

efka variostop

CONTROL

5G82BV2304

with/without control panel V810/V820

INSTRUCTION MANUAL

WITH PARAMETER LIST

No. 0402237

english

efka variostop

CONTROL

5G82BV2222

Replaces 5G62BV / 5G52CP

INSTRUCTION MANUAL

WITH PARAMETER LIST

No. 402192 english

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1. Important Safety Instructions

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

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

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

- Use this drive only for its intended use as described in the instruction manual.
- Use only attachments recommended by the manufacturer or as contained in the instruction manual.
- Do not operate without corresponding protective devices.
- Never operate this drive if one or more parts (e.g. cables, plugs) are damaged, if it is not working properly, if any damages can be identified or are to be suspected (e.g. after it has been dropped). Only qualified personnel are authorized to make adjustments, eliminate faults and complete repair work.
- Never operate the drive with the air openings blocked. Keep ventilation openings of the drive free from the accumulation of lint, dust and loose cloth.
- Never drop or insert any object into any opening.
- Do not use drive outdoors.
- Do not operate where aerosol (spray) products are being used or where oxygen is being administered.
- To disconnect, turn off main switch, then remove plug from outlet.
- Do not unplug by pulling on cord. To unplug, grasp the plug, not the cord.
- Keep fingers away from all moving machine parts. Special care is required e.g. around the sewing machine needle and the V-belt.
- Before mounting and adjusting accompanying devices, i.e. position transmitter, reversing device, light barrier, etc., disconnect drive from mains (turn off main switch, remove mains plug from outlet [DIN VDE 0113 part 301; EN 60204-3-1; IEC 204-3-1]).
- Always switch off (0) machine and remove plug from outlet, when removing covers, mounting accompanying devices, position transmitter especially, light barrier, etc., or any other devices mentioned in the instruction manual.
- Only qualified personnel are authorized to work on the electrical components.
- Work on high voltage circuit areas is forbidden, except as stated in the respective regulations, e.g. DIN VDE 0105 part 1.
- Only specially trained personnel are authorized to complete repair work.
- Cables to be wired must be protected against expectable strain and fastened adequately.
- Cables near moving machine parts (e.g. V-belts) must be wired at a minimum distance of 25 mm (see DIN VDE 0113 part 301; EN 60204-3-1; IEC 204-3-1).
- For safety it is preferred to wire the cables separately from each other.
- Before connecting the mains line make sure that the mains voltage corresponds to the specifications on the motor rating plate and on the nameplate of the power pack.
- Connect this drive to a properly grounded outlet only. See Grounding Instructions.
- Electric accompanying devices and accessories must only be connected to safety low voltage.
- EFKA DC drives are protected according to overvoltage class 2 (DIN VDE 0160 § 5.3.1).
- Observe all safety guidelines before undertaking conversions or modifications.
- For repair and maintenance use only original replacement parts.



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



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

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

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

Save these instructions for future reference.

2. Range of Applications

The drive is suitable for the following industrial sewing machines:

Brand	Series
PFAFF	all with: 900/..., 909/..., 910/..., 911/.. and 5642/900

2.1 Use in Accordance with Regulations

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

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

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

The drive can only be operated:

- on thread processing machines
- in dry areas

3. Complete Drive Unit Consisting of

1	Induction motor with electromagnetic clutch	V....
1	Control	variostop 5G82BV2222
	- Power pack	N30
1	Position transmitter	P5-2
1	Set of standard accessories consisting of:	B10 belt guard, complete (for pulleys up to 132 mm ϕ) set of hardware motor mounting foot bracket 1 and 2, short documentation
1	Set of accessories consisting of	Z3
1	Pulley	pitman rod, complete

3.1 Special Accessories

Variocontrol V720	- part no. 5900124
Variocontrol V730	- part no. 5900125
Belt guard (for pulleys up to 180 mm ϕ)	- part no. 7960012
Storage unit Memory Box MB001	- part no. 7900052
Storage card Memory Card MC001	- part no. 1111602
Reflection light barrier module LSM001	- part no. 6100028
Reflection light barrier Variolux LS-001-004 (only in conjunction with V730)	- part no. 6100007
Solenoid type EM1..(for e.g. presser foot lift, backtacking, etc.)	- available versions see specification "solenoids"
Extension cable for external actuator, approx. 750 mm long, complete with plug and socket connector	- part no. 1111845
Extension cable for external actuator, approx. 1500 mm long, complete with plug and socket connector	- part no. 1111787
5-pin plug with locking screw for the connection of another external actuator	- part no. 0501278
External actuator type EB301 with approx. 250 mm connecting cable and 5-pin plug with locking screw	- part no. 41.0011
External actuator type EB302 (softer spring) approx. 250 mm connecting cable and 5-pin plug with locking screw	- part no. 41.0012
Foot control type FB302 for standing operation with approx. 1400 mm connecting cable and plug	- part no. 4160018
Potential equalization cord 700 mm long, LIY 2.5 mm ² , grey, with forked cable brackets on both sides	- part no. 1100313
Extension cable for position transmitter P5-..., approx. 1100 mm long, complete with plug and socket connector	- part no. 1111584
Extension cable for position transmitter P5-..., approx. 315 mm long, complete with plug and socket connector	- part no. 1111229
Knee switch type KN3 (pushbutton) with cord of approx. 950 mm length without plug	- part no. 58.0013
Sewing light transformer	- please indicate line voltage and sewing light voltage (6.3V or 12V)
3-pin plug with locking screw	- part no. 0500402
4-pin plug with locking screw	- part no. 0500615
6-pin plug with locking screw	- part no. 0500703
6-pin plug (Hirschmann Mes60)	- part no. 0500457
7-pin plug with locking screw	- part no. 0502474
8-pin plug with locking screw	- part no. 0502865

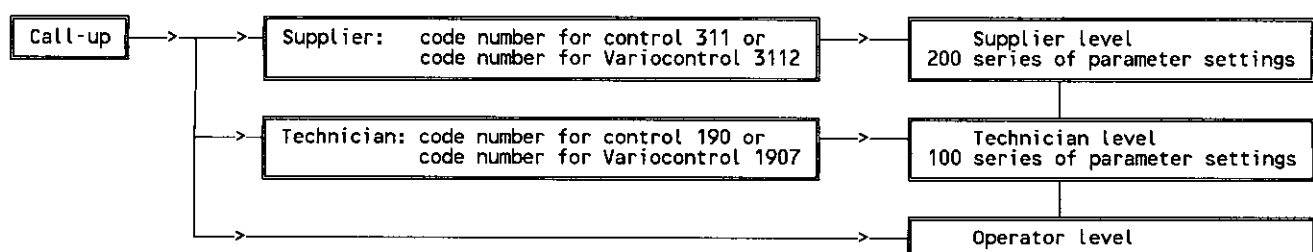
4. Operating the Control without Variocontrol

4.1 Access to Programming on Command Input

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

The following persons have access:

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

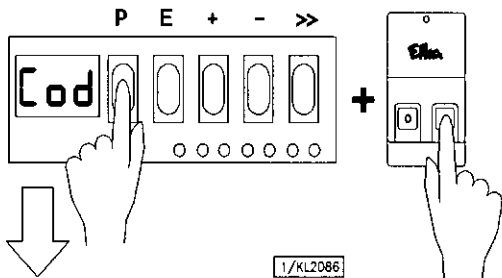


4.2 Programming the Code Number

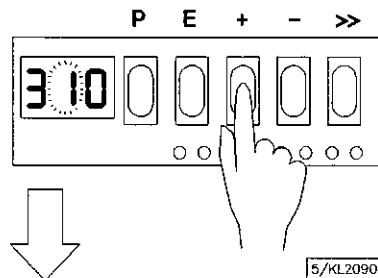
Note

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

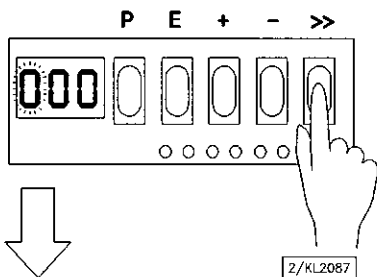
1. Press pushbutton **P** and turn power on



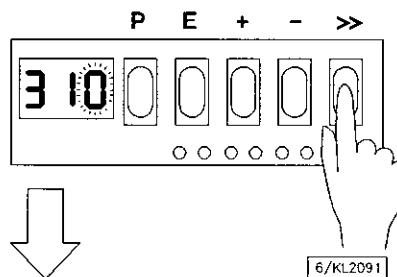
5. Press pushbutton **+** and/or **-** to select the second digit



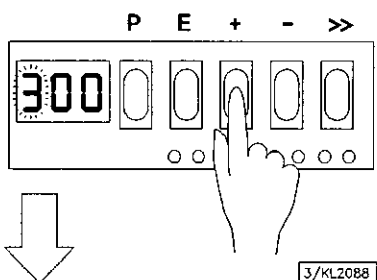
2. Press pushbutton **>>** (first digit blinks)



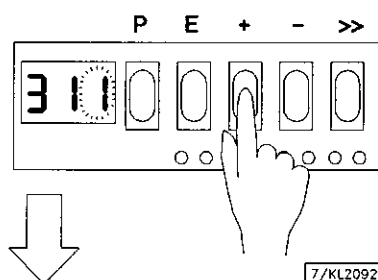
6. Press pushbutton **>>** (third digit blinks)



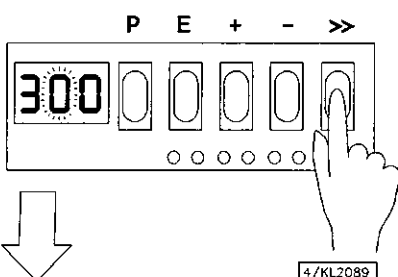
3. Press pushbutton **+** and/or **-** to select the first digit
 Technician level ==> Code no. 190
 Supplier level ==> Code no. 311



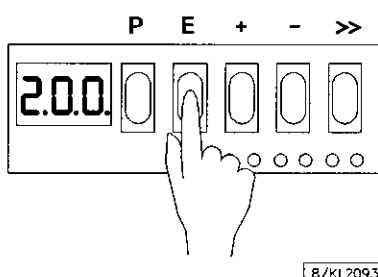
7. Press pushbutton **+** and/or **-** to select the third digit



4. Press pushbutton **>>** (second digit blinks)



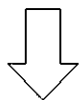
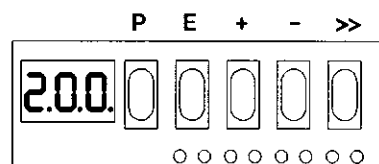
8. Press pushbutton **E**; the parameter number is displayed, which is indicated by points between the digits.



4.3 Selection of the Parameters

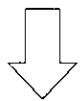
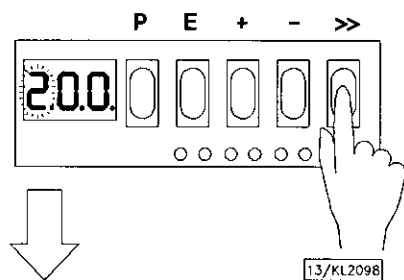
4.3.1 Direct Selection

1. After inputting the code number on the programming level



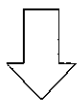
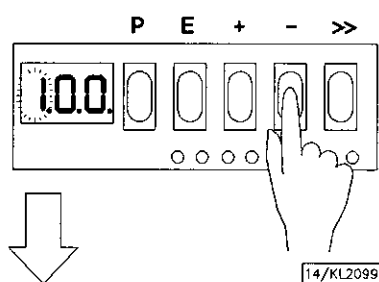
9/KL2094

2. Press pushbutton >> (first digit blinks)



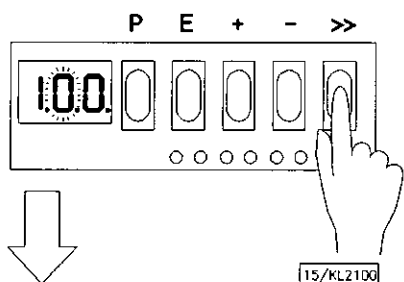
13/KL2098

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



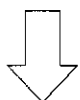
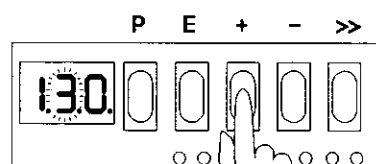
14/KL2099

4. Press pushbutton >> (second digit blinks)



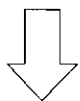
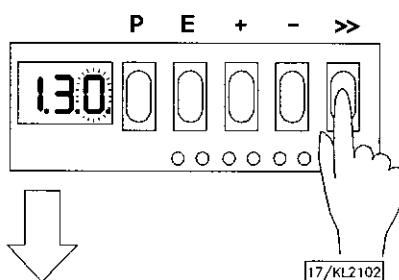
15/KL2100

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



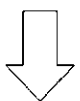
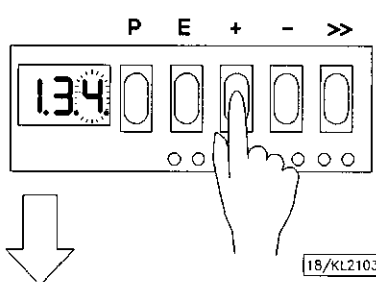
16/KL2101

6. Press pushbutton >> (third digit blinks)



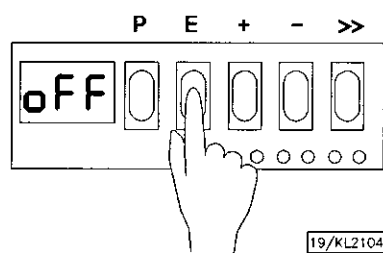
17/KL2102

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



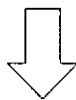
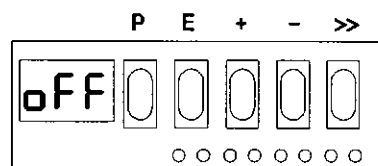
18/KL2103

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



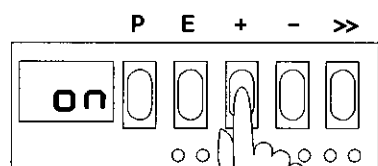
19/KL2104

4.3.2 Changing Parameter Values



20/KL2105

Display after selecting the parameter value

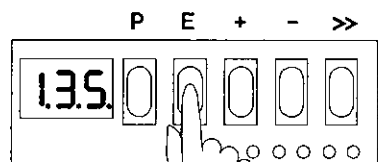


21/KL2106

Change parameter value by pressing pushbutton + and/or -

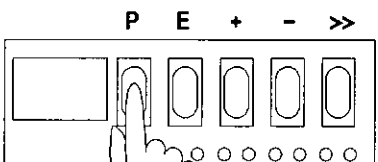
Possibility n° 1:

Press pushbutton E. The next parameter number is displayed.



22/KL2107

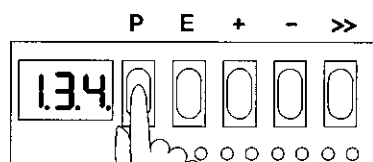
Press pushbutton P. Exit programming. The changed parameter values will only be saved by starting to sew again!



25/KL2111

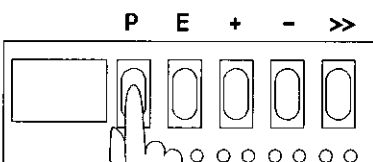
Possibility n° 2:

Press pushbutton P. The same parameter number is displayed.



23/KL2108

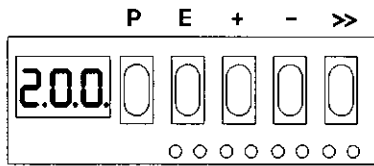
Press pushbutton P. Exit programming. The changed parameter values will only be saved by starting to sew again!



25/KL2111

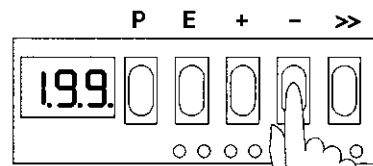
4.3.3 Selection by Using the +/- Pushbuttons

1. After inputting the code number on the programming level



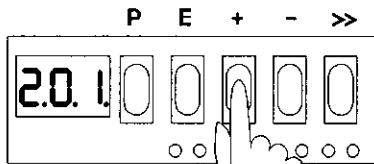
9/KL2094

3. Select previous parameter by pressing the - pushbutton



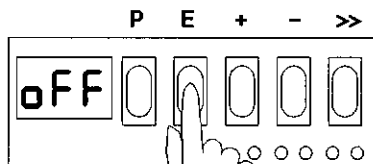
11/KL2096

2. Select the next parameter by pressing the + pushbutton



10/KL2095

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

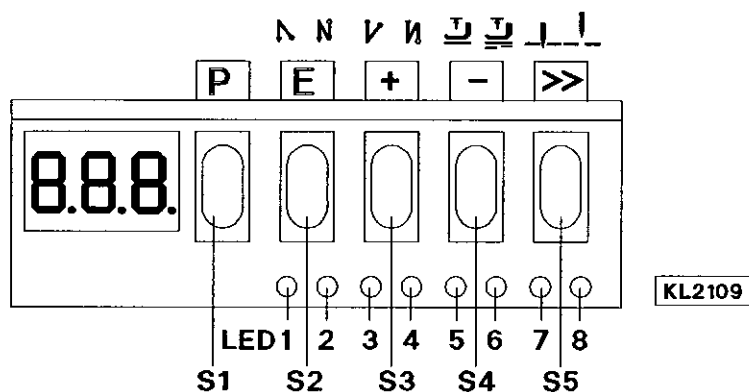


12/KL2097

4.4 Changing All Parameter Values of the Operator Level

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

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



4.5 Switchable Functions

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

Table: Allocation of functions for pushbuttons and LEDs

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

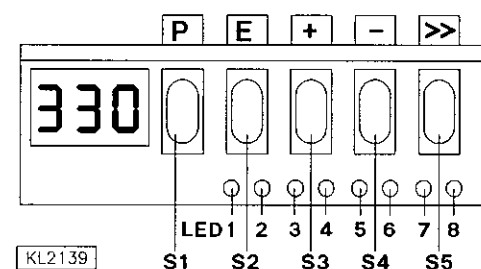
4.6 Direct Input of Maximum Speed Limitation (DED)

The maximum speed of the machine can be limited to the specific level according to the application directly by using pushbuttons +/- on the Variocontrol during machine run or during intermediate stop.

This function is blocked at the start of the seam and/or after the seam end. The actual value is shown on the display and must be multiplied by 10.

Example:

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



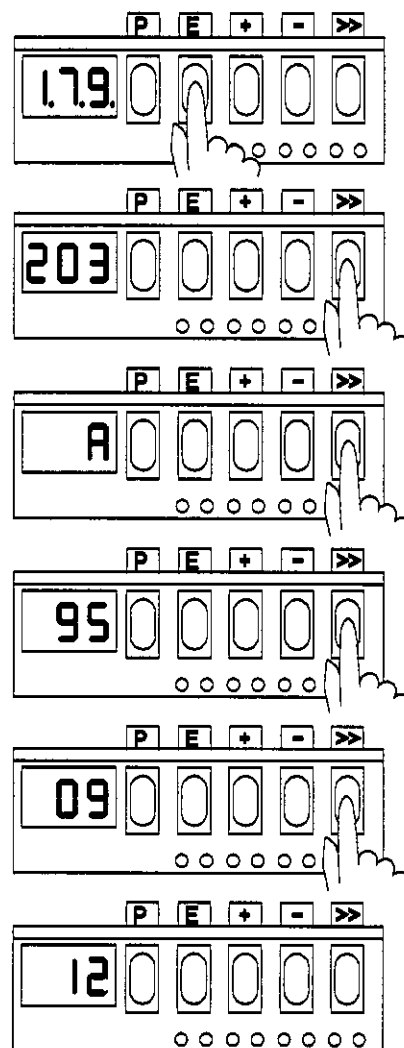
4.7 Program Identification on the Control

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

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

Example:

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



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

5. Operating the Control with Variocontrol

5.1 Code Number Input

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

F-XXX = first parameter number in the recalled level

5.2 Direct Operation

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

Example: Start backtack

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

5.3 Input by Parameters on the Operator Level

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

1. => P => LED pushbutton P blinks ! ==>
 2. => E => Display of the first parameter
parameter no. does not appear ! ==> aaa bbb
- aaa = abbreviation of the parameter
bbb = value of the parameter
3. => + => - => Change parameter value !
 4. => E => PARAMETER VALUE is entered
Display steps to next PARAMETER ==> aaa bbb
- OR
- => P => PARAMETER VALUE is entered ! ==> EXIT PROGRAMMING !

5.4 Input by Parameters on the Technician and Supplier Level

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

F-XXX

1. =>

P

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

F-XXX

2. =>

1

 =>

2

 =>

3

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

E

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

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

F-XXX
aaa bbb
- F-XXX = recalled parameter number
aaa = abbreviation of the parameter
bbb = value of the parameter
4. =>

+

 =>

-

 => Change parameter value !
5. =>

E

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

F-XXX
aaa bbb
- OR
- =>

P

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

F-XXX

- OR
- =>

P

 =>

P

 => Press button twice ==>

EXIT PROGRAMMING !

5.5 Maximum Speed Limitation by Direct Input (DED)

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

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

The actual value is shown on the display.

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

Actual value on the display in the direct mode:

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

=>  =>  => Change value

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

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

Note

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

5.6 Pushbuttons for Background Information (HIT)

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

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

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

5.6.1 Examples for HIT

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

If stitch counting (pushbutton 1) is turned off.

1500 5G82BV	Display after power on: => Maximum speed => Type designation
----------------	--

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

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

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

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

1500 5G82BV	Display after approx. 3 seconds: => Maximum speed => Type designation
----------------	---

If stitch counting (pushbutton 1) is turned on.

1500
5G82BV

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.

1500
5G82BV

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

With the sewing start the new value is saved.

Function key F

By the function key (pushbutton 3) various parameters, also from a higher level, can be switched on or off.
This pushbutton can be set to the following functions of parameter 008:

1. SSt Softstart ON/OFF
2. SrS Ornamental backtack ON/OFF
3. Sht Single stitch with pushbutton needle up/down ON/OFF
4. LSS Sewing start blocked with light barrier uncovered ON/OFF

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

1500
5G82BV

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.

1500 Setting is completed, display:
5G82BV => Maximum speed
=> Type designation

The number of Softstart stitches can be changed as follows:

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

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

SSc 001 Display:
1 stitch is set

+ Press pushbutton +,
number of stitches increases.

SSc 003 Display:
3 stitches are set
Changes are automatically entered after
3 seconds.

1500 Display after approx. 3 seconds:
5G82BV => Maximum speed
=> Type designation

If Softstart (pushbutton 3) is turned on.

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

SSc 001 Display:
1 stitch is set

+ Press pushbutton +,
number of stitches increases.

SSc 003 Display:
3 stitches are set

1500 Display after approx. 3 seconds:
5G82BV => Maximum speed
=> Type designation

With the sewing start the new value is saved.

5.7 Program Identification

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

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

Display example parameter 179:

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

5.8 Display Actual Speed

Functions with Variocontrol	Parameter
Display actual speed nIS	139

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

During machine run:

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

2350

At machine standstill after trimming:

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

3300
XY82ZV

At stop in the seam:

- The stop indication

Stop

6. Starting Service

The machine is ready for operation immediately after:

- mounting the drive and the position transmitter
- adapting the control to the sewing machine
- setting the needle positions on the position transmitter

7. Setting the Basic Functions

7.1 Selection of the Type of Machine

Functions with or without Variocontrol	Parameter
Selection of the type of machine (mFc) 0 = Pfaff industrial sewing machines with 900/..., 909/..., 910/..., 911/.. 1 = Pfaff industrial sewing machine class 5642/900 (replacing 5G52CP...)	190

Depending on the selection of parameter 190 various inputs and outputs are set according to the following table.

Socket	Parameter 190 = 0	Parameter 190 = 1
Outputs: B13/1-2 and/or B14/1-2 B13/3-5 and/or B14/3-5 B15/1-2 and/or B16/1-2 Inputs: B15/3-4 and/or B16/3-4	Magn. thread trimmer Thread wiper Backtacking Intermediate backtack	Revolve roller Lift roller Jam + Pull on thread Needle up/down

See also chapters "Connection Diagram" and "Function Diagrams" !

7.2 Positioning Speed

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

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

7.3 Maximum Speed Compatible with the Sewing Machine

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

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

7.4 Maximum Speed

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

Note:

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

Note:

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

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

7.5 Positions

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



Attention!

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



Attention!

Turn power off before adjusting the positioning discs.



Attention!

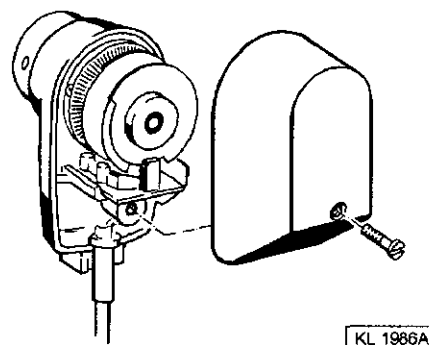
Be very careful when adjusting the positioning discs.

Risk of injury.

Please ensure that positioning discs and generator disc (inner disc) are not damaged.

The positions are set as follows:

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



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

Note:

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

Note:

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

7.6 Display of the Signal and Stop Positions

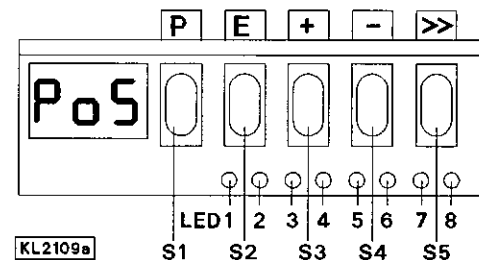
Function with or without Variocontrol	Parameter
Display of positions 1 and 2 (Sr3)	172

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

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

Control display without Variocontrol

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



Display on the Variocontrol

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

7.7 Braking Behavior

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

The braking effect of the drive can be set.

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

7.8 Braking Power at Standstill

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

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

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

7.9 Start Behavior

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

The drive accelerating dynamics can be adapted to the characteristic of the sewing machine (light, heavy).

- High setting value = high acceleration

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

7.10 Speed Gate

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

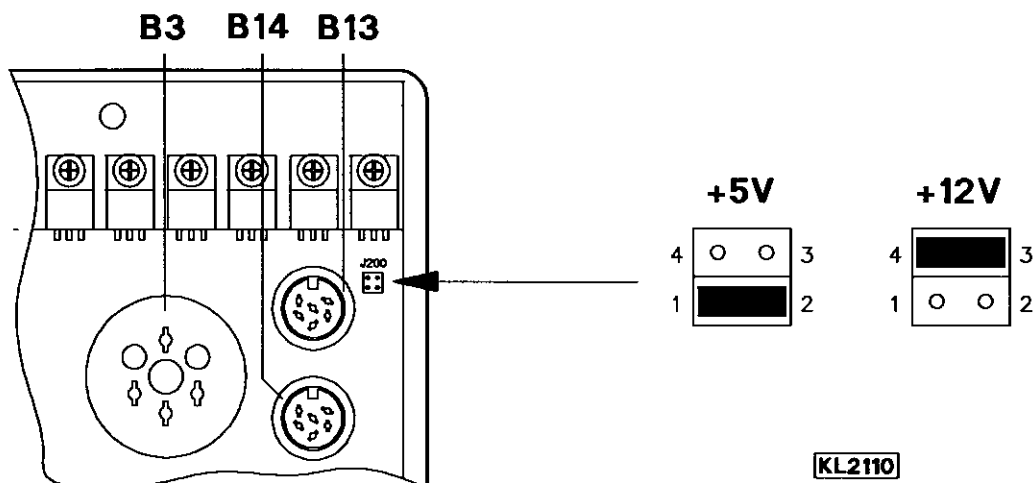
The speed gate setting and the setting of the speed gate damping period are important for exact positioning. The switching point of the speed gate is determined by positioning speed + value in parameter 221; example: $n1 = 180 \text{ RPM} + \text{value } 100 = 280 \text{ RPM}$.

7.11 Supply Voltage 5V and/or 12V

For external devices as for ex. thread monitor, there is a supply voltage of +5V on socket B17/6. After opening the cover, this voltage can be changed to +12V by moving a jumper on the printed circuit board to a different position.

+5V = Connect top pins 1 and 2 with jumper (factory setting)

+12V = Connect bottom pins 3 and 4 with jumper



8. Functions without Variocontrol

8.1 First Stitch After Power On

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

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

8.2 Softstart

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

Function:

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

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

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

8.2.1 Softstart Speed

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

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

8.2.2 Softstart Stitches

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

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

8.3 Presser Foot Lifting

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

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

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

Presser foot is lifted:

- in the seam
 - by heeling the pedal back (position -1)
 - or automatically (by pushbutton S4 on the control, LED 5 lights up)
 - or automatically (by pushbutton 5 on the Variocontrol)
- after thread trimming
 - by pressing the pushbutton on socket B18/1-5, if parameter 242 = 12
 - by heeling the pedal back (position -1 or -2)
 - or automatically (by pushbutton S4 on the control, LED 6 lights up)
 - or automatically (by pushbutton 6 on the Variocontrol)
 - by pressing the pushbutton on socket B18/1-5, if parameter 242 = 12
 - by light barrier, automatically
 - by stitch counting, automatically
 - activation delay after thread wiping (t7)
 - activation delay without thread wiping (tFL)

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

Holding power of the lifted foot:

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

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



Caution!

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

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

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

Foot lowers:

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

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

See also chapter "Timing Diagrams"!

8.4 Start Backtrack

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

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

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

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

Switching on the start backtrack is synchronized to position 1.

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

The counting is synchronized to position 1.

8.4.1 Start Backtracking Speed

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

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

8.4.2 Start Backtrack Stitches

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

The stitches for start backtrack forward and backward can be programmed by the above parameters in the control or on a connected Variocontrol.

The start backtrack stitches can also be varied directly on the control, as described in chapter "Changing All Parameter Values of the Operator Level".

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

8.4.3 Stitch Correction and Speed Release

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

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

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

8.4.4 Double Start Backtrack

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

8.4.5 Single Start Backtrack

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

8.5 End Backtrack

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

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

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

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

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

8.5.1 End Backtacking Speed

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

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

8.5.2 End Backtack Stitches

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

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

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

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

8.5.3 Stitch Correction and Last Stitch Backward

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

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

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

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

8.5.4 Double End Backtack

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

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

For slow backtack mechanisms in the double end backtack the stitch regulator can be disabled with a time-lag of $t9$ (end backtack stitch correction).

8.5.5 Single End Backtack

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

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

8.6 Start Ornamental Backtack

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

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

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

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

Differences from the standard start backtack:

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

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

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

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

8.7 End Ornamental Backtack

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

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

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

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

Differences from the standard start backtack:

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

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

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

8.8 Intermediate Backtack

The backtack solenoid can be switched on anywhere in the seam by the external pushbutton.
See chapter "Connection Diagram" !

8.9 Backtack Suppression/Recall

Effective in standard and ornamental backtack

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

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

The double backtack is performed in the above cases.
See chapter "Connection Diagram" !

8.10 Holding Power of Backtacking

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

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

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



Caution!

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

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

8.11 Blocking of Machine Run (Safety Switch)



Caution!

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

The function "blocking of machine run" is possible by connecting a switch to socket B3/2-3.

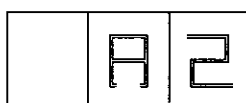
Functions with or without Variocontrol	Parameter
Blocking of machine run (safety switch) (LSP)	280 = ON

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

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

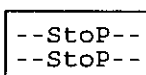
Display on the control !

==>



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

Display on the Variocontrol ! ==>
Symbol blinking alternately !



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

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

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

Blocking of machine run in the start backtack:

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

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

Blocking of machine run in the end backtack:

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

- Presser foot lifting is possible

New start after blocking of machine run

A new start after closing the switch is only possible if the pedal was in position 0 (neutral).

8.12 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 with or without Variocontrol	Parameter
Thread monitor On/Off (SSF)	080
Thread monitor status (SSF)	182
Activation time of thread monitor in the case of a thread error (tFA)	183
Number of backtacking stitches in the case of a thread error (SFr)	184
Number of stitches until stop in the case of a thread error (cSP)	189

Status thread monitor 0 = thread monitor off
 1 = version for magnetic thread trimmer
 2 = version for pneumatic thread trimmer
 3 = version for stop without thread trimming

**Attention!**

Turn power off before changing the thread or the bobbins.

8.12.1 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.

Start backtack:

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

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

Seam with stitch counting (only in conjunction with a Variocontrol):

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

End backtack:

After recognition of an empty bobbin, the end backtack is completed, 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 completed. 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.

8.12.2 Bobbin Thread Monitor 926/01

In each seam section, a special backtack is initiated and the end 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 (parameter 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 184.

Start backtack:

After recognition of an empty bobbin, the start backtack is completed. 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 (only in conjunction with a Variocontrol):

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 completed. 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 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!

End 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!

8.12.3 Bobbin Thread Monitor 926/04

In each seam section, after recognition of the empty bobbin, the thread monitor module activates a counting (parameter 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 start and end backtack are only executed after a stop in the basic position has been initiated.

8.12.4 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.

8.13 Thread Trimmer

Function without Variocontrol	Parameter
Thread trimmer On/Off	013

Function with Variocontrol	Pushbutton
Thread trimmer On/Off	Pushbutton 9

8.13.1 Trimming Speed

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

The thread trimming is performed at trimming speed.

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

8.14 Thread Wiper

Function without Variocontrol	Parameter
Thread wiper On/Off	014

Function with Variocontrol	Pushbutton
Thread wiper On/Off	Pushbutton 9

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

The thread wiper can only be switched on if the thread trimmer is on as well.

The operating time (t6) is set by parameter 205.

The return time (t7), which can be set by parameter 206, prevents presser foot lifting before the thread wiper is in its basic position.

If a thread wiper is not connected there will be a time lag tFL after thread trimming until the presser foot is lifted.

8.15 Machine Class 5642/900 (Function as with 5G52CP)

(If parameter 190 = 1)

Function with or without Variocontrol	Parameter
Machine class 5642/900 is activated	190 = 1

At this setting of parameter 190 various inputs and outputs are set to the following signals.

Output: Socket B13/1-2 and/or B14/1-2 ==> Revolve roller
 Socket B13/3-5 and/or B14/3-5 ==> Lift roller
 Socket B15/1-2 and/or B16/1-2 ==> Jam + Pull on thread

Input: Socket B15/3-4 and/or B16/3-4 ==> Needle up/down

See also chapter "Connection Diagram".

Function with or without Variocontrol	Parameter
Thread trimmer until new start / over time (FFA)	190
Delay time revolve roller (ddr)	192
Activation time revolve roller (tdr)	193
Activation time thread trimmer and/or delay time lift roller (SFA)	194

Parameter 191 = 0: The thread trimmer remains activated until the next start.
 See chapter "Function Diagrams" sequence 2.

Parameter 191 = 1: The thread trimmer is activated for the time set by parameter 194.
 See chapter "Function Diagrams" sequence 1.

8.15.1 Needle Up / Single Stitch

Function with or without Variocontrol	Parameter
Switching between needle up / single stitch (Sht)	140

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 external pushbutton on socket B12/2, 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.

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

Functions with Variocontrol	Parameter
Single stitch On/Off (-F-)	008 = 3

8.16 Seam with Stitch Counting

Functions without Variocontrol	Parameter
Stitch counting On/Off	015

Functions with Variocontrol	Pushbutton
Stitch counting On/Off	Pushbutton 1

8.16.1 Stitches for Stitch Counting

Functions with Variocontrol	Parameter
Number of stitches for a seam with stitch counting (Stc)	007

8.16.2 Stitch Counting Speed

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

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

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

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

8.16.3 Seam with Stitch Counting When Light Barrier Is On

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

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

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

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

8.17 Free Seam and Seam with Light Barrier

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

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

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

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

8.18 Light Barrier

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

8.18.1 Speed after Light Barrier Sensing

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

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

8.18.2 General Light Barrier Functions

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

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

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

Functions with Variocontrol	Parameter
Sewing start blocked with light barrier uncovered On/Off (-F-)	008 = 3

8.18.3 Reflection Light Barrier

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

Adjustments

Sensitivity:

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

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

Mechanical Adjustment:

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

8.18.4 Automatic Start by Light Barrier

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

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

The following conditions must be met:

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

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

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

8.18.5 Light Barrier Filter for Knitted Fabrics

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

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

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

8.18.6 Heelback Blocked

Functions with or without Variocontrol	Parameter
Heelback blocked (-1, -2) On/Off (EPd)	281

After switching parameter 281 on it is possible to prevent the activation of the functions initiated by heelback (presser foot lifting, thread trimming).

The blocking for pedal position -1, -2 is also effective if parameter 142 = 3.

This function is only effective, when the light barrier is on!

8.18.7 Functional Variations of the Light Barrier Input

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

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

The following input functions are possible by parameter 242:

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

- 242 = 6 **Blocking of machine run effective with open contact**
When opening the switch the drive stops in the preselected basic position.
- 242 = 7 **Blocking of machine run effective with closed contact**
When closing the switch the drive stops in the preselected basic position.
- 242 = 8 **Blocking of machine run effective with open contact (unpositioned)**
When opening the switch the drive stops immediately unpositioned
- 242 = 9 **Blocking of machine run effective with closed contact (unpositioned)**
When closing the switch the drive stops immediately unpositioned
- 242 = 10 **Run at automatic speed (n12)**
When pressing the pushbutton the drive runs at automatic speed. The pedal is not used.
- 242 = 11 **Run at limited speed (n12)**
When pressing the pushbutton the drive runs at limited speed. The pedal must be pushed forward.
- 242 = 12 **Presser foot lifting with pedal in position 0 (neutral)**

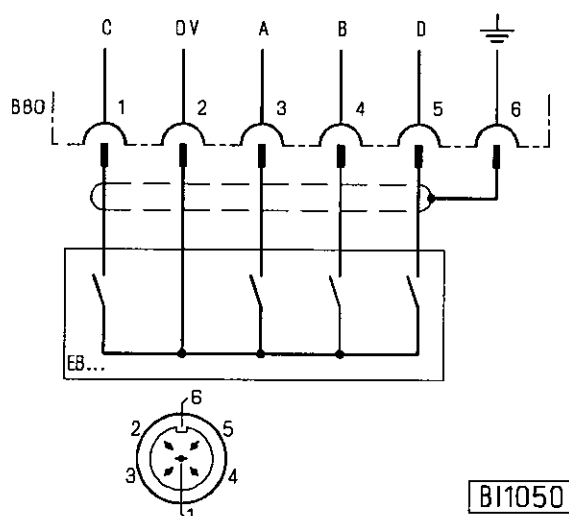
8.19 Actuator

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

Table: Coding of the pedal steps

Pedal step	D	C	B	A
-2	H	H	L	L
-1	H	H	H	L
0	H	H	H	H
½	H	H	L	H
1	H	L	L	H
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	H	L
11	L	H	H	L
12	L	H	H	H

Full heelback (e.g. initiating the seam end)
Slight heelback (e.g. presser foot lifting)
Pedal in position 0 (neutral)
Pedal slightly forward (e.g. presser foot lowering)
Speed stage 1 (n1)
.
.
.
.
.
.
.
.
.
Speed stage 12 (n2)
(Pedal fully forward)



B11050

EB... - Actuator

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

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

Possible characteristic curves:

- linear
- progressive
- highly progressive

9. Additional Functions by Using a Variocontrol

9.1 Operation with Two Light Barriers

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

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

9.2 Programming Seams (Teach-in)

- A maximum of 8 patterns with a total of 40 seams can be established.
- Programming is possible only if no code number was input after switching on!
- The functions start backtack, end backtack, stitch counting, thread trimming and presser foot lifting can be assigned individually to each seam.
- **Backward sewing** by reversing the feeding direction can only be programmed in the teach-in mode.

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

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

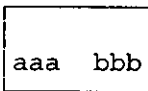
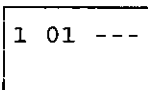
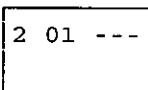
9.2.1 Teach-in Mode

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

Display configuration:

X	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 =>		==>	LED pushbutton P blinks on the operator level	==>	
2 =>		==>	Display of a parameter	==>	
3 =>		==>	LED pushbutton 2 blinks Entry into pattern and seam programming!	==>	
4 =>		==>	Changing the pattern number!	==>	

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

9.2.1.1 Seam with Stitch Counting

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

9.2.1.2 Backward Seam with Stitch Counting

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

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

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

9.2.1.3 Stitch Counting and/or Light Barrier

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

With V720/V730!

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

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

After programming the functions

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

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

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

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

Note

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

Note

The patterns are permanently saved only after the sewing start.

9.2.1.4 Detailed Example

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

Display before programming		==>	XXXX XY82ZV
1. => P	=> LED pushbutton P blinks	==>	
2. => E	=> Display of a parameter on the operator level	==>	aaa bbb
3. => 2	LED pushbutton 2 blinks => Pattern 1, seam 1	==>	1 01 ---
4. => 2	LED pushbutton 2 blinks => Pattern 2, seam 1	==>	2 01 ---
5. => 2	LED pushbutton 2 blinks => Pattern 3, seam 1	==>	3 01 ---
6. => 2	LED pushbutton 2 blinks => Pattern 4, seam 1	==>	4 01 ---
7. => 7	Bottom LED pushbutton 7 lights up => Single start backtack is on	==>	4 01 ---
8. => 6	LED pushbutton 6 lights up => Foot lifting at the seam end is on	==>	4 01 ---
9. => 1	=> Stitch counting is on	==>	4 01 000
10. => + => -	Changing the number of stitches by pushbuttons or by using the pedal		4 01 017
	=> Seam length of 17 stitches is set		
11. => E	=> Pattern 4, seam 2	==>	4 02 ---
12. => 1	=> Stitch counting is on	==>	4 02 000
13. => + => -	Changing the number of stitches by pushbuttons or by using the pedal		4 02 008
	=> Seam with 8 stitches is set		
14. => E	=> Pattern 4, seam 3 Free seam is selected	==>	4 03 ---

15. =>	0	=> Light barrier is activated	==>	4 03 --- LS 000
16. =>	+	=> - Changing the stitches by pushbuttons / 5 compensating stitches are set		4 03 --- LS 005
17. =>	8	=> Top LED pushbutton 8 lights up Single end backtack is on	==>	4 03 --- LS 005
18. =>	9	=> Bottom LED pushbutton 9 lights up Thread trimmer is on	==>	4 03 --- LS 005
19. =>	E	=> Pattern 4, seam 4 By changing to the next seam the settings of the preceding seams are automatically entered.	==>	4 04 ---
20. =>	P	=> Exit programming, first seam can be executed	==>	4 01 017

9.2.2 Max. Number of Seams Exceeded

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

A further sewing start is impaired.

The display shows the warning below.

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

Display:

DELETE
X YY NN

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

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

=> 2 => Call-up of the pattern to be deleted

DELEtE
X YY NN

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

=> P => Deletion of the pattern

DELEtE
X YY NN

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

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

9.2.3 Execution (Pattern) Mode

1. $\Rightarrow$ 2 Switch on mode by pushbutton 2
(LED lights up) $\Rightarrow$ X 01 ZZZ
 2. $\Rightarrow$ + $\Rightarrow$ - Select pattern 1...8
- Seam number 01 is displayed $\Rightarrow$ X 01 030
 3. $\Rightarrow$ E If one should not start with seam 1
select different seam number
- Push button E several times
until desired seam number is displayed $\Rightarrow$ 2 05 ZZZ
- The pattern can now be started by pushing the pedal.
4. $\Rightarrow$ 2 Exit the execution (pattern) mode
- Switch off by pressing pushbutton 2

10. Memory Box

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

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

A maximum of 10 different programs (data records) can be stored, each with the total program contents of the control.

10.1 Preparation for Memory Box Operation



Caution! - Turn power off

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

10.2 Formatting of the Memory Card

The Memory Card is the storage medium for the programs.

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

Note:

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

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

10.3 Operating the Memory Box

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

Note:

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

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

SAvE
0--9
- Input any address between 0 and 9 for the data record.
 - The yellow BUSY-LED on the Memory Box lights up.
 - In case a data record already exists under the selected reference number, it will be overwritten.

SAvE
|||||
- Display after the storing is completed

1500
5G82BV
- 4. » Reading data from the Memory Card into the control (2 possibilities)

Possibility:

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

rEAd
0--9
 - Input address under which the desired data record is stored.

Note:

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

Possibility:

Push pedal twice in short intervals, after the seam end.

Save
0--9

Push pedal fully forward and put back to position 0 (neutral)

rEAd
0--9

Input address under which the desired data record is stored.

- The yellow BUSY-LED on the Memory Box lights up.

rEad
|||||

Display after saving the program.

1500
5G82BV

Note:

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

5. » 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!

6. » Operation without Variocontrol

Writing and reading is done by pushing the pedal as described in step 3 and 4.

Data record 1 is always automatically selected.

Reading-in is only possible if power is turned on with pedal fully forward.

7. » Error messages

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

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 178. All additional information is then shown in the corresponding language.

dEU USA
ESP FrA

11. Signal Test

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

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

11.1 Signal Test with Variocontrol

Output test:

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

Pushbutton	Output
1	Backtacking / Jam + Pull on thread
2	Presser foot lifting
3	Magnetic thread trimmer / Revolve roller
4	Pneumatic thread trimmer
5	Thread wiper / Lift roller
6	Motor running
7	free
8	free
9	free
0	Reset thread monitor

Input test:

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

11.2 Signal Test without Variocontrol

Output test:

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

Pushbutton	Output
01	Backtacking / Jam + Pull on thread
02	Presser foot lifting
03	Magnetic thread trimmer / Revolve roller
04	Pneumatic thread trimmer
05	Thread wiper / Lift roller
06	Motor running
07	free
08	free
09	free
10	Reset thread monitor

Input test:

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

12. Error Messages

General Information

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

Programming of Functions and Values (Parameters)

Display	Signification
Info F1	Wrong code number or parameter number input

Serious Situation

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

Hardware Disturbance

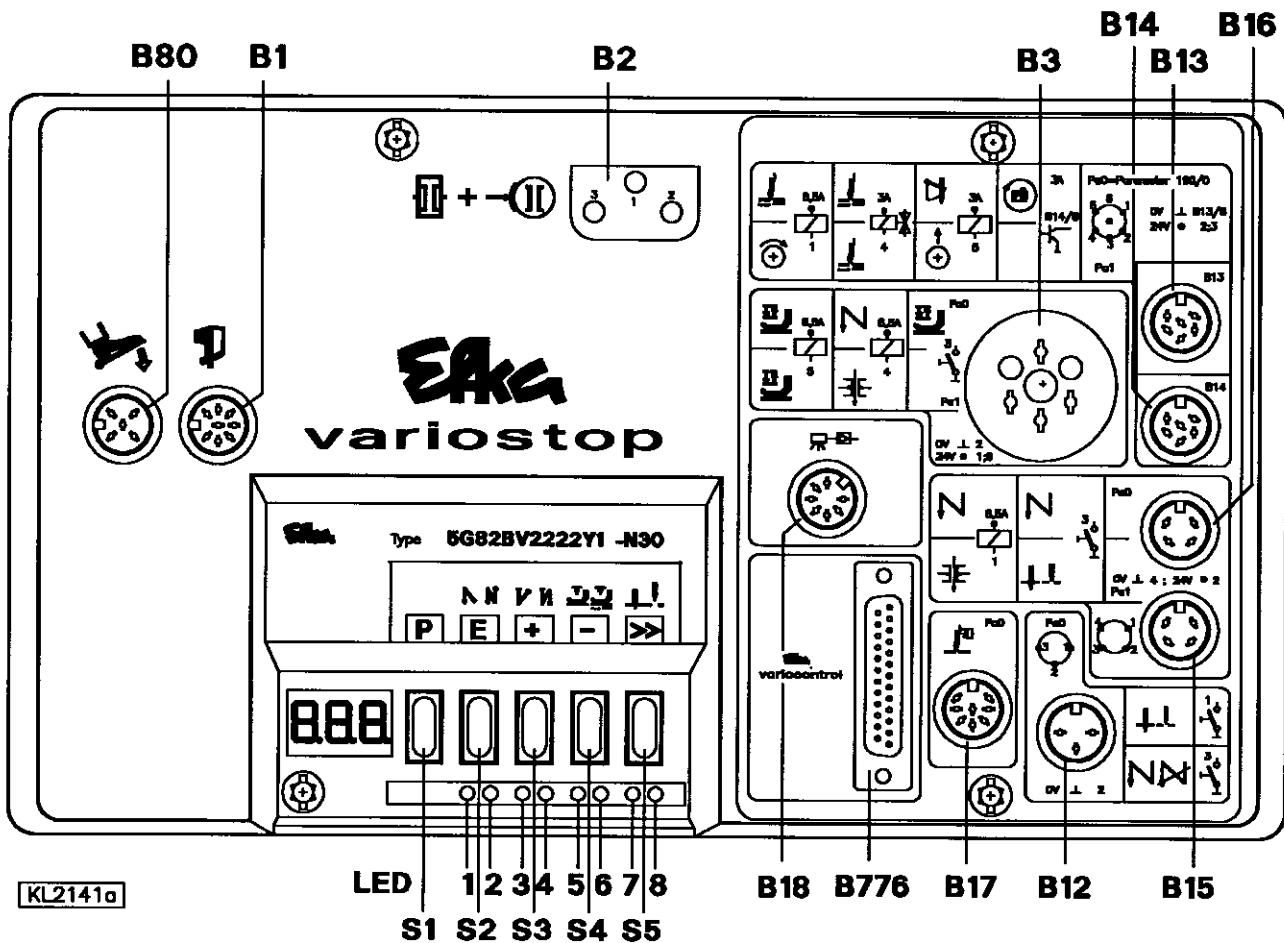
Display	Signification
Info H2	Processor disturbed

Memory Card Information

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

13. Socket Connectors

13.1 Position in the Control

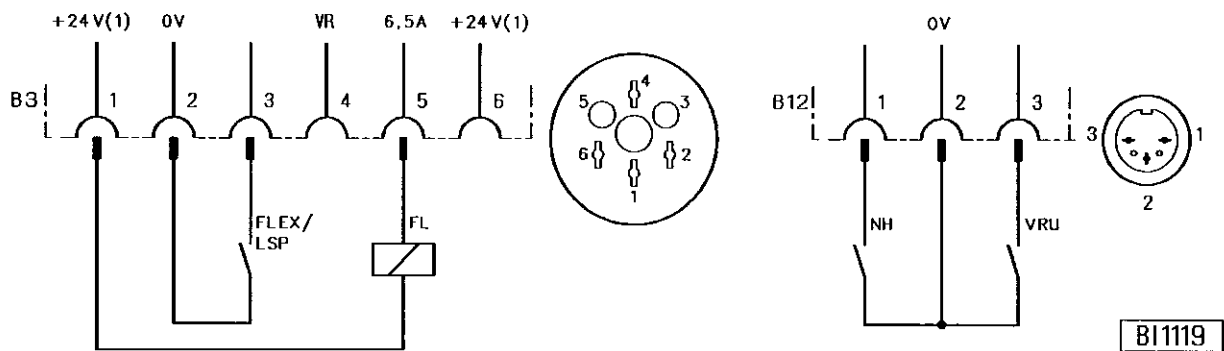


- B1 - Position transmitter
- B2 - Clutch/brake of the motor
- B3 - Machine
- B12 - Pushbuttons
- B13 - Machine
- B14 - Machine
- B15 - Machine
- B16 - Machine
- B17 - Thread monitor
- B18 - Light barrier module
- B80 - Actuator
- B776 - Control panel Variocontrol

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

LED 1..8 - Indicators for switched on functions

13.2 Connection Diagram

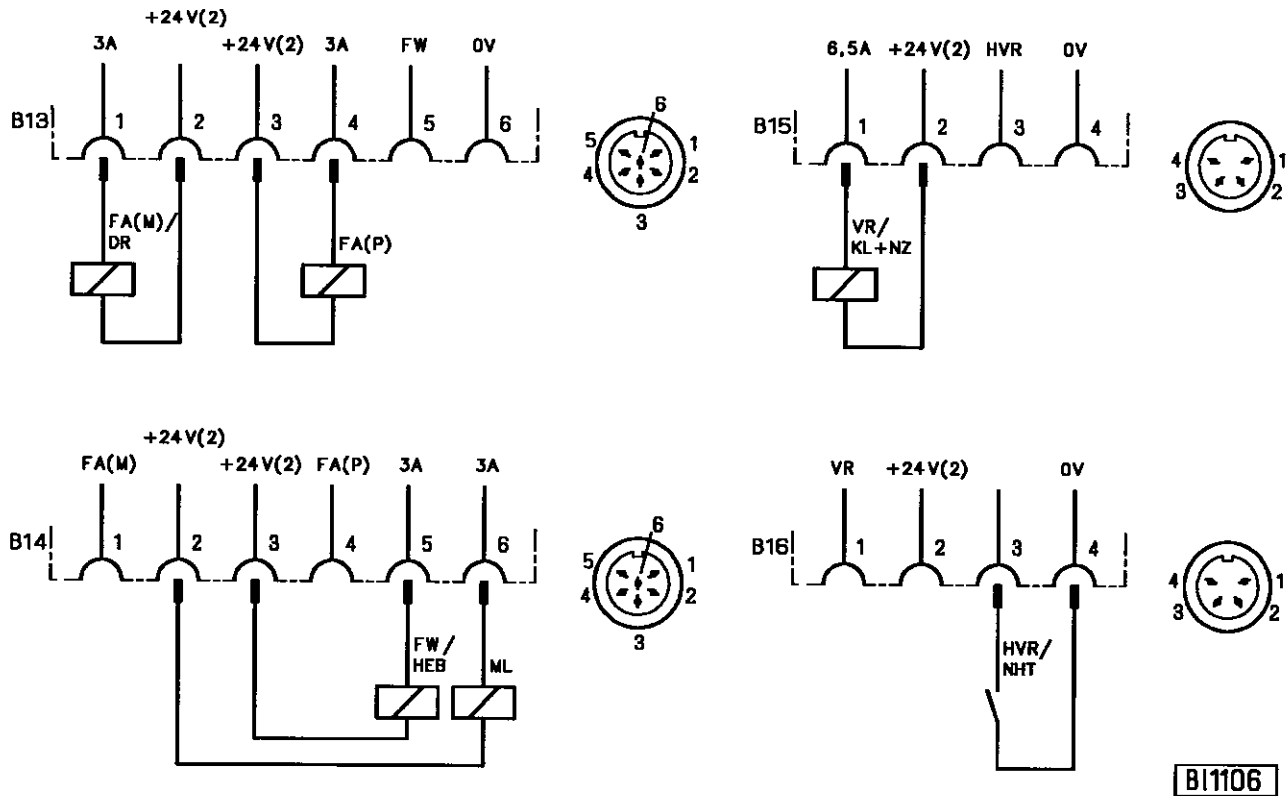


Attention!

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

- FL - Presser foot lifting
- FLEX - External activation of presser foot
- LSP - Blocking of machine run
- NH - Needle up
- VRU - Backtack suppression/recall

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



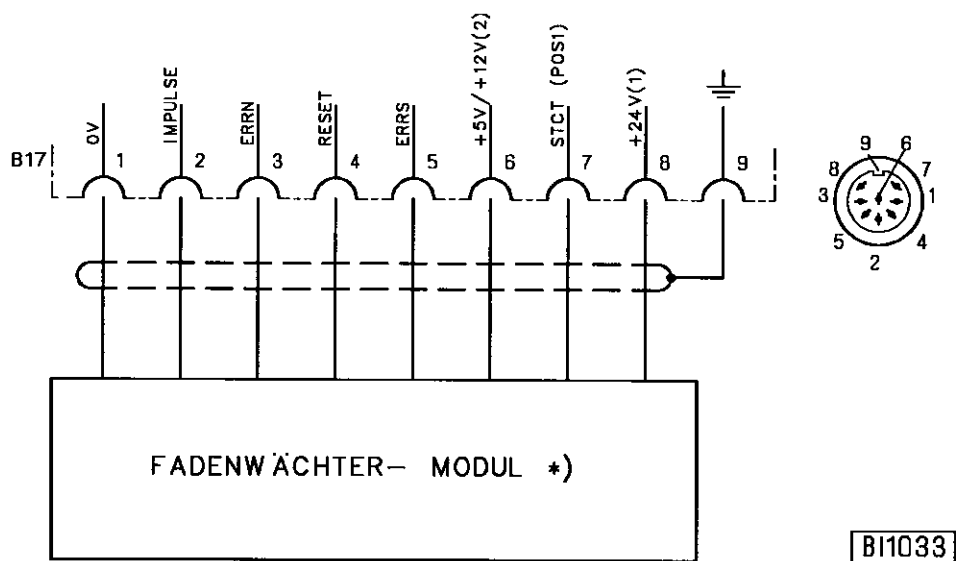
Attention!

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

FA(M) - Thread trimmer (magnetic)
 DR - Revolve roller
 FA(P) - Thread trimmer (pneumatic)
 VR - Backtacking
 KL+NZ - Jam + Pull on thread
 FW - Thread wiper
 HEB - Lift roller
 ML - Machine running

with parameter	190 = 0
" "	190 = 1
" "	190 = 0
" "	190 = 0
" "	190 = 1
" "	190 = 0
" "	190 = 1
HVR	- Intermediate backtack
NHT	- Needle up/down
" "	190 = 0
" "	190 = 1

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

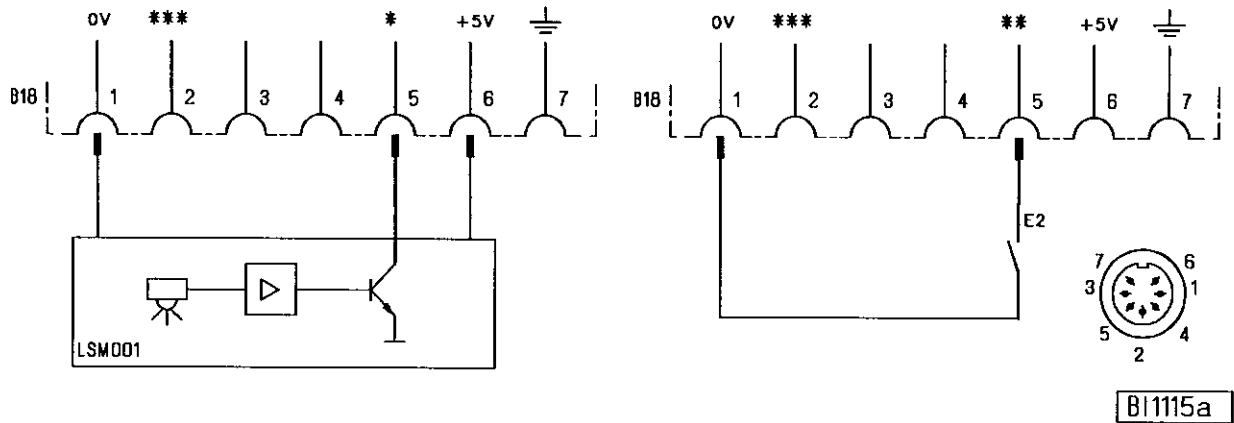


*) - Thread monitor module

512 IMPULSE	- 512 impulses / rotation
ERRN	- Needle thread monitor
ERRS	- Bobbin thread monitor
STCT	- Stitch counting (POS1)

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

2) Output +5V, 250 mA (can be changed to 12V, 250 mA after opening the cover)



LSM001 - Reflection light barrier module

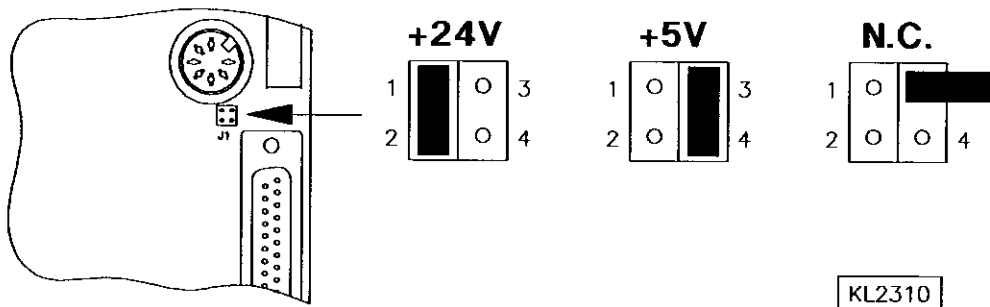
- * - Parameter 242 = 0 => Light barrier function is selected (identified when switched to 0V)
- ** - Parameter 242 = 1...12 => Various input functions are possible on socket B18/5



Attention!

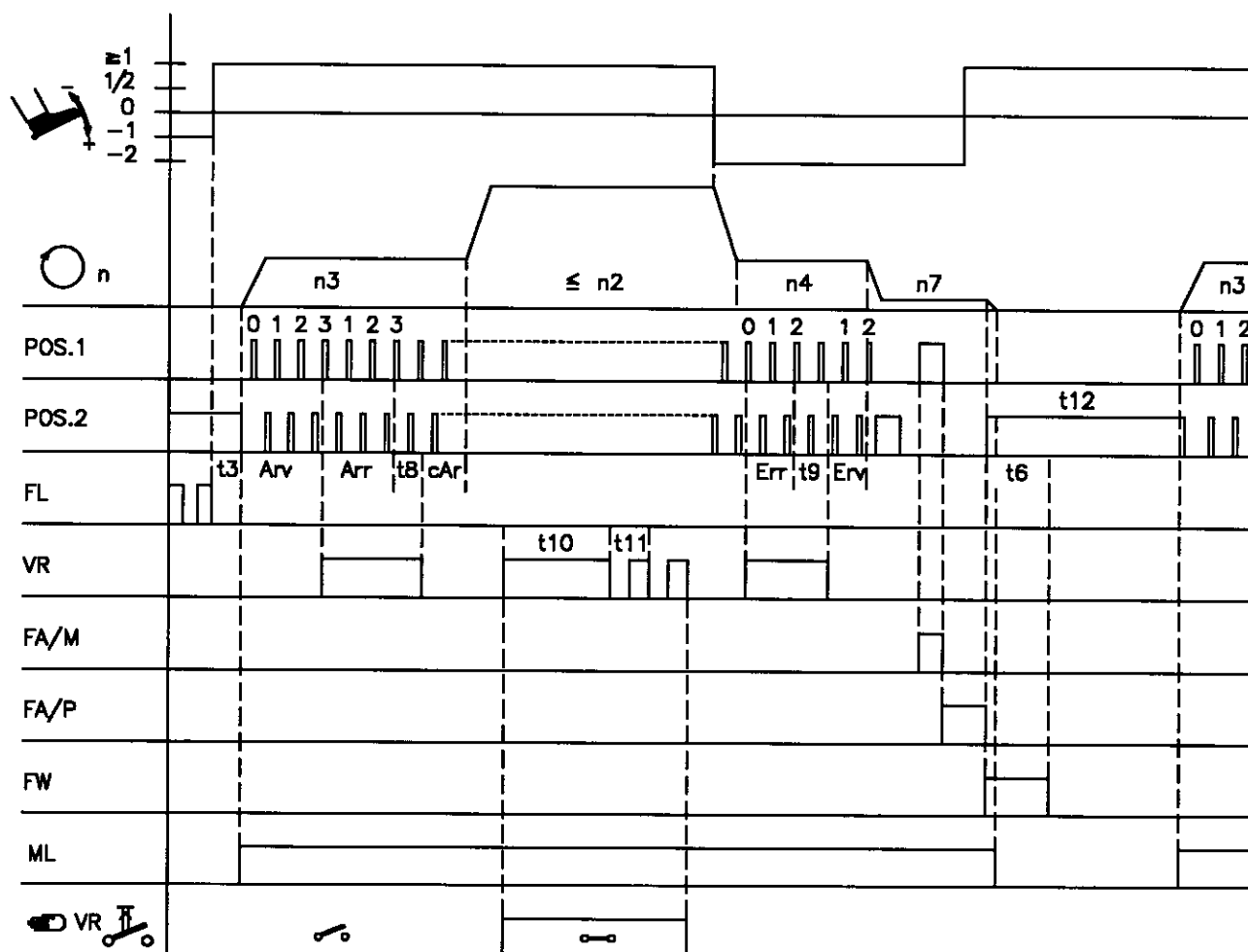
Please ensure that pushbuttons or switches are connected according to the top right connection diagram. In the case of a short circuit with current-carrying sockets the electronic control may be permanently damaged !

- *** +24V => Connect left pins 1 and 2 with jumper.
- +5V => Connect right pins 3 and 4 with jumper.
- N.C. => Connect jumper with only one pin (factory setting) or remove completely.



14. Timing Diagrams

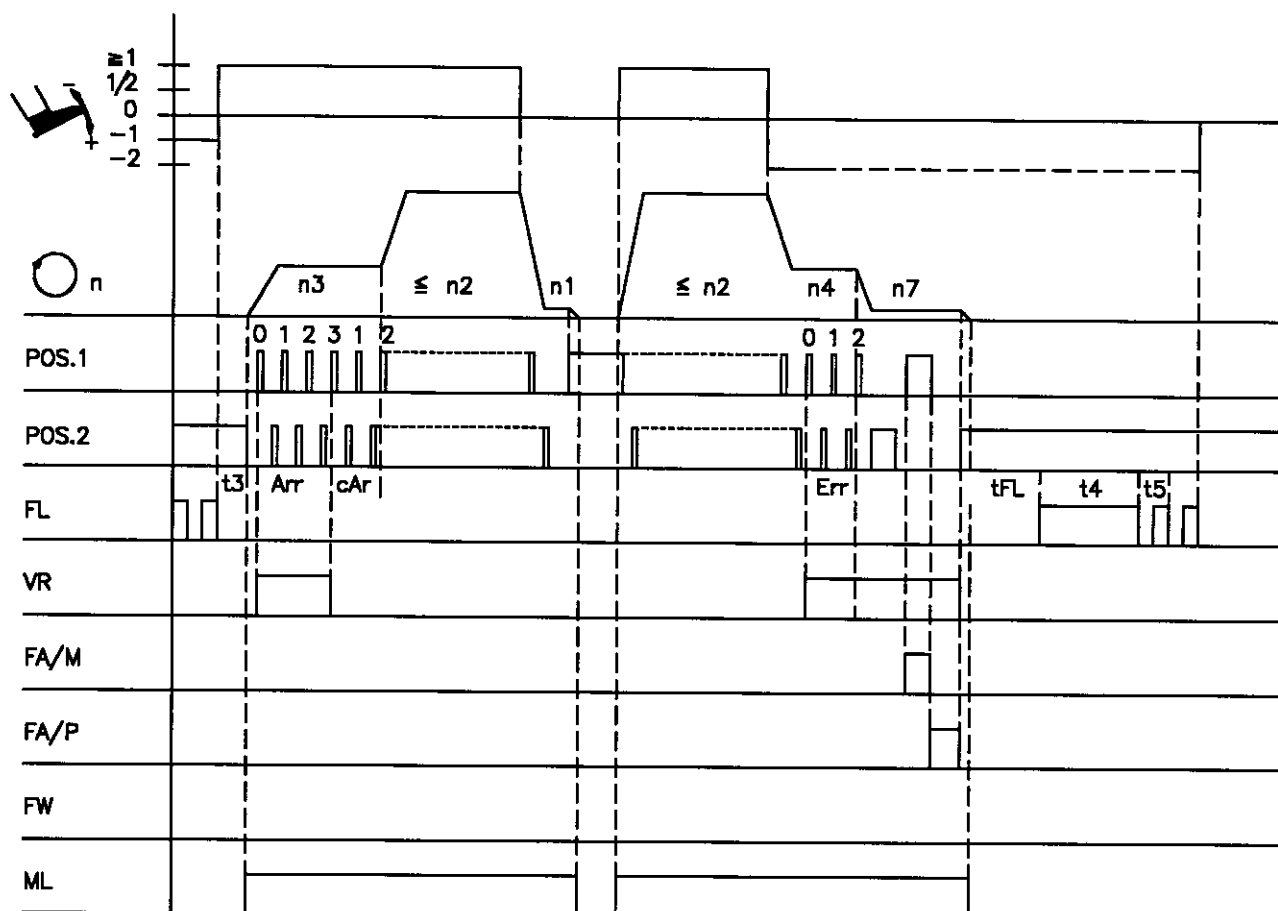
Trimming from full run (parameter 190 = 0)



2146/FALAU

Abbreviation	Function	Parameter	Pushbutton Control	Pushbutton Variocontrol
	Mode 0 Double start backtack with stitch correction on Double end backtack with stitch correction on	190 = 0	Pushbutton S2 Pushbutton S3	Pushbutton 7 Pushbutton 8
n2 n3 n4 n7	Maximum speed Start backtacking speed End backtacking speed Trimming speed	111 112 113 116		
t3 t6 t8 t9 t10 t11 t12 cAr	Start delay from lifted foot Activation time thread wiper Start backtack stitch correction End backtack stitch correction Full power of backtacking Pulsing of backtacking Start delay after thread trimming Stitch counting until speed release after start backtack	202 205 150 151 212 213 fixed 200		
Arv Arr Err Erv	Start backtack stitches forward Start backtack stitches backward End backtack stitches backward End backtack stitches forward	000 001 002 003		

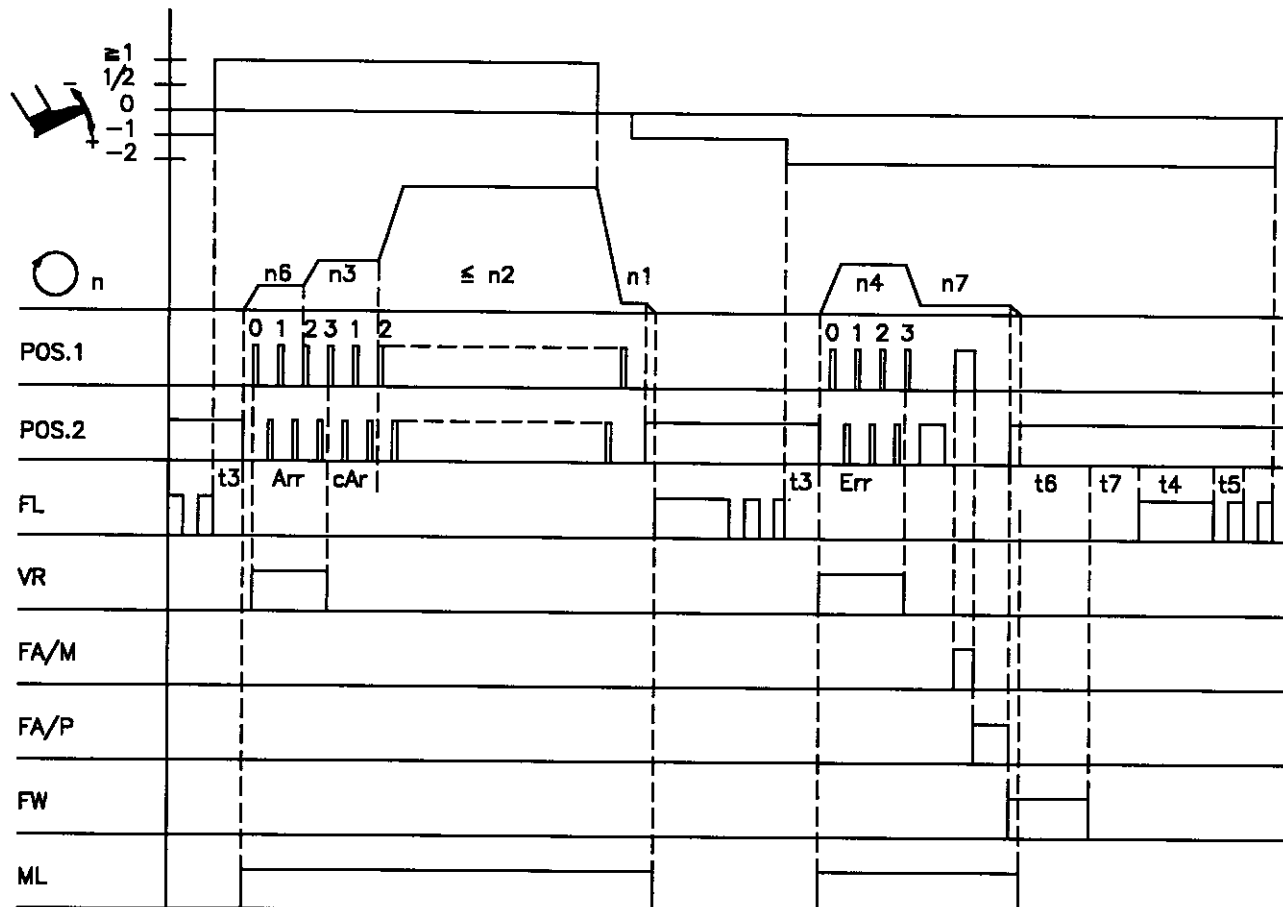
Run with intermediate stop (parameter 190 = 0)



2146/LAUFZW

Abbreviation	Function	Parameter	Pushbutton Control	Pushbutton Variocontrol
	Mode 0 Single start backtack Single end backtack Thread wiper Trimming stitch backward	190 = 0 136 = ON	Pushbutton S2 Pushbutton S3	Pushbutton 7 Pushbutton 8 Pushbutton 9
n1 n2 n3 n4 n7	Positioning speed Maximum speed Start backtacking speed End backtacking speed Trimming speed	110 111 112 113 116		
t3 t4 t5 cAr	Start delay from lifted foot Full power of presser foot lifting Pulsing of presser foot lifting Stitch counting until speed release after start backtack	202 203 204 200		
tFL Arr Err	Activation delay of presser foot without thread wiper Start backtack stitches backward End backtack stitches backward	211 001 002		

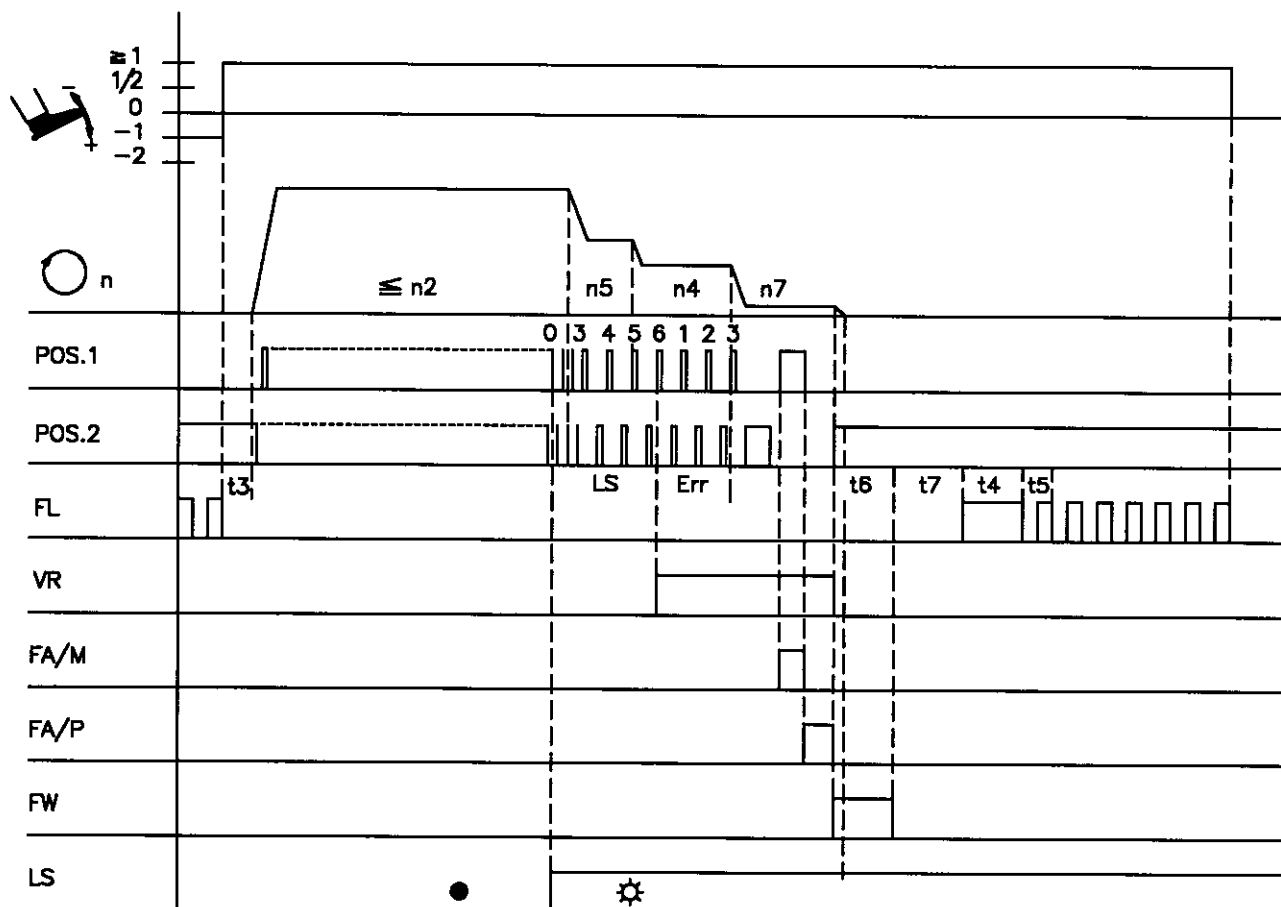
Trimming from intermediate stop (parameter 190 = 0)



2146/FAZW

Abbreviation	Function	Parameter	Pushbutton Control	Pushbutton Variocontrol
	Mode 0 Softstart Single start backtack Single end backtack Basic position 2	190 = 0 134	Pushbutton S2 Pushbutton S3 Pushbutton S5	Pushbutton 7 Pushbutton 8 Pushbutton 4
n1	Positioning speed	110		
n2	Maximum speed	111		
n3	Start backtacking speed	112		
n4	End backtacking speed	113		
n6	Softstart speed	115		
n7	Trimming speed	116		
t3	Start delay from lifted foot	202		
t4	Full power of presser foot lifting	203		
t5	Pulsing of presser foot lifting	204		
t6	Activation time thread wiper	205		
t7	Delay end thread wiper until presser foot lifting	206		
SSc	Softstart stitches	100		
cAr	Stitch counting until speed release after start backtack	200		
Arr	Start backtack stitches backward	001		
Err	End backtack stitches backward	002		

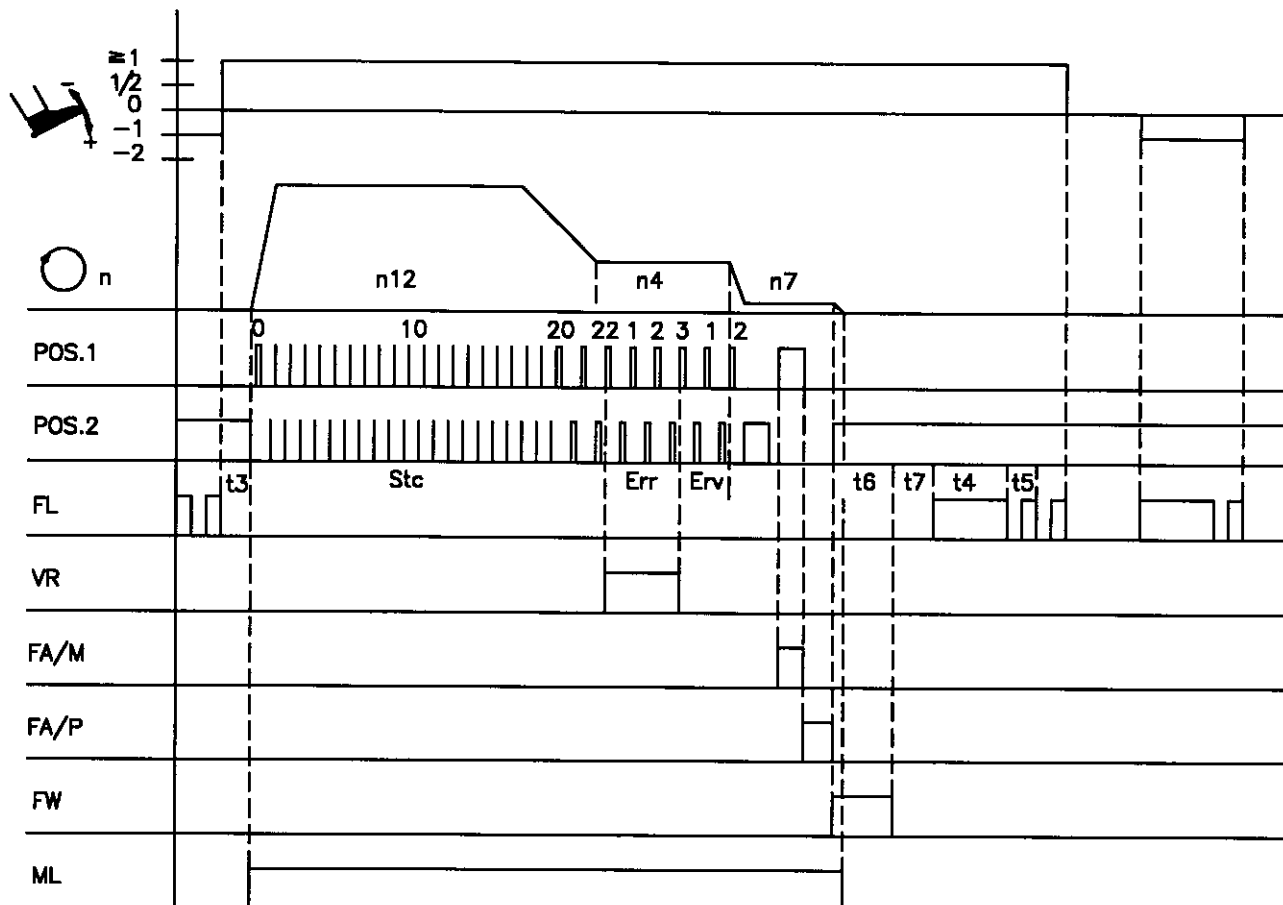
End sensing by light barrier (parameter 190 = 0)



2146/ENDELS

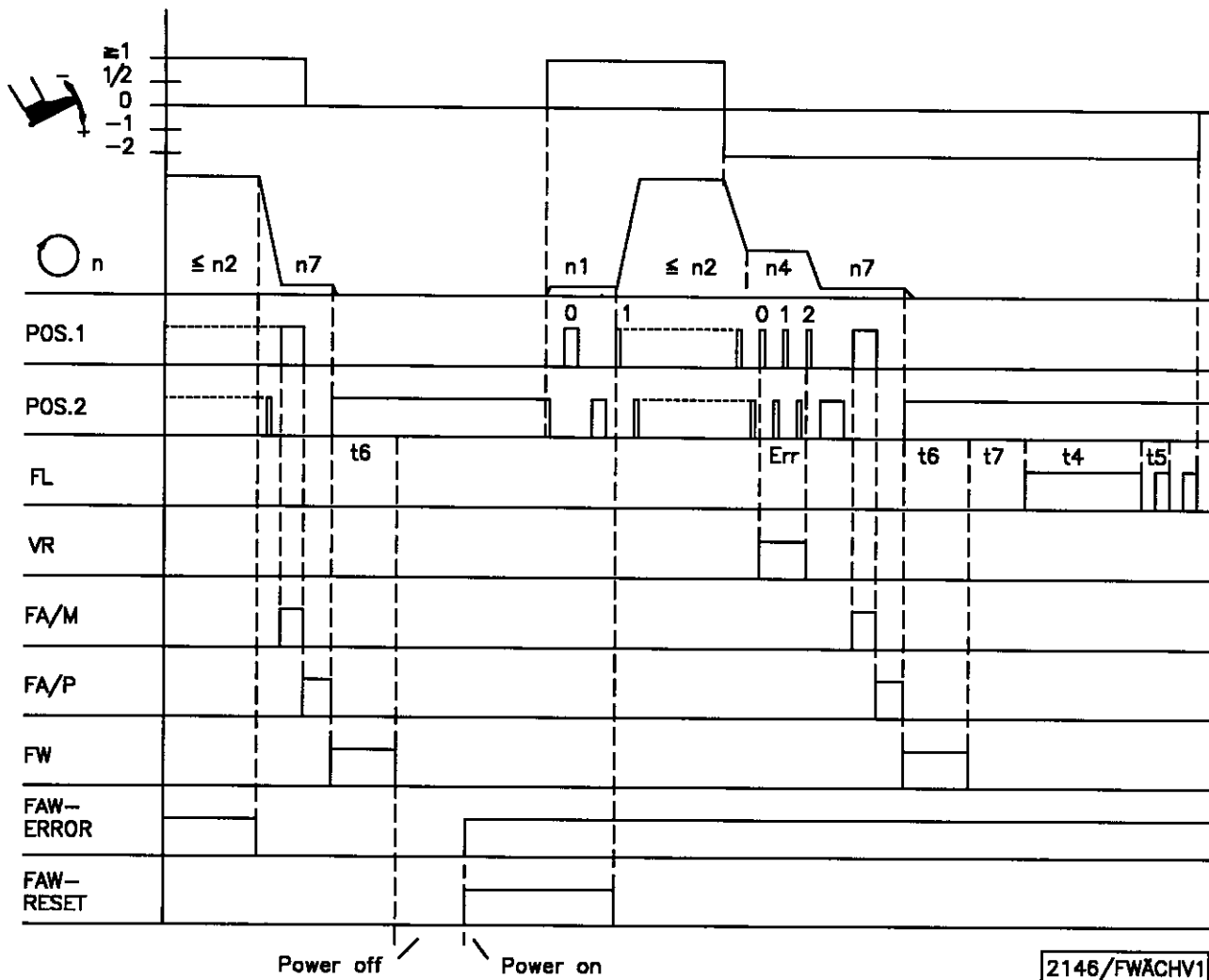
Abbreviation	Function	Parameter	Pushbutton Control	Pushbutton Variocontrol
	Mode 0 Start backtack Single end backtack Light barrier Light barrier covered/uncovered Trimming stitch backward	190 = 0 131 136	Pushbutton S2 Pushbutton S3	Pushbutton 7 Pushbutton 8 Pushbutton 0
n2 n4 n5 n7	Maximum speed End backtacking speed Speed after light barrier sensing Trimming speed	111 113 114 116		
t3 t4 t5 t6 t7 Err LS	Start delay from lifted foot Full power of presser foot lifting Pulsing of presser foot lifting Activation time thread wiper Delay end thread wiper until presser foot lifting End backtack stitches backward Stitches after light barrier sensing	202 203 204 205 206 002 004		

Seam end by stitch counting (parameter 190 = 0)



2146/ENDEZAE

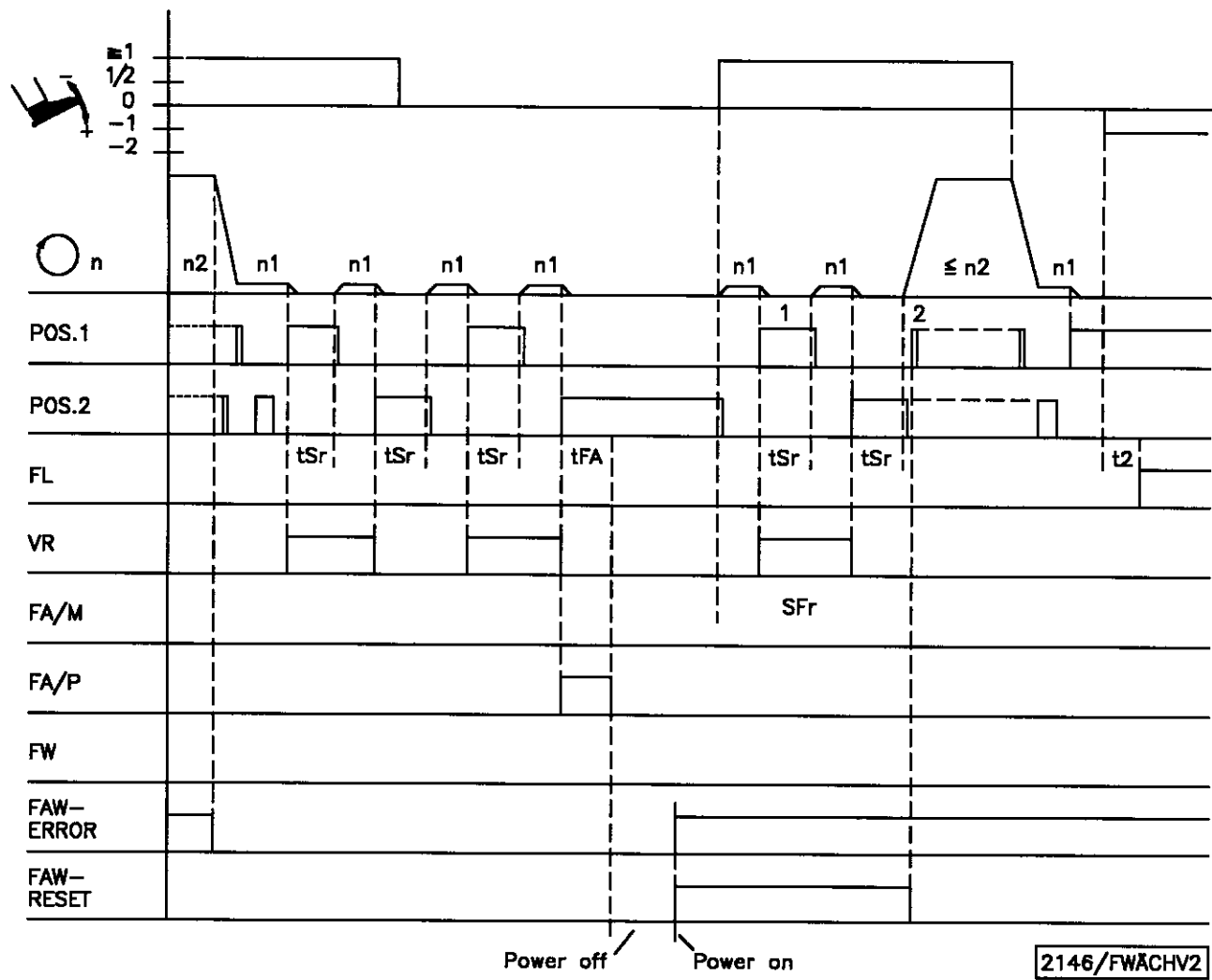
Abbreviation	Function	Parameter	Pushbutton Control	Pushbutton Variocontrol
	Mode 0 Start backtack Double end backtack Stitch counting Speed mode stitch counting (limited speed)	off on on 190 = 0 015 141 = 2	Pushbutton S2 Pushbutton S3	Pushbutton 7 Pushbutton 8 Pushbutton 1
n4 n7 n12	End backtacking speed Trimming speed Automatic speed for stitch counting	113 116 118		
t2 t3 t4 t5 t6 t7 Err Erv Stc	Delay of presser foot lifting with pedal in pos. -1 Start delay from lifted foot Full power of presser foot lifting Pulsing of presser foot lifting Activation time thread wiper Delay end thread wiper until presser foot lifting End backtack stitches backward End backtack stitches forward Stitches for the seam with stitch counting	201 202 203 204 205 206 002 003 007		

Bobbin thread monitor for magnetic thread trimmer (parameter 190 = 0)


FAW = thread monitor

Abbreviation	Function	Parameter	Pushbutton Control	Pushbutton Variocontrol
	Mode 0 Single start backtack Single end backtack Thread monitor version 1	190 = 0 182 = 1	Pushbutton S2 Pushbutton S3	Pushbutton 7 Pushbutton 8
n2 n3 n4 n7	Maximum speed Start backtacking speed End backtacking speed Trimming speed	111 112 113 116		
t3 t4 t5 t6 t7 Err	Start delay from lifted foot Full power of presser foot lifting Pulsing of presser foot lifting Activation time thread wiper Delay end thread wiper until presser foot lifting End backtack stitches backward	202 203 204 205 206 002		

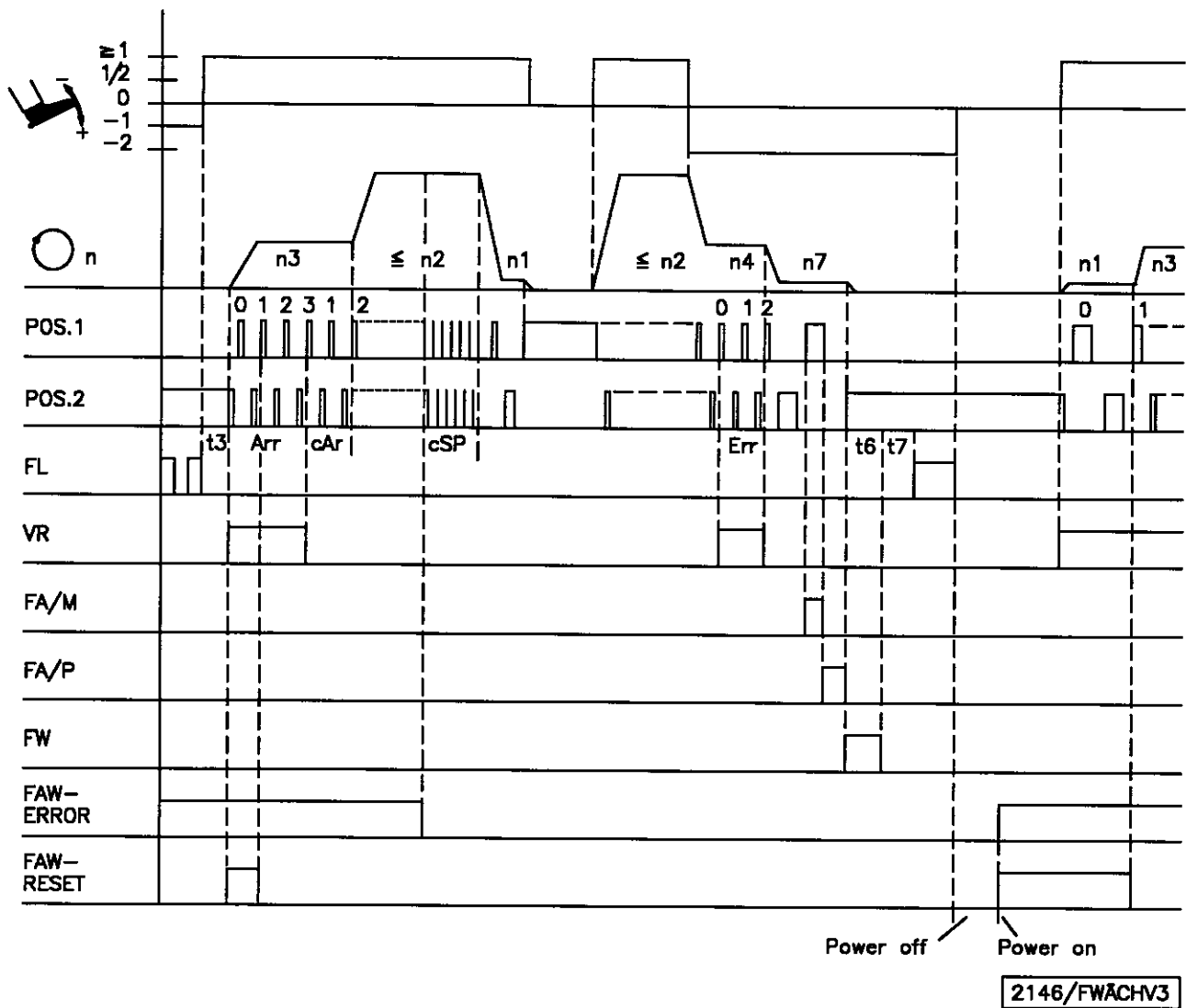
Bobbin thread monitor for pneumatic thread trimmer (parameter 190 = 0)



FAW = thread monitor

Abbreviation	Function	Parameter	Pushbutton Control	Pushbutton Variocontrol
	Mode 0 Single start backtack Thread monitor version 2 on	190 = 0 182 = 2	Pushbutton S2	Pushbutton 7
n1 n2	Positioning speed Maximum speed	110 111		
t2 tSr tFA SFr	Delay of presser foot lifting with pedal in pos. -1 Stop time for ornamental backtack Activation time of pneumatic thread trimmer Backtack for bobbin thread breakage	201 210 183 184		

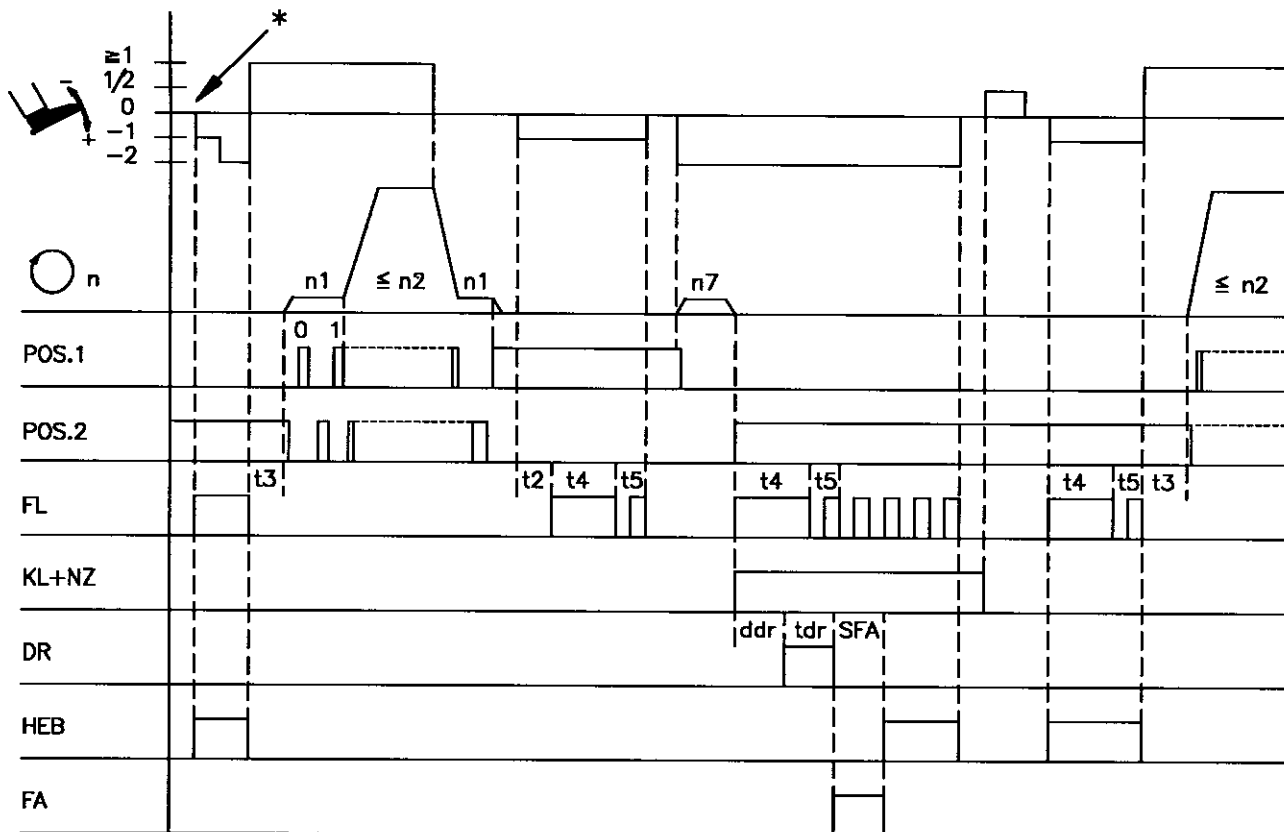
Thread monitor version 3 (parameter 190 = 0)



FAW = thread monitor

Abbreviation	Function	Parameter	Pushbutton Control	Pushbutton Variocontrol
	Mode 0 Single start backtack Single end backtack Thread monitor version 3	190 = 0 182 = 3	Pushbutton S2 Pushbutton S3	Pushbutton 7 Pushbutton 8
n1 n2 n3 n4 n7	Positioning speed Maximum speed Start backtacking speed End backtacking speed Trimming speed	110 111 112 113 116		
t3 t6 t7 cSP Err Errv cAr	Start delay from lifted foot Activation time thread wiper Delay end thread wiper until presser foot lifting Stitches until stop with thread monitor End backtack stitches backward End backtack stitches forward Stitch counting until speed release after start backtack	202 205 206 189 002 003 200		

Sequence 1 (parameter 190 = 1)

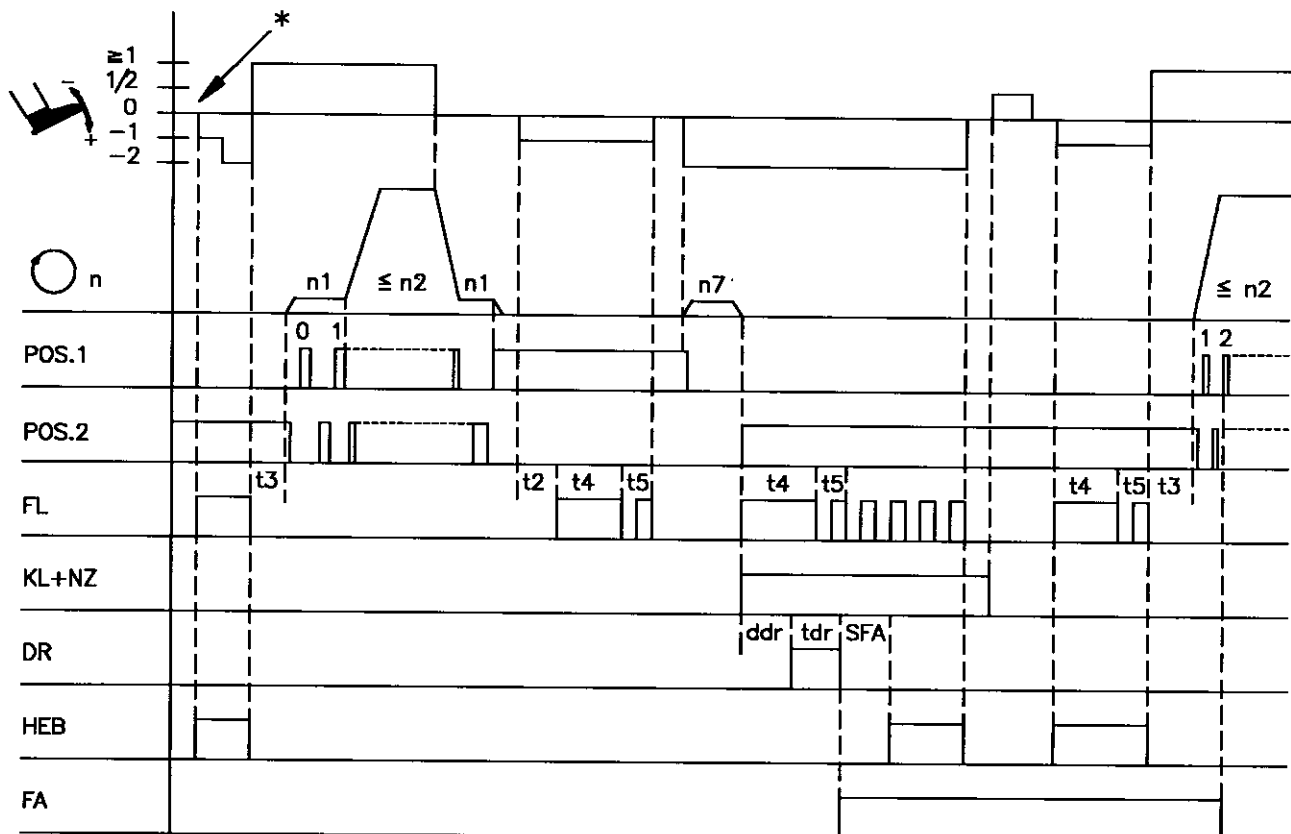


2146/ABLAUF1

*) Sequence starts after power on!

Abbreviation	Function	Parameter	Pushbutton Control	Pushbutton Variocontrol
	Mode 1 Thread trimmer is activated over time	190 = 1 191 = 1		
n1 n2 n7	Positioning speed Maximum speed Trimming speed	110 111 116		
t2 t3 t4 t5 ddr tdr SFA	Delay of presser foot lifting with pedal in pos. -1 Start delay from lifted foot Full power of presser foot lifting Pulsing of presser foot lifting Delay time revolve roller Activation time revolve roller Activation time thread trimmer	201 202 203 204 192 193 194		

Sequence 2 (parameter 190 = 1)



2146/ABLAUF2

*) Sequence starts after power on!

Abbreviation	Function	Parameter	Pushbutton Control	Pushbutton Variocontrol
	Mode 1 Thread trimmer remains on until the next start	190 = 1 191 = 0		
n1 n2 n7	Positioning speed Maximum speed Trimming speed	110 111 116		
t2 t3 t4 t5 ddr tdr SFA	Delay of presser foot lifting with pedal in pos. -1 Start delay from lifted foot Full power of presser foot lifting Pulsing of presser foot lifting Delay time revolve roller Activation time revolve roller Activation time thread trimmer	201 202 203 204 192 193 194		

15. Parameter List

15.1 OPERATOR LEVEL

Parameter	Designation	Unit	max	min	Preset	Ind. Prg. No.
000 Arv	Start backtacking stitches forward		254	0	3	A
001 Arr	Start backtacking stitches backward		254	0	3	A
002 Err	End backtacking stitches backward		254	0	3	A
003 Erv	Final backtacking stitches forward		254	0	3	A
004 LS	Light barrier compensating stitches		254	0	7	A
005 LSF	Number of stitches of the light barrier filter for knitted fabrics		254	0	0	A
006 LSn	Number of light barrier seams		15	1	1	A
007 Stc	Number of stitches for the seam with stitch counting		254	0	20	A
008 -F-	Setting of pushbutton 3 with a parameter from the technician level 1 = Softstart ON/OFF 2 = Ornamental backtack ON/OFF 3 = Single stitch with pushbutton needle up ON/OFF 5 = Sewing start blocked with light barrier uncovered ON/OFF		4	1	1	A
009 LS	Light barrier	ON/OFF			OFF	A
Group 1 Switching functions						
013 FA	Thread trimmer ON/OFF	ON/OFF			ON	A
014 FW	Thread wiper ON/OFF	ON/OFF			ON	A
015 StS	Stitch counting	ON/OFF			OFF	A
Group 8 Bobbin thread monitor						
080 SSF	Bobbin thread monitor	ON/OFF			ON	A

15.2 TECHNICIAN LEVEL

Code no. 190 with control operation

Code no. 1907 with Variocontrol operation

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

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

TECHNICIAN LEVEL

Code no. 190 with control operation

Code no. 1907 with Variocontrol operation

Parameter	Designation	Unit	max	min	Preset	Ind. Prg. No.
Group 3 Switching functions						
130 LSF	Light barrier filter for knitted fabrics	ON/OFF			OFF	A
131 LSd	ON = Light barrier sensing "uncovered" OFF = Light barrier sensing "covered"	ON/OFF			ON	A
132 LSS	Blocking of machine start, when light barrier "uncovered"	ON/OFF			ON	A
133 LSE	Thread trimmer, when completing the seam after light barrier sensing	ON/OFF			ON	A
134 SSSt	Softstart	ON/OFF			OFF	A
135 SrS	Ornamental backtack	ON/OFF			OFF	A
136 FAr	Trimming stitch backward	ON/OFF			OFF	A
139 nIS	Display of machine speed	ON/OFF			OFF	A
Group 4 Switching functions						
140 Sht	Needle up/full stitch (only if 186 = 1) OFF = needle up ON = full stitch (position 1 to position 1)	ON/OFF			OFF	A
141 SGn	Speed status for a seam with stitch counting 0 = speed controllable by the pedal up to the set maximum speed (parameter 111) 1 = fixed speed (parameter 118) without influence by the pedal (machine stop by pushing the pedal to the basic position) 2 = limited speed controllable by the pedal up to the set limit (parameter 118) 3 = at fixed speed (parameter 118), can be interrupted by full heelback		3	0	0	A

TECHNICIAN LEVEL

Code no. 190 with control operation

Code no. 1907 with Variocontrol operation

Parameter	Designation	Unit	max	min	Preset	Ind. Prg. No.
Group 4 Switching functions						
142 SFn	Speed status for the free seam and for the seam with light barrier 0 = speed controllable by the pedal up to the set maximum speed (parameter 111) 1 = fixed speed (parameter 118) without influence by the pedal (machine stop by pushing the pedal to the basic position) 2 = limited speed controllable by the pedal up to the set limit (parameter 118) 3 = at fixed speed (parameter 118), can be interrupted by full heelback		3	0	0	A
Group 5 Time functions						
150 t8	Stitch correction of the double start backtack (prolongation of the operating time of the stitch regulator / not effective with ornamental backtack)	ms	500	0	0	A
151 t9	Stitch correction of the double end backtack (prolongation of the operating time of the stitch regulator / not effective with ornamental backtack)	ms	500	0	0	A
153 brt	Braking power at machine standstill		50	0	0	A
Group 7 Service functions						
172	Display on the control: Pos. 1 to 1A (LED 7 lights up) Pos. 2 to 2A (LED 8 lights up)					A
172 Sr3	Display on the Variocontrol: Pos. 1 to 1A (LED next to pushbutton 1 lights up) Pos. 2 to 2A (LED next to pushbutton 2 lights up)					

TECHNICIAN LEVEL

Code no. 190 with control operation

Code no. 1907 with Variocontrol operation

Parameter	Designation	Unit	max	min	Preset	Ind. Prg. No.
Group 7 Service functions						
173 Sr4	Checking of the signal outputs and inputs with Variocontrol Pushbutton 1 = Backtacking / Jam + Pull on thread Pushbutton 2 = Presser foot lifting Pushbutton 3 = Magnetic thread trimmer / Revolve roller Pushbutton 4 = Pneumatic thread trimmer Pushbutton 5 = Thread wiper / Lift roller Pushbutton 6 = Motor running Pushbutton 7 = free Pushbutton 8 = free Pushbutton 9 = free Pushbutton 0 = Reset thread monitor By actuating the switches connected to the control the function of these switches is checked and displayed with "ON/OFF".					A
173	Checking of the signal outputs and inputs without Variocontrol 01 = Backtacking / Jam + Pull on thread 02 = Presser foot lifting 03 = Magnetic thread trimmer / Revolve roller 04 = Pneumatic thread trimmer 05 = Thread wiper / Lift roller 06 = Motor running 07 = free 08 = free 09 = free 10 = Reset thread monitor OFF/ON = By actuating the switches connected to the control the function of these switches is checked and displayed with "ON/OFF".					A
178	Language selection				dEU--USA ESP--Fra	A
179	Display on the Variocontrol: control program number with index (top line) and identification number (bottom line) Display on the control: When pressing the button, the data will be displayed in succession					A

TECHNICIAN LEVEL

Code no. 190 with control operation

Code no. 1907 with Variocontrol operation

Parameter	Designation	Unit	max	min	Preset	Ind. Prg. No.
Group 8 Functions of specific types						
182 SSF	Status thread monitor 0 = Bobbin thread monitor and needle thread monitor OFF 1 = Magnetic thread trimmer in the case of a bobbin thread or needle thread error 2 = Bobbin thread monitor 926/01 Magnetic thread trimmer in the case of a needle thread error Pneumatic trimmer in the case of a bobbin thread error 3 = Bobbin supply monitor 926/04, stop in basic position. New sewing start possible with pedal in position 0 (neutral).		3	0	2	A
183 tFA	Activation time of the pneumatic thread trimmer in the case of a bobbin thread error	ms	990	0	80	A
184 SFr	Number of backtackin stitches in the case of a bobbin thread breakage		3	2	2	A
189 cSP	Number of stitches until stop in the case of a thread error (parameter 189 is only effective if parameter 182 = 3)		2540 *)	0	30	A
Group 9 Functions of specific types						
190 mFc	0 = Pfaff industrial sewing machines with 900/..., 909/..., 910/..., 911/.. 1 = Pfaff cl. 5642/900		1	0	0	A
191 FFA	0 = Thread trimmer remains activated until the next start 1 = Thread trimmer is activated over time		1	0	0	A
192 ddr	Delay time revolve roller	ms	990	0	80	A
193 tdr	Activation time revolve roller	ms	990	0	150	A
194 SFA	Activation time thread trimmer and/or delay time lift roller	ms	990	0	80	A
197 FMb	Function Membox	ON/OFF			OFF	A
198 Foc	Format Memory Card	ON/OFF			OFF	A

15.3 SUPPLIER LEVEL

Code no. 311 with control operation

Code no. 3112 with Variocontrol operation

Parameter	Designation	Unit	max	min	Preset	Ind. Prg. No.
Group 0 Time functions						
200 cAr	Stitches until speed release after start backtack		3	0	1	A
201 t2	Activation delay of presser foot lifting with half heelback	ms	500	20	60	A
202 t3	Start delay after presser foot lifting	ms	500	0	80	A
203 t4	Time of full power of presser foot lifting	ms	600	0	500	A
204 t5	Holding power for presser foot lifting Stages 0...7 Stage 1 = 12.5% Stage 7 = 87.5% Stage 0 = 100% Stage 1 = low holding power Stage 0 = high holding power		7	1	3	A
205 t6	Thread wiper time	ms	500	0	120	A
206 t7	Delay end of thread wiping until presser foot lifting ON	ms	800	40	80	A
207 br1	Braking effect with speeds > 800 RPM		255	1	80	A
208 br2	Braking effect wwith speeds < 800 RPM		255	1	50	A
Group 1 Time functions						
210 tSr	Stop time for switching the stitch regulator in the ornamental backtack	ms	500	0	140	A
211 tFL	Activation delay of presser foot lifting with thread wiper off	ms	500	0	60	A
212 t10	Time of full power of backtacking	ms	600	0	500	A
213 t11	Holding power for backtacking Stages 0...7 Stage 1 = 12.5% Stage 7 = 87.5% Stage 0 = 100% Stage 1 = low holding power Stage 7 = high holding power		7	0	3	A

SUPPLIER LEVEL

Code no. 311 with control operation

Code no. 3112 with Variocontrol operation

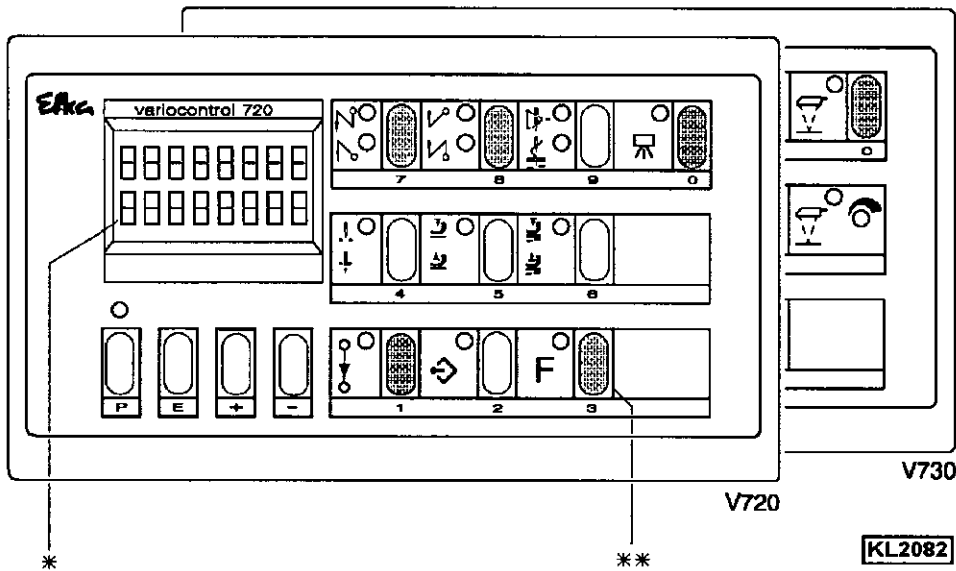
Parameter	Designation	Unit	max	min	Preset	Ind. Prg. No.
Group 2 Speeds						
220 ALF	Accelerating power of the drive		255	1	40	A
221 dGn	Speed gate		990 *)	50	100	A
222 tGn	Speed gate damping period	ms	990	0	120	A
Group 3 Switching functions						
231 Sn1	Execution of the first stitch after power ON at positioning speed	ON/OFF			ON	A
Group 4 Switching functions						
242	Selection of the input function on socket B18/5 0 = Light barrier function, if 009 = ON 1 = Needle up/down 2 = Needle up 3 = Single stitch (basting stitch) 4 = Full stitch 5 = Needle to position 2 6 = Blocking of machine run effective with open contact 7 = Blocking of machine run effective with closed contact 8 = Blocking of machine run (unpositioned) effective with open contact 9 = Blocking of machine run (unpositioned) effective with closed contact 10 = Automatic speed without pedal (n12) 11 = Limited speed with pedal (n12) 12 = Presser foot lifting with pedal in position 0 (neutral)		12	0	0	A
Group 8						
280 LSP	ON = Blocking of machine run OFF = External presser foot lifting at machine standstill	ON/OFF			OFF	A
281 EPd	Blocking pedal -1 and -2, when light barrier ON	ON/OFF			OFF	A

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

For your notes:

For your notes:

16. Operating Elements of the Variocontrol



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

Functional Setting of the Pushbuttons

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

Special Setting of the Pushbuttons for HIT

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

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



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