

# **EFKA** vario dc

**CONTROL**

**US80A4117**

## **INSTRUCTION MANUAL**

**WITH PARAMETER LIST**

**No. 402186**

**english**

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**EFKA**  
FRANKL & KIRCHNER  
GMBH & CO KG

**EFKA**  
EFKA OF AMERICA INC.

**EFKA**  
EFKA ELECTRONIC MOTORS  
SINGAPORE PTE. LTD.

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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 sewing machines:

Brand	
Union Special	Chainstitch machines class 34700/800, class 600, class 36200 class 37500 with Mayer trimmer class 39500 with Mayer trimmer Lockstitch machines class 63900 with Refrey trimmer

### 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	Direct current motor	DC...
1	Electronic control	vario dc US80A4117
	- Power pack	N153 (optional N155)
	- External actuator	EB301 (optional EB302, reduced actuating force)
1	Position transmitter	P6-1
1	Mains switch	NS105
1	Set of standard accessories	B131
	consisting of:	belt guard, complete set of hardware motor mounting foot bracket 1 and 2, short documentation
1	Set of accessories	Z3
	consisting of:	pitman rod, complete
1	Pulley	



### 3.1 Special Accessories

Solenoid type EM1..(for e.g. sewing foot lifting, 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 (Mas 5100W) with locking screw for the connection of another external actuator	- part no. 0501278
Foot control type FB302 for standing operation with approx. 1400 mm connecting cable and plug	- part no. 1460018
Potential equalization cord 700 mm long, LIY 2.5 mm <sup>2</sup> , grey, with forked cable brackets on both sides	- part no. 1100313
Extension cable for position transmitter P6-..., approx. 1100 mm long, complete with plug and socket connector	- part no. 1100409
Extension cable for commutation transmitter, approx. 315 mm long, complete with plug and socket connector	- part no. 1111229
Extension cable for commutation transmitter, approx. 1100 mm long, complete with plug and socket connector	- part no. 1111584
Extension cable for motor connection, approx. 400 mm long	- part no. 1111858
Extension cable for motor connection, approx. 1500 mm long	- part no. 1111857
Pulley 40 mm $\phi$ with special belt intake and slip-off protection (use SPZ belt)	- part no. 1112223
Pulley 50 mm $\phi$ with special belt intake and slip-off protection (use SPZ belt)	- part no. 1112224
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 (Mas 3100) with locking screw	- part no. 0500402
4-pin plug (Mas 4100) with locking screw	- part no. 0500615
6-pin plug (Meb 60)	- part no. 0500457
8-pin plug (Mas 8100 S) with locking screw	- part no. 0502865
10-pin plug (Meb 100)	- part no. 0500357

## 4. Operation

### 4.1 Access to Programming on Command Input

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

The following persons have access:

- the operator to the first level
- the technician to both levels

### 4.2 The Operator Level

On this level, simple functions which have to be changed frequently during operation can easily be switched on or off and/or changed by the operator.

For example, basic position needle up/down, sewing foot lifting at seam end automatically on/off.

This level is always accessible when power is on, unless the technician level is open.

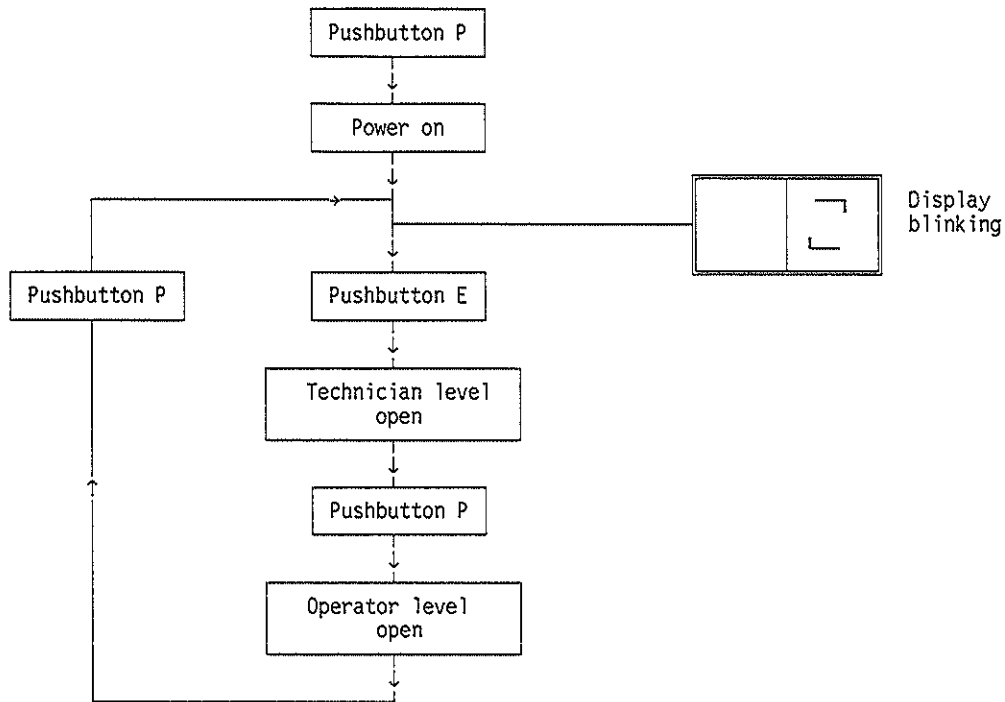
**Note:**

A changed (switched) function will only be permanently saved by a new sewing start before turning power off.

### 4.3 The Technician Level

On this level fundamental functions can be programmed.

#### 4.3.1 Access to the Technician Level



#### 4.3.2 Programming a Parameter

##### 1. Open technician level

Press **P** + TURN POWER ON / Display blinks ==>

##### 2. Set parameters

Press **E** Parameter A is displayed = Setting the reference position ==>

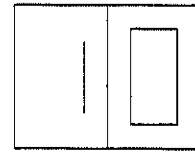
The desired parameter can be selected by pressing pushbutton E repeatedly. The respective abbreviation appears on the display. See also chapter -Parameter List-

### 3. Change parameter value



Displayed value  
e.g. 10

==>



or



==> Change value

On with step 2.



==> Address next parameter  
or 4. Close technician level

### 4. Close technician level

Press



Display goes off

==>



### 5. Saving a changed value

A changed setting is permanently saved only after the sewing start before turning power off.

**Note:**

A new entry into the technician level is now possible by pressing pushbutton **P** again.  
The display shows the blinking programming mark. By pressing pushbutton **E** the last parameter programmed appears on the display.

## 5. Starting Service

### 5.1 General Instructions

When putting the control into operation, programming has to be done in the following manner:

- Set the direction of rotation of the motor (parameter "N")
- If necessary, set the reference position (parameter "A")
- If necessary, set the positions (parameters "B", "C", "D")
- If necessary, set the speeds (parameters "E", "G", "H")
- If necessary, set the remaining relevant parameters
- Start sewing in order to save the set values

**Note:**

If the power is turned off the adjustments made before starting to sew get lost.



**Attention!**

If the direction of rotation of the motor is changed the positions must be reprogrammed.

## 5.2 Initial Operation on Class 36200

- Program the direction of rotation of the motor (parameter "N" = 01)
- Set the reference position (parameter "A")
- Set the positions (parameters "B", "C", "D")
- If necessary, set the speeds (parameters "E", "G", "H")
- If necessary, set the remaining relevant parameters
- Start sewing in order to save the set values

**Note:**

If the power is turned off the adjustments made before starting to sew get lost.

## 5.3 Initial Operation on Class 34700/800

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

- The positions must not have been reprogrammed.
- The direction of rotation of the motor shaft must be set to "clockwise rotation" ( parameter "N" = 00).
- Before mounting the position transmitter the sewing machine shaft is to be set to the reference position.
- Markings on the position transmitter shaft and on the position transmitter housing have to be aligned, then mount the position transmitter on the sewing machine shaft.
- If necessary, set the speeds, parameters "E", "G", "H".
- If necessary, set the remaining relevant parameters.
- Start sewing in order to save the set values.

**Note:**

If the power is turned off the adjustments made before starting to sew get lost.

## 5.4 Fast Installation by Preset Values

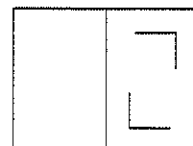
Fast setting of the functions at values preprogrammed in the factory is possible by using this function. (see parameter list)

**Exception:** direction of rotation and positions

1. Turn power off

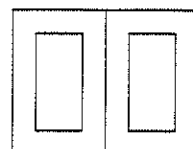
2. Press P + TURN POWER ON

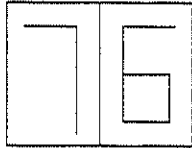

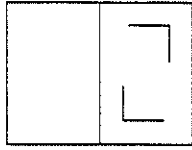
Display blinks ==>



3. Press - for about 5 seconds

until 00 appears on the display ==>



4. Press **+** or **-** several times  
until 76 appears on the display ==> 
5. Press **P** briefly (< 2sec.)  
Display goes off ==>   
The drive is ready for operation on the operator level
6. Press **P** longer (> 2sec.)  
Display blinks ==>   
The technician level is open for further programming

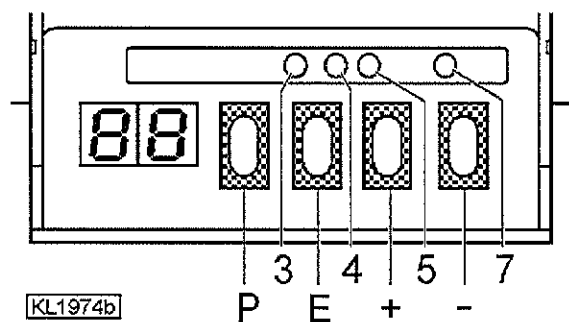
## 6. Functions and Settings

### 6.1 Functions and Settings on the Operator Level

#### 6.1.1 Switchable Functions

Switchable functions can be changed by pushbutton. The switching state is indicated by corresponding light emitting diodes (LED).

**Table:** Allocation of functions for the pushbuttons and LEDs



Function	Pushbutton	LED No. = on	LED No. = off
Sewing foot lifting at stop in the seam (automatic)	E	3 = on	3 = off
Sewing foot lifting at the seam end (automatic)	E	4 = on	4 = off
Thread trimmer and thread wiper	+	5 = on	5 = off
Basic position (at stop in the seam)	-	7 = POS2 (Needle up)	7 = POS1 (Needle down)

### 6.1.2 Needle Up

When actuating an external switch, the drive runs from position needle down to position needle up.

The function is activated only if the needle is within an angular range of 10° before position 1 and position 1A.

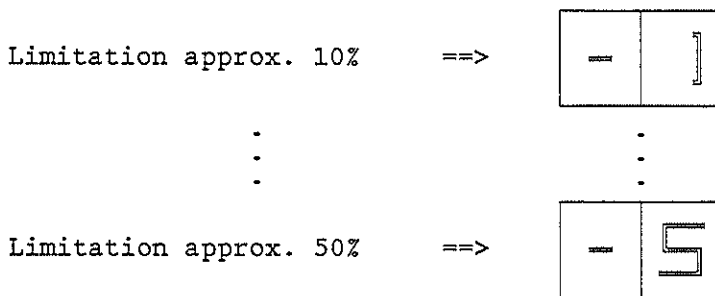
If the flatseam mode is programmed (parameter Q = 01) there is no function needle up.

### 6.1.3 Limitation of the Maximum Speed

By pressing the pushbuttons + or -, or while the motor is running, the programmed maximum speed can be changed.

A limitation to approx. 50% of the programmed value is possible.

The activated speed limitation is shown on the display.



**Note:**  
The changed setting is permanently saved only after trimming and a new sewing start.

## 6.2 Functions and Settings on the Technician Level

### 6.2.1 Softstart

Functions	Parameter
Number of Softstart stitches	I
Softstart speed	H
Softstart on/off	PC

**Function:**

- after power on
- at the beginning of a new seam
- speed limited (can be set by parameters), controlled by the pedal
- stitch counting is synchronized to position 1
- interruption by pedal in position 0 (neutral)
- exit by full heelback (position -2)

## 6.2.2 Functional Selection Chainstitch/Refrey Trimmer / Flatseamer

Functions	Parameter
Mode 0 = Chainstitch trimmer Mode 1 = Flatseamer Mode 2 = Refrey trimmer	Q = 0 Q = 1 Q = 2

### 6.2.2.1 Chainstitch Trimmer (Q = 0)

Functions	Parameter
Chainstitch trimmer On Activation delay of the thread wiper Operating time of the thread wiper Operating time of the thread trimmer Thread trimming by pedal -1 on/off Pulsing of the thread trimmer backward Activation delay of the thread trimmer backward Operating time of the thread trimmer backward	Q = 00 J K P R S T U

- The thread trimmer can be switched on or off by pushbutton +.
- The thread wiper can only be switched on together with the thread trimmer.
- The execution of the seam end is optimized by sensing whether or not a thread wiper is connected.
- The thread trimmer is switched on at stop in position 2 for a time that can be set by parameter P.
- Activation delay and operating time can be programmed separately each for the thread trimmer backward and the thread wiper.
- The holding power for the original position of the thread trimmer backward can be programmed. It is active even if the thread trimming function is off.  
**The operating time should be selected such that the solenoid maintains its original position without being overstressed.**

### 6.2.2.2 Flatseamer (Q = 1)

Functions	Parameter
Flatseamer On	Q = 01

Unlocking the chain at the seam end is possible by the flatseamer function.

Program parameter Q = 01 (on). The function of a switch/pushbutton connected to B9/2 or B11/2 will be switched from Needle up to Flatseamer on/off.

In the flatseamer mode, the function needle up is not provided.

The function "flatseamer On" modifies the execution of the seam end.

Thread trimmer and thread wiper as well as the programmed reversing function are switched off.

#### Sequence when heeling the pedal back

during machine run or stop in needle-up position

- set needle down
- delay according to setting of parameter M
- 180° reversion

during machine run in needle-down position

- delay according to setting of parameter M
- 180° reversion

### 6.2.2.3 Refrey Trimmer (Q = 2)

Functions	Parameter
Refrey trimmer On	Q = 02
Activation delay of the thread wiper	J
Operating time of the thread wiper	K
Activation delay of the sewing foot lifting	P
Operating time of the thread trimmer backward	U

- The thread trimmer can be switched on or off by pushbutton +.
- The thread wiper can only be switched on together with the thread trimmer.
- The thread trimming is performed at positioning speed.
- The holding power for the original position of the thread trimmer backward can be programmed. It is active even if the thread trimming function is off.  
**The operating time should be selected such that the solenoid maintains its original position without being overstressed.**

### 6.2.3 Protection of the Thread Trimmer

In order to protect the thread trimmer against damage the run of the drive can be blocked by a sensor (proximity switch, hall sensor) if the thread trimmer is not in the original position.

- From machine run the drive stops in the selected basic position.
- A new sewing start is possible only after returning to the pedal position 0.
- The activated function "blocking of machine run" is indicated on the display by -A2-.
- Sewing foot lifting is possible.

### 6.2.4 Thread Monitor

The function "blocking of machine run" is activated by a thread monitor signal.

- From machine run the drive stops in the selected basic position.
- A new sewing start is possible only after returning to the pedal position 0.
- The activated function "blocking of machine run" is indicated on the display by -A2-.
- Sewing foot lifting is possible.

### 6.2.5 Sewing Foot Lifting

Functions	Parameter
Activation delay of sewing foot lifting (parameter Q = 3)	P
Activation delay of sewing foot lifting (parameter Q = 1 and/or 2)	W
Start delay from lifted foot	Y
Pulse width for pulsing	PB

The connection of electromagnetic or electropneumatic sewing foot lifting is possible. There is an additional unpulsed signal output at the socket B13.



**Foot is lifted:**

- in the seam
  - by heelback (position -1)  
or automatically (LED 3 = on)
  - Exception:** if seam end by pedal position -1 is programmed (param. R)  
foot lifting is possible only by an external switch
- after thread trimming
  - by heelback (position -1 or -2)  
or automatically (LED 4 = on)

**Holding power of the lifted foot:**

The sewing foot is lifted by full power (approx. 500ms). Then the solenoid is switched to partial power in order to reduce the load for the control and for the connected solenoid.

The holding power at partial power can be set by parameter PB.

**Caution!**

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

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

**Foot lowers:**

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

The start is delayed until the foot has securely lowered.

- delay time adjustable (param. Y)

**6.2.6 Reversion**

Functions	Parameter
Number of reversing increments	L
Activation delay of reversion	M
Positioning speed	E

The function "reversion" is performed after trimming.

When the stop position is reached, the drive stops for a time adjustable by parameter M. Then it reverses at positioning speed for an adjustable number of increments (param. L).

1 increment corresponds to approx 0.7°.

**When the function flatseamer is on, programmable reversion is inactive.**

## 6.3 Machine Functions

### 6.3.1 Direction of Rotation of the Motor

Functions	Parameter
Direction of rotation of the motor	N

Look at the motor shaft:  
 Parameter "N" = 00 - clockwise rotation  
 Parameter "N" = 01 - counterclockwise rotation



#### Attention!

If the motor is mounted differently, e.g. at a different angle or with gear, make sure that the parameter value is correctly assigned to the direction of rotation.  
**This is valid especially for sewing machines of the class 36200.**

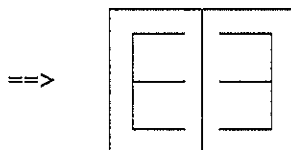
### 6.3.2 Start Behavior

Functions	Parameter
Starting edge	PD

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

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



### 6.3.3 Braking Behavior

Functions	Parameter
Braking parameter 1	PE
Braking parameter 2	PF

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

**Parameter PE** influences the slowing down, when a slight change of the speed is desired (changing the pedal position by less than 5 pedal steps, e.g. from step 10 to step 6).

**Parameter PF** influences the slowing down, when a major change of the speed is desired (changing the pedal position by more than 4 pedal steps, e.g. for positioning from step 12 to step 0).

### 6.3.4 Braking Power at Standstill

Functions	Parameter
Braking power at standstill	0

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

- The braking power works at standstill
  - at stop in the seam
  - after trimming
- The effect can be set
- The higher the set value, the higher the braking power
- It does not work after power on, unless sewing has not been started

### 6.3.5 Setting the Positions

Functions	Parameter
Reference position	A
Position 1 (lower needle position)	B
Position 2 (upper needle position)	C
Position 1A (second internal switching point for the slot between position 1 and 1A)	D

#### 6.3.5.1 Reference Position

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

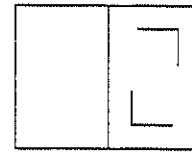
In order to establish a relationship between the electric position transmitter information and actual mechanical position a reference position is needed.

**The reference position must be set:**

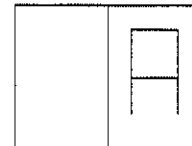
- for initial operation
- after changing the position transmitter
- after changing the microprocessor

**Programming:****Open the technician level**

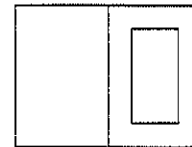
- Press **P** + TURN POWER ON / display blinks ==>

**Address parameter**

- Press **E** Parameter A is displayed  
= Setting the reference position ==>

**Prepare setting**

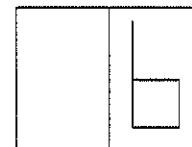
- Press **+** Display 0 blinking ==>

**Setting**

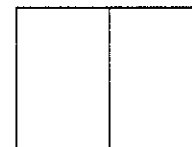
- Turn handwheel until display 0 is constant.
- Turn handwheel in the direction of rotation to half a needle bar high lift behind the bottom dead center (use caliber as setting aid)

**Enter setting**

- Press **E** Display changes to next parameter, here from A to B. ==>

**Exit programming**

- Press **P** Display goes off ==>  
(Technician level is closed)

**Save programmed settings**

A changed setting is saved only after the sewing start before turning power off.

**Note:**

A new entry into the technician level is now possible by pressing pushbutton P again. The display shows the blinking programming mark. By pressing pushbutton E the last parameter programmed appears on the display.

### 6.3.5.2 Signal and Stop Positions

The values of the signal and stop positions are factory set. After setting the reference position, the machine is ready for operation. Settings only need to be changed on non-standard machines and/or for fine tuning.



#### Attention!

When using the drive for sewing machines of the class 36200, the direction of rotation and the positions 1 and 2 must be reset.

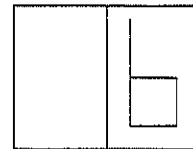
If necessary, the signal and stop positions can be set as described in chapter "Reference Positions" from step 3 onwards.


In this case pushbutton E must be pressed several times after opening the technician level until the parameter for the desired position appears on the display.

#### Set position 1

- Actual display

==> Parameter B




- Press 

==> Display for Set position 1 blinks



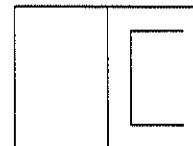
- Set position 1 by turning the handwheel

- or press 

==> Switch to the next parameter

- Press  to enter the setting

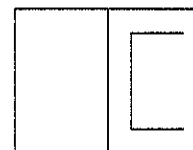
==> Display switches to the next parameter "C"




#### Set position 2

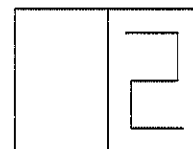
- Actual display

==> Parameter C




- Press 

==> Display for Set position 2 blinks



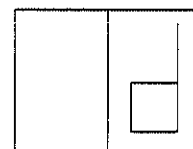
- Set position 2 by turning the handwheel

- or press 

==> Switch to the next parameter

- Press  to enter the setting

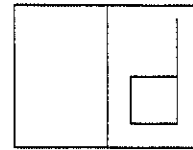
==> Display switches to the next parameter "D"



**Set position 1A**

• Actual display

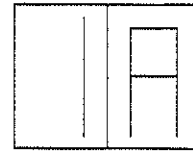
==> Parameter D



• Press



==> Display for Set position 1A blinks



• Set position 1A by turning the handwheel

• or press



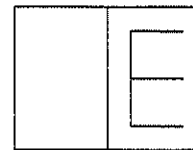
==> Switch to the next parameter

• Press



to enter the setting

==> Display switches to the next parameter "E"



Setting the positions is completed.

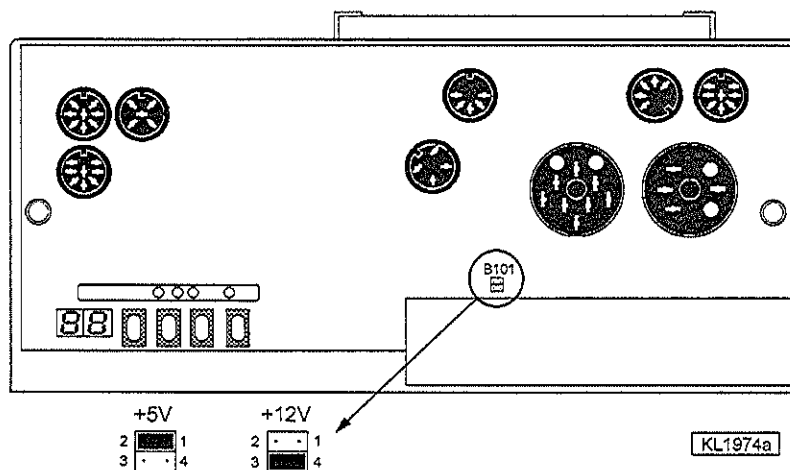
**6.3.6 Supply Voltage 12V and/or 5V**

For external devices as for ex. thread monitor, there is a supply voltage of +12V on socket B5/5. After opening the cover, this voltage can be changed to +5V by moving a jumper on the printed circuit board to a different position.



**Attention!**  
Before opening the cover, turn power off and remove mains plug from outlet!

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



### 6.3.7 External Actuator EB301 and EB302

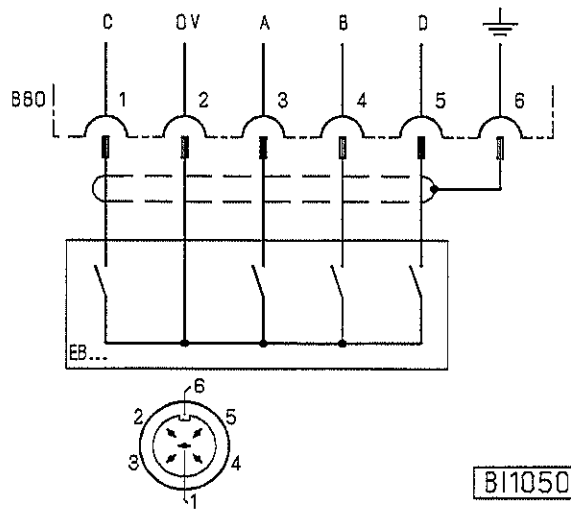
With the help of the external actuator connected with the pedal the commands for the sewing operation are inputted. Instead of the external actuator connected to the socket connector B80 (see chapter Socket Connectors) another external actuator can be connected.

The external actuator EB302 has softer springs than EB301. This means that a lower actuating force is needed.

**Table: Coding of the pedal steps**

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

L = switch contact closed, H = switch contact open



B11050

EB... - External actuator

## 7. Error Messages

### General Information

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

### Serious Situation

Display	Signification
E1	Position transmitter not connected or defective
E2	Line voltage too low, or time between power off and power on too short
E3	Machine locks, or does not reach the desired speed
E4	Control disturbed by deficient grounding or loose contact

### Hardware Disturbance

Display	Signification
H1	Commutation transmitter cord or frequency converter disturbed
H2	Processor disturbed



## 8. Signal Test

### 8.1 Position Transmitter and Output Tests

Functions	Parameter
Test function position transmitter and outputs	PH

The functions of the position transmitter and of the outputs can be tested by a routine that can be activated with parameter PH.

#### 8.1.1 Position Transmitter Test

The functions are indicated by light emitting diodes on the operation panel.

**The position transmitter test can only be performed after the sewing has been started.**

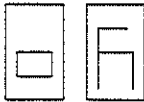
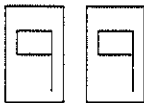
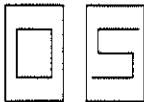
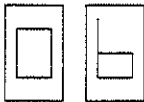
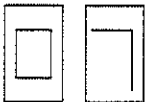
- Address parameter PH
- Press the + pushbutton
- Turn handwheel
  - when a position is reached, light emitting diodes are turned on
  - when a position is left, light emitting diodes are turned off
- LED 5 = on - angular position between position 1 and 1A
  - in addition LED 3 = on, signal output position 1 switched
- LED 7 = on - angular position between position 2 and 2A
  - in addition LED 3 = on, signal output position 2 switched
- Press pushbutton P or E to exit the test mode

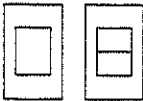
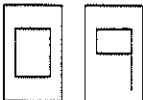
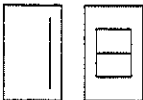
#### 8.1.2 Output Test

The function is indicated on the display.

For testing, the outputs below are briefly activated.

- Address parameter PH
- Press the + pushbutton; the following messages are shown on the display:

OK		All outputs o.k.
99		Error localization not possible
05		Error on B3/1-5 Sewing foot lifting
06		Error on B5/1-10 Thread trimmer backward
07		Error on B3/1-3 Motor running

08		Error on B5/1-2 Thread trimmer backward
09		Error on B3/1-6 Thread trimmer forward or B5/1-3 Thread wiper
18		Error on B13/5 Signal output sewing foot lifting

If several output errors are identified they are displayed one after the other, alternating automatically.

**Exit output test:** Press pushbutton P or E

### 8.2 Input Test

Functions	Parameter
Test function inputs	PI

The input function can be tested by a routine that can be activated with parameter PI.

When the test function is activated, the actual switching state of the connected pushbuttons and switches is read and is shown on the display by 00.

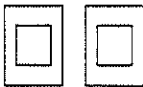
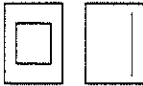
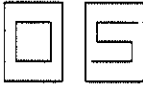
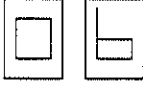
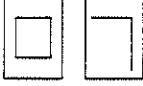
If the switching state of a switch changes this is indicated by a code allocated to the input.

Only one switch at a time may switch its switching state.

#### Test sequence

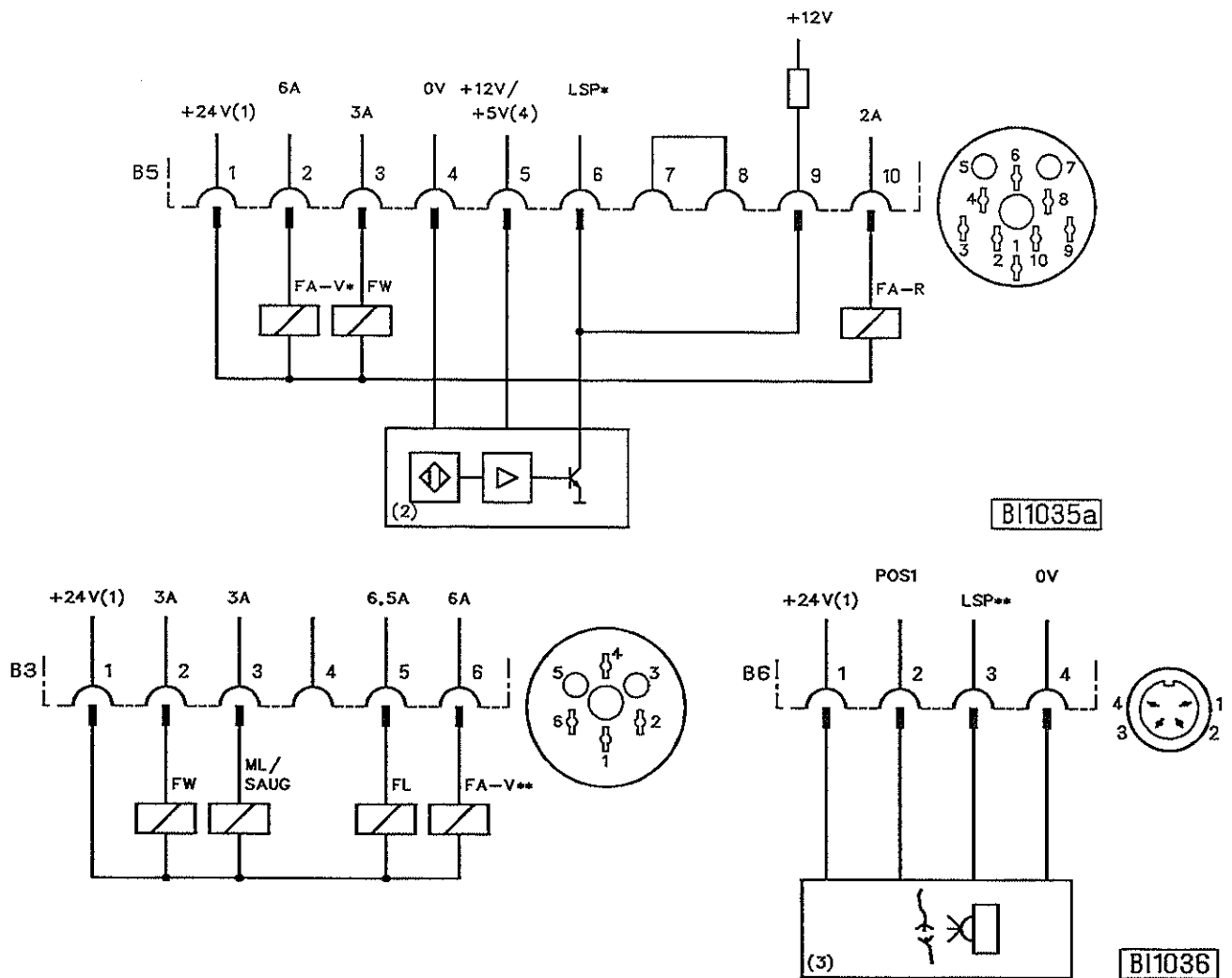
- Address parameter PI

- Press the + pushbutton; the following messages are shown on the display:

00		No change of the switching state
01		Input B5/4-6 was switched Proximity switch for thread trimmer
05		Input B9/1-3 or B11/1-3 was switched External sewing foot lifting
06		Input B9/1-2 or B11/1-2 was switched Needle up or flatseamer
07		Input B6/3-4 was switched Thread monitor

**Exit input test:** Press pushbutton P or E

## 9. Connection Diagrams



### Attention!

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

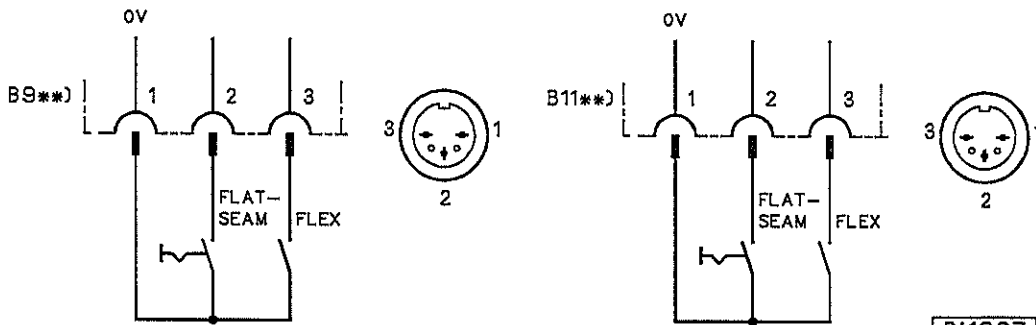
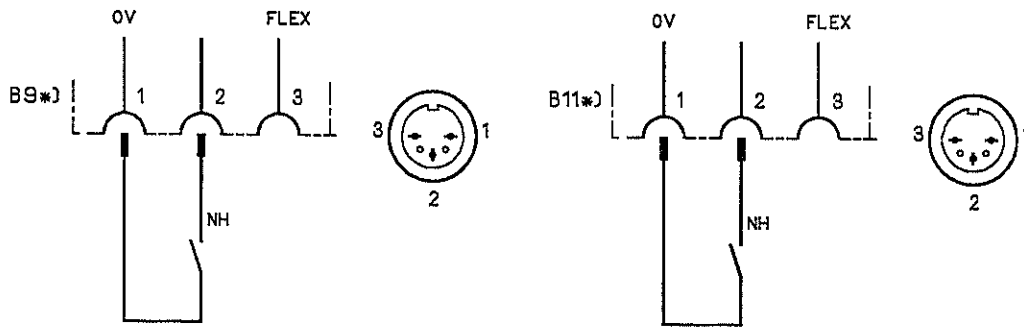
- FA-V\* - B5/2 - Thread trimmer (class 34700/800)  
 - Thread trimmer forward and drawing-off of the thread/triggering of thread tension
- FA-V\*\*- B3/6 - Mayer thread trimmer forward (class 37500 and 39500)
- FA-R - Thread trimmer backward
- FL - Sewing foot lifting
- FW - Thread wiper
- LSP\* - Input blocking of machine run of the proximity switch of the thread trimmer control
- LSP\*\* - Input blocking of machine run of the thread monitor
- ML/SAUG - Motor running/ suction
- POS 1 - Transistor output as counting signal (1/rotation)

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

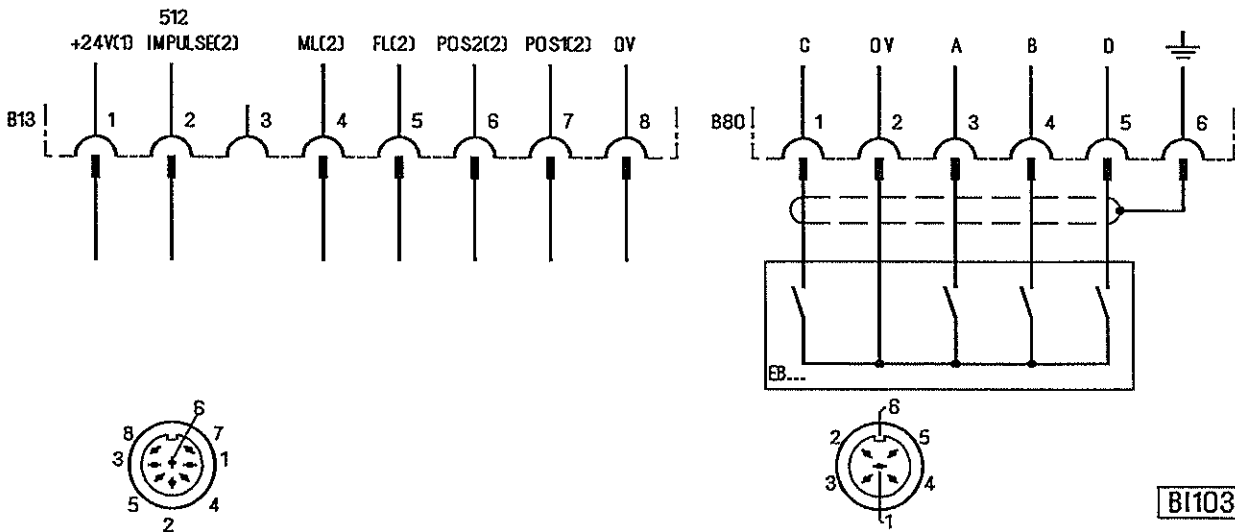
2) Proximity switch for thread trimmer control

3) Thread monitor

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



B11037



B11038

- \*) Connection diagram with function "flatseamer off" (parameter Q = 00)
- \*\*\*) Connection diagram with function "flatseamer on" (parameter Q = 01)

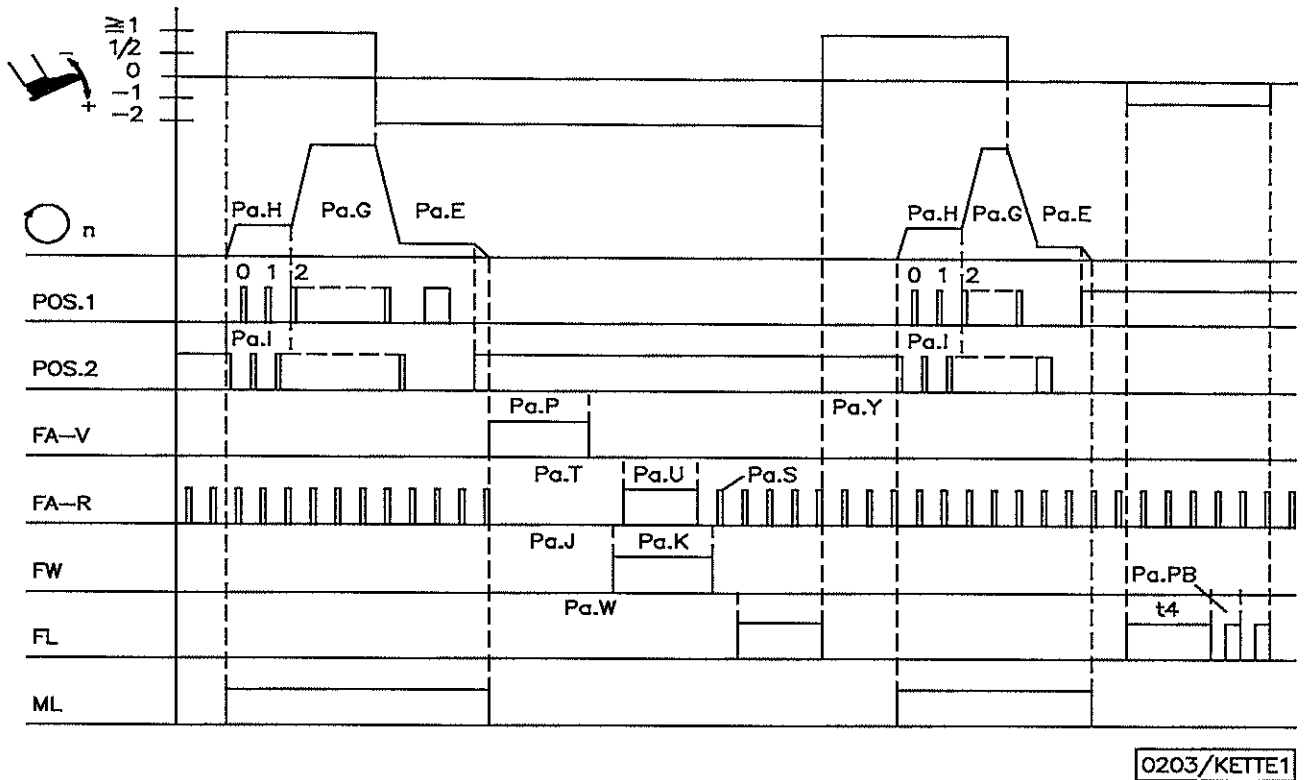
- FLATSEAM - Switch for flatseam function
- FLEX - Pushbutton for sewing foot lifting
- NH - Pushbutton for needle up
- 512 Impulse - Signal output 512 impulses / rotation
- FL - Signal output sewing foot lifted
- ML - Signal output motor
- POS1 - Signal output position 1 (needle down position)
- POS2 - Signal output position 2 (needle up position)

EB... - External actuator

- 1) Nominal voltage 24V, no-load voltage max. 36V
  - 2) Transistor output with open collector (max. 40V, 100mA)
- The signals "position 1" and "position 2" are suppressed after power on. When starting to sew, these signals will be activated. Pay attention to the time constant of the power resistor with the internal capacity (220pF) at the output of the signal "512 impulses".

### 10. Timing Diagrams

#### 10.1 Chainstitch Trimmer (Trimming from Full Machine Run)

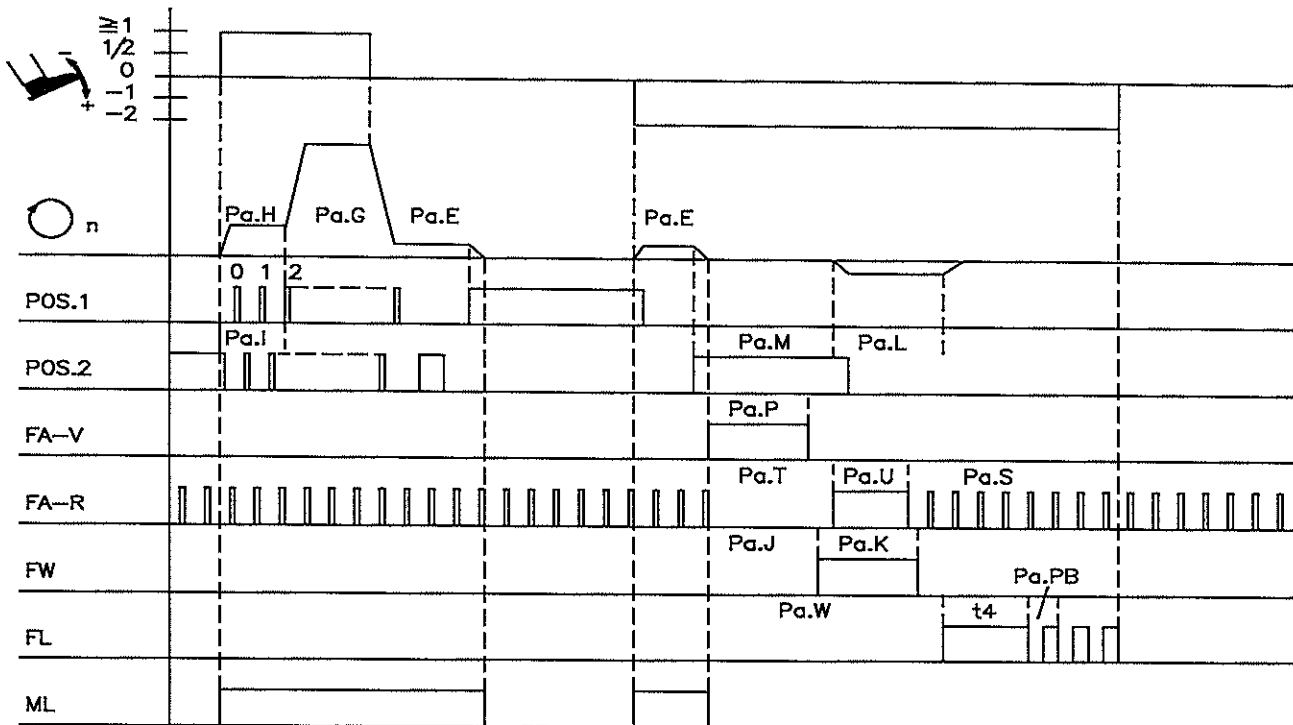


0203/KETTE1

Parameter	Function	
Q	Mode 0, chainstitch trimmer	Q = 00
PC	Softstart	on
E	Positioning speed	
G	Maximum speed	
H	Softstart speed	
J	Activation delay of the thread wiper	
K	Operating time of the thread wiper	
P	Operating time of the thread trimmer forward	
S	Pulsing of the thread trimmer backward	
T	Activation delay of the thread trimmer backward	
U	Operating time of the thread trimmer backward	
W	Activation delay of sewing foot lifting	
Y	Start delay from lifted foot	
PB	Pulse width of sewing foot lift pulsing	
I	Number of softstart stitches	
t4	Time of full power of sewing foot lifting	fixed

Pa. = Parameter

### 10.2 Chainstitch Trimmer (Trimming from Intermediate Stop)

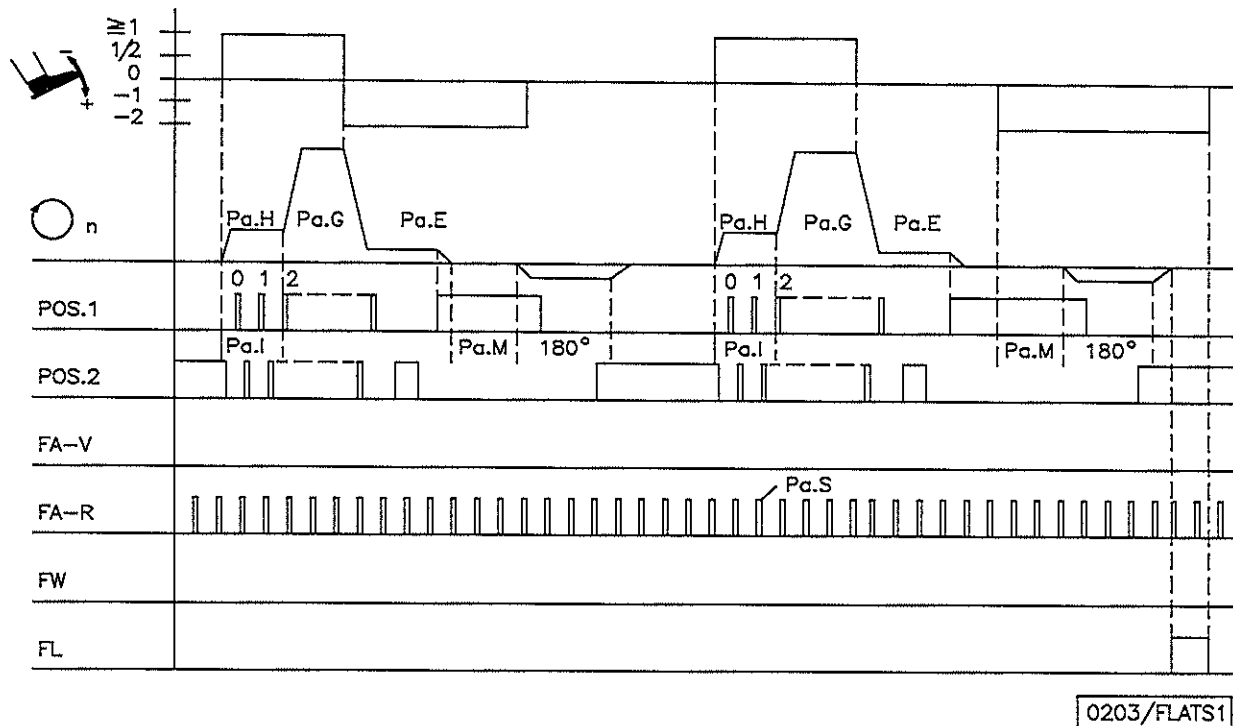


0203/KETTE2

Parameter	Function	
Q	Mode 0, chainstitch trimmer	Q = 00
L	Reversion	on
PC	Softstart	on
E	Positioning speed	
G	Maximum speed	
H	Softstart speed	
J	Activation delay of the thread wiper	
K	Operating time of the thread wiper	
L	Number of reversing increments	
M	Activation delay of reversion	
P	Operating time of the thread trimmer forward	
S	Pulsing of the thread trimmer backward	
T	Activation delay of the thread trimmer backward	
U	Operating time of the thread trimmer backward	
W	Activation delay of sewing foot lifting	
PB	Pulse width of sewing foot lift pulsing	
I	Number of softstart stitches	
t4	Time of full power of sewing foot lifting	fixed

Pa. = Parameter

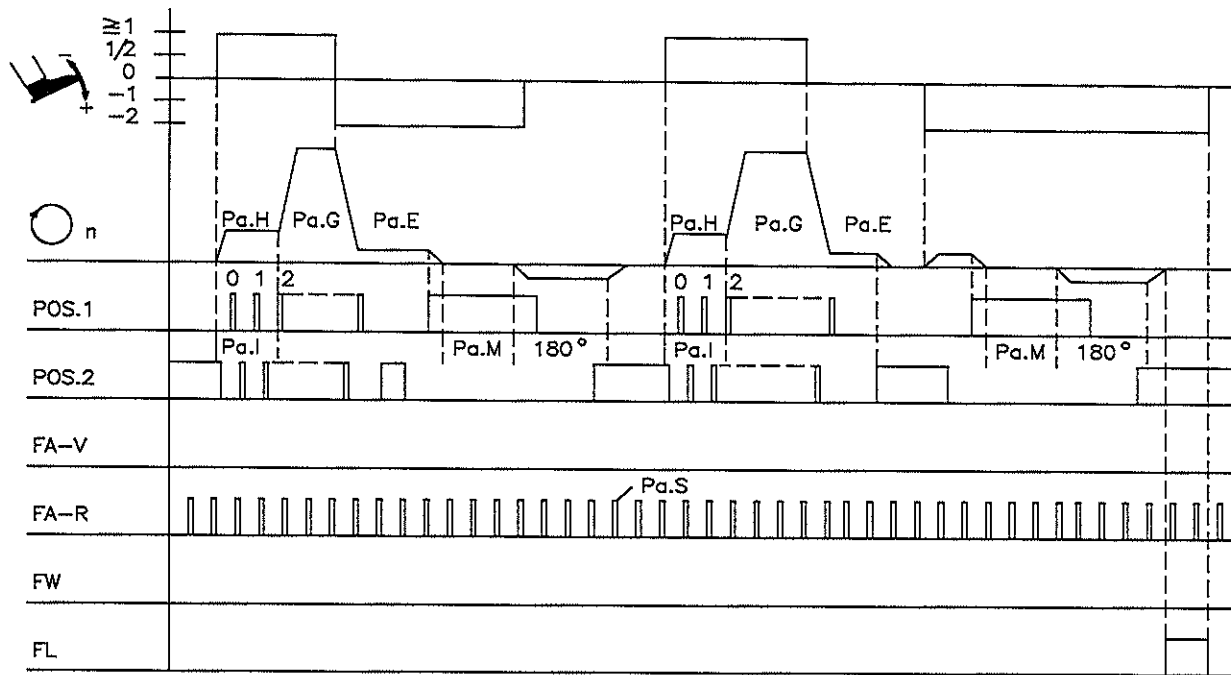
### 10.3 Function Flatseamer (Basic Position 1)



Parameter/ Pushbutton	Function	
Q Pushbutton -	Mode 1, flatseamer On Basic position 1	Q = 01 LED 7 = off
PC E G H	Switch "flatseamer" on socket B9/1-2 or B11/1-2 Softstart Positioning speed Maximum speed Softstart speed	on on
M S	Activation delay of reversion Pulsing of the thread trimmer backward	
I	Number of softstart stitches	

Pa. = Parameter

10.4 Function Flatseamer (Basic Position 2)



Q203/FLATS2

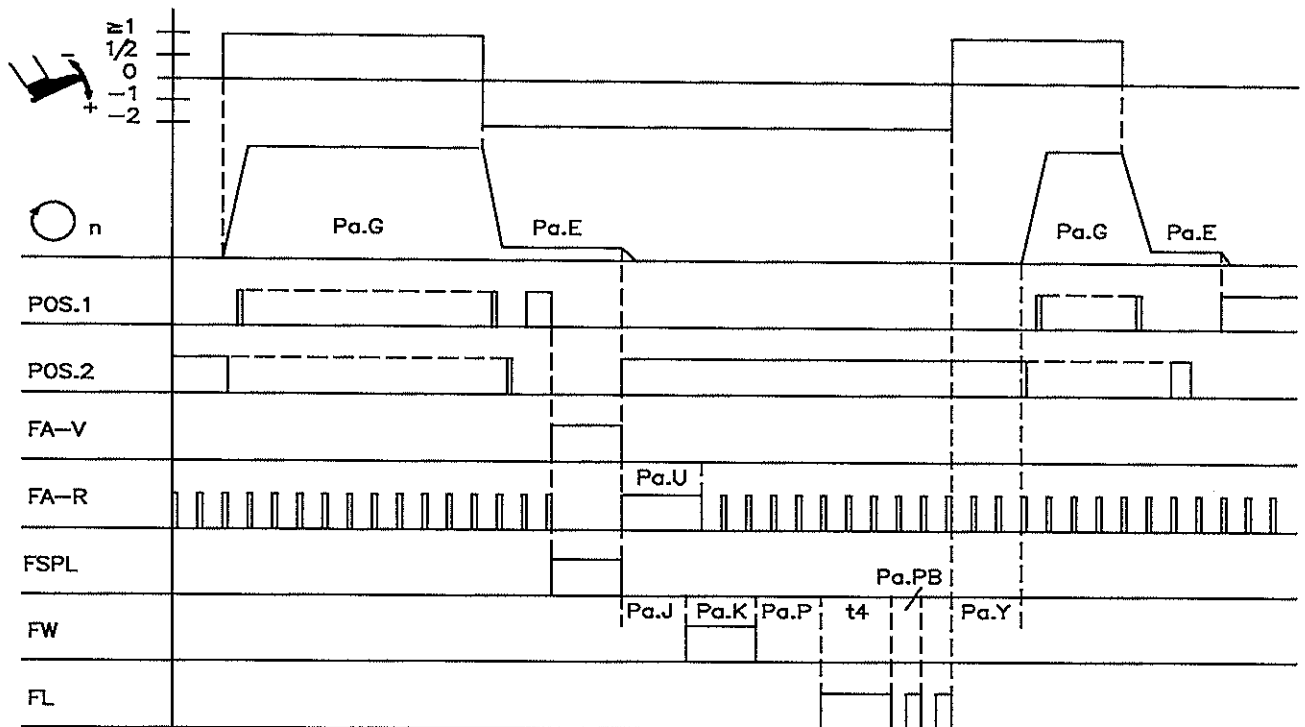
Parameter/ Pushbutton	Function
Q Pushbutton -	Mode 1, flatseamer On Basic position 2
PC E G H	Switch "flatseamer" on socket B9/1-2 or B11/1-2 Softstart Positioning speed Maximum speed Softstart speed
M S	Activation delay of reversion Pulsing of the thread trimmer backward
I	Number of softstart stitches

Pa. = Parameter

Q = 01  
LED 7 = off  
on  
on



10.5 Refrey Trimmer (Trimming from Full Machine Run)

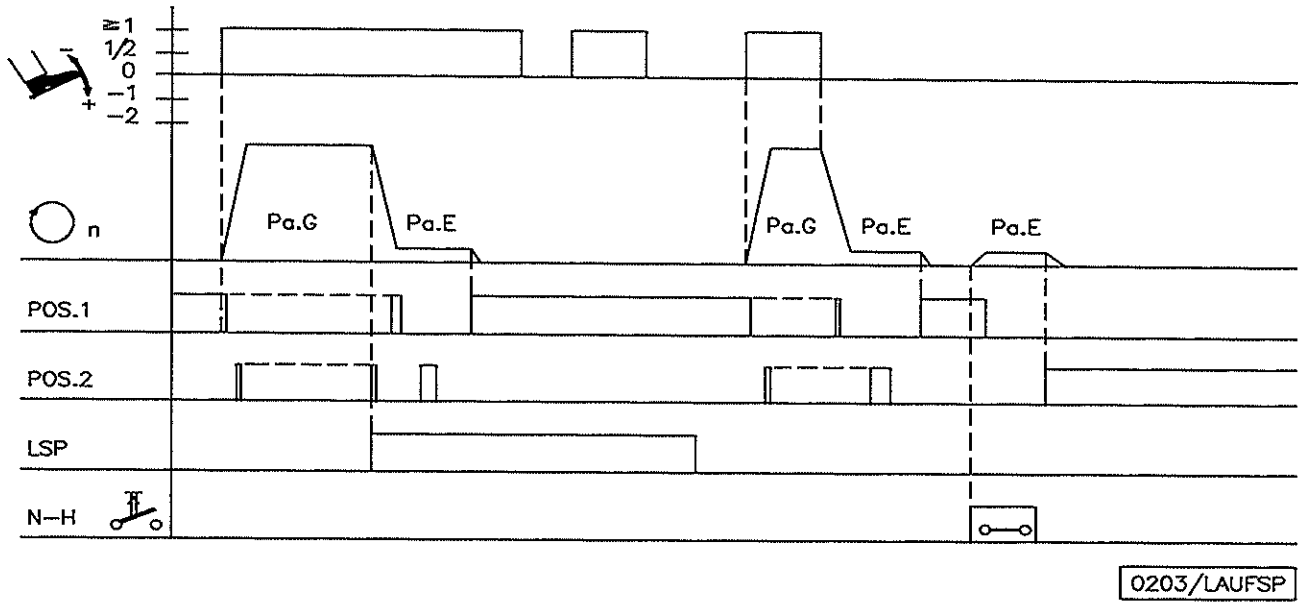


0203/REFREY

Parameter	Function	
Q	Mode 2, Refrey trimmer	Q = 02
L	Reversion	on
PC	Softstart	on
E	Positioning speed	
G	Maximum speed	
H	Softstart speed	
J	Activation delay of the thread wiper	
K	Operating time of the thread wiper	
L	Number of reversing increments	
M	Activation delay of reversion	
P	Operating time of the thread trimmer forward	
S	Pulsing of the thread trimmer backward	
T	Activation delay of the thread trimmer backward	
U	Operating time of the thread trimmer backward	
W	Activation delay of sewing foot lifting	
PB	Pulse width of sewing foot lift pulsing	
I	Number of softstart stitches	
t4	Time of full power of sewing foot lifting	fixed

Pa. = Parameter


















10.6 Needle Up / Blocking of Machine Run









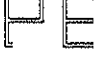





Parameter	Function
E G	Positioning speed Maximum speed
	Pushbutton "needle up" on socket B9/1-2 or B11/1-2 Switch "blocking of machine run" on socket B5/4-6 or B6/3-4

Pa. = Parameter

## 11. Parameter List

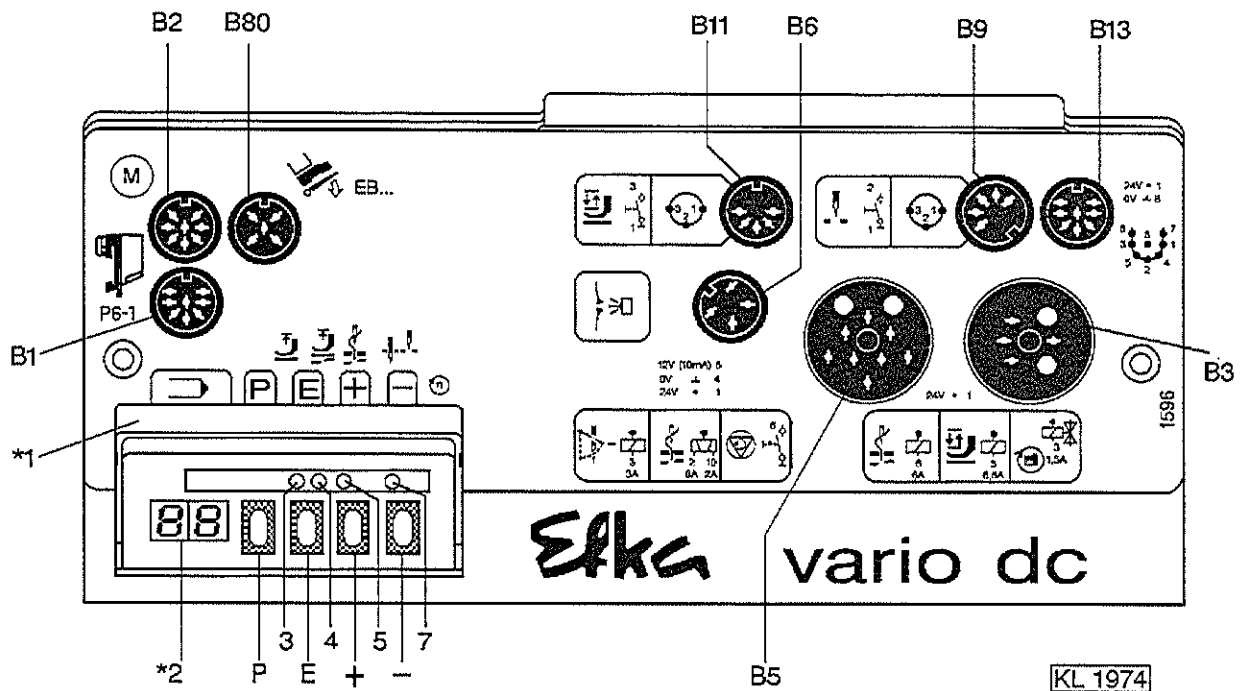
Parameter	Display	Function	Unit	Max	Min	Preset
A		Setting the reference position				
B		Setting position 1				
C		Setting position 2				
D		Setting position 1A				
E		Positioning speed, first pedal step	x 10 rpm	39	07	18
G		Maximum speed	x 100 rpm	99	04	45
H		Softstart speed	x 10 rpm	99	07	50
I		Number of softstart stitches		09	00	03
J		Activation delay of thread wiper	x 10 ms	99	00	09
K		Operating time of thread wiper	x 100 ms	25	0.0	1.1
L		Number of reversing increments	x 10 incr.	60	00	00
M		Activation delay of reversion	x 10 ms	99	00	00
N		Direction of rotation of the motor (look at motor shaft)	counterclockwise = 01 clockwise = 00	01	00	00
O		Braking power at standstill		30	00	00
P		Operating time thread trimmer forward      Pa Q = Mode 0/1 Delay sewing foot      Pa Q = Mode 2	x 10 ms	60	00	09
Q		Mode 0 = Chainstitch trimmer Mode 1 = Flatseamer Mode 2 = Refrey trimmer		02	00	00
R		Thread trimming by pedal -1 on/off		01	00	00

Parameter	Display	Function	Unit	Max	Min	Preset
S		Pulsing of the thread trimmer backward (0% - 18%)	%	18	00	10
T		Activation delay of the thread trimmer backward	x 100 ms	25	0.0	1.2
U		Operating time of the thread trimmer backward	x 10 ms	50	03	28
W		Activation delay of sewing foot	x 100 ms	25	0.0	2.7
Y		Start delay from lifted foot	x 10 ms	60	00	05
PB		Pulse width for sewing foot lift pulsing (1 = low holding power) (7 = high holding power) (0 = full power)		07	00	03
PC		Softstart on/off		01	00	00
PD		Starting edge		60	01	32
PE		Braking edge 1		60	01	10
PF		Braking edge 2		60	01	32
PH		Test function for the outputs and the position transmitter				
PI		Test function for the inputs				

**For your notes:**

**For your notes:**

## 12. Operating Elements and Socket Connectors



- B1 = Position transmitter
- B2 = Commutation transmitter for d.c. motor
- B3 = Solenoids
- B5 = Solenoids and sensor
- B6 = Sensor
- B9 = Switches and pushbuttons
- B11 = Switches and pushbuttons
- B13 = Output signals for automats
- B80 = Actuator

- \*1 = Type designation
- \*2 = Display (2-digit seven segment display)

- Pushbutton P = Recall or exit of programming mode
- Pushbutton E = Programming mode: enter button for modifications  
Operator mode: automatic sewing foot lifting
- Pushbutton + = Programming mode: increase of the indicated value  
Operator mode: thread trimmer on/off
- Pushbutton - = Programming mode: decrease of the indicated value  
Operator mode: basic position
- LED 3 = Sewing foot lifting in the seam (LED on = automatic)
- LED 4 = Sewing foot lifting after the seam end (LED on = automatic)
- LED 5 = Thread trimmer (LED on = on)
- LED 7 = Basic position (LED on = up)

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**Efka**

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