Efka variostop

CONTROL

8F80AV2231

Replaces 8F60A

INSTRUCTION MANUAL

WITH PARAMETER LIST

No. 402249 **English**

Efka
FRANKL & KIRCHNER
GMBH & CO KG

Efka
EFKA OF AMERICA INC.

Efka
EFKA ELECTRONIC MOTORS
SINGAPORE PTE. LTD.

Contents Page

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 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. postion 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 COMPLETT hand stitch machines.

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

The drive can only be operated:

· on thread processing machines
· in dry areas

3. Complete Drive Unit Consisting of

1	Induction motor with electromagnetic clutch	V....
1	Electronic control	8F80AV2231
	- Power pack	N30
2	Position transmitters	P5-5
1	Set of standard accessories consisting of:	B152 belt guard, complete (for pulleys up to 132 mm ϕ) set of hardware toothed washer bracket 1 and 2, short documentation
1	Set of accessories consisting of	Z3 pitman rod, complete
1	Pulley	

3.1 Special Accessories

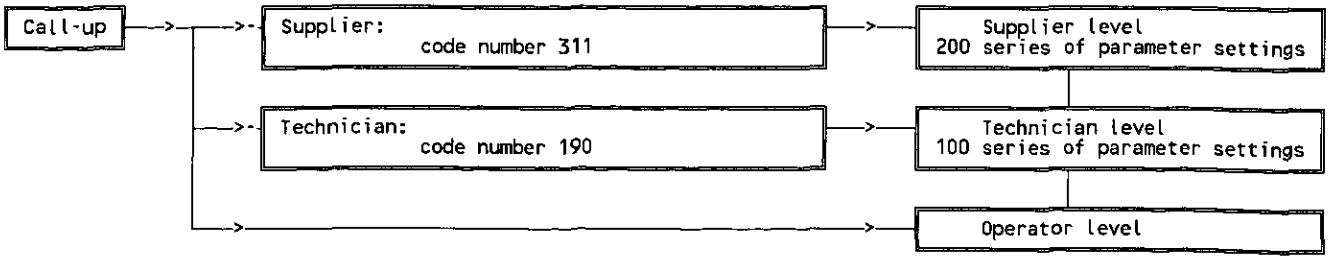
Belt guard (for pulleys up to 180 mm ϕ)	- part no. 7960012
Reflection light barrier module LSM001A	- part no. 6100028
Extension cable for external actuator, approx. 750 mm long, complete with plug and socket connector	- part no. 1111845
Extension cable for external actuator, approx. 1500 mm long, complete with plug and socket connector	- part no. 1111787
5-pin plug with locking screw for the connection of another external actuator	- part no. 0501278
External actuator type EB301 with approx. 250 mm connecting cable and 5-pin plug with locking screw	- part no. 41.0011
External actuator type EB302 (softer spring) approx. 250 mm connecting cable and 5-pin plug with locking screw	- part no. 41.0012
Foot control type FB302 for standing operation with approx. 1400 mm connecting cable and plug	- part no. 4160018
Potential equalization cord 700 mm long, LIY 2.5 mm², grey, with forked cable brackets on both sides	- part no. 1100313
Extension cable for position transmitter P5-.., approx. 1100 mm long, complete with plug and socket connector	- part no. 1111584
Extension cable for position transmitter P5-.., approx. 315 mm long, complete with plug and socket connector	- part no. 1111229
Knee switch type KN3 (pushbutton) with cord of approx. 950 mm length without plug	- part no. 58.0013
Sewing light transformer	- please indicate line voltage and sewing light voltage (6.3V or 12V)
3-pin plug with locking screw (Hirschmann MAS 3100) B16	- part no. 0500402
5-pin plug with locking screw (Hirschmann MAS 5100S) B14	- part no. 0501431
6-pin plug with locking screw (Hirschmann MAS 6100) B17, B32	- part no. 0500703
7-pin plug with locking screw (Hirschmann MAS 7100S) B18	- part no. 0502474

4. Control Operation

4.1 Access Authorization upon Command Input

In order to prevent the unintentional changes of preset functions the command input is distributed at various levels.

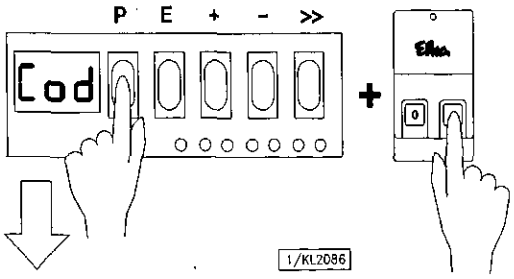
The following persons have access:
- the supplier to the highest and all subordinate levels by means of a code number
- the technician to the next lower and all subordinate levels by means of a code number
- the operator to the lowest level without code number



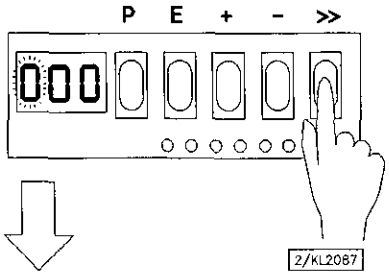
Note: If closed contact in1...in6 = 17 (stitch counting with stop at the seam end), parameter 007 can be accessed directly at the operator level. Call the parameter by means of the P key and the value by means of the E key.

4.2 Programming the Code Number

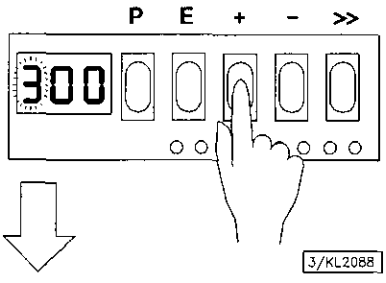
1. Press the **P** key and turn power on



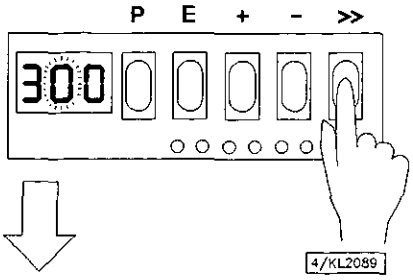
2. Press the > > key (first digit blinks)



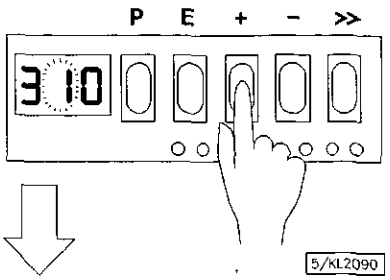
3. Press the + or - key to select the first digit
Technician level = = > Code no. 190
Supplier level = = > Code no. 311



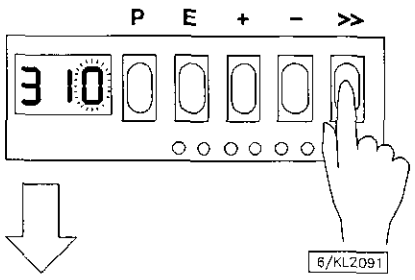
4. Press the > > key (second digit blinks)



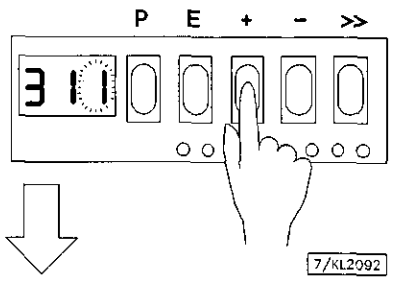
5. Press the + or - key to select the second digit



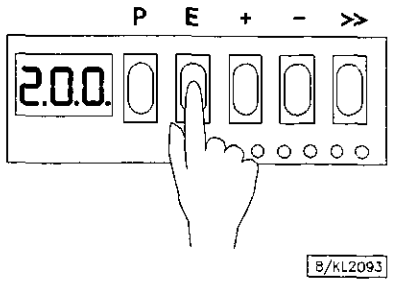
6. Press the > > key (third digit blinks)



7. Press the + or - key to select the third digit



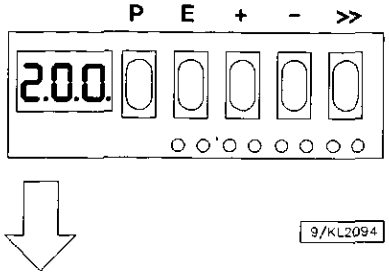
8. Press the **E** key; the parameter number is displayed, which is indicated by points between the digits.



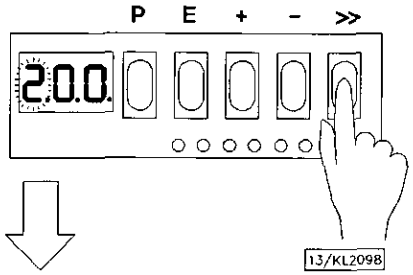
4.3 Parameter Selection

4.3.1 Direct Selection

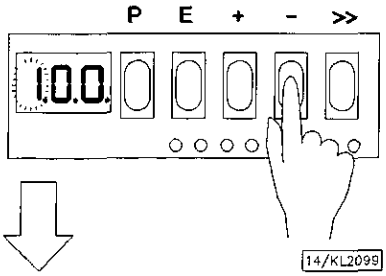
1. After code number input at the programming level



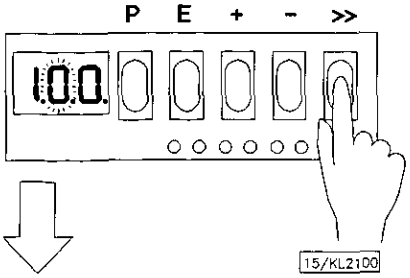
2. Press the > > key (first digit blinks)



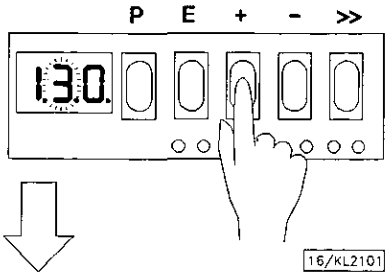
3. Press the + or - key to select the first digit



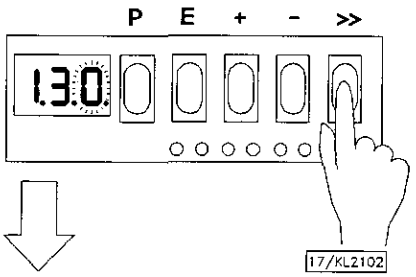
4. Press the > > key (second digit blinks)



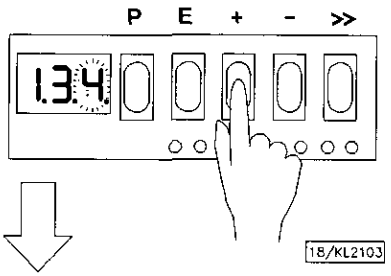
5. Press the + or - key to select the second digit



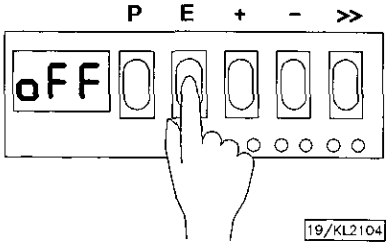
6. Press the > > key (third digit blinks)



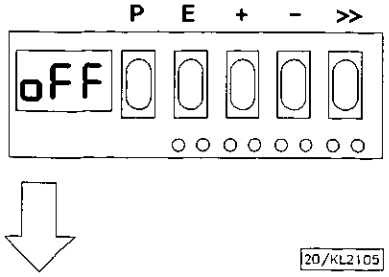
7. Press the + or - key to select the third digit



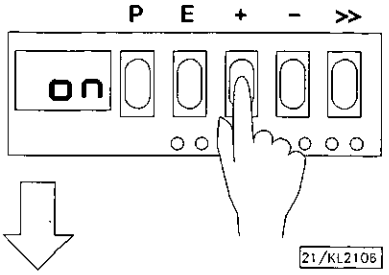
8. Press the **E** key; the parameter value is displayed. There are no points between the digits.



4.3.2 Changing Parameter Values



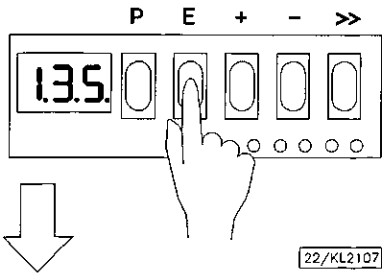
Display after parameter value selection



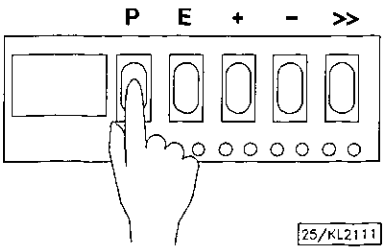
Change the parameter value by pressing the + or - key

Option 1:

Press the **E** key. The next parameter number is displayed.

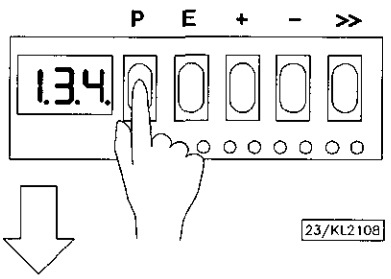


Press the **P** key. Exit programming. The changed parameter values will be be saved when you start sewing again!

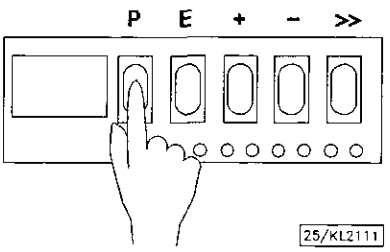


Option 2:

Press the **P** key. The same parameter number is displayed.

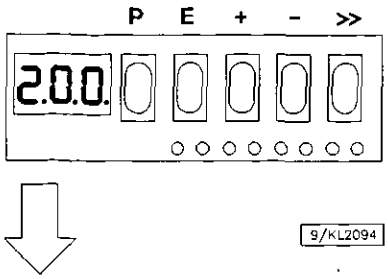


Press the **P** key. Exit programming. The changed parameter values will be saved when you start sewing again!

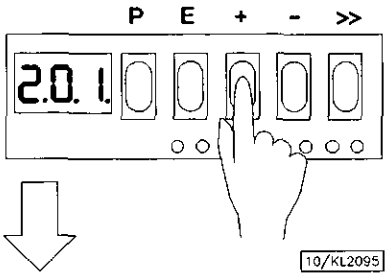


4.3.3 Parameter Selection with the +/- Keys

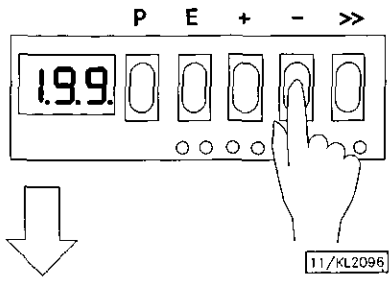
1. After inputting the code number on the programming level



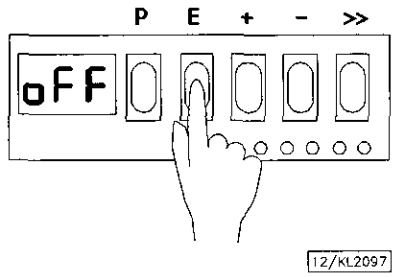
2. Select the next parameter by pressing the + pushbutton



3. Select previous parameter by pressing the - pushbutton



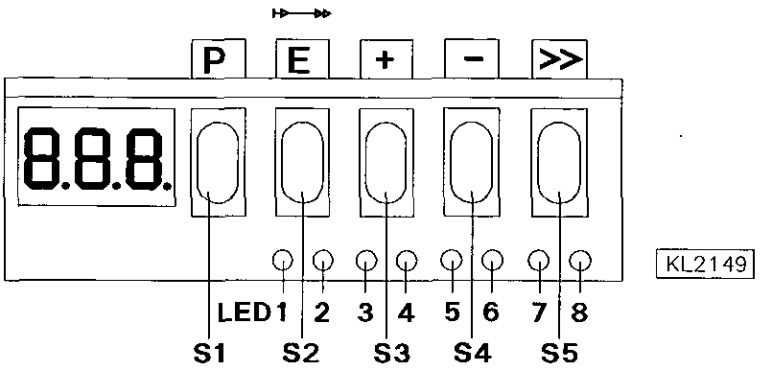
4. After pressing pushbutton E, the parameter value is displayed



4.4 Changing All Parameter Values at the Operator Level

All parameter values at the operator level can be changed without code number input (see List of Parameters).

- Press the **P** key => The first parameter number will be displayed.
- Press the **E** key => The parameter value will be displayed.
- Press the +/- keys => The parameter value will be changed.
- Press the **E** key => The next parameter will be displayed.
- Press the **E** key => The parameter value will be displayed.
- Press the +/- keys => The parameter value will be changed.
  etc.
- Press the **P** key twice => Exit programming at the operator level.



4.5 Switchable Functions

Switchable functions can be changed by pressing the appropriate key. The switching state is indicated by light emitting diodes (LED). See above illustration!

Table: Assignment of functions to keys and LEDs

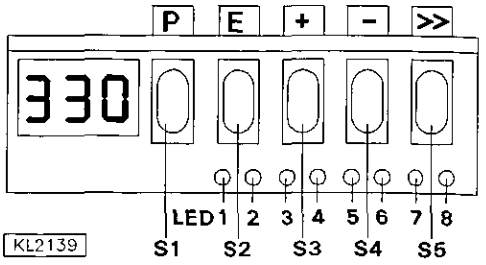
Function	Key	LED number	
Softstart On	**E**	1 = on	2 = off
Softstart Off	**E**	1 = off	2 = off

4.6 Direct Input of Maximum Speed Limitation (DED)

The maximum speed of the machine must be limited to the specific level according to the application. Do the setting at the operator level on the control by means of the +/- keys during operation or at intermediate machine stop. This function is blocked at the start of the seam or after the seam end. The actual value is shown on the display and must be multiplied by 10.

Example:

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



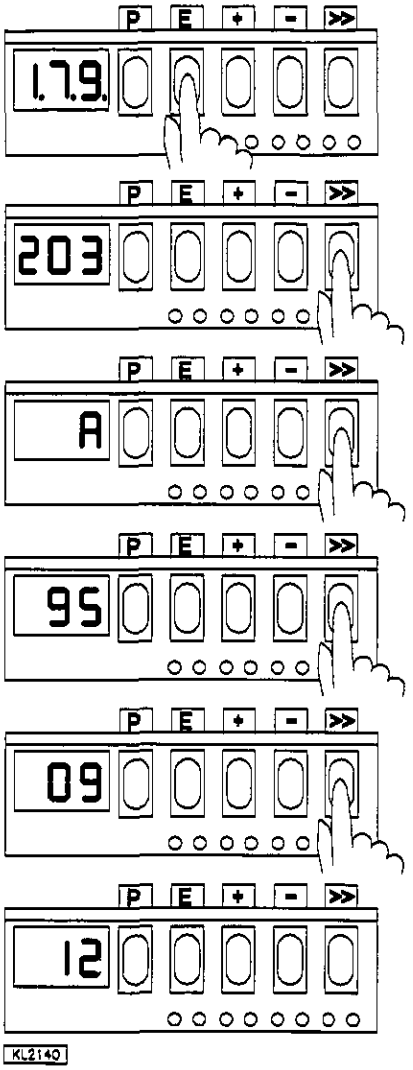
4.7 Program Identification on the Control

Functions	Parameter
Program number, modification index and identification number display	179

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

Example:

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



Exit the routine by pressing the **P** key twice. The drive is again ready for sewing. Exit the routine as well by pressing the E key, and the next parameter number is displayed.

5. Putting into Service

The machine is ready for operation immediately after:

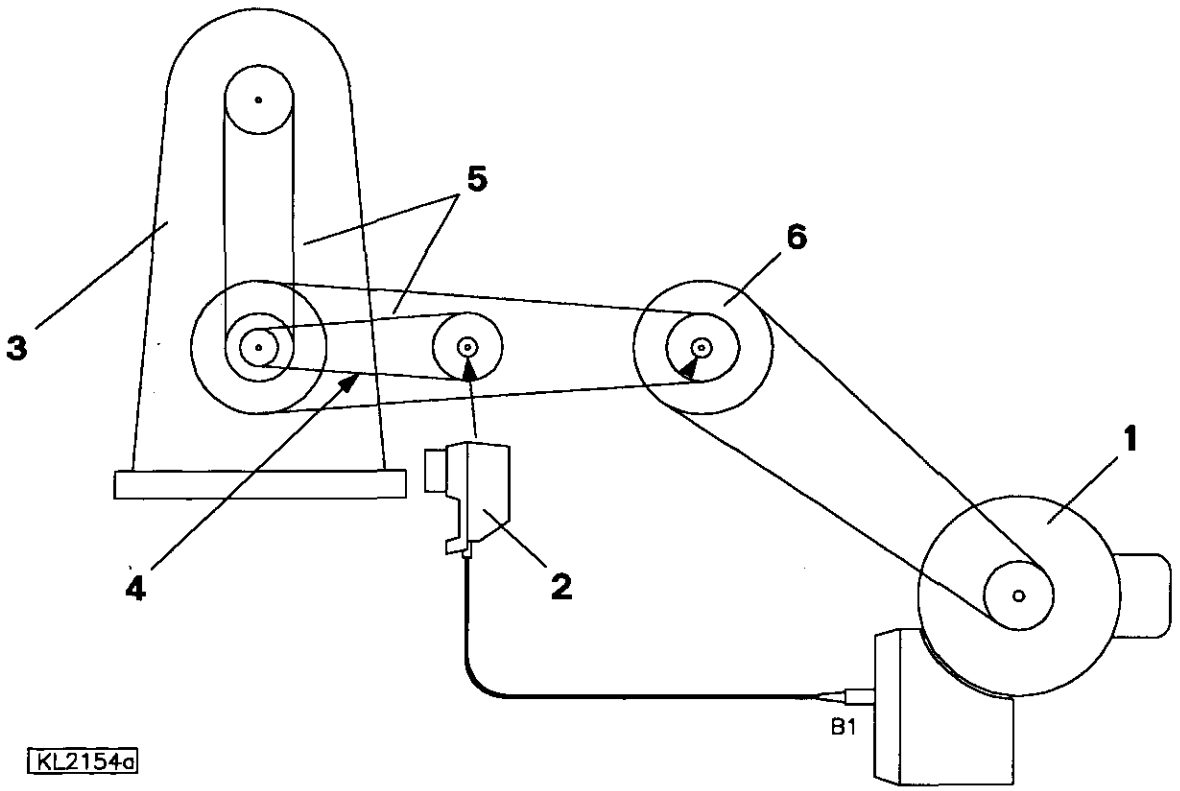
- installing the drive and the position transmitter
- adapting the control to the sewing machine
- setting the needle positions on the position transmitter

6. Setting the Basic Functions

6.1 Schematic Representation of the Machine

The maximum speed of the machine is 500 RPM.

Programming the speed:
Example: When inputting 500 RPM, the motor runs at 250 RPM and the sewing machine with the preset transmission ratio at 500 RPM.



1	=	Efka drive
2	=	Position transmitter (for positions 1 / 1' / 2 / 2' and generator)
3	=	Machine
4	=	Transmission ratio 2:1
5	=	Toothed belt
6	=	Intermediate gear

Attention!
Upon inputting the parameter the speed is displayed in relation to the generator shaft.
When the drive is in operation, the maximum speed of the machine is displayed (2:1).
The speed value displayed on the control must always be multiplied by 10.

Example: Speed display when the machine is in operation = 050 x10 = 500

6.2 Positioning Speed

Functions	Parameter
Positioning speed	110

The positioning speed can be set by means of parameter 110 on the control.

6.3 Maximum Speed Compatible with the Sewing Machine

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

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

6.4 Maximum Speed

Functions	Parameter
Maximum Speed	111

Note:
See instruction manual of the sewing machine manufacturer for the maximum speed of the sewing machine.

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

6.5 Positions

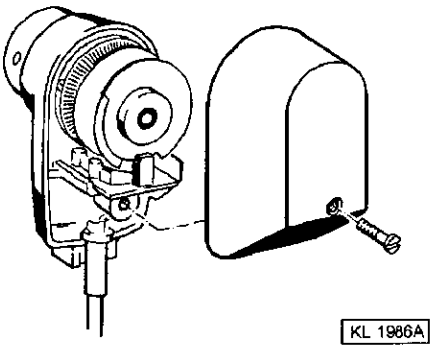
Before setting the position transmitter ensure that the direction of rotation of the motor shaft is set correctly !

Caution!
If the motor is mounted differently, e.g at a different angle or with gear, make sure that the direction of rotation is correct. Reset the positions if necessary.

Caution!
Turn power off before adjusting the positioning discs.

Caution!
Be very careful when adjusting the positioning discs.
Risk of injury!

The positions are set as follows:



- Remove position transmitter cover after loosening the screw.
- Press the pedal briefly forward.
- Turn central disc for position 1 and/or 1' in the desired direction and set it to the corresponding notch.
- Press the pedal briefly forward.
- Check the stop position.
- Heel the pedal back (pedal position -1 or -2).
- Turn outer disc for position 2 and/or 2'in the desired direction and set it to the corresponding notch.
- Press the pedal briefly forward.
- Heel the pedal back (pedal position -1 or -2).
- Check the stop position.
- Repeat procedure if necessary.
- Put cover on again and tighten screw.

See chapter "Timing Diagrams" for the sequence of positions.

6.6 Display of the Signal and Stop Positions

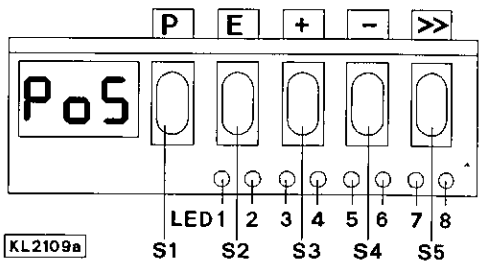
Function	Parameter
Display of positions 1/1' and 2/2'	172

The position settings can easily be checked by means of parameter 172.

- Select parameter 172
- "PoS" appears on the control display
- Turn handwheel according to the direction of motor rotation

Control display

- LED 7 on corresponds to position 1 and/or 1'
- LED 7 turns off corresponds to position 1A and/or 1A'
- LED 8 on corresponds to position 2 and/or 2'
- LED 8 turns off corresponds to position 2A and/or 2A'



6.7 Braking Chararcteristics

Function	Parameter
Braking effect with speeds > 800 RPM Braking effect with speeds < 800 RPM	207 208

The braking effect of the drive can be set.

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

6.8 Braking Power at Standstill

Function	Parameter
Braking power at standstill	153

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

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

6.9 Starting Characteristics

Function	Parameter
Starting edge	220

The drive acceleration dynamics can be adapted to the sewing machine characteristic (light/heavy).

- High setting value = high acceleration

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

6.10 Speed Gate

Function	Parameter
Speed gate Speed gate damping period	221 222

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

7. Functions

7.1 First Stitch After Power On

Function	Parameter
1 stitch at npos after POWER ON	231

If parameter 231 is on, the first stitch after power on will be performed at positioning speed for the protection of the sewing machine. This is independent of the pedal position and the softstart function-

7.2 Softstart

Function	Parameter
Softstart on/off	134

Function:
- after power on
- at the beginning of a new seam
- speed pedal controlled and limited to (n6)
- lower speed of a parallel function prevailing (e.g. positioning speed)
- suspension with pedal in position 0 (neutral)
- Interruption by full heelback (position -2)

7.2.1 Softstart Speed

Function		Parameter
Softstart speed	(n6)	115

When programming 4-digit parameter values on the control, the 3-digit values displayed must be mutliplied by 10.

7.2.2 Softstart Stitches

Function		Parameter
Number of softstart stitches	(SSc)	100

7.3 Tongue Lift Signal

Function		Parameter
Start delay after tongue lift signal	(t3)	202

A solenoid and/or solenoid valve for a tongue lift signal can be connected to socket B32/3-5. This tongue lift signal is always issued at pedal position -2.
If the drive is in position 2 and the pedal in position -2, the drive runs at positioning speed to position 2' and issues the tongue lift signal.
If the drive is already in position 2', the tongue lift signal is immediately issued.

Upon pressing the pedal forward with activated tongue lift signal, the start delay (t3) that can be set by means of parameter 202 becomes effective.

See also chapter "Timing Diagrams"!

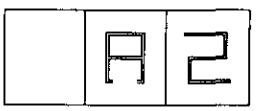
7.4 Machine Run Blockage (Safety Switch)

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

The function "machine run blockage" is enabled by connecting a switch to input 6 (in6).

Display after enabling machine run blockage:

Control display ==>



Machine run blockage in the free seam or in the light barrier seam:

The seam is suspended by opening and/or closing the switch
- Stop in psition 1
- Tongue lift signal is not issued
- Needle up is not possible

New start after machine run blockage

New start after closing and/or opening the switch only if the pedal is in position 0 (neutral).

7.5 Free Seam and Seam with Light Barrier

Function		Parameter
Positioning speed	(n1)	110
Upper limit of maximum speed	(n2)	111
Limited speed according to setting of parameter 142	(n12)	118
Lower limit of maximum speed		121
Speed mode free seam		142

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

142 = 0: Execution at pedal controlled speed from n1 to n2.
142 = 1: Execution at fixed speed n12, when pressing the pedal forward (position >=1).
142 = 2: Execution at limited speed n12, when pressing the pedal forward (position >=1)
142 = 3: Only for the seam with light barrier:
- Automatic execution at fixed speed after having pressed the pedal once.
- The seam end is initiated by light barrier.
- The procedure can be interrupted by heelback (-2).
- If the light barrier is not on, speed as with parameter setting 142 = 0.

7.6 Light Barrier

Function	Parameter/Key
Light barrier On/Off	009

7.6.1 Speed after Light Barrier Sensing

Function		Parameter
Speed after light barrier sensing	(n5)	114

7.6.2 General Light Barrier Functions

Functions	Parameter
Light barrier compensating stitches	004
Number of light barrier seams	006
Light barrier sensing uncovered	131
Start of sewing blocked with light barrier uncovered	132

- After sensing the seam end, the compensating stitches are counted at light barrier speed.
- Suspension of the procedure with pedal in position 0 (neutral). Interruption of the prcedure with pedal in position -2.
- Programming of max. 15 light barrier seams, depending on the setting of parameter 006, with stop in position 1. Seam end after the last light barrier seam.
- Light barrier sensing uncovered or covered at the seam end can be selected by means of parameter 131.
- Start blockage with light barrier uncovered programmable by means of parameter 132.

7.6.3 Reflection Light Barrier

Function	Parameter
Light barrier On/Off	009

Settings

Sensitivity:

Set minimum sensitivity depending on the distance between light barrier and reflection area.
(Turn potentiometer as far as possible to the left).

- LSM001 - Potentiometer directly on the light barrier module

Mechanical orientation:

- LSM001- Orientation is facilitated by a visible light spot on the reflection area.

7.6.4 Automatic Start Controlled by Light Barrier

Functions	Parameter
Delay of automatic start	128
Automatic start on/off	129
Start of sewing blocked with light barrier uncovered	132

The function enables an automatic start of the sewing operation as soon as the light barrier senses the insertion of fabric.

Prerequisites for the operation:

- Parameter 132 = on (no start of sewing with light barrier uncovered).
- Parameter 131 = on (light barrier sensing uncovered).
- Parameter 129 = on (automatic start On).
- Light barrier On.
- The pedal must be kept pressed forward at the seam end.

For safety reasons this function is enabled only after a normal start of sewing. The light barrier must be covered as long as the pedal is in position 0 (neutral). Then press the pedal forward.
This function is disabled when the pedal is no longer pressed forward after the seam end.

7.6.5 Light Barrier Filter for Knitted Fabrics

Functions	Parameter
Number of stitches of the light barrier filter	005
Light barrier filter On/Off	130

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

- Enabling/Disabling of the filter by means of parameter 130
- The filter is not active if parameter 005 = 0
- Adaptation to the mesh is possible by varying the number of filter stitches
- Knitted fabric sensing will only be activated when the light barrier senses covered -> uncovered

7.6.6 Functional Variations of the Light Barrier Input

Function	Parameter
Selection of the input function on socket B18/5	239

If the light barrier function is not used, a different function can be assigned to the input on socket B18/5, and a key can be connected.

The following input functions are possible with parameter 239:
Parameter 239 = 0 Light barrier function: The input is prepared for a light barrier function.
Parameter 239 = 1...17 All other input functions are identical with those described for parameter 240 below.

7.7 Switching Functions of Inputs in1...in6

Function		Parameter
Selection of the input function	(in1...in6)	240...245

240 = 0 **Input function blocked**

240 = 1 **Needle up/down**
Upon pressing the key, the drive runs from position 1 to position 2 or from position 2 to position 1' or from position 1' to position 2'. If the drive is not in the stop position, it runs to the preselected basic position.

240 = 2 **Needle up**
Upon pressing the key, the drive runs from position 1 to position 2 and/or from position 1' to position 2'. If the drive is not in position 1 or 1', any operation is blocked for safety reasons.

240 = 3 **Single stitch (basting stitch)**
Upon pressing the key, the drive performs one rotation from position 1 to position 1 or from position 1' to position 1'.
If the drive is in position 2 (2'), it runs to position 1 (1') upon pressing the key and from position 1' (1) to position 1' (1) each time the key is pressed again.

240 = 4 **Full stitch**
Upon pressing the key, the drive performs a full rotation depending upon the set stop position. If the drive is not in any of the positions, it runs to the preselected basic position.

240 = 5 **Needle to position 2**
If the drive is not in position 2, it runs to position 2 upon pressing the key.

240 = 6 **Machine run blockage effective with open contact**
Upon opening the switch, the drive stops in the preselected basic position.

240 = 7 **Machine run blockage effective with closed contact**
Upon closing the switch, the drive stops in the preselected basic position.

240 = 8 **Machine run blockage effective with open contact (unpositioned)**
Upon opening the switch, the drive stops immediately unpositioned.

240 = 9 **Machine run blockage effective with closed contact (unpositioned)**
Upon closing the switch, the drive stops immediately unpositioned.

240 = 10 **Run at automatic speed (n12)**
Upon pressing the key, the drive runs at automatic speed. The pedal is not used.

240 = 11 **Run at limited speed with flip-flop function (n12)**
Upon pressing the key, the drive runs at limited speed. This speed is disabled when pressing the key again. The pedal must be pressed forward.

240 = 12 **Enable/Disable tongue lift signal**
Upon pressing the key, the tongue lift signal is enabled and disabled when the key is released. This function is possible only in position 2'.

240 = 13 **Backward stitch RST**
Upon pressing the key, the signal and corresponding LED is enabled and disabled when the key is released or pressed again according to the setting of parameter 146. This function can be activated during machine run or at machine standstill. The switching state of signal RST can be stored in case of a power failure, depending on the setting of parameter 147.

240 = 14 **Stitch length reduction STK**
Upon pressing the key, the signal STK is enabled on socket B32/1 and disabled when the key is opened again.

240 = 15 **Stitch condensing STV with stitch counting 001**
Upon pressing the key, the stitch condensing signal is activated and disactivated after stitch counting. Signal activation can also be disabled with the pedal in position -2. Set the number of stitches by means of parameter 001. This function can be activated during machine run or at machine standstill.

240 = 16 **Stitch condensing STV as flip-flop**
Upon pressing the key, stitch condensing is enabled on and disabled when the key is pressed again.

240 = 17 **Stitch counting 007 with stop**

a) Upon pressing the key, stitch counting Stc (parameter 007) is started. When stitch counting is completed, an LED "stop at the seam end" STNE lights up, and the drive stops in position 2'.
Parameter 023 = 0: The tongue lift signal is not activated when the pedal is forward.
Parameter 023 = 1: The tongue lift signal is activated when the pedal is forward.
No function when the pedal is in position 0 and >0.
The tongue lift signal is issued when the pedal is in position -2, and the LED "stop at the seam end" goes off. If the pedal is now pressed to position >1, a new start with counting is performed.

b) Stitch counting is performed at pedal controlled speed. An intermediate stop is possible.

c) Counting may be interrupted with the pedal in position -2.

d) A new start is possible only after the pedal has been pressed to position -2. The LED "stop at the seam end" goes off.

e) The counts of parameter 001 and 007 do not influence each other. Should count 001 still be active after completion of count 007, count 001 will also be completed before the drive stops in position 2'. If the external switch in.. is closed (without code number), parameter 007 will be displayed directly after pressing the P and E keys. The parameter value can be varied by means of the +/- keys. As long as the external switch is closed, no other parameter is accessible at the operator level. After code number input all parameters are accessible (even if the switch in.. is closed).

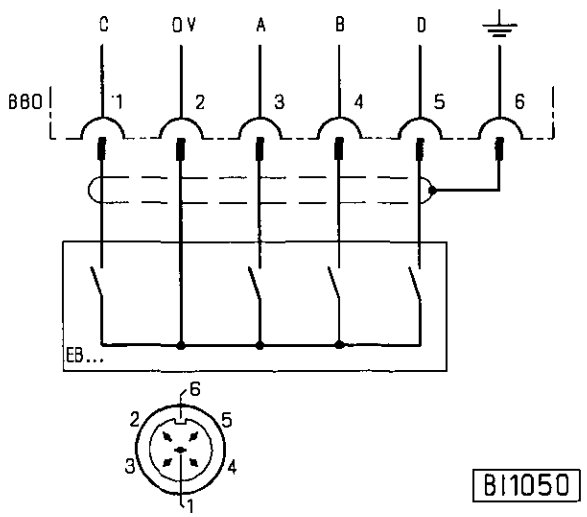
The input functions of parameters 241...245 are identical with those described for parameter 240.

7.8 Actuator

The commands for the sewing operation are input by means of the actuator, which is connected to the pedal. Instead of the built-in actuator another actuator can also be connected to socket B80.

Table: Coding of the Pedal Steps

Pedal step	D	C	B	A		
-2	H	H	L	L	Full heelback	(after sewing operation machine run to position 2' and tongue lift signal)
-1	H	H	H	L	Slight heelback	(after sewing operation machine run to position 2')
0	H	H	H	H	Pedal in position 0 (neutral)	
½	H	H	L	H	Pedal slightly forward	(no function)
1	H	L	L	H	Speed stage 1	(n1)
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)	(n2)



EB... - Actuator

Function	Parameter
Speed stage graduation	119

The pedal characteristic (speed change from stage to stage) can be varied.

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

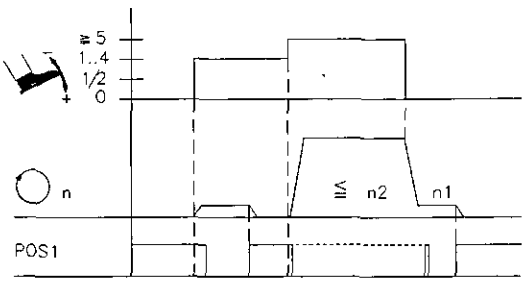
7.8.1 Functional Variations of the Pedal

Function	Parameter
Variations of the speed stages on the pedal Reaction delay of the pedal	180 181

Using parameter 180, set one of the 12 pedal steps from which you want to start the speed control for the sewing operation. If you actuate a pedal step below the set value, the drive performs a single stitch (see parameters 239...245) at positioning speed.

The pedal function is determined by the time set by means of parameter 181; i. e. if the pedal is actuated beyond the step set by means of parameter 180 within this time, the pedal function is the same as with pedal position "0". If the delay time elapses before the preset pedal step is reached, a single stitch is performed.

Example of a pedal function:



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8. Signal Test

Functions	Parameter
Input and output test	173

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

Output test:
- Select parameter 173
- Select the desired output by means of the +/- keys
- Enable the selected output by means of the > > key

Display	Assignment of the outputs
OFF/ON	Input test
01	LED for backward stitch
02	Tongue lift signal
03	Stitch condensing
04	Machine running
05	Backward stitch
06	Stitch length reduction
07	LED stop at the seam end

Input test:
- Press the -key several times until "OFF" or "ON" appears on the control display.
- Actuation of external switches is displayed by the switching state ON/OFF.
- Several switches must not be closed at the same time.

9. Error Displays

General Information

Display	Signification
Info A1	Pedal not in neutral position, when turning the machine on
Info A2	Machine run blockage (safety switch)

Programming Functions and Values (Parameters)

Display	Signification
Info F1	Wrong code number or parameter number input

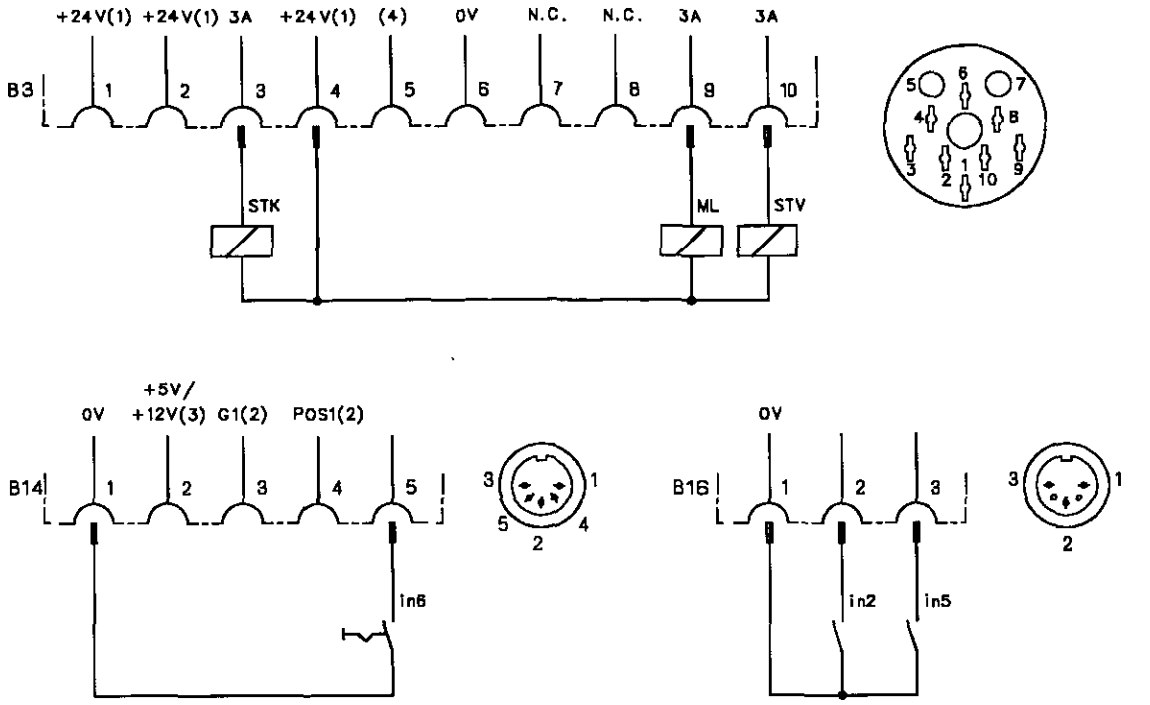
Serious Condition

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

Hardware Disturbance

Display	Signification
Info H2	Processor disturbed

10. Connection Diagram

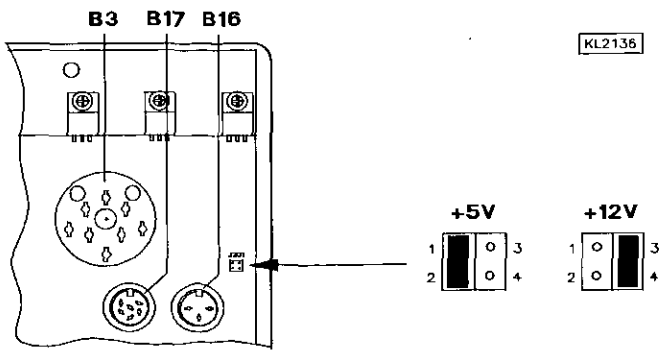


STV - Output for stitch condensing
STK - Output for stitch length reduction
ML - Output for machine running
G1 - Signal output for generator impulses
POS1 - Signal output for position 1

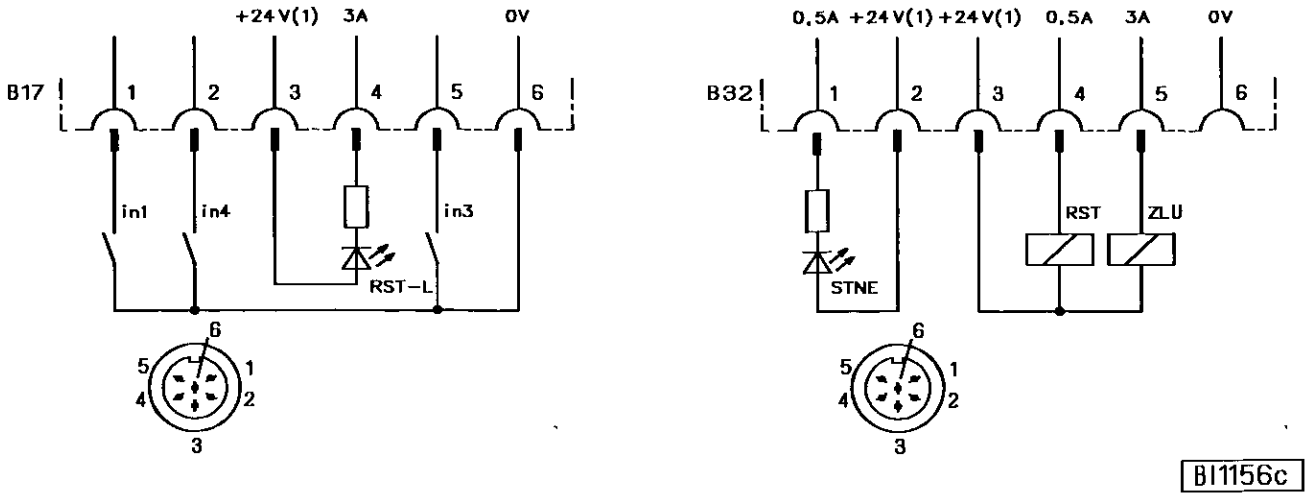
in2 - Input 2 according to the setting of parameter 241
in5 - Input 5 according to the setting of parameter 244
in6 - Input 6 according to the setting of parameter 245

For external devices, as for example thread monitor, there is a supply voltage of +5V on socket B14/2. After opening the cover, this voltage can be changed to +12V by moving a jumper on the printed circuit board to a different position.

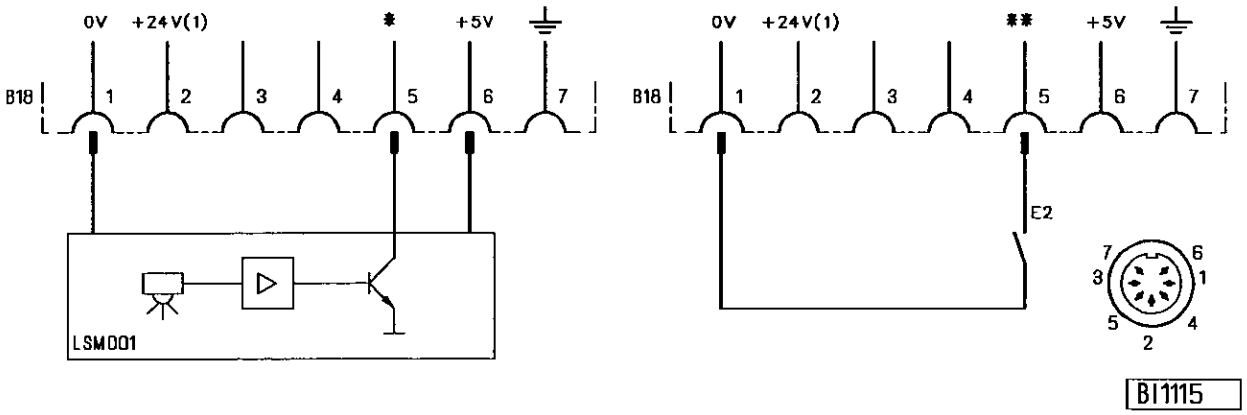
+5V = Connect lefthand pins 1 and 2 with jumper (factory setting)
+12V = Connect righthand pins 3 and 4 with jumper



1) Nominal voltage 24V, no-load voltage max. 36V
2) Transistor output with open collector (max. 40V, 30mA)
3) Nominal voltage +5V, 250 mA (repluggable to +12V, 250 mA after opening the cover)
4) Outputs without function, but not potential-free



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

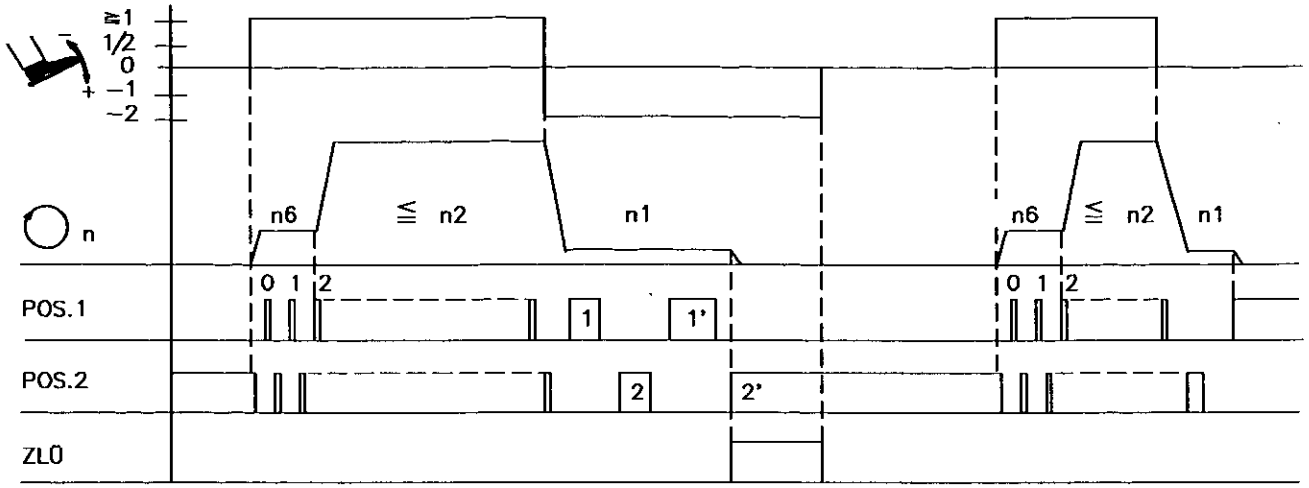


STNE	- LED stop at the seam end		
RST	- Output for backward stitches		
RST-L	- LED for backward stitches		
ZLÜ	- Output for tongue lift signal		
in1	- Input 1 according to the setting of parameter 240		
in3	- Input 3 according to the setting of parameter 242		
in4	- Input 4 according to the setting of parameter 243		
LSM001A	- Reflection light barrier module		
*	- Parameter 239 = 0	=>	The light barrier function has been selected (identified when switched to 0V)
**	- Parameter 239 = 1...17	=>	Various input functions are possible on socket B18/5

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

11. Timing Diagrams

Actuating the pedal during full run



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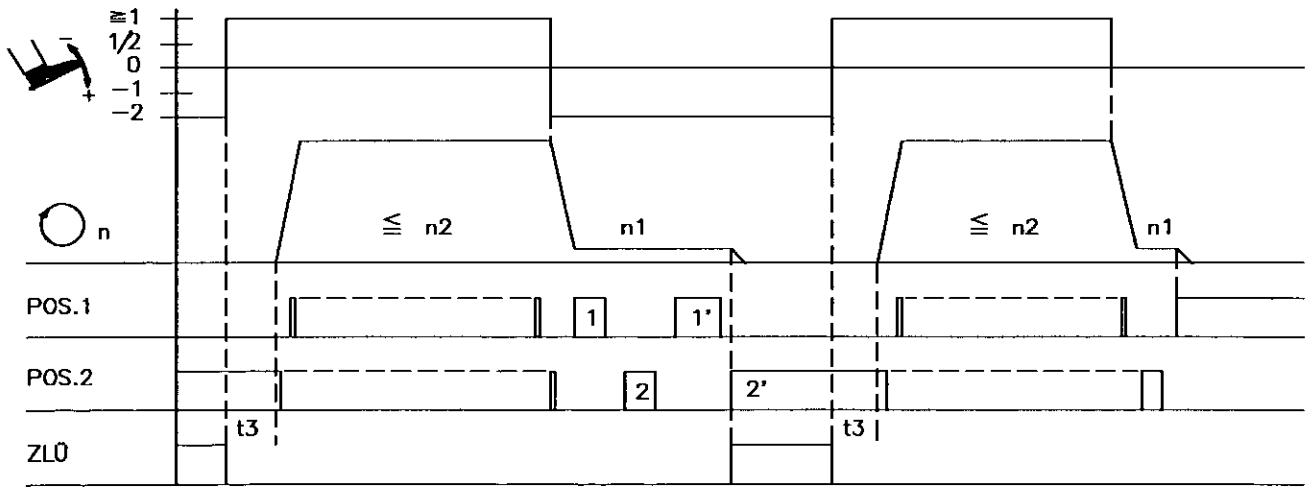


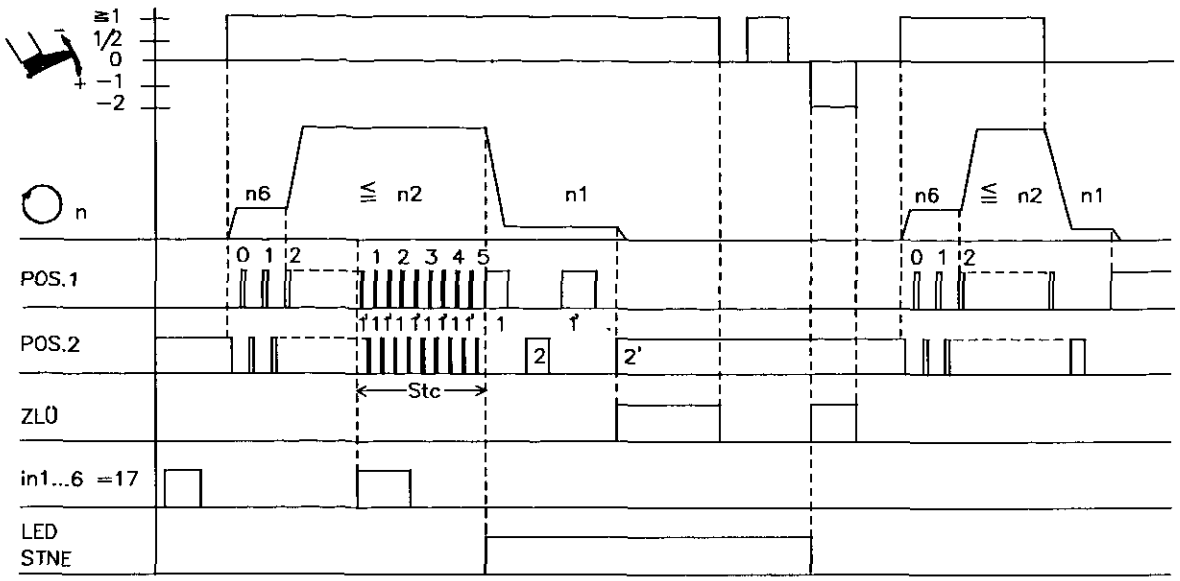
2171/8F80A−2

Abbreviation	Function		Parameter	Key Control
	Softstart	On	134	S2 key
n1 n2 n6	Positioning speed Maximum speed Softstart speed		110 111 115	
t3	Start delay after tongue lift signal		202	

Positions:

1 = Small slot on central position transmitter disc
1' = Large slot on central position transmitter disc
2 / 2' = Small slots on outer position transmitter disc

Stitch counting with stop at the seam end



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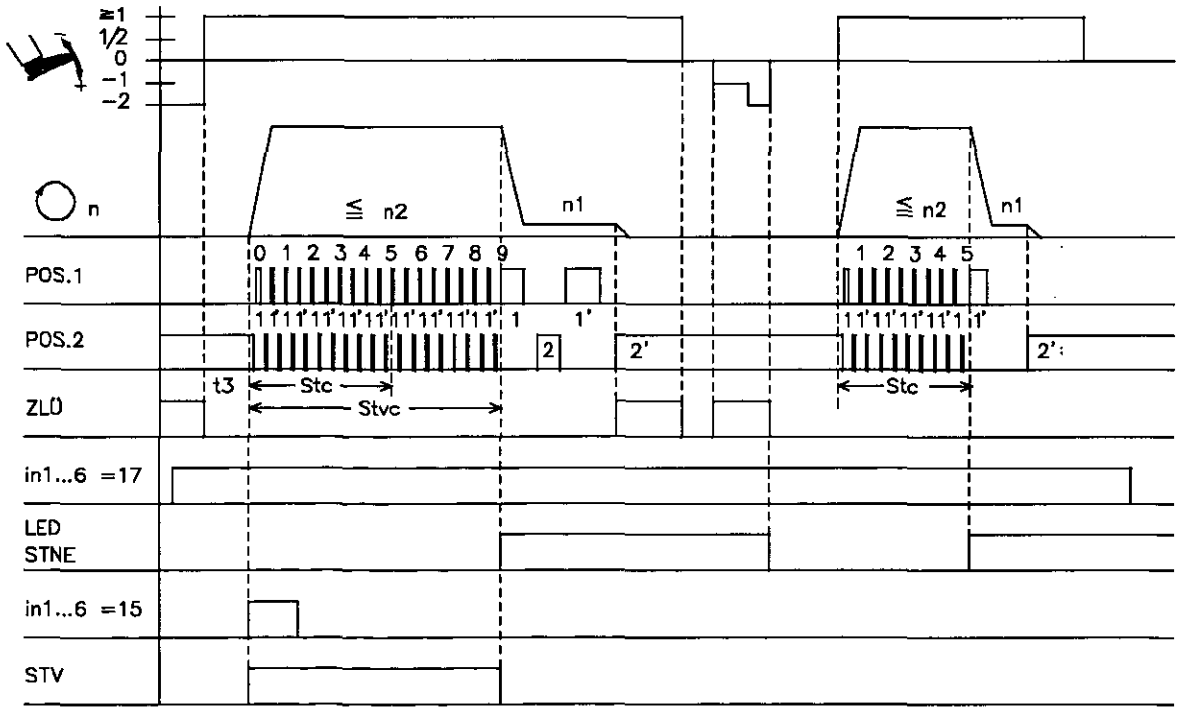
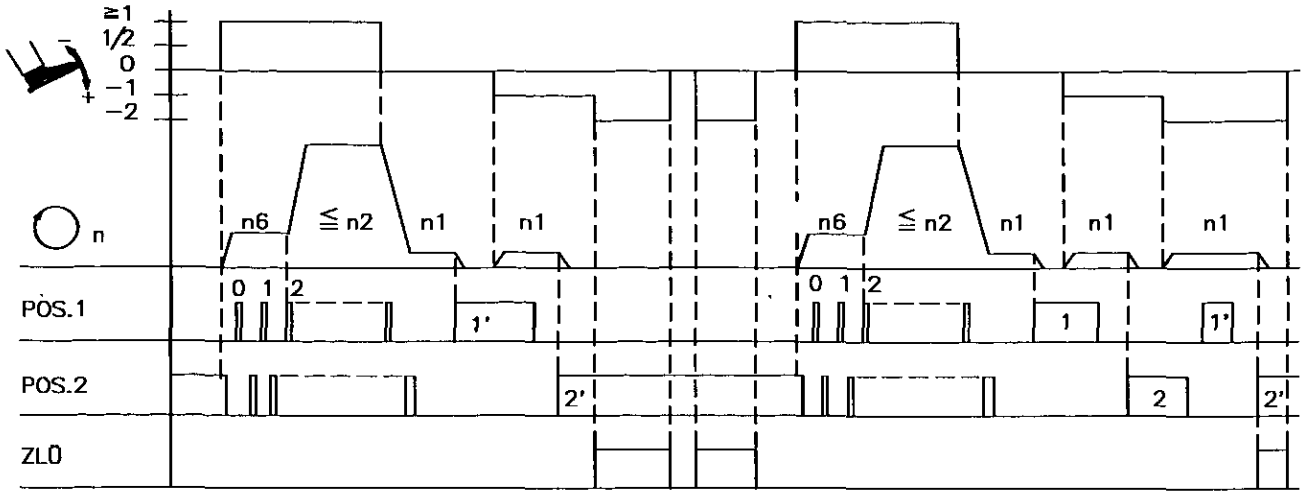


2171/8F80A–7

Abbreviation	Function		Parameter	Key Control
	Softstart	On	134	S2 key
n1 n2 n6	Positioning speed Maximum speed Softstart speed		110 111 115	
t3 Stvc Stc	Start delay after tongue lift signal Number of stitches for stitch condensing Number of stitches for seam end with stop		202 001 007	

Aactuating the pedal during intermediate stop



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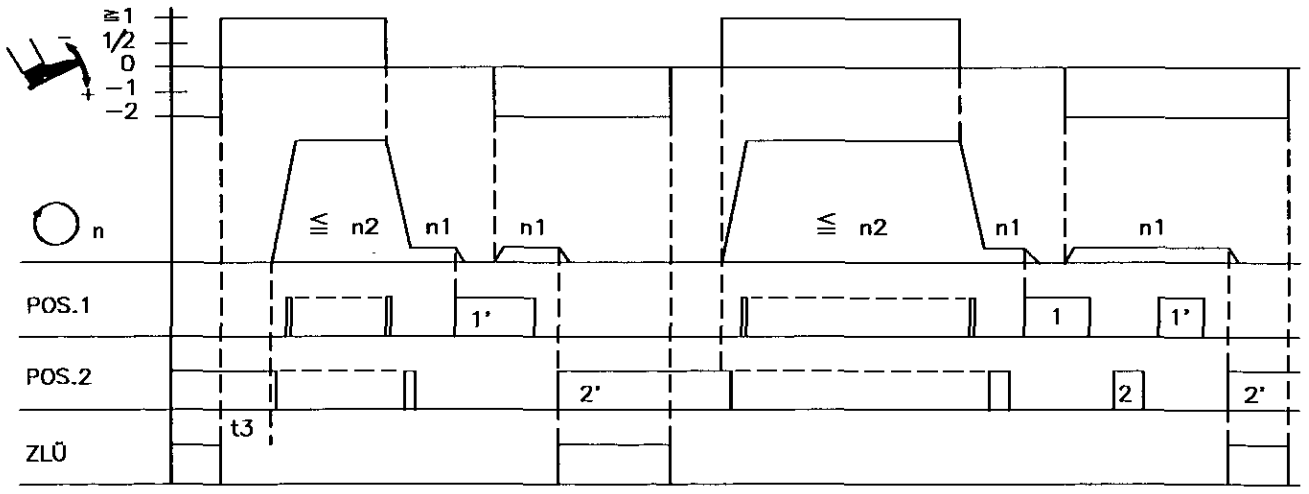


2171/8F80A–4

Abbreviation	Function		Parameter	Key Control
	Softstart	On	134	S2 key
n1 n2 n6	Positioning speed Maximum speed Softstart speed		110 111 115	
t3	Start delay after tongue lift signal		202	

Positions:

1 = Small slot on central position transmitter disc
1' = Large slot on central position transmitter disc
2 / 2' = Small slots on outer position transmitter disc

12. List of Parameters

12.1 OPERATOR LEVEL

Parameter		Designation	Unit	max	min	Preset	Ind. Prg. No.
001		Number of stitch condensing stitches		120	0	10	B
004	LS	Light barrier compensating stitches		254	0	7	A
005	LSF	Number of stitches of the light barrier filter for knitted fabrics		254	0	0	A
006		Number of light barrier seams		15	1	1	A
007	Stc	Number of stitches for seam end with stop		255	0	20	B
009	LS	Light barrier	ON/OFF			OFF	A
023	AFL	Automatic tongue lift with pedal forward at the seam end, if light barrier or stitch counting is On 0 = Automatic tongue lift Off 1 = Automatic tongue lift On		1	0	0	B

12.2 TECHNICIAN LEVEL

Code no. 190 with control operation

Parameter		Designation	Unit	max	min	Preset	Ind. Prg. No.
100	SSc	Number of softstart stitches		20	0	2	A
110	n1	Positioning speed	RPM	250 *)	140	180	A
111	n2-	Upper limit setting range n-max	RPM	2550 *)	n2_	500	A
114	n5	Speed after light barrier sensing	RPM	2550 *)	200	200	A
115	n6	Softstart speed	RPM	1500 *)	140	200	A
118	n12	Automatic speed	RPM	2550 *)	200	300	A

Note

Upon parameter input the speed will be displayed relative to the generator shaft. When the drive is in operation, the display shows the maximum speed of the machine (2:1).

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

TECHNICIAN LEVEL

Code no. 190 with control operation

Parameter	Designation	Unit	max	min	Preset	Ind. Prg. No.
119	Speed stage graduation 1 = linear 2 = slightly prograssive 3 = highly progressive		3	1	2	A
121	Lower limit setting range n-max	RPM	n2 *)	180	180	B
128	Start delay, when command "start" is given by covering the light barrier (see parameter 129)	ms	2000 *)	0	0	A
129	Machine start by covering the light barrier (only in conjunction with parameter 132 = ON)	ON/OFF			OFF	A
130 LSF	Light barrier filter for knitted fabrics	ON/OFF			OFF	A
131 LSd	ON = Light barrier sensing "uncovered" OFF = Light barrier sensing "covered"	ON/OFF			ON	A
132	Machine start blockage, when light barrier "uncovered"	ON/OFF			ON	A
134 SSt	Softstart	ON/OFF			OFF	A
142	Speed status for the free seam and for the seam with light barrier 0 = speed controllable by the pedal up to the set maximum speed (parameter 111) 1 = fixed speed (parameter 118) without influence by the pedal (machine stop by pressing the pedal to the basic position) 2 = limited speed controllable by the pedal up to the set limit (parameter 118) 3 = at fixed speed (parameter 118), can be interrupted by full heelback		3	0	0	A
146	Signal "backward stitch (RST)" 0 = Operational mode not stored 1 = Operational mode stored		1	0	1	B
147	Switching state of signal "backward stitch (RST)" after power Off 0 = Switching state not stored 1 = Switching state stored		1	0	1	B

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

TECHNICIAN LEVEL

Code no. 190 with control operation

Parameter	Designation	Unit	max	min	Preset	Ind. Prg. No.
153	Braking power at machine standstill		50	0	0	A
172	**Display on the control:** Pos. 1 to 1A (LED 7 lights up) Pos. 2 to 2A (LED 8 lights up)					A
173	Checking of the signal outputs and inputs 01 = LED for backward stitch (RST) 02 = Tongue lift signal (ZLÜ) 03 = Stitch condensing (STV) 04 = Machine running (ML) 05 = Backward stitch (RST) 06 = Stitch length reduction (STK) 07 = LED for stop at the seam end (STNE) OFF/ON = By actuating the switches connected to the control, the function of these switches is checked and displayed on the control with "ON/OFF".					B
179	**Display on the control:** Upon pressing the appropriate key, the data will be displayed in succession					A
180	Variations of the speed stages on the pedal 0 = Standard function 1 = Only one type of operation according to the setting of parameters 239...245 is possible up to the set pedal step		12	0	4	A
181	Reaction delay of the pedal (effective only if parameter 180 is set >0)	ms	2550 *)	0	100	A

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

12.3 SUPPLIER LEVEL

Code no. 311 with control operation

Parameter	Designation	Unit	max	min	Preset	Ind. Prg. No.
202 t3	Start delay after switching off the tongue lift signal	ms	500	0	50	A
207	Braking effect with speeds >800 RPM		255	1	80	A
208	Braking effect with speeds <800 RPM		255	1	50	A
220	Accelerating power of the drive		255	1	40	A
221	Speed gate		990 *)	50	100	A
222	Speed gate damping period	ms	990	0	120	A
231	Execution of the 1st stitch after power ON at positioning speed	ON/OFF			ON	A
239	**Selection of the input function on socket B18/5** 0 = Light barrier function if 009 = ON All other functions as with parameter 240		17	0	17	B
240	**Selection of the input function on socket B17/1** 0 = No function 1 = Needle up/down 2 = Needle up 3 = Single stitch (basting stitch) 4 = Full stitch 5 = Needle to position 2 6 = Machine run blockage effective with open contact 7 = Machine run blockage effective with closed contact 8 = Blocking of machine run (unpositioned) effective with open contact 9 = Blocking of machine run (unpositioned) effective with closed contact 10 = Automatic speed without pedal (n12) 11 = Limited speed with pedal (n12) (flip-flop function) 12 = Tongue lift signal 13 = Backward stitches RST 14 = Stitch length reduction STK 15 = Stitch condensing STV with stitch counting 001 16 = Stitch condensing STV with flip-flop 17 = Stitch counting 007 with stop		17	0	14	B

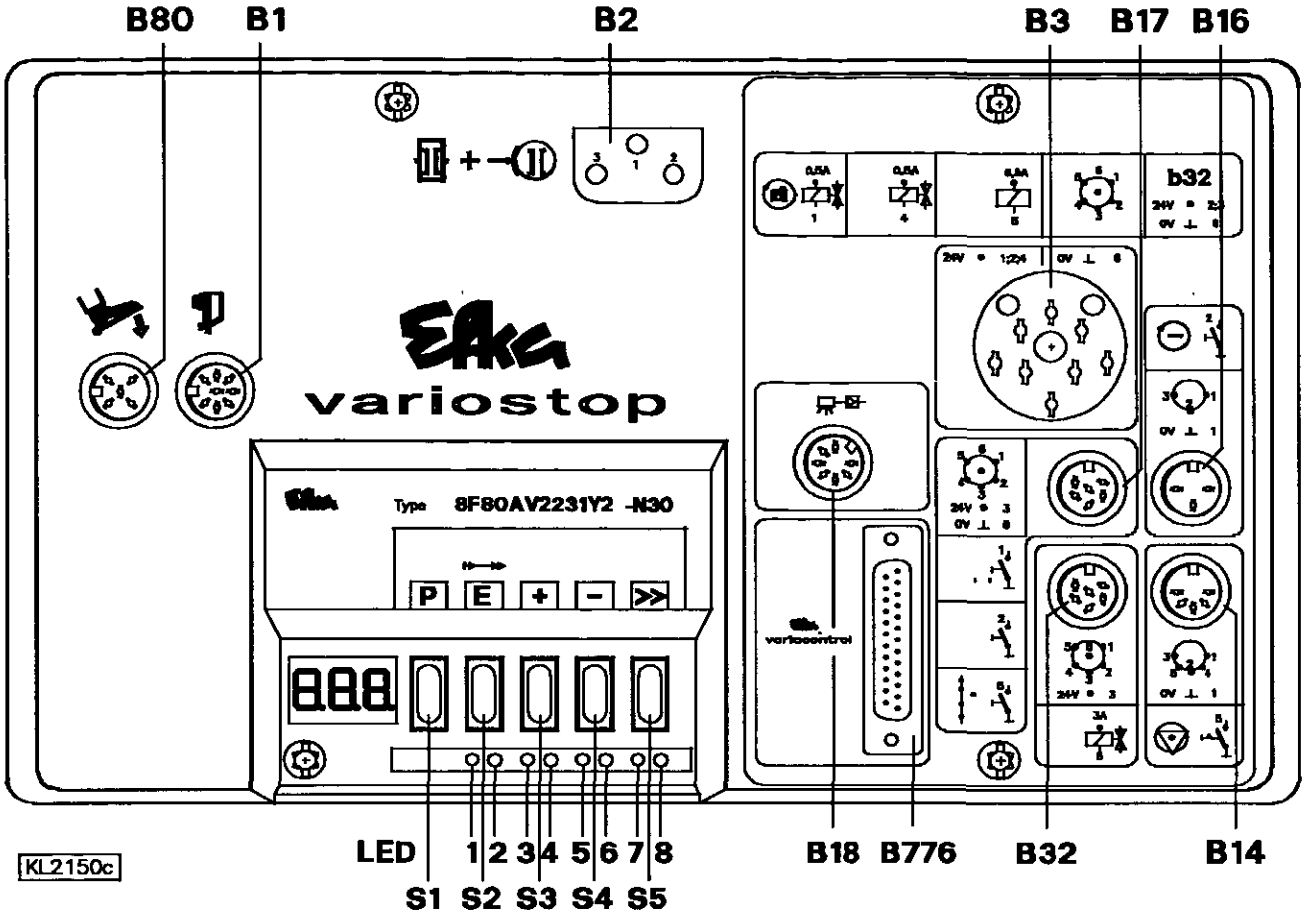
*) When programming the 3-digit or 4-digit control parameter values, the 2-digit or 3-digit value displayed must be multiplied by 10.

SUPPLIER LEVEL

Code no. 311 with control operation

Parameter	Designation	Unit	max	min	Preset	Ind. Prg. No.
241 in2	**Selection of the input function on socket B16/2 input 2** 0 = No function All other functions as with parameter 240		17	0	11	B
242 in3	**Selection of the input function on socket B17/5 input 3** 0 = No function All other functions as with parameter 240		17	0	13	B
243 in4	**Selection of the input function on socket B17/2 input 4** 0 = No function All other functions as with parameter 240		17	0	15	B
244 in5	**Selection of the input function on socket B16/3 input 5** 0 = No function All other functions as with parameter 240		17	0	15	B
245 in6	***Selection of the input function on socket B14/5 input 6*** 0 = No function All other functions as with parameter 240		17	0	6	B

13. Operating Elements and Connectors



B1 - Position transmitter
B2 - Clutch/brake of the motor
B3 - Machine
B14 - Machine
B16 - Keys
B17 - Keys
B32 - Machine
B18 - Light barrier module
B80 - Actuator

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

LED 1..8 - Indicators for switched on functions

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