Efka vario dc

CONTROL   MS80A4114

INSTRUCTION MANUAL

WITH PARAMETER LIST

No. 402148   english

Contents   **Page**

1. Important Safety Instructions

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

- Read all instructions thoroughly before using this drive.

- Drive and accompanying appliances should be mounted and put into operation by qualified personnel in accordance with the guidelines provided in the instruction manual.

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

- Use this drive only for its intended use as described in the instruction manual.

- Use only attachments recommended by the manufacturer or as contained in the instruction manual.

- Do not operate without corresponding protective devices.

- Never operate this drive if one or more parts (e.g. cables, plugs) are damaged, if it is not working properly, if any damages can be identified or are to be suspected (e.g. after it has been dropped). Only qualified personnel are authorized to make adjustments, eliminate faults and complete repair work.

- Never operate the drive with the air openings blocked. Keep ventilation openings of the drive free from the accumulation of lint, dust and loose cloth.

- Never drop or insert any object into any opening.

- Do not use drive outdoors.

- Do not operate where aerosol (spray) products are being used or where oxygen is being administered.

- To disconnect, turn off main switch, then remove plug from outlet.

- Do not unplug by pulling on cord. To unplug, grasp the plug, not the cord.

- Keep fingers away from all moving machine parts. Special care is required e.g. around the sewing machine needle and the V-belt.

- Before mounting and adjusting accompanying appliances, i.e. postioner, reversing device, light barrier, etc., disconnect drive from mains (turn off main switch, remove mains plug from outlet [DIN VDE 0113 part 301; EN 60204-3-1; IEC 204-3-1]).

- Always switch off (0) machine and remove plug from outlet, when removing covers, mounting accompanying appliances, positioner especially, light barrier, etc., or any other devices mentioned in the instruction manual.

- Only qualified personnel are authorized to work on the electrical components.

- Work on high voltage circuit areas is forbidden, except as stated in the respective regulations, e.g. DIN VDE 0105 part 1.

- Only specially trained personnel are authorized to complete repair work.

- Cables to be wired must be protected against expectable strain and fastened adequately.

- Cables near moving machine parts (e.g. V-belts) must be wired at a minimum distance of 25 mm (see DIN VDE 0113 part 301; EN 60204-3-1; IEC 204-3-1).

- For safety it is preferred to wire the cables separately from each other.

- Before connecting the mains line make sure that the mains voltage corresponds to the specifications on the motor rating plate and on the nameplate of the power pack.

- Connect this drive to a properly grounded outlet only. See Grounding Instructions.

- Electric accompanying appliances and accessories must only be connected to safety low voltage.

- EFKA DC drives are protected according to overvoltage class 2 (DIN VDE 0160 § 5.3.1).

- Observe all safety guidelines before undertaking conversions or modifications.

- For repair and maintenance use only original replacement parts.

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

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

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

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

Save these instructions for future reference.

2. Range of Applications

The drive is suitable for embroidery machines:

Brand	Series
MSI	GT 216/GT 226

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//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   Electric equipment of industrial machines:
                           special requirements for industrial sewing machines,
                           sewing units and sewing systems.

The drive can only be operated:

• on thread processing machines
• in dry areas

3. Complete Drive Unit Consisting of

1	Direct current motor	DC....
1	Control	vario dc MS80A4114
	- Power pack	N153 (optional N155)
1	Position transmitter	P6-1
1	Set of standard	
	accessories	B131
	consisting of:	belt guard complete
		set of hardware
		motor foot
		bracket 1 and 2, short
		documentation
1	Set of accessories	Z3
	consisting of:	pitman rod, complete
1	Pulley	

3.1 Special Accessories

External actuator type EB301, complete with approx. 250 mm connecting cable and plug	- part no. 4160011
External actuator type EB302 (reduced actuating force), complete with approx. 250 mm connecting cable and plug	- part no. 4160012
External actuator type EB301, complete with approx. 750 mm connecting cable and plug	- part no. 4160016
External actuator type EB301, complete with approx. 1500 mm connecting cable and plug	- part no. 4160014
Foot control type FB302 for standing operation with approx. 1400 mm connecting cable and plug	- part no. 4160018
Extension cable for ext. actuator, approx. 750 mm long, complete with plug and socket connector	- part no. 1111845
Extension cable for ext. actuator, approx. 1500 mm long, complete with plug and socket connector	- part no. 1111787
5-pin-plug with slide index for the connection of another external actuator	- part no. 0501278
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 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 ϕ with special belt intake and slip-off protection (use SPZ belt)	- part no. 1112223
Pulley 50 mm ϕ 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)
6-pin plug with slide index (Mas 6100)	- part no. 0500703
8-pin plug with slide index (Mas 8100S)	- part no. 0502865

---

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.
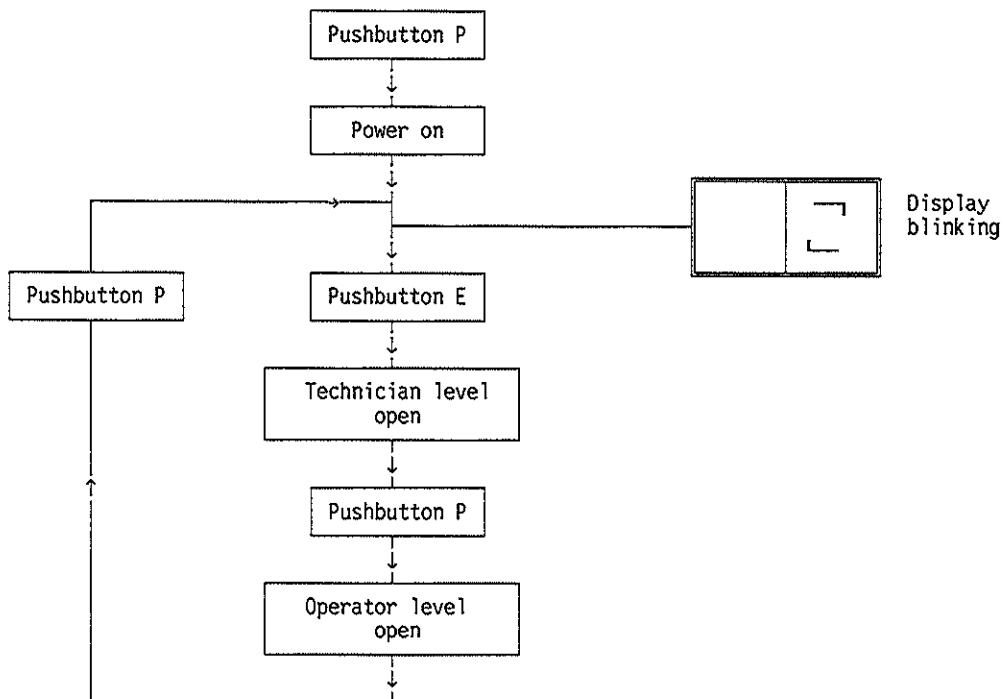For example, basic position needle up/down, Softstart on/off.
This level is always accessible when power is on, unless the technician level is open.

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.
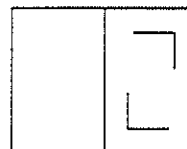
4.3.1 Access to the Technician Level

```
          ┌─────────────────┐
          │  Pushbutton P   │
          └─────────────────┘
                   ↓
          ┌─────────────────┐
          │   Power  on     │
          └─────────────────┘
                   ↓
                                        ┌──────────┐
                                        │      ⌐   │   Display
                                        │      └   │   blinking
                                        └──────────┘
                   ↓
┌─────────────────┐   ┌─────────────────┐
│  Pushbutton P   │   │  Pushbutton E   │
└─────────────────┘   └─────────────────┘
                   ↓
              ┌─────────────────┐
              │ Technician level│
              │      open       │
              └─────────────────┘
                   ↓
              ┌─────────────────┐
              │  Pushbutton P   │
              └─────────────────┘
                   ↓
              ┌─────────────────┐
              │ Operator level  │
              │      open       │
              └─────────────────┘
                   ↓
```

4.3.2 Programming a Parameter

1. Open technician level

Press ⌐P⌐   + TURN POWER ON

           Display blinks   ==>   [⌐ └]

2. Set parameters

| E |

```
Parameter A      ==>
= Set the
reference point
```
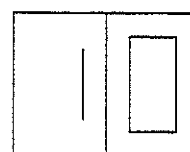
The desired parameter can be selected by pressing pushbutton E repeatedly.
The respective abbreviation appears on the display. See also chapter -Parameter List-

3. Change parameter value

| + |

```
Displayed value  ==>
e.g. 10
```

| + | or | - | ==> Change value

On with 2. | E | ==> Address next parameter
                   or   4. Close technician level

4. Close technician level

| P |

```
Display goes off  ==>
```
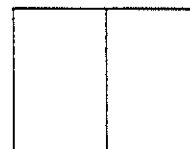
5. Saving a changed value

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:

- Adjust the direction of rotation of the motor (parameter "S")
- If necessary, set the reference position (parameter "A")
- If necessary, set the positions (parameters "B...I")
- If necessary, set the speeds (parameters "J", "K", "L", "M")
- If necessary, set the remaining relevant paramenters
- 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!**
> When changing the direction of rotation of the motor, the positions must be reprogrammed.

5.2 Initial Operation

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

- The positions must not have been reprogrammed.
- Program the direction of rotation "**counterclockwise rotation**" (parameter "N" = 01).
- Set the reference position (parameter "A").

> **Note:**
> Reference position = position of thread lever where change from one needle to another takes place (see also MSI instruction manual).

- Set positions (parameter "B...I").
- If necessary, set the speeds (parameters "J", "K", "L", "M").
- If necessary, set the remaining relevant parameters.
- **Start sewing in order to save the set values.**

5.3 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   ==>
```
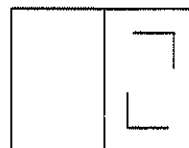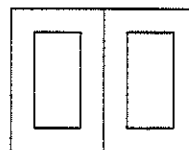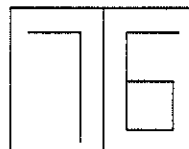
5.

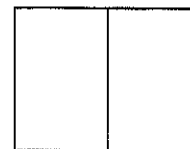Press P briefly (< 2sec.)

                                   Display goes off   ==>
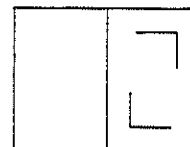
   The drive is ready for operation on the
   operator level

6.

Press P longer (> 2sec.)

                                   Display blinks   ==>
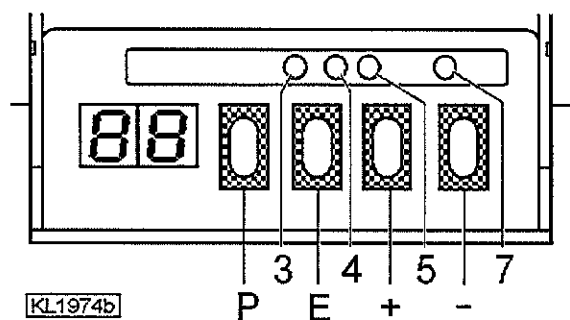
   The technician level is open for
   further programming

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
Softstart	E	3 = on	3 = 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 Limitation of the Maximum Speed

By pressing the pushbuttons + or -, or while the motor is running, a speed limitation is possible.
A limitation to approx. 50% of the programmed maximum speed is possible.
The activated speed limitation is shown on the display.

```
Limitation approx. 10%      ==>        [ - | ] ]

                   .                        .
                   .                        .
                   .                        .

Limitation approx. 50%      ==>        [ - | 5 ]
```
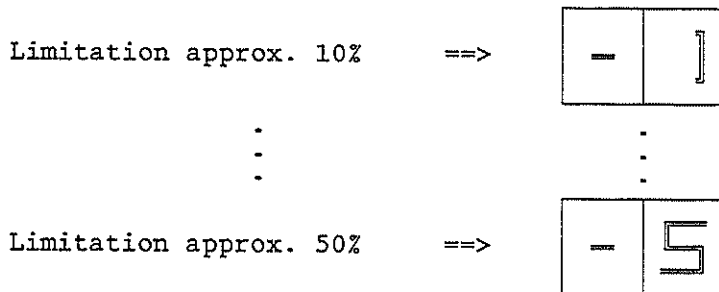
Note:
The changed setting is permanently saved only after trimming and a new sewing start.

6.2 Functions and Settings on the Technician Level

6.2.1 First Slow Stitch After Power On

After power on, the drive performs on rotation from position 1 to position 1 at positioning speed, independently of the actuator setting. This function is not disengageable.

6.2.2 Softstart

Functions	Parameter
Softstart on/off	Pushbutton E
Number of Softstart stitches Softstart speed Softstart on/off	N M Pushbutton E

Function:
- after power on
- at the beginning of a new seam
- speed limited (can be set by parameters)
- stitch counting is synchronized to position 1
- interruption by actuator stage 0
- exit by actuator stage -2

6.2.3 Maximum Speed

Functions	Parameter
Maximum speed	L

The maximum speed can be set by parameter L within a range of 400 to 1300 RPM in steps of 10 RPM. Read the display according to the following table:

Display from...to	Corresponding speed RPM
40...49	400...490
50...59	500...590
60...69	600...690
70...79	700...790
80...89	800...890
90...99	900...990
A0...A9	1000...1090
B0...B9	1100...1190
C0...C9	1200...1290
D0	1300

The right side of the table shows "decimal" values. The display shows "hexadecimal" values. Example: "C9" corresponds to "C = 12" and "9" is 129 x 10 = 1290 RPM (see also chapter "Parameter List").

6.2.4 Thread Trimmer, Thread Wiper

Functions	Parameter
Thread trimmer, thread wiper	Pushbutton +
Operating time of the thread wiper	O

-      The thread trimmer is switched on in position 4 and is switched off after reaching a fixed angle.
-      The thread trimming operation can be switched on or off by pushbutton +.
-      The thread wiper can only be switched on or off jointly with the thread trimmer.
-      The function of the thread trimming and thread wiping signal is described in chapter "Function Diagrams".

6.2.5 Thread Tension Release

Functions	Parameter
Thread tension release	Pushbutton +
Activation delay of the thread tension release Operating time of the thread tension release	U V

-      The thread tension release can be switched on and/or off by pushbutton +, jointly with the thread trimmer and the thread wiper.
-      The function of the thread tension release is described in chapter "Function Diagrams".

6.2.6 Thread Tension Release at Machine Standstill

Functions	External Pushbutton
Thread tension release	B13/4-8

- The thread tension release can be switched on and/or off at machine standstill by an external pushbutton.
- The thread tension release is automatically switched off, when the drive starts.
- The function of the thread tension release at standstill of the drive is described in chapter "Function Diagrams".

6.2.7 Presser Foot Lifting

Functions	Parameter
Activation delay of presser foot lifting Start delay from lifted foot	P W

- Transistor output with open collector.

Foot is lifted:

- in the seam by position -1
  after thread trimming by position -1 or -2

Foot lowers:

- in the seam and after thread trimming at position ≥ 0

6.2.8 Reversion

Functions	Parameter
Number of reversion increments Activation delay of reversion Positioning speed	Q R J

- The function "reversion" is performed after trimming.
- When the stop position is reached, the drive stops for a time that can be set (parameter R). Then it reverses at positioning speed for an adjustable number of increments (param. Q).
- 1 increment corresponds to approx 0.7°.

6.2.9 Signal Output Position 1

- Transistor output with open collector.
- Switches whenever the needle is in the slot between position 1 and 1A.
- Independent of sewing, thus also when turning the handwheel manually.
- The movement of the frame on the above mentioned embroidery machine is possible.
- Suitable e.g. for the connection of a counter.
- The function is described in chapter "Function Diagrams".

6.2.10 Signal Output Position 2

- Transistor output with open collector.
- Switches whenever the needle is in the slot between position 2 and 2A.
- Independent of sewing, thus also when turning the handwheel manually.
- The function is described in chapter "Function Diagrams".

6.2.11 Signal Output Position 3

- Transistor output with open collector.
- Switches whenever the needle is in the slot between position 3 and 3A.
- Independent of sewing, thus also when turning the handwheel manually.
- In this position a jump stitch is performed on the above mentioned embroidery machine.
- The function is described in chapter "Function Diagrams".

6.2.12 Signal Output G1

- Transistor output with open collector.
- Switches whenever a generator slot of the positioner is sensed (512 times per rotation).
- Independent of sewing, thus also when turning the handwheel manually.
- Suitable e.g. for the connection of a counter.

6.2.13 Signal Output Synchronous Thread Trimmer

- Transistor output with open collector.
- Is switched on whenever trimming has been initiated by position -2 of the actuator and the speed is below a set value.
- The signal is switched off after the last output signal of the trimming sequence.

6.3 Machine Functions

6.3.1 Direction of Rotation of the Motor

Functions	Parameter
Direction of rotation of the motor	S

Look at the motor shaft: Parameter "S" = 00 - clockwise rotation
                             Parameter "S" = 01 - anticlockwise rotation

⚠️ | **Attention!**
If the motor is mounted differently, e.g at a different angle or with gear, ensure that the parameter value is correctly assigned to the direction of rotation.

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 actuator by less than 5 stages, e.g. from stage 10 to stage 6).
Parameter PF influences the slowing down, when a major change of the speed is desired (changing the actuator by more than 4 stages, e.g. for positioning from stage 12 to stage 0).

6.3.4 Braking Power at Standstill

Functions	Parameter
Braking power at standstill	T

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 (movement of the frame is possible)	B
Position 1A	C
Position 2 (stop position)	D
Position 2A	E
Position 3 (jump stitch)	F
Position 3A	G
Position 4 (thread trimming)	H
Position 4A	I

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 positioner 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:

1. Open the technician level

```
Press  P   + TURN POWER ON / Display blinks        ==>
```
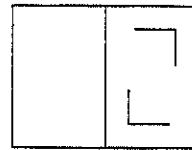
2. Address parameter

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

3. Prepare setting

```
Press  +                   Display 0 blinking   ==>
```
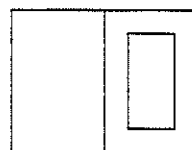
4. Setting

```
- Turn handwheel until display 0 is constant.
- Turn handwheel in the direction of rotation to one half needle bar stroke
behind the bottom dead center (use caliber)
```

> **Note:**
> Reference position = position of thread lever where change from one needle to another takes place (see also MSI instruction manual).

5. Enter setting

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

6. Exit programming

```
Press  P                   Display goes off  ==>
(Technician level is closed)
```
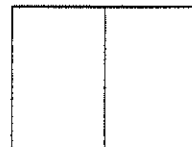
7. Save programmed settings

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.
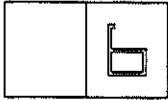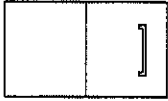
6.3.5.2 Signal and Stop Positions

> 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.

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

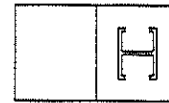- or press   ⌐E⌐   confirm setting   ==>   Display switches to next parameter C
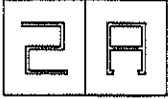
Set position 1A

- Press   ⌐+⌐   ==>   Display for "Set position 1A" blinks

- Set position 1A by turning the handwheel

- or press   ⌐E⌐   confirm setting   ==>   Display switches to next parameter D

Set position 2

- Press   ⌐+⌐   ==>   Display for "Set position 2" blinks

- Set position 2 by turning the handwheel

- or press   ⌐E⌐   confirm setting   ==>   Display switches to next parameter E

Set position 2A

- Press   ⌐+⌐   ==>   Display for "Set position 2A" blinks

- Set position 2A by turning the handwheel

- or press   ⌐E⌐   confirm setting   ==>   Display switches to next parameter F

Set position 3
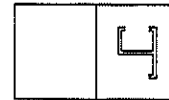
- Press   ⌐+⌐   ==>   Display for "Set position 3" blinks

- Set position 3 by turning the handwheel

- or press   ⌐E⌐   confirm setting   ==>   Display switches to next parameter G

Set position 3A

- Press [+]   ==>   Display for
                                      "Set position 3A" blinks
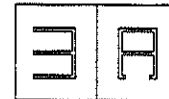
- Set position 3A by turning the handwheel

- or press [E] confirm ==>   Display switches to
               setting   next parameter H

Set position 4

- Press [+]   ==>   Display for
                                      "Set position 4" blinks

- Set position 4 by turning the handwheel

- or press [E] confirm ==>   Display switches to
               setting   next parameter I

Set position 4A

- Press [+]   ==>   Display for
                                      "Set position 4A" blinks
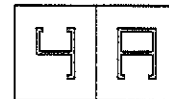
- Set position 4A by turning the handwheel

- Press [P]   ==>   Display goes off

Setting of the positions is completed

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

6.3.6 External Actuator

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

Table: Coding of the stages

Stages:	D	C	B	A	
-2	H	H	L	L	Initiating the seam end
-1	H	H	H	L	Presser foot lifting
0	H	H	H	H	Position 0
½	H	H	L	H	Presser foot lowering
1	H	L	L	H	Speed stage 1 (n_{pos})
2	H	L	L	L	.
3	H	L	H	L	.
4	H	L	H	H	.
5	L	L	H	H	.
6	L	L	H	L	.
7	L	L	L	L	.
8	L	L	L	H	.
9	L	H	L	H	.
10	L	H	L	L	.
11	L	H	H	L	.
12	L	H	H	H	Speed stage 12 (n_{max})

L = switch contact closed, H = switch contact open

7. Error Messages

General Information

Display	Signification
A1	Pedal not in neutral position, when switching the machine on

Serious Situation

Display	Signification
E1	Position transmitter not connected or defective
E2	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 by parameter PH.

8.1.1 Position Transmitter Test

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

The position transmitter test is only possible if sewing has been started.
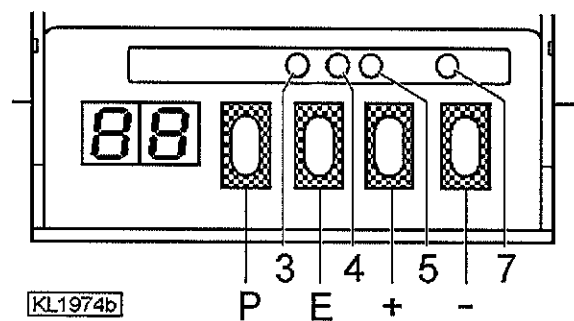
- Address parameter **PH**
- Press pushbutton +
- Turn handwheel
    - when reaching a position, the light emitting diodes are switched on
    - when leaving a position, the light emitting diodes are switched off

- LED 5 = on   - angular position between position 1 and 1A
- LED 7 = on   - angular position between position 2 and 2A
- LED 3 = on   - angular position between position 3 and 3A

- Press pushbutton P or E to exit the test mode
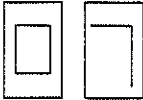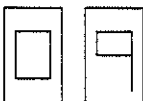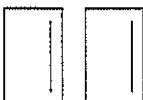
8.1.2 Output Test

The function is indicated on the display.

For testing, the outputs below are briefly activated.

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

OK	▢ ⊓	All outputs o.k.
99	⊐ ⊏	Error localization not possible
07	☐ ⊓	Error on B7/1-6 Thread trimmer
08	☐ ⊟	Error on B7/3-6 Thread tension release
09	☐ ⊐	Error on B7/4-6 Thread wiper
11	│ │	Error on B7/5 Signal output presser foot lifting
15	│ 5	Error on B7/2 Signal output synchronous thread trimmer
18	│ ⊟	Error on B13/5 Signal output position 3 (jump stitch)

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

Exit output test: Press pushbutton P or E
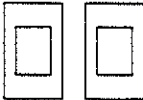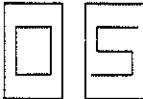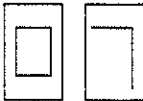
8.2 Input Test

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 and is shown on the display by the message 00.
If the switching state of a switch changes this is indicated by a code allocated to the input.
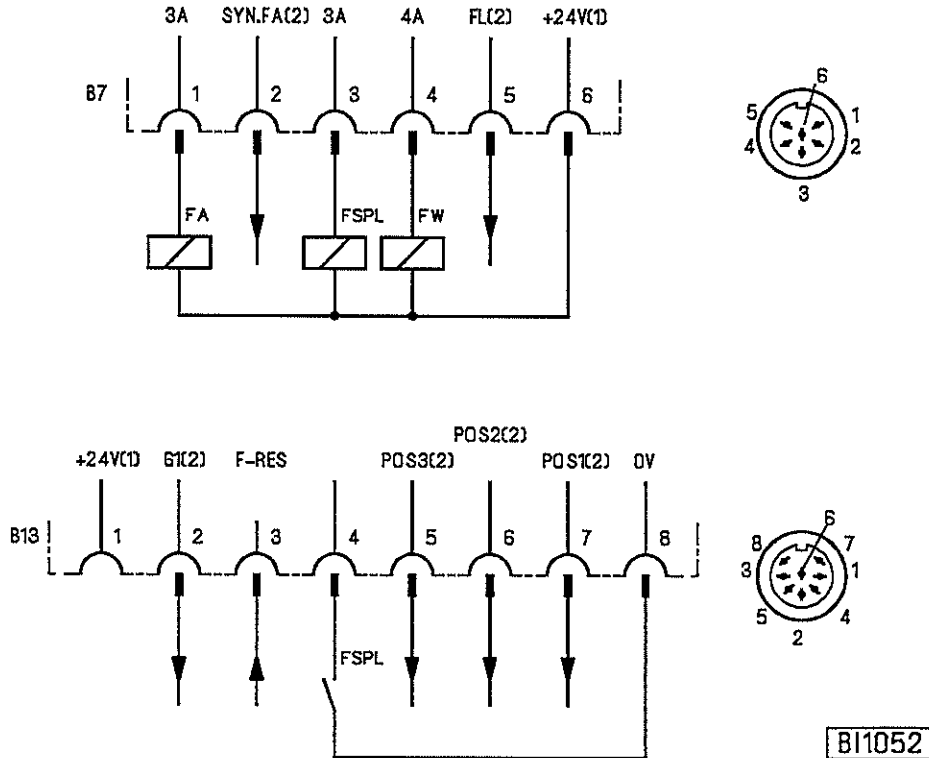Only one switch at a time may switch its switching state.

Test sequence

- Address parameter PI
- Press pushbutton + and the display shows the following messages:

00   No change of the switching state

05   Input B13/3 was switched
            Error reset

07   Input B13/4 was switched
            Thread tension release

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	- Thread trimmer
SYN-FA	- Transistor output synchronous thread trimmer
FSPL	- Thread tension release
FW	- Thread wiper
FL	- Transistor output presser foot lifting
G1	- Transistor output 512 impulses/rotation
F-RES	- Error reset
POS.1	- Transistor output position 1 (1/rotation)
POS.2	- Transistor output position 2 (1/rotation)
POS.3	- Transistor output position 3 (1/rotation)

1) Nominal voltage 24V, no-load voltage max. 36V.
2) Transistor ouput with open collector (max. 40V, 100mA).
   The signals of positions "1, 2 and 3" 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".
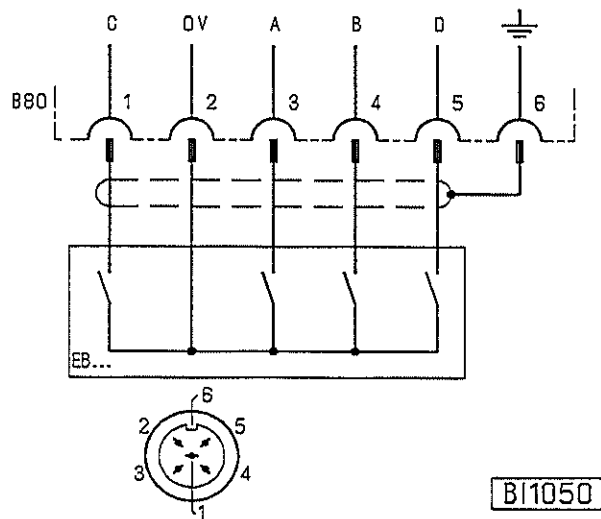
EB - External actuator

10. Function Diagrams

10.1 Trimming from Full Machine Run
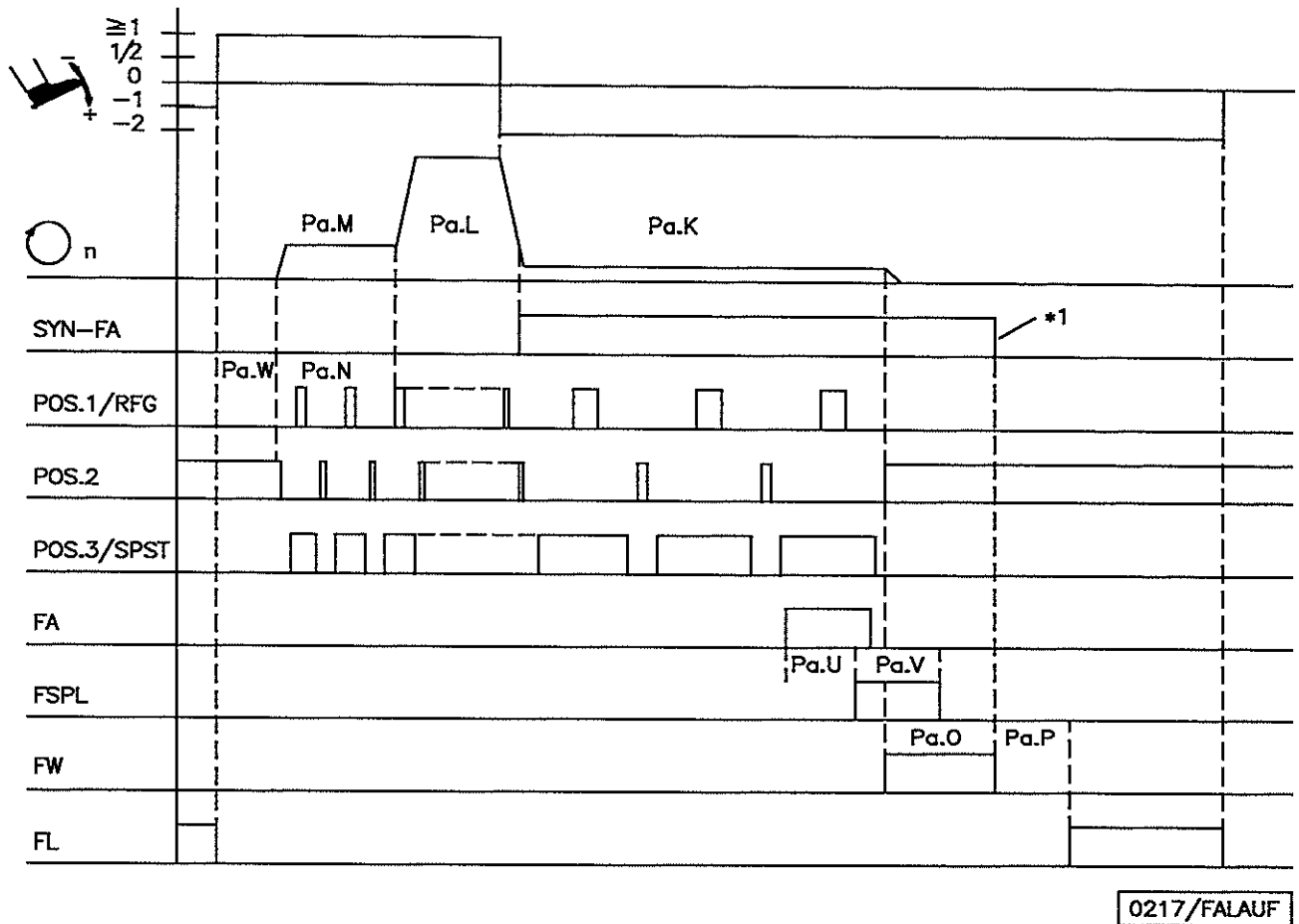
0217/FALAUF

Parameter/Pushbutton	Function	
Pushbutton "E"	Softstart	on
Pushbutton "+"	Thread trimmer	on
Pushbutton "−"	Basic position	up
K	Thread trimming speed	
L	Maximum speed	
M	Softstart speed	
U	Activation delay thread tension release	
V	Operating time thread tension release	
O	Operating time thread wiper	
P	Activation delay of presser foot lifting after thread wiper	
W	Start delay from lifted foot	
N	Number of Softstart stitches	

Abbreviations:
FL	=	Presser foot lifting
FA	=	Thread trimmer
FSPL	=	Thread tension release
FW	=	Thread wiper
POS.1/RFG	=	Position 1/ frame movement possible
POS.2	=	Position 2
POS.3/SPST	=	Position 3 / jump stitch
SYN-FA	=	Synchronous thread trimmer

Pa. = Parameter

*1 = The signal remains until the activation of thread wiper and/or thread tension release is completed !

10.2 Trimming from Intermediate Stop
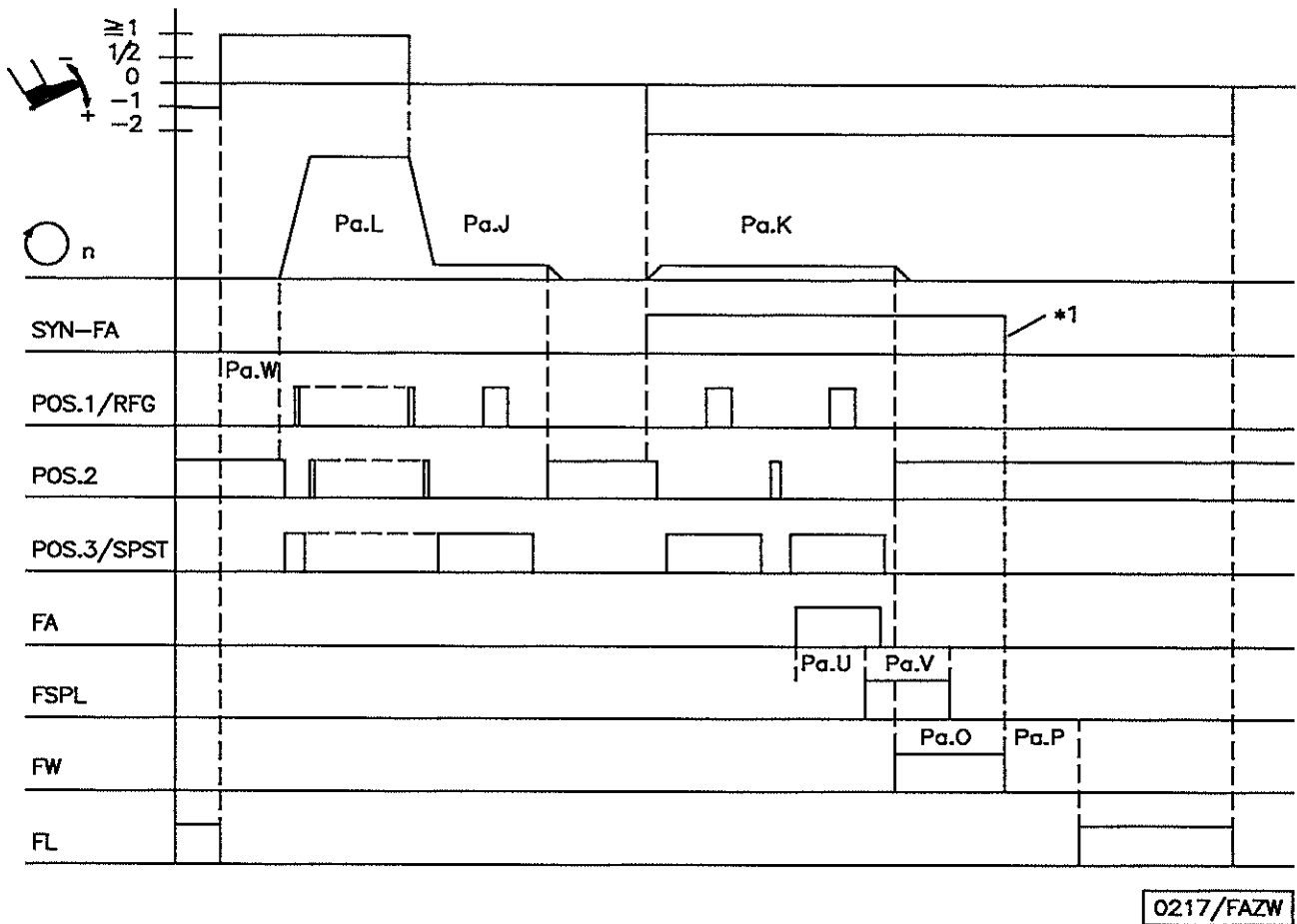
0217/FAZW

Parameter/Pushbutton	Function	
Pushbutton "E"	Softstart	off
Pushbutton "+"	Thread trimmer	on
Pushbutton "-"	Basic position	up
J	Positioning speed	
K	Thread trimming speed	
L	Maximum speed	
U	Activation delay thread tension release	
V	Operating time thread tension release	
O	Operating time thread wiper	
P	Activation delay of presser foot lifting after thread wiper	
W	Start delay from lifted foot	

Abbreviations:
FL	=	Presser foot lifting
FA	=	Thread trimmer
FSPL	=	Thread tension release
FW	=	Thread wiper
POS.1/RFG	=	Position 1/ frame movement possible
POS.2	=	Position 2
POS.3/SPST	=	Position 3 / jump stitch
SYN-FA	=	Synchronous thread trimmer

Pa. = Parameter

*1 = The signal remains until the activation of thread wiper and/or thread tension release is completed !

## 10.3 Run with Intermediate Stop without Thread Trimmer
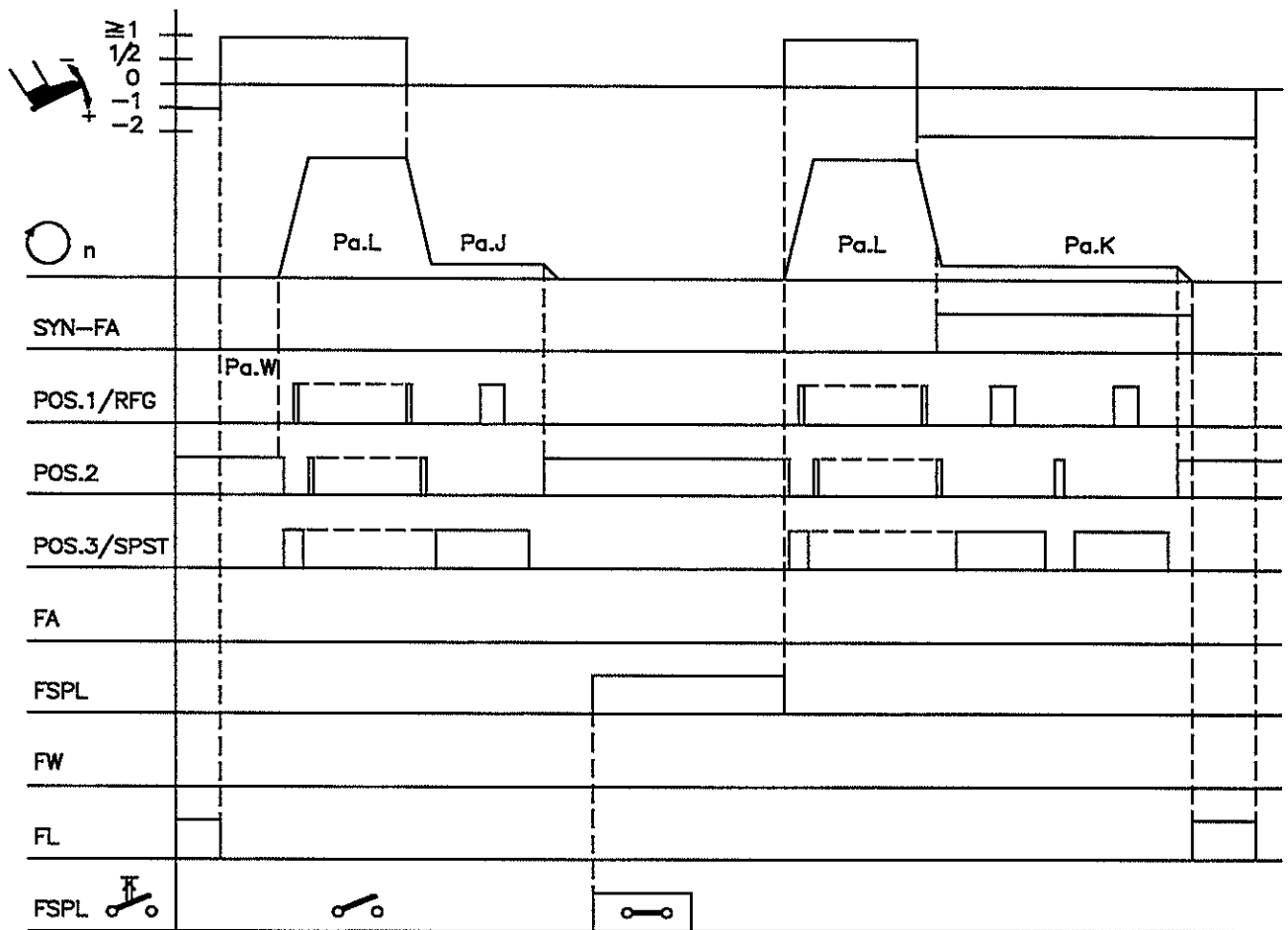
0217/LAUFZW

Parameter/Pushbutton	Function	
Pushbutton "E"	Softstart	off
Pushbutton "+"	Thread trimmer	off
Pushbutton "-"	Basic position	up
J	Positioning speed	
K	Thread trimming speed	
L	Maximum speed	
U	Activation delay thread tension release	
V	Operating time thread tension release	
O	Operating time thread wiper	
P	Activation delay of presser foot lifting after thread wiper	
W	Start delay from lifted foot	

Abbreviations: FL   = Presser foot lifting
                FA   = Thread trimmer
                FSPL   = Thread tension release
                FW   = Thread wiper
                POS.1/RFG   = Position 1/ frame movement possible
                POS.2   = Position 2
                POS.3/SPST = Position 3 / jump stitch
                SYN-FA   = Synchronous thread trimmer

Pa. = Parameter

11. Parameter List

Para-meter	Display	Function	Unit	Max	Min	Preset
A		Setting the reference position				
B		Setting position 1 (movement of frame possible)				
C		Setting position 1A (movement of frame possible)				
D		Setting position 2 (stop position)				
E		Setting position 2A (stop position)				
F		Setting position 3 (jump stitch)				
G		Setting position 3A (jump stitch)				
H		Setting position 4 (thread trimmer)				
I		Setting position 4A (thread trimmer)				
J		Positioning speed (first stage)	x 10 RPM	39	06	16
K		Trimming speed	x 10 RPM	39	06	16
L		Maximum speed	x 10 RPM	d0 (=1300)	40	80
M		Softstart speed	x 10 RPM	99	06	30
N		Softstart stitches (look at the motor shaft)	right = 00	09	00	03
O		Thread wiper operating time	x 10 ms	60	00	40
P		Activation delay of presser foot lifting after thread wiper	x 10 ms	99	00	50

Para-meter	Display	Function	Unit	Max	Min	Preset
Q		Number of reversion increments	x 10 incr.	50	00	00
R		Activation delay of reversion	x 10 ms	99	00	00
S		Direction of rotation of the motor (look at the motor shaft)	left = 01 right = 00	01	00	01
T		Braking power at standstill		30	00	00
U		Activation delay of thread tension after reaching position 4	x 10 ms	99	00	15
V		Deactivation delay of thread tension after reaching position 4	x 10 ms	99	00	50
W		Start delay after presser foot lifting	x 10 ms	99	00	08
PD		Starting edge		60	01	25
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				

Note:
The preset values of parameters A...I are not displayed.

12. Operating Elements and Socket Connectors
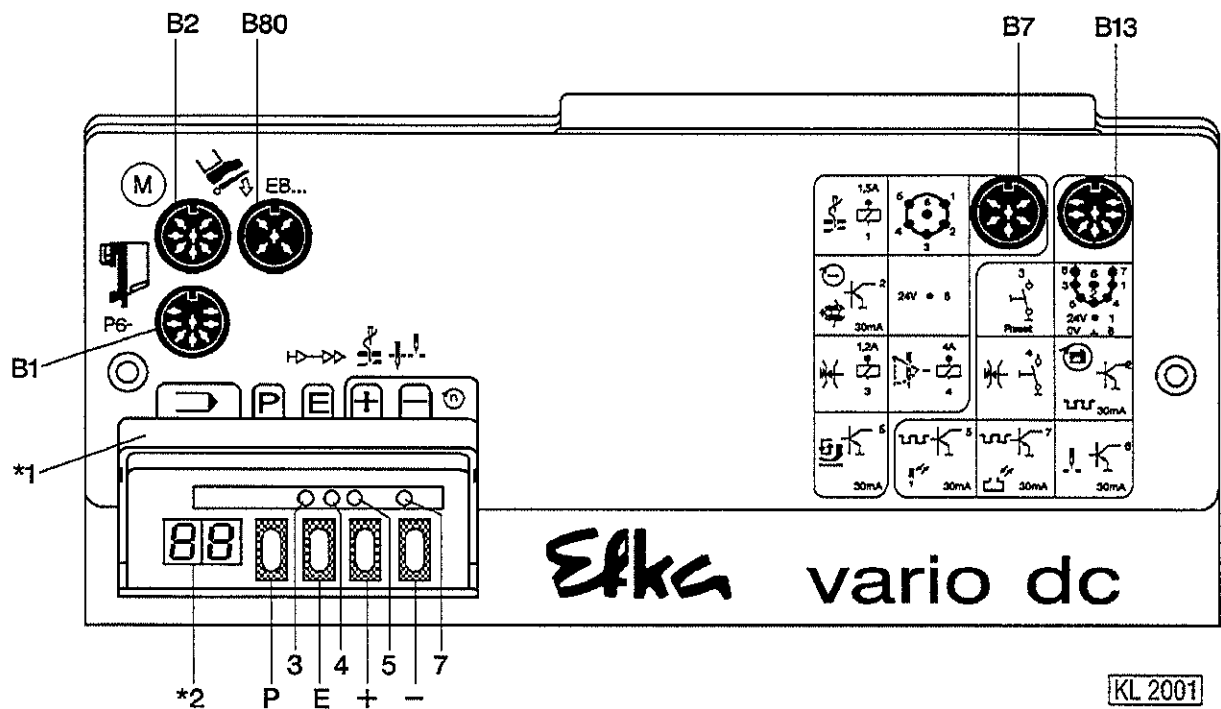
B1 = Position transmitter
B2 = Commutation transmitter for d.c. motor
B7 = Solenoids and output signals
B13 = Solenoids, output and input signals
B80 = Actuator

*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: Softstart on/off
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 up/down
LED 3 = Softstart (LED on = on)
LED 4 = free
LED 5 = Thread trimmer (LED on = on)
LED 7 = Basic position (LED on = up)