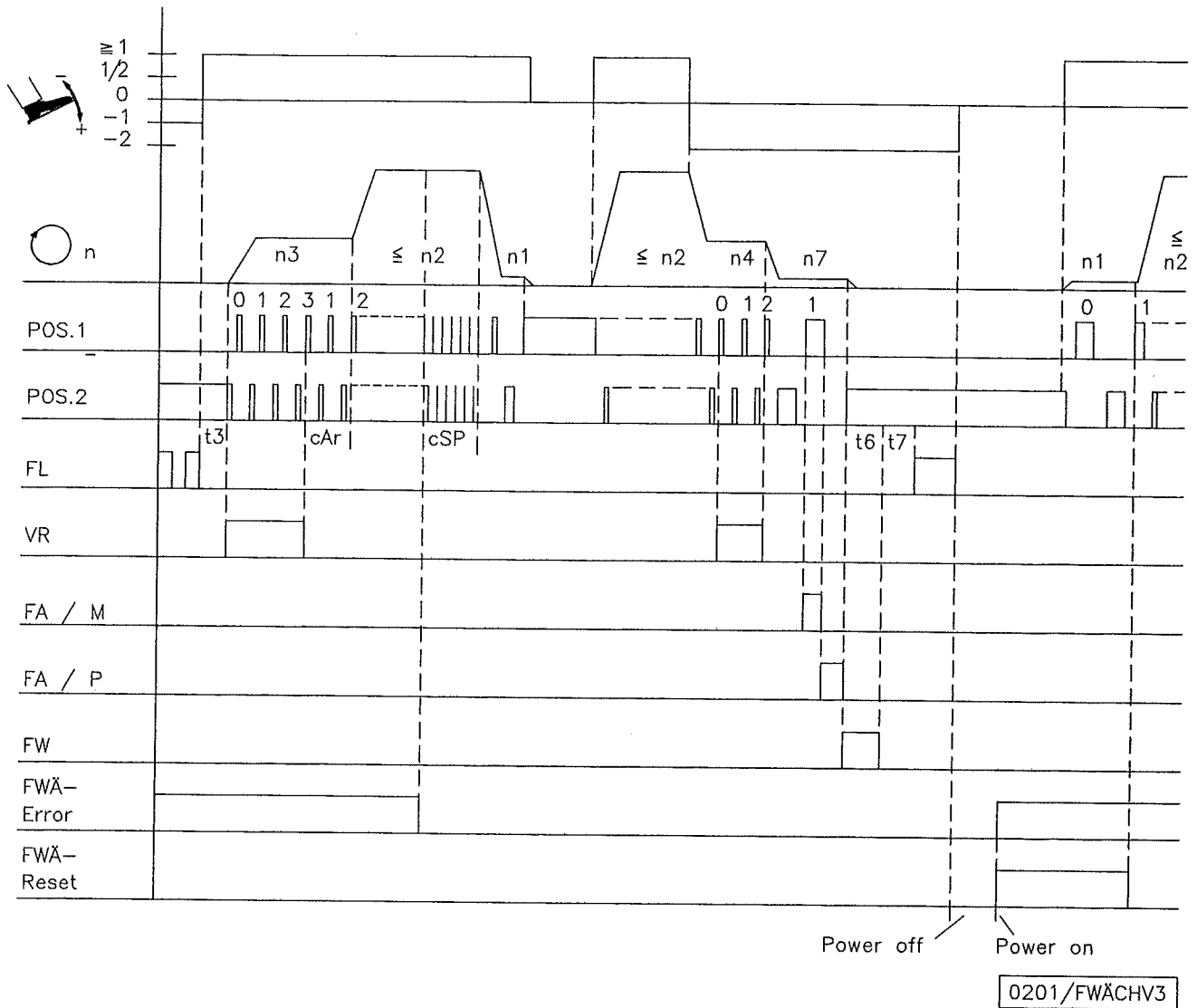
Abbreviation	Function	Parameter/Pushbutton
	Single initial backtack Single final backtack Thread monitor version 1 (magnetic)	on Pushbutton 7 on Pushbutton 8 on F-182 = 1
n2 n3 n4 n7	Maximum speed Initial backtacking speed Final backtacking speed Trimming speed	F-111 F-112 F-113 F-116
t3 t4 t5 t6 t7	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-202 F-203 F-204 F-205 F-206
cAr	Stitch counting until speed release after initial backtack	F-200

Bobbin thread monitor for pneumatic thread trimmer



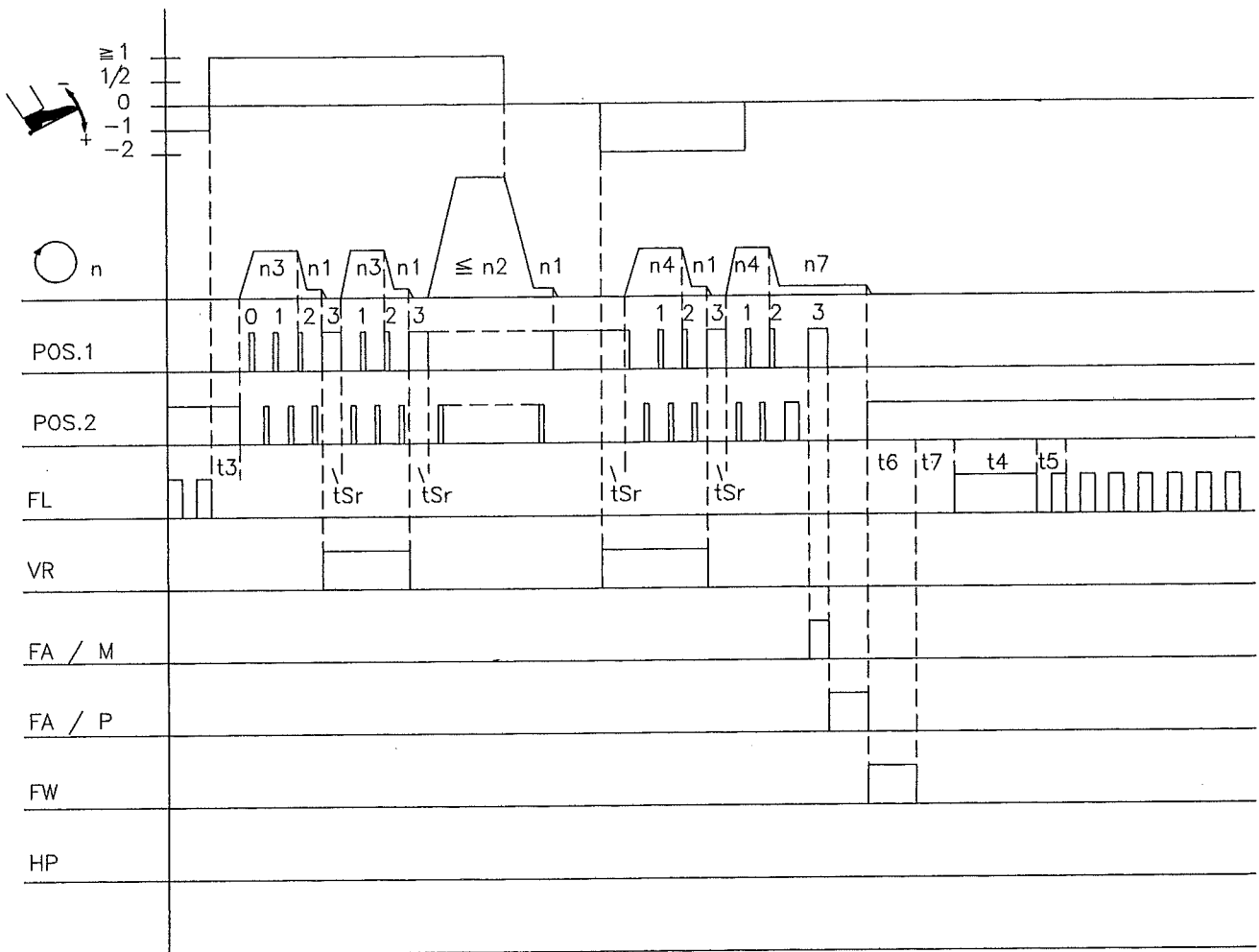
Abbreviation	Function	Parameter/Pushbutton
	Single initial backtack Thread monitor version 2	on on Pushbutton 7 F-182 = 2
n1 n2 n3 n7	Positioning speed Maximum speed Initial backtacking speed Trimming speed	F-110 F-111 F-112 F-116
t2 t3 t4 t5 t6 t7	Delay of presser foot lifting with pedal in position -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 catching	F-201 F-202 F-203 F-204 F-205
tSr tFA SFr	Stop time for ornamental backtack Activation time of the pneumatic thread trimmer Backtack in the case of bobbin thread breakage	F-210 F-183 F-184

Thread monitor version 3



Abbreviation	Function	Parameter/Pushbutton
	Single initial backtack on Single final backtack on Thread monitor version 3 on	Pushbutton 7 Pushbutton 8 F-182 = 3
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
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 catching	F-206

Run with ornamental backtack



0201/LAUZVR

Abbreviation	Function	Parameter/Pushbutton
	Double initial backtack	on Pushbutton 7
	Double final backtack	on Pushbutton 8
	Ornamental backtack	on F-135
	Thread trimmer and thread wiper	on Pushbutton 9
	Presser foot lifting saved after trimming	on Pushbutton 6
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
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
tSr	Stop time for ornamental backtack	F-210

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