CONTROL

AB611A5021
AB611A5022

Operating manual

With parameter list

- Putting into Service
- Settings
- Functional Description
- Connection Diagrams
- Timing Diagrams

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Efka
FRANKL & KIRCHNER
GMBH & CO KG

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Important Notes

The particulars used in various figures and tables, such as type, program number, speed, etc., serve as examples. They may differ from those in your display.

For current versions of the Instructions for Use and Lists of Parameters, necessary for operating EFKA drives in accordance with regulations, please refer to the EFKA web site **www.efka.net**, page **“Downloads”**.

On our web site, you will also find the following supplementary instructions for this control:

- General instructions for use and programming
- Use with USB Memory Stick
- Adapter cords

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1 Range of Applications

The drive is suitable for lockstitch, chainstitch and overlock machines of various manufacturers.
With the help of adapter cords (adapter cords see Special Accessories), the drive can be used in replacement of the controls listed in the table below, as long as backtacking, stitch condensing, and chain suction are not used.

Machine manufacturer	Replacing	Machine	Model	Thread trimming mode	Adapter cord
Aisin	AB62AV	Lockstitch	AD3XX, AD158, 3310, EK1	0	1112815
Brother	AB62AV	Lockstitch	737-113, 737-913	0	1113420
Brother	AC62AV	Chainstitch	FD3 B257	5	1112822
Dürkopp Adler	DA62AV	Lockstitch	210, 270	0	1112845
Global		Chainstitch	CB2803-56	5	1112866
Juki	AB62AV	Lockstitch	5550-6	14	1112816
Juki	AB62AV	Lockstitch	5550-7, 8500-7, 8700-7	14	1113132
Kansai	AC62AV	Chainstitch	RX 9803	5	1113130
Pegasus	AC62AV	Chainstitch	W500/UT, W600/UT/MS, with/without stitch condensing	5	1112821
Pegasus	AB60C	Backlatch		8	1113234
Pfaff	PF62AV	Lockstitch	563, 953, 1050, 1180	0	1113746
Rimoldi		Chainstitch	F27	5	1113096
Singer	SN62AV	Lockstitch	212 UTT	2	1112824
Union Special	AC62AV	Chainstitch	34700 with stitch lock	5	1112844
Yamato	AC62AV	Chainstitch	VC series	5	1113345
Yamato		Chainstitch	VG series	5	1113345
Yamato	AB60C	Backlatch	ABT3	9	1112826
Yamato		Backlatch	ABT13, ABT17	9	1113205
Medium-duty sewing machine, general		Lockstitch	e.g. Dürkopp Adler, Juki, Pfaff, Sunstar, Golden Wheel	3	Suitable adapter, upon request

1.1 Use in Accordance with Regulations

The drive is not an independent functional machine. It has been designed for integration into other machines by trained specialists.
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 relevant EC standards:

IEC/EN 60204-31 Electrical equipment of industrial machines:
Particular requirements for industrial sewing machines, sewing units and sewing systems.

Operate the drive only in dry areas.

ATTENTION
When selecting the installation site and the layout of the connecting cable, the Safety Instructions must be followed with no exceptions.
Particular attention should be paid to maintaining the proper distance from moving parts!

2 Scope of Supply

Standard Scope of Supply		
1	Direct current motor	**DC1200 optional DC1250**
1	Electronic control/Power supply unit	**AB611A5021/N214**
1	Set of accessories (standard)	**B156**
1	Actuator	**EB401**
	Consisting of:	Plastic bag for B156 + documentation
and		
1	Set of accessories	**Z55**
	Consisting of:	37-contact SubminD plug, potential equalization cord
Option 1		
1	Actuator	**EB401**
and		
1	Set of accessories	**Z66**
	Consisting of:	37-contact SubminD plug, tension rod, potential equalization cord
Additional options		
	Below table assembly set	Z71 AB6..-DC12.. Below table assembly
	Pulse encoder IPG001	Z72 AB6..-DC12.. IPG

NOTE

If there is no metallical contact between drive (motor) and machine head, the potential equalization cord supplied with the unit is to be wired from the machine head to the terminal provided on the control box!

2.1 Special Accessories

The special accessories available ex works allow the augmentation and enhancement of functions, operating, connecting, and mounting options.
Since the range of available components is continually expanded, we kindly ask you to contact us in case of need.

Designation	Material No.
Reflection light barrier module LSM002	6100031
Hall sensor module HSM001	6100032
Pulse encoder IPG001	6100033
Adapter cord for the connection of light barrier module and/or Hall sensor module HSM001 and/or pulse encoder IPG001	1113229
Extension cable approx. 1000 mm long for commutation transmitter DC12.. + DC15..	1113151
Extension cable approx. 1000 mm long for Netz DC12.. line + DC15..	1113931
Potential equalization cord 700 mm long, LIY 2.5 mm², gray, with spades on both sides	1100313
Foot control type FB302B with three pedals for standing operation, with approx. 1400 mm connecting cable and plug	4170025
Fitting piece for position transmitter	0300019
Knee switch type KN19 (pushbutton) with cord of approx. 450 mm length and western plug (RJ11)	5870021
Knee switch type KN20 (pushbutton + selector switch) with cord of approx. 1640 mm length and Western plug (RJ11)	5870022
Adapter set for DC12. + DC15.. on PEGASUS model W600	1113125
Adapter set for DC12. + DC15.. on PEGASUS Ex/Ext	1113126
Adapter set for DC12. + DC15.. on PEGASUS model W1500N, W1600	1113647
Undertable mounting kit for DC1200/DC1250	1113956
Undertable mounting kit for DC1500/DC1550	1113427
9-contact SubminD male connector	0504135

9-contact SubminD female connector	0504136
Half-shell housing for 9-contact SubminD	0101471
37-contact SubminD male connector, complete	1112900
Single pins for 37-contact SubminD with strand of 50 mm length	1112899
Adapter set direct drives DC1210 & DC1230	
Mounting kit for DC1210 on JUKI M067, M069	1114085
Mounting kit for DC1210 on JUKI M068	1114093
Mounting kit for DC1210 on PEGASUS EX	1114082
Mounting kit for DC1210 on PEGASUS M900	1114088
Mounting kit for DC1210 on YAMATO AZ, CZ	1114084
Mounting kit for DC1230 on PEGASUS chainstitch	1114119
Mounting kit for DC1230 on YAMATO VC, VE, VF, VG	1114102

2.1.1 Adapter Cords for Special Machines

For interconnection diagrams of the adapter cords, please refer to our web site at www.efka.net/downloads.

Machine / Type / Model	Material No.
AISIN high-speed seamer AD3XX, AD158, 3310 and overlock machine EK1	1112815
BROTHER models 737-113, 737-913	1113420
BROTHER Lockstitch machines, with 100 Ω selective resistance, cl. 7xxx, B84xx, 877B, B87xx, 878B (mode 31)	1113420
BROTHER chainstitch machines, with 150 Ω selective resistance, cl. FD3-B257, 25xx, 26xx, 27xx (mode 32)	1112822

Designation	Material No.
BROTHER models B721, B722, B724, B737, B748, B772, B774, B778, B842, B845, B872, B875 ***Connection of the position sensor incorporated in the hand wheel***	1113433
DÜRKOPP ADLER models 210 and 270	1112845
GLOBAL model CB2803-56	1112866
JUKI high-speed seamer with index -6	1112816
JUKI high-speed seamer with index -7	1113132
JUKI lockstitch machines ***Connection of the position sensor incorporated in the hand wheel***	1113157
JUKI DNU1541, LU2210, LU1510	1114023
JUKI LU2810-6	1114024
JUKI PLC 2760	1114025
KAISER models 1245 & 335	1114003
KANSAI machines model RX 9803	1113130
PEGASUS models W500/UT, W600/UT/MS with or without stitch condensing	1112821
PEGASUS backlatch machine	1113234
PFAFF models 563, 953, 1050, 1180	1113746
PFAFF models 1245 & 335	1114003
SINGER models 211, 212U, 212UTT and 591	1112824
TYPICAL models 1245 & 335	1114003
UNION SPECIAL lockstitch machine model 63900AMZ (in replacement of US80A)	1112823
UNION SPECIAL model 34700 with stitch lock	1112844
UNION SPECIAL models 34000 and 36200 (in replacement of US80A)	1112865
UNION SPECIAL models CS100 and FS100	1112905
YAMATO VC/VG series chainstitch machines + stitch lock	1113345
YAMATO backlatch machine ABT3	1112826
YAMATO backlatch machine ABT13, ABT17	1113205
MAUSER models 1245 & 335	1114003
MITSUBISHI lockstitch machines ***Connection of the position sensor incorporated in the hand wheel***	1113411

3 Putting into Service

Before putting the control into service, the following must be ensured, checked and/or adjusted:

- Selection of motor type using parameter **467**
- The correct installation of the drive, position transmitter and accompanying devices, if necessary
- The correct selection of the trimming operation using parameter **290**
- If necessary, the correct adjustment of the direction of motor rotation using parameter **161**
- The correct selection of the functions of keys (inputs) using parameters **240...246**
- The setting of the transmission ratio between motor shaft and machine shaft using parameter **272**
- The setting of the type of position sensor using parameter **270**
- If necessary, the adjustment of the positions using parameter **171**
  if necessary, the setting of the positions using parameter **171** (possible with all settings of parameter **270**)
- The correct positioning speed using parameter **110**
- The correct maximum speed compatible with the sewing machine using parameter **111**
- The setting of the remaining relevant parameters
- Begin sewing in order to save the set values

4 Setting and Putting into Service with the Aid of the Fast Installation Routine (SIR)

Function **with** or **without** control panel		Parameters
Call-up of the Fast Installation Routine SIR	(Sir)	**500**

The Fast Installation Routine (SIR) passes through all parameters necessary for programming the functional sequence and the positions.

With SIR you can do the most important settings for initial operation with menu prompting.
For safety reasons, the menu must be executed point by point. This ensures correct setting of all important parameters.

Input of the code number for the fitting level. ➔

Parameter **500** is displayed. ➔

Parameter **290** for functional sequence of the cutting procedures. ➔

Parameter **467** for selection of motor. ➔

Parameter **111** for the maximum speed. ➔

Parameter **161** for direction of motor rotation. ➔

Parameter **270** for type of position sensor. ➔

Parameter **272** for transmission ratio. ➔
Important! The transmission ratio should be determined and indicated as precisely as possible.

If parameter **270 =0 or 5**, continue with input of **451**. ➔
Check the transmission ratio.

Move pedal forwards. Let the drive run until ready (rdy) is displayed. ➔
Press pedal to position 0. The check is complete.

if parameter **270 = 6**, set the reference position. ➔

Turn hand wheel until symbol **o** display goes off. ➔
Set reference position (e.g. height of the stitch plate, lower dead point).

Parameter **451** for position 1. ➔

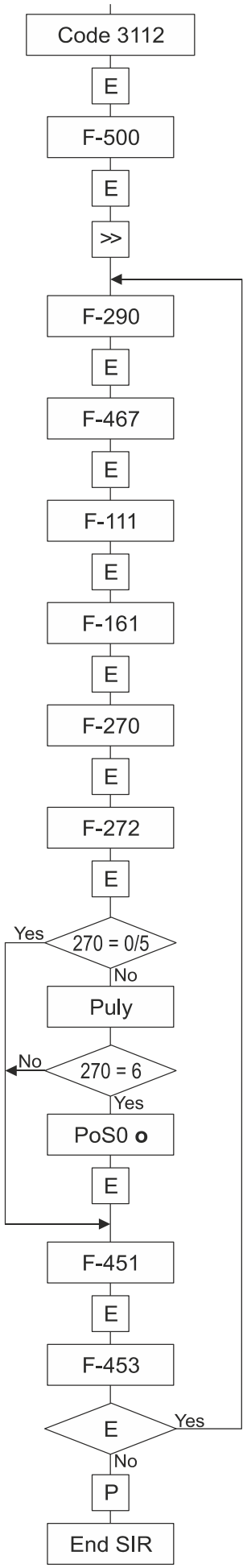
Parameter **453** for position 2. ➔

To repeat the cycle from parameter **290**, push button **E.** ➔

Or end with button **P** (2x). ➔

The values can be varied by pressing key +/-.

The input of the code number is described in the general operating manual!



KL2438f

Setting on the operating part of the controls (onboard)

1	Input code number **3112**!			
2	Press the **E** key	➔	Parameter **5.0.0.** displayed	
3	Press the **E** key	➔	**Sir** displayed. The 2 lower segments of the right 7 segment display flash.	
4	Press the **>>** key	➔	Parameter **2.9.0.** appears	**(Functional cycle cutting processes)**
5	Press the **E** key	➔	Parameter value e.g. **05** appears.	
6	Press the **+/-** key	➔	The parameter value can be changed.	
7	Press the **E** key	➔	Parameter **4.6.7.** appears	**(Selection of motor)**
8	Press the **E** key	➔	Parameter value e.g. **3** appears.	
9	Press the **+/-** key	➔	The parameter value can be changed.	
10	Press the **E** key	➔	Parameter **1.1.1.** appears	**(Maximum speed)**
11	Press the **E** key	➔	Value of the set speed appears.	
12	Press the **+/-** key	➔	The parameter value can be changed.	
13	Press the **E** key	➔	Parameter **1.6.1.** appears	**(Direction of motor rotation)**
14	Press the **E** key	➔	Parameter value e.g. **1** appears.	
15	Press the **+/-** key	➔	The parameter value can be changed.	
16	Press the **E** key	➔	Parameter **2.7.0.** appears	**(Type of position sensor)**
17	Press the **E** key	➔	Parameter value e.g. **0** appears.	
18	Press the **+/-** key	➔	The parameter value can be changed.	
19	Press the **E** key	➔	Parameter **2.7.2.** appears	**(Transmission Ratio)**
20	Press the **E** key	➔	Parameter value e.g. **1000** appears.	
21	Press the **+/-** key	➔	The parameter value can be changed.	
22			If parameter **270 =0 or 5**, or the check of the transmission ratio is already done, continue with Point 30.	
23	Press the **E** key	➔	**PULY** is displayed.	**(Check the transmission ratio)**
24	Move pedal forwards		Let the drive run until ready (**rdy**) is displayed. For a maximum speed that is too high, an error message A12 is generated. Push button **E** as often as needed until parameter **111** (Point 12) is reached again to set the permitted maximum speed.	
25	Press pedal to position 0 (neutral)		The check is complete.	
26			When parameter **270 ≠ 6**, continue with Point 31.	
27			**P0 o** is displayed (**o** in red).	**(Setting the reference position)**
28	Rotate the hand wheel in the running direction until **o** extinguishes *****. Set reference position (e.g. height of the stitch plate, lower dead point).			
29	Press the **E** key	➔	Parameter **4.5.1.** appears	**(Position 1 leading edge, position 1 trailing edge is automatically set 60° higher)**
30	Press the **E** key	➔	Angle from position 1 is displayed.	
31	Turn the hand wheel	➔	Set position 1 (at least 1 rotation *****).	
32	Or press the **+/-** key	➔	The parameter value can be changed.	
33	Press the **E** key	➔	Parameter **4.5.3.** appears	**(Position 2 leading edge, position 2 trailing edge is automatically set 60° higher)**
34	Press the **E** key	➔	Angle from position 2 is displayed.	
35	Turn the hand wheel	➔	Set position 2 (at least 1 rotation *****).	
36	Or press the **+/-** key	➔	The parameter value can be changed.	
37	Upon pressing the **E** key once more the program returns to parameter **2.9.0.**!			
38	Press the **P** key twice	➔	The system exits the SIR routine.	

***)** *All operations carried out by turning the hand wheel must always be carried out in the direction of rotation set up on the machine. Under no circumstances should you turn against the machine direction.*

5 Setting the Basic Functions

5.1 Direction of motor rotation

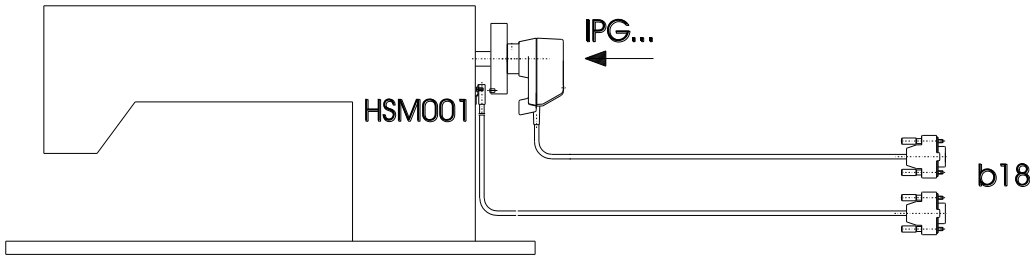
Function **with** or **without** control panel		Parameters
Direction of motor rotation	(drE)	**161**

161 =0 Clockwise motor rotation (look at the motor shaft)
161 =1 Counterclockwise motor rotation

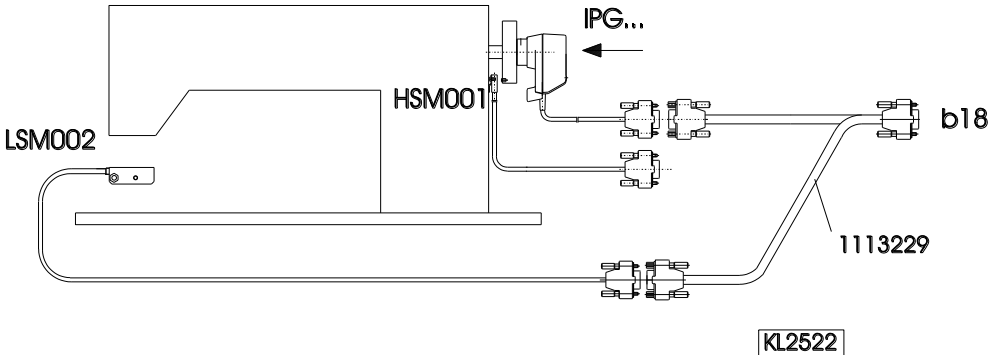
ATTENTION
If the motor is mounted differently, e. g. at a different angle or with gear, make sure that the value set using parameter **161** corresponds to the direction of rotation.

5.2 Use of a HSM001 Hall Sensor Module or IPG... Pulse Encoder

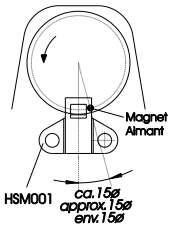
Representation and installation of a HSM001 Hall sensor module or IPG... pulse encoder !



Representation and installation of a HSM001 Hall sensor module or PG... pulse encoder together with a LSM002 light barrier module by means of adapter cord no. 1113229 !



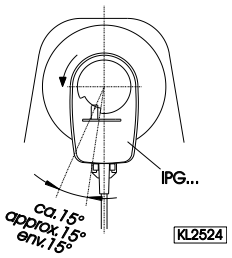
Operation with HSM001 Hall sensor module **Operation with IPG... pulse encoder**



← - Get machine to the needle-up position.
- Position bore for magnet such that the magnet is located approx. 15° after the sensor in the sense of rotation.

- Get machine to the needle-up position.
- Turn disk in the pulse encoder such that the leading edge will be located approx. 15° after the sensor on the board in the sense of rotation.

→



5.3 Transmission Ratio

NOTE

The transmission ratio must always be input if no transmission ratio of 1:1 exists, because only motors with integrated incremental transmitters will be used. **The transmission ratio should be determined and set as precisely as possible!**

The transmission ratio between motor shaft and shaft of the sewing machine head must be input, so that the set speeds of parameters **110...117** correspond to the sewing speeds.

Function **with** or **without** control panel		Parameters
Transmission ratio between motor shaft and machine shaft	(trr)	**272**

The transmission ratio can be selected within a range of 150...40000 using parameter **272**.

Example: With a motor pulley diameter of 40 mm and a sewing machine head pulley diameter of 80 mm the value 500 can be calculated using the formula below. If the value 2000 has been selected in parameter 272, it follows that the motor pulley is double the size of the sewing machine head pulley.

$$\text{Value of parameter } \mathbf{272} = \frac{\text{Motor pulley diameter}}{\text{Machine pulley diameter}} \times 1000$$

5.4 Selection of Functional Sequences (Thread Trimming Operations)

This drive is suitable for different lockstitch, chainstitch and overlock machines. The mode for the functional sequence required on the respective machine can be selected using parameter **290**.

ATTENTION

Before switching the functional sequences, you must disconnect input and output plug-and-socket connections between control and machine. Please ensure that the functional sequence (mode) suitable for the respective machine is selected.
Settings with parameter 290 are possible only after the power is turned On.

You will find a summary of the modes that can be set and the corresponding machines and adapter cords, to include available output signals in the List of Parameters chapter: Table of adapter cords.

Further information see chapter "Timing Diagrams" for the various modes.

5.5 Functions of the Keys Inputs in1...in7

The function that is started when a button or switch connected to one of the inputs in1 to in7 is actuated can be selected using parameters **240...246**.
The possible functions are listed in the section "Parameter list".

5.6 Positioning speed

Function **with** or **without** control panel		Parameters
Positioning speed	(n1)	**110**

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

5.7 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)".

5.8 Maximum speed

Function **with** or **without** control panel		Parameters
Maximum speed	(n2)	**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 motor runs at approx. 4000 RPM with max. number of stitches.

5.9 Positions

Function **with** or **without** control panel		Parameters
Mode for the position sensor Setting the needle positions Transmission ratio between motor shaft and machine shaft	(PGm) (Sr2) (trr)	**270** **171** **272**

A sensor can be used as a position sensor, e.g. Efka Hall sensor module (HSM1) or pulse generator (IPG) with either NC or NO functionality.
It is connected to socket B18/7.
Parameter **270** is used to select the mode to be selected depending on the type and mounting of the sensor used (see section Parameter List under parameter **270** for a description and flow chart).
After configuration of parameter **270** to "**1, 2, 3 o 4**", parameter **171** must be used to set the angle for positions 1 and/or 2, incoming and outgoing.
Alternatively, the positions can be configured using the fast-installation routine.
The transmission ratio must already have been input using parameter **272**.

5.9.1 Setting the reference position (Parameter 170)

The angular positions necessary on the machine e.g. “needle down position“ or “thread lever up position“ are stored in the control. A reference position is needed in order to establish a relationship between position transmitter information and actual mechanical position.

The reference position must be set:
- For initial operation
- After replacing the motor

Setting the reference position on the control
- Input code number and select parameter **170**!
- Press the **E** key ➔ Display **Sr1_**
- Press the **>>** key ➔ Display **P o u** (character “o” rotating) *1
- Turn hand wheel until rotating character **o** goes off on the display. By turning the hand wheel, set the needle to the bottom dead center or the needle point to the height of the needle plate in the direction of rotation of the motor shaft, while needle is moving downward. ➔ Display **P o**
  ➔ Configuration of the zero point of the machine
- Press the **P** key once ➔ Actual parameter number 170 is displayed *2

or
- Press the **P** key twice ➔ Exit programming at the technician level.

5.9.2 Setting the positions (Parameter 270 = 0 or 6)

Do these settings whenever the encoder incorporated in the motor is used (Parameter **270 =0**), or a position transmitter mounted on the machine head (e.g. IPG pulse encoder or HSM Hall sensor) (Parameter **270 =6**), whose preset values must be adapted.

Setting the positions on the control
- Input code number and select parameter **171**!
- Press the **E** key ➔ **[o]** is displayed
- Press the **>>** key ➔ **P1E** is displayed; set "position 1 On" on the hand wheel
- Press the **E** key ➔ **P2E** is displayed; set "position 2 On" on the hand wheel
- Press the **E** key ➔ **P1A** is displayed; set "position 1 Off" on the hand wheel
- Press the **E** key ➔ **P2A** is displayed; set "position 2 Off" on the hand wheel
- Press the **P** key twice ➔ Exit programming at the technician level.

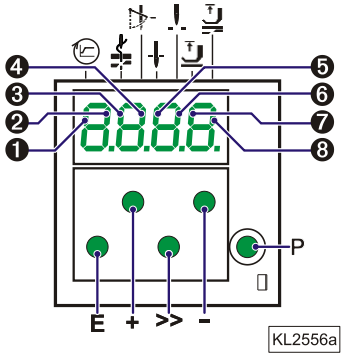
**1) If P 0 or Pos 0 is displayed, the reference position is already set. To repeat the setting the power must be switched off and the code number reentered.*
**2) The next parameter to be set can be selected.*
3) The button **>>(F2) is the farthest button to the right on the control part.*

If error message A3 (reference position not set) appears, repeat the above setting sequence.

5.10 Control display of signal position and stop position

Function		Parameter
Display of position 1 and 2	(Sr3)	**172**

Control display



- Segment ❺ is turned on corresponds to position 1 On
- Segment ❺ is turned off corresponds to position 1 Off
- Segment ❻ is turned on corresponds to position 2 On
- Segment ❻ is turned off corresponds to position 2 Off

5.11 Positioning shift

Function		Parameters
Positioning shift	(PSv)	**269**

Determine by means of parameter **269** whether the drive is to stop exactly on the position (Parameter **269 =0**) or some increments after the position.

5.12 Braking Characteristics

Function		Parameters
Braking ramp running Braking ramp stop Braking ramp for n < 350 $^{min^{-1}}/_{ms}$ when drive stopped	(br1) (br2) (br3)	**207** **208** **219**

- Parameter **207** regulates the braking effect between speed stages
- Parameter **208** influences the braking effect for the stop
- Parameter **219** influences the braking effect before the stop

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

5.13 Braking Power at Standstill

Function		Parameters
Braking Power at Standstill	(brt)	**153**

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

- 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

5.14 Starting Characteristics

Function **with** or **without** control panel		Parameters
Starting edge	(ALF)	**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.

5.15 Operating hours counter

Function **with** or **without** control panel		Parameters
Acoustic signal (operating part) Service routine for total operating hours Service routine for operating hours before service Input of operating hours before service	(AkS) (Sr6) (Sr7) (Sr)	**127** **176** **177** **217**

The integrated operating hours counter records the time of motor operation. Downtimes are not recorded. Time recording accuracy is 1ms. There are two ways of operating hours counting.

1. Basic operating hours counting:

217 =0 Operational mode: Operating hours counting

2. Service Hours Monitoring:

217 =>0 Operational mode: Number of operating hours before the next service.
Input of operating hours before the next service.
This value is compared to the operating hours counter.
The input of hours is done in steps of 10. i. e. the lowest display of 001 corresponds to 10 hours (e. g. 055 = 550 hours).
When the set number of operating hours are reached, the message "C1" will show on the display after each trimming operation. In addition, the speed indicator blinks on the control during operation or after drive standstill.

176 In this service routine, the total operating hours can be read out according to the procedure example described below for parameter **177**.

177 Display of operating hours since the **last** service.

Display example of operating hours or hours since the last service and operating hours counter reset.

Display on the control:

- Select parameter **177**
- Press the **E** key → **Sr7**
- Press the **>>** key → **h t** (hours /thousands letter symbol)
- Press the **E** key → **000** hours /thousands display)
- Press the **E** key → **h h** (hours / hundreds letter symbol)
- Press the **E** key → **000** (hours / hundreds display)
- Press the **E** key → **Min** (minutes letter symbol)
- Press the **E** key → **00** (minutes display)
- Press the **E** key → **SEc** (seconds letter symbol)
- Press the **E** key → **00** (seconds display)
- Press the **E** key → **MS** (milliseconds letter symbol)
- Press the **E** key → **000** (milliseconds display)
- Press the **E** key → **rES** See chapter "Set and Reset Operating Hours Counter"
- Press the **E** key → The process will be repeated from the hours display.
- Press the **P** key twice → e.g. **400** (sewing process can be started)

5.15.1 Set and Reset Operating Hours Counter

The number of hours has been reached (service necessary):

- Press the **>>** key once ➔ The operating hours counter is set to "0" and restarted.

The number of hours has not yet been reached:

- Press the **>>** key three times ➔ The operating hours counter is set also to "0" and restarted.

A value in parameter 177 has been changed:

- After displaying **rES ...,** when the **E** key is pressed again, **SEt** will then be displayed.
- If the changed value is to be saved, press the **>>** key 3 times.

5.15.2 Total Operating Hours Display

In this service routine enabled using parameter **176**, the total number of operating hours is displayed.
The sequence of displayed values is as with parameter **177**.
The values can only be displayed, not varied. Therefore, letter symbols "rES" for "reset" and "SEt" for "set" will not appear.

6 Functions

6.1 First Stitch after Power On

Function		Parameters
1 stitch at positioning speed after power On	(Sn1)	**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.

6.2 Softstart

Function		Parameters
Softstart On/Off	(SSt)	**134**

Functions:

- 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. Stitch count)
- Stitch counting synchronized to position 1
- Suspension with pedal in position 0 (neutral)
- Interruption by full heelback (position -2)

6.2.1 Softstart speed

Function		Parameters
Softstart speed	(n6)	**115**

6.2.2 Softstart stitches

Function		Parameters
Number of softstart stitches	(SSc)	**100**

6.3 Sewing foot lifting

Function		Control
Automatic in the seam Automatic after thread trimming	Segment 7 on Segment 8 on	Key **–** (S4)

Function		Parameters
Automatic sewing foot with pedal forward at the seam end if light barrier or stitch counting is On	(AFL)	**023**
Coupled thread tension release and sewing foot lifting. The function can be activated only with a thread trimmer that depends on the angle.	(FSP)	**024**
Switch-on delay with pedal in position –1	(t2)	**201**
Start delay after disabling the sewing foot lifting signal	(t3)	**202**
Time of full power of sewing foot lifting	(t4)	**203**
Duty ratio (ED) with pulsing	(t5)	**204**
Delay after thread wiping until sewing foot lifting	(t7)	**206**
Delay after thread trimming without thread wiper until sewing foot lifting	(tFL)	**211**
Upper limit ON period of sewing foot lifting 1...100	(EF-)	**254**

Sewing foot is lifted:

- in the seam
  by heelback (position -1)
  or automatically (using the **-** S4 key on the control, segment 7 lights up)
  by pressing a key depending on the pre-selection of parameters **240...246**
- after thread trimming
  by heelback (position -1 or -2)
  or automatically (using the **-** S4 key on the control, segment 8 lights up)
  by pressing a key depending on the pre-selection of parameters **240...246**
  automatically by light barrier when pedal forwards, according to the setting of parameter **023**
  automatically by stitch counting when pedal forwards, according to the setting of parameter **023**
  Switch-on delay after thread wiper (t7)
  Switch-on delay without thread wiper (tFL)

It is possible to prevent unintentional foot lifting before thread trimming when changing from pedal position 0 (neutral) to position -2 by setting a switch-on delay (t2) using parameter**201**.

Holding power of the lifted foot:
The sewing foot is lifted by full power. Then the system switches automatically to partial power in order to reduce the load for the control and the connected solenoid.
Set the duration of full power using parameter **203** and the partial holding power using parameter **204**.

ATTENTION
If the holding power is set too high, the solenoid and the control may be permanently damaged. Please observe the permissible duty ratio (ED) of the solenoid and set the appropriate value according to the table below.

Value	Duty ratio (ED)	Effect
1	1 %	Low holding power
100	100 %	High holding power (full power)

Sewing foot lowers:

- Press pedal to position 0 (neutral)
- Press pedal to position ½ (slightly forward)
- Release key for manual sewing foot lifting

Upon pressing the pedal forward from lifted sewing foot, the start delay (t3) that can be set using parameter **202** becomes effective.

6.4 Reverse motor rotation

Function		Parameter
Positioning speed	(n1)	**110**
Reversing angle	(ird)	**180**
Switch-on delay of reverse motor rotation	(drd)	**181**
Reverse motor rotation On/Off	(Frd)	**182**

The function "reverse motor rotation" is performed after trimming. When the stop position is reached, the drive stops for the duration of the switch-on delay of reverse motor rotation. Then it runs in reverse direction at positioning speed according to the set degrees.

6.5 Unlocking the Chain (Mode 5/6/7)

Function **with** or **without** control panel		Parameters
Number of run-out stitches when unlocking the chain	(c6)	**184**
Function “unlock the chain” in modes 5, 6 and 7	(mEk)	**190**

Upon unlocking the chain at the seam end, the functions **thread trimming** and tape cutter/fast scissors are automatically suppressed. When setting parameter **190 = 3**, the function **tape cutter/fast scissors** is however possible. After pressing the key "unlocking the chain" and with pedal in position 0 (neutral), the drive always stops in position 1.

Settings necessary for the operation “unlocking the chain”:

- Set “unlock the chain” using parameter **190 =1 / 2 / 3 / 4** (**190 =0** “unlock the chain” off)
- Set **switch-on delay** using parameter **181** and **reversing angle** using parameter **180**
- Determine the **function of the key “unlock the chain”** using one of the parameters **240...246**
- If parameter **290** is set at“

190 =0 **Unchaining switched off**

190 =1 **Sequence with pedal in position -2 from machine run or from position 2:**
- Press key "unlock the chain"
- Run at positioning speed to position 1
- Sequence of reversing angle at positioning speed after a switch-on delay that can be set

190 =1 **Sequence with pedal in position -2 from standstill in position 1:**
- Press key "unlock the chain"
- Run at positioning speed to position 1
- Sequence of reversing angle at positioning speed after a switch-on delay that can be set

190 =2 **Automatic sequence with light barrier at the seam end without tape cutting / pedal in position –2 according to the setting of parameter 019**
- Press key "unlock the chain"
- Run to position 1 after light barrier sensing
- Sequence of reversing angle at positioning speed after a switch-on delay that can be set

190 =3 **Automatic sequence with light barrier on the seam end with tape cutter and run-out stitches(Only possible in mode 7 and if parameter 018 =0)**
- Press key "unlock the chain"
- After light barrier detection, sequence of the compensation stitches and end count up to tape cutting
- Run-out stitches up to unlocking the chain, adjustable with parameter 184
- Sequence of reversing angle at positioning speed after a switch-on delay that can be set

190 =4 **Sequence with pedal in position –2 / no unlocking of the chain if seam end with light barrier, cutting and run-out stitches is set:**
- Press the pedal to position -2
- Run at positioning speed to position 1
- Sequence of reversing angle at positioning speed after a switch-on delay that can be set
- No unlocking of the chain at the seam end with light barrier
- Reverse motor rotation is suppressed when the drive stops. The signals “blow fabric onto stack”, M2 and “sewing foot lift” will be issued.

6.6 Machine run blockage

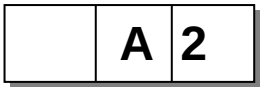
ATTENTION

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 socket ST2, depending on the pre-selection of parameters 240...246

Display after enabling machine run blockage without control panel:

Control display ➔



Machine run blockage in the free seam, seam with stitch counting and light barrier seam:
The seam is suspended by opening and/or closing the switch.

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

Machine run blockage in the start backtack / start stitch condensing:
The start backtack / start stitch condensing is interrupted by opening and/or closing the switch.

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

New start after machine run blockage

Function		Parameter
New start after machine run blockage	(Pdo)	**234**

Parameter 234 determines how a new start is possible after closing and/or opening the switch.

234 = 0 New start after disabling machine run blockage without influence by the pedal. This setting is applicable, for example, to automats.

234 = 1 New start after disabling machine run blockage only if the pedal is in position 0 (neutral).

6.7 Thread trimming operation

Function		Parameters
Thread trimmer On/Off	FA	**013**
Thread wiper On/Off	FW	**014**

6.7.1 Thread Trimmer/Thread Wiper (Lockstitch Modes)

Function		Parameters
Thread wiper time	(t6)	**205**
Thread wiper switch-on delay	(dFw)	**209**
Holding power output M1 of the thread trimmer backward	(t11)	**213**
Thread trimmer activation angle	(iFA)	**250**
Switch-off delay of thread tension release	FSA	**251**
Thread tension release switch-on delay	FSE	**252**
Stop time for thread trimmer	(tFA)	**253**
Upper limit ON period of thread trimmer backward	EV-	**255**
Switch-on delay angle of the thread trimmer	FAE	**259**

Thread trimming in the lockstitch modes is performed at trimming speed.
When the thread trimmer is off, the drive stops in position 2 at the seam end; it stops in position 1 at the end of programmed seams.
The thread wiper ON period can be set depending on the selected trimming mode (see chapter "Timing Diagrams" in the List of Parameters). The delay time (t7) (Parameter **206**) prevents sewing foot lifting before the thread wiper is in its initial position.
If the thread wiper is not connected, there will be a delay time (tFL) after thread trimming until sewing foot lifting.

6.7.2 Trimming speed

Function		Parameters
Trimming speed	(n7)	**116**

6.7.3 Chainstitch thread cutter (var. modes)

Thread trimming in the chainstitch modes is performed at machine standstill in position 2.
The signal sequence of M1...M4 and sewing foot lifting at the seam end can be set as desired using parameters **280...288** (Parallel or sequential).
When the thread trimmer is off, the drive stops in position 2 at the seam end.

6.7.4 Chainstitch Machine Trimming Signal Times

Signal delay times and ON periods can be set with the help of the following parameters.
See chapter 8 »Setting the Basic Functions, Selection of Functional Sequences« in this manual for further information on chain stitch seam end variants and chapter »Timing Diagrams« in the List of Parameters.

Function		Parameters
Delay time output M1	(kd1)	**280**
ON period output M1	(kt1)	**281**
Delay time output M2	(kd2)	**282**
ON period output M2	(kt2)	**283**
Delay time output M3	(kd3)	**284**
ON period output M3	(kt3)	**285**
Delay time output M4	(kd4)	**286**
ON period output M4	(kt4)	**287**
Delay time until sewing foot On	(kdF)	**288**

6.8 Overlock Machine Functions (Mode 7)

Function		Parameter
Stop when tape cutting at the seam end On/Off	(SAb)	**017**
Sequence overlock mode with or without stop	(UoS)	**018**
Stitches until thread tension release Off after light barrier covered at the start of the seam	(SFS)	**157**
Braking curve in overlock mode On/Off	(bdO)	**235**
Start count cancellation and seam end initiation by light barrier uncovered On/Off	(Abc)	**267**

There are various setting possibilities with the following parameters in the overlock mode (mode 7).

018 =0 Sequence with stop.

018 =1 Sequence without automatic stop at the seam end. When the command “run” is given, the drive runs at the pre-selected speed. The program switches to the next start of a seam without issuing signals M1/M2, when the pedal is in pos. 0 (neutral) or the light barrier is covered.

018 =2 Sequence as with setting 1. But with pedal in pos. 0 signals M1/M2 will be issued, and the program switches to the next start of a seam.

018 =3 Sequence as with setting 1. But with pedal -2 signals M1/M2 will be issued, and the program switches to the next start of a seam. Intermediate stop and sewing foot lifting with pedal in pedal -1 is possible.

018 =4 If the light barrier is covered during the end count for chain suction, the program switches immediately to the next start of a seam. If the end count has been completed and the light barrier remains uncovered, the drive stops immediately.

018 =5 Tape cutting at the start of the seam with stop.

267 =0 Start count cancellation by light barrier uncovered impossible.

267 =1 Start count cancellation by light barrier uncovered.
Chain suction or tape cutting at the start of the seam are cancelled whenever the light barrier senses “uncovered”, and the seam end will be initiated.

6.8.1 Start and End Counts

Function		Parameter
Count (c3) tape cutter at the start of the seam	(c3)	**002**
End count (c4) for tape cutter at the seam end	(c4)	**003**

6.9 Tape Cutter/Fast Scissors (Modes 6/7)

6.9.1 Tape Cutter/Fast Scissors in Mode 6

The signal **tape cutter/fast scissors** is issued only at the seam end. Furthermore, the manual tape cutter/fast scissors function can be set. See also chapter "**Manual Tape Cutter/Fast Scissors**".

Function	Parameters
Tape cutter at the seam end On/Off	**014**

Output and Times for Tape Cutter

Function		Parameters
Delay time for output M3 (ST2/27) **tape cutter** AH	(kd3)	**284**
ON period for output M3 (ST2/27) **tape cutter** AH	(kt3)	**285**

- Parameter **232** must be set at "**0**" (tape cutter function).
- The delay time for the tape cutter is usually set at "**0**".

Output and Times for Fast Scissors

Function		Parameters
Delay time for output M3 (ST2/27) **fast scissors** AH1	(kd3)	**284**
ON period for output M3 (ST2/27) **fast scissors** AH1	(kt3)	**285**
Delay time for output M4 (ST2/36) **fast scissors** AH2	(kd4)	**286**
ON period for output M4 (ST2/36) **fast scissors** AH2	(kt4)	**287**

- Parameter **232** must be set at "**1**" (fast scissors function).
- The delay times for "fast scissors" are usually set at "**0**".

6.9.2 Tape Cutter/Fast Scissors in Mode 7

The signal tape cutter/fast scissors can be set separately for start and end counting. See also chapter "Manual Tape Cutter/Fast Scissors".

Function		Control
Tape cutter/Fast scissors at the start of the seam On	Segment 3 on	key + (S3)
Tape cutter/Fast scissors at the end of the seam On	Segment 4 on	
Tape cutter/Fast scissors at the start and end of the seam On	Segment 3 and 4 on	
Tape cutter/Fast scissors at the start and end of the seam Off	Segment 3 and 4 off	

Output and Times for Tape Cutter

Function		Parameters
Delay time for output M3 (ST2/27) **tape cutter** AH	(kd3)	**284**
ON period for output M3 (ST2/27) **tape cutter** AH	(kt3)	**285**

- Parameter **232** must be set at "**0**" (tape cutter function).
- The delay time for the tape cutter is usually set at "**0**".

Output and Times for Fast Scissors

Function		Parameters
Delay time for output M3 (ST2/27) **fast scissors** AH1	(kd3)	**284**
ON period for output M3 (ST2/27) **fast scissors** AH1	(kt3)	**285**
Delay time for output M4 (ST2/36) **fast scissors** AH2	(kd4)	**286**
ON period for output M4 (ST2/36) **fast scissors** AH2	(kt4)	**287**

- Parameter **232** must be set at "**1**" (fast scissors function).
- The delay times for "fast scissors" are usually set at "**0**".

6.10 Manual Tape Cutter/Fast Scissors

Upon pressing an external key depending on the pre-selection of parameters **240...246**, the **tape cutter** or **fast scissors** can be enabled anywhere in the seam or at standstill.
See also chapter "Connection Diagram" in the List of Parameters!

6.11 Seam with Stitch Counting

Function		Parameters
Stitch counting On/Off	(n7)	**015**

6.11.1 Number of Stitches for a Seam with Stitch Counting

Function with or **without** control panel		Parameters
Number of stitches for the seam with stitch counting	(Stc)	007

The number of stitches for stitch counting can be set directly on the control with parameter **007**.

6.11.2 Stitch Counting Speed

Function		Parameters
Positioning speed	(n1)	**110**
Stitch Counting Speed	(n12)	**118**
Speed mode for a seam with stitch counting	(SGn)	**141**

A certain speed behavior for the stitch counting can be selected using **parameter141**.

141 =0 Execution at pedal controlled speed
141 =1 Execution at fixed speed n12, when pressing the pedal forward (position >1)
141 =2 Execution at limited speed n12, when pressing the pedal forward (position >1)
141 =3 Automatic execution at fixed speed after having pressed the pedal once. The procedure can be interrupted by "heelback (-2)"
141 =4 Automatic execution at fixed speed n1 after having pressed the pedal once. The procedure can be interrupted by "heelback (-2)"

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

6.11.3 Seam with Stitch Counting When Light Barrier Is On

Function		Parameters
Light barrier On/Off	LS	**009**
Stitch counting On/Off	(StS)	**015**

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

6.12 Free Seam and Seam with Light Barrier

Function		Parameters
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	(n2_)	**121**
Speed mode free seam	(SFn)	**142**

Speed control for the free seam and the seam with stitch counting can be selected using the speed mode.

142 =0 Execution at pedal controlled speed

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**.

6.13 Light barrier

Function	Parameters
Light barrier On/Off	**009**

The light barrier function at the input of socket B18/8 is active only if parameter value **239 = 0**.

6.13.1 Speed after Light Barrier Sensing

Function		Parameters
Speed after Light Barrier Sensing	(n5)	**114**

6.13.2 General Light Barrier Functions

Function		Parameters
Light barrier compensating stitches	LS	**004**
Number of light barrier seams	(LSn)	**006**
Light barrier sensing uncovered/covered	(LSd)	**131**
Start of sewing blocked/unblocked with light barrier uncovered	LSS	**132**
Light barrier seam end with thread trimming On/Off	(LSE)	**133**
Speed of the light barrier compensating stitches	PLS	**192**

- After sensing the seam end, the compensating stitches are counted at light barrier speed.
- Suspension of the procedure with pedal in pos. 0 (neutral). Interruption of the procedure with pedal in pos. -2.
- The thread trimming operation can be disabled using parameter **133**. Stop in the basic position.

- Programming of max. 15 light barrier seams depending on the setting of parameter **006** with stop in the basic position. Thread trimming after the last light barrier seam.
- Light barrier sensing uncovered or covered at the seam end can be selected using parameter **131**.
- Start blockage with light barrier uncovered programmable using parameter **132**.
- Speed selection pedal controlled / n5 during the light barrier compensating stitches using parameter **192**.

6.13.3 Reflection Light Barrier LSM002

Sensitivity setting:
Set minimum sensitivity depending on the distance between light barrier and reflection area (turn potentiometer as far as possible to the left).
- Potentiometer directly on the light barrier module

Mechanical orientation:
Orientation is facilitated by a visible light spot on the reflection area.

6.13.4 Automatic Start Controlled by Light Barrier

This function is not possible when parameter F-290 =8 or 9 (modes 8 and 9)!

Function		Parameters
Delay of automatic start	(ASd)	**128**
Automatic start On/Off	(ALS)	**129**
Light barrier sensing uncovered	(LSd)	**131**
Start of sewing blocked with light barrier uncovered	LSS	**132**

This 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 **009 = 1** Light barrier On
- Parameter **129 = 1** Automatic start On
- Parameter **131 = 1** Light barrier sensing uncovered
- Parameter **132 = 1** No start of sewing with light barrier uncovered
- 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. Then press the pedal forward. This function is disabled when the pedal is no longer pressed forward after the seam end.

6.13.5 Light barrier filter for knitted fabrics

Function		Parameters
Number of stitches of the light barrier filter	(LSF)	**005**
Light barrier filter On/Off	(LSF)	**130**
Light barrier sensing uncovered or covered	(LSd)	**131**

The filter prevents premature enabling of the light barrier function when sewing knitted fabrics.
- Enabling/Disabling of the filter using 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 with light barrier
  - Uncovered ➔ covered, if parameter **131 = 0**.
  - Covered ➔ uncovered, if parameter **131 = 1**.

6.13.6 Functional Variations of the Light Barrier Input

Function	Parameters
Selection of the input function on socket B18/8	**239**

If the light barrier function is not used, a switching function can be assigned to the input on socket B18/8 as well as to inputs in1...in7.

The following input functions are possible with parameter **239**

239 =0 Light barrier function: The input is prepared for a light barrier function.

239 =>0 All other input functions are identical, as described in the next section "Inputs for switches and keys".

6.14 Switching Functions of Inputs in1...i13

Function		Parameters
Selection of the input function	(in1...in7) (in11-LSM) (in12...in13)	**240...246** **239** **550...551**

The functions of the keys/switches connected to socket connectors ST2, B18 and B22 can be selected for inputs in1...in13 using parameters **240...246, 239 (LSM), 550, 551**.

240...249, 239 (LSM), 550, 551 =

0 Input function blocked

1 Needle up/down: Upon pressing the key, the drive runs from position 1 to position 2 or from position 2 to position 1. If the drive is not in the stop position, it runs to the pre-selected basic position.

2 Needle up: Upon pressing the key, the drive runs from position 1 to position 2.

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

4 Full stitch: Upon pressing the key, the drive performs a full rotation depending on the set stop position.

5 Needle to position 2: If the drive is not in position 2, it runs to position 2 upon pressing the key. After power On the drive runs until it has been synchronized.

6 Machine run blockage effective with open contact: Upon opening the switch, the drive stops in the pre-selected basic position.

7 Machine run blockage effective with closed contact: Upon closing the switch, the drive stops in the pre-selected basic position.

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

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

10 Run at automatic speed (n12): Upon pressing the key, the drive runs at automatic speed. The pedal is not used. (This input function is inverted in mode 9.)

11 Run at limited speed (n12): Upon pressing the key, the drive runs at limited speed. The pedal must be pressed forward.

12 Sewing foot lifting with pedal in position 0 (neutral)

15 Tape cutter or fast scissors (mode 6/7): Upon pressing the key, the tape cutter will be enabled for a preset time.

18 Unlocking the chain: Upon pressing the key, the motor performs a reverse rotation at the seam end. Moreover, backtacking and thread trimmer will be suppressed.

24 Needle to position 2: Upon pressing the key, the drive runs from position 1 to position 2, and the sewing foot is lifted. The start is blocked after that. Upon pressing the key again, the sewing foot is lowered, and the start is possible again.

27 Unlocking the chain: Upon pressing the key, the function “unlock the chain” will be performed without using the pedal.

28 External light barrier: In this mode it is possible to initiate the seam end using a key, not the light barrier. But the light barrier function must be On.

33 Speed n9: Below this speed, operation can be pedal controlled.

34 Automatic speed n9: The speed can be suspended by pressing the pedal to position 0.
37 Speed n12 with break contact: Below this speed, operation can be pedal controlled.
38 Automatic speed n12 with break contact: Not influenced by the pedal.
41 Tape cutting only at machine standstill.

6.15 Software Debouncing of All Inputs

Function		Parameters
Software debouncing of all inputs	(EnP)	**238**

238 =0 No debouncing
238 =1 Debouncing

6.16 Special pedal function Single stitch / Full stitch

Function		Parameters
Special pedal function Single stitch / Full stitch	(EZP)	**041**
Pedal travel forwards for detection of the special pedal function	(GrP)	**042**
Time for detection of the special pedal function	(dPd)	**051**
Speed for single stitch / full stitch	(n9)	**122**

With the single stitch / full stitch function, it is possible to enable the execution of a stitch though pedal forwards actuation. For this it is necessary to move the pedal forward only far enough so that the percentage portion (e.g., 40%) of the maximum possible pedal travel (100%) set by the parameter **042**, is not exceeded.
The execution is done as single stitch (Parameter **041 = 1**) or full stitch (Parameter **041 =2**)
If the travel set with parameter **042** is exceeded within the time set with parameter **051**, the drive runs with the speed specified by the respective pedal setting, even when under the threshold.
First after pedal 0-position can the special pedal function be actuated again.
The single/full stitch is executed in the speed set with parameter **122**. To ensure that only a single stitch is executed, the setting 300 rpm must not be exceeded.

041 =0 Special pedal function Off
041 =1 Single stitch:
The performs one rotation from position 1 to position 1. If it is standing in position 2, it runs to position 1 the first time and then each time from position 1 to position 1.
041 =2 Full stitch:
The drive executes a complete rotation corresponding to its starting position.

6.17 Signal “Machine Running“

Function		Parameters
Mode "machine running"	(LSG)	**155**
Switch-off delay for signal "machine running"	(t05)	**156**

Set activation of signal “machine running” using parameters 155/156 .

155 =0 Signal "machine running" Off.
155 =1 Signal "machine running" will be issued whenever the drive is running.
155 =2 The signal "machine running" will be issued whenever the speed is higher than 3000 RPM
155 =3 Signal "machine running" will be issued whenever the pedal is not in position 0 or neutral.
155 =4 Signal "machine running" will be issued only after motor synchronization (one rotation at positioning speed after power On).
156 Delay of switch-off time.

6.18 Signal Output Position 1

- Transistor output with open collector
- Signal whenever the needle is in the slot between position 1 and 1A
- Independent of sewing, thus also when turning the handwheel manually
- Suitable e. g. for the connection of a counter
- An inverted signal is issued at socket ST2/22

6.19 Signal Output Position 2

- Logic level output
- Signal whenever the needle is in the slot between position 2 and 2A
- Independent of sewing, thus also when turning the handwheel manually
- Suitable e. g. for the connection of a counter
- An inverted signal is issued at socket B18/9

6.20 Signal Output 512 Impulses per Rotation

- Logic level output
- Signal whenever a generator slot of the position transmitter is sensed
- 512 impulses per rotation of the handwheel
- Independent of sewing, thus also when turning the handwheel manually
- Suitable e. g. for the connection of a counter
- A signal is issued at socket B18/1+6

6.21 Actuator

6.21.1 Analog actuator

Function		Parameter
Selectable pedal functions	(-Pd)	**019**
Characteristic of the "analog pedal" EB401	(APd)	**026**
Area for position +1/2 of “analog pedal” in percent	(plu)	**027**
Speed- step distrinution	(nSt)	**119**

The effect of pedal actuation on the drive functions can be set using parameter 019:

019 = 0 Pedal in pos. -1 blocked in the seam. But with pedal in pos. -2 sewing foot lifting is possible in the seam (function active whenever the light barrier is On).
019 = 1 With pedal in pos. -1 sewing foot lifting is blocked in the seam.
019 = 2 With pedal in pos. -2 thread trimming is blocked (function active whenever the light barrier is On).
019 = 3 The functions “pedal in pos. –1” and “pedal in pos. –2” are active.
019 = 4 The functions “pedal in pos. –1” and “pedal in pos. –2” are blocked in the seam (function active whenever the light barrier is On).
019 = 5 Start seam end by placing the portal at -1 (slightly back)

The characteristic of the "analog pedal" can be set using parameter **026**:

026 = 0 Analog function off
026 = 1 12-level selected, like prior pedal function of the digital actuator.
026 = 2 Continuously variable (specially for external potentiometer, without thread trimming function)
026 = 3 24-level
026 = 4 60-level
026 = 5 48-level
026 = 6 40-level, for SOP (standing operation)

119 = 1 Speed- step distrinution linear
119 = 2 Speed- step distrinution low progressiv
119 = 3 Speed- step distrinution high progressiv

7 Signal Test

Function		Parameters
Input and output test	(Sr4)	**173**

Function test of external inputs, multiple-function key bar and transistor power outputs with connected actuators (e.g. solenoids and solenoid valves).

7.1 Signal Test Using the Incorporated Control Panel

7.1.1 Inputs to the control

- Select parameter **173** (OFF is displayed).
- **Control pad on controller:** By actuating the keys or switches connected to inputs in1 to in7, the number of the input actuated appears on the display, e.g. **i06**. More than one switch and/or key may not be actuated at the same time.
  If more than one key or switch is activated at once, the number of the lowest-numbered input is displayed. If, for example, **in3, in5, in6, in7** are actuated, **i03** is displayed.

Note: Checking of positions is described in chapter "Displaying the signal and stop positions".

7.1.2 Outputs of control

- Select parameter **173**.
- Select the desired output using the **+/-** keys.
- On the built-in keypad in the control, the **>>** key is used to turn on the associated output, if it is connected and working.

Assignment of outputs		
Display	**Function / Output**	**on socket ST2**
OUT FL	Sewing foot lifting	35
OUT 1	M1	37
OUT 2	M2	28
OUT 3	M3	27
OUT 4	M4	36
OUT 5	M5	32
POS 1	Position 1	22

8 Table of Machine Functions and Adapter Cords

ATTENTION

Before switching functional sequences, detach cables from the inputs and outputs! It must be absolutely certain that for the functional sequence to be changed the machine provided has been installed! Then proceed with the setting using parameter 290!

Setting the functional sequence using parameter 290

			Functions / Outputs							
	Power transistors ➔		FL	VR	M1	M2	M3	M4	M5	
Mode	Function / Machine	Adapter	ST2/35		ST2/37	ST2/28	ST2/27	ST2/36	ST2/32	
0	**Lockstitch: e. g.**		**FL**		**FA1**	**FA2**	**FW**	**FA1+2**	**ML**	
	Brother (737-113, 737-913)	1113420	FL		FA1	FA2	FW			
	Aisin (AD3XX, AD158, 3310; EK1)	1112815	FL		FA1	FA2	FW			
	Pfaff (563, 953, 1050, 1180)	1113746	FL		FA1	FA2	FW		ML	
	Dürkopp Adler (210, 270)	1112845	FL		FA1	FA2	FW			
2	**Lockstitch: e. g.**		**FL**			**FA**	**FSPL**	**FL1**	**ML**	
	Singer (212 UTT)	1112824	FL			FA	FSPL	FL1		
3	**Lockstitch: e. g. Dürkopp Adler (467)**		FL		FA	ML	FW	FSPL		
5	**Chainstitch: parallel sequence**		**FL**		**AH1**	**AH2**	**AH3**	**AH4**	**ML**	
	Yamato (VC/VG series)	1113345	FL		FA		FW		ML	
	Kansai (RX 9803)	1113130	FL		FA		FW		ML	
	Pegasus (W500/UT, W600/UT/MS with or without stitch condensing)	1112821	FL		FA	FA	FW			
	Union Special (34700)	1112844	FL		FA	FA	FW		ML/NK	
	Global (CB2803-56)	1112866	FL				FA			
	Rimoldi (F27)	1113096	FL		FW	FAO	FAU		ML	
6	**Chainstitch: tape cutter/fast scissors**		FL		FA	M2	AH1	AH2	ML	
7	**Overlook**		FL		FA	M2	AH	FSPL	ML	
8	**Backlatch**		**FL**		**PD≤-1**	**PD≥1**	**PD≥1***		**ML**	
	Pegasus	1113234			PD≤-1	PD≥1				
9	**Backlatch**		**FL**		**PD≤-1**	**PD≥1**	**PD≥1***		**ML**	
	Yamato (ABT3)	1112826			PD≤-1	PD≥1				
	Yamato (ABT13, ABT17)	1113205			PD≤-1	PD≥1				
14	**Lockstitch: e. g.**		**FL**		**FA1+2**	**FA2**	**FW**	**FA1**	**ML**	
	Juki (5550-6)	1112816	FL		FA1+2		FW			
	Juki (5550-7, 8500-7, 8700-7)	1112816	FL		FA1+2		FW			
	With short trimmer Adapter for position sensors incorporated in the handwheel	1113157								
25	**Lockstitch: JUKI** (LU2210 / LU2260)		FL		FA	FSPL	FW	HP	ML	
37	**Heavy duty bag machine Union Special**		FL			IMP	BR		M2	
38	**Lockstitch: : e. g.** HonYu class HY-4410		FL		FA1	FA2	AFF2	AFF1	MST/HP	
53	**Lockstitch: : e. g.** Juki (LU2810-6)		FL		FA1	FA2	AFF2	AFF1	MST/HP	
55	**Chainstitch with UTQ: e. g.** Yamato		FL		AH1	M2	M3	M4	M2	
56	**Strobel:** Replacement for ST220		FL		AH1	AH1	BS		M2	
57	**Lockstitch: e. g.**Typical Kl. TW1-591		FL		FA	M2		FSP2		
58	**Lockstitch: e. g.** Juki PLC 2760		FL		FA1	AFF3	FA3	FSP2	MST/HP	
59	**Lockstitch: e. g.**DA class 768		FL		FA1	AFF3	FA3	FA2	MST/HP	
60	**Lockstitch: e. g.**Typical class 1245		FL		FA1	M2	FA3	FA2	MST/HP	
61	**Lockstitch: e. g.**Kaiser class 570/590		FL		FA	M2	2FSRL	FSP2		
62	**Lockstitch: e. g.** Typical/Mauser class 335		FL		FA	M2	FW	FSP2	MST/HP	
63	**Lockstitch: e. g.**Juki DNU 1541-7		FL		FA	FSP2	AFF2	AFF1	MST/HP	
65	**Kettenstich: e. g.** Sagitta		**FL**		**AH1**	**AH2**	**AH3**	**AH4**	**ML**	

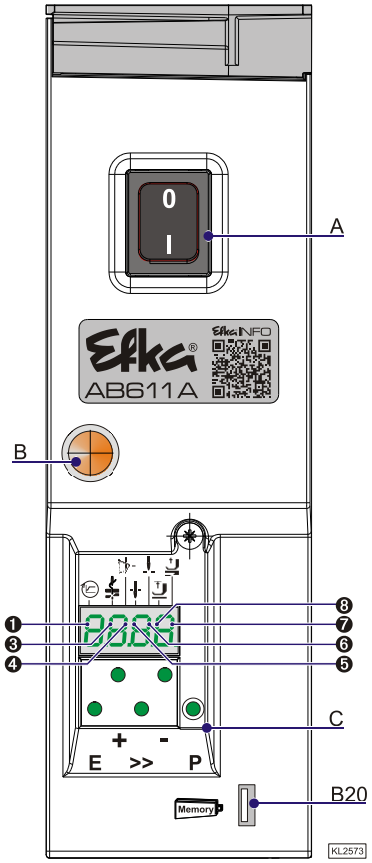
**) The signal issued at this output is inverted!*

Explanation of letter symbols of the above table and chapter ”Timing Diagrams“			
Outputs		**Outputs**	
AH	Tape cutter	FL1	Sewing foot lifting without pulsing
AH1/AH2	Fast scissors	FSPL	Thread tension release
FA	Thread trimmer	FW	Thread wiper
FA1	Thread trimmer pos. 1...1A (e.g. Pfaff, magnetic)	ML/NK	Machine running / Needle cooling
FA1+2	Thread trimmer pos. 1...2	PD≥1	Pedal forwards until the engine is running (min. to max. rotational speed)
FA2	Thread trimmer pos. 1A...2 (e.g. Pfaff, pneumatic)	PD≤-1	Pedal slightly back (FL) or entirely back (FA)
FAO	Needle thread trimmer	PD=0	Pedal in pos. 0 (neutral)
FAU	Bobbin thread trimmer	PD-2	Full heelback (FA)
FL	Sewing foot lifting		

9 Operating Elements and Socket Connectors

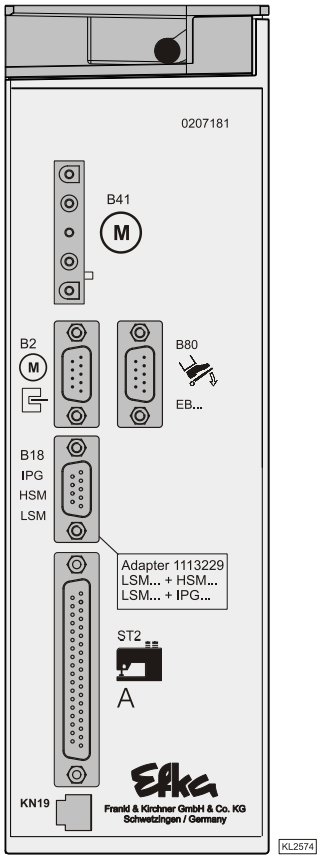
9.1 Positions of the Front Side

A	**Power switch**
B	**Network control lights**
C	**Control panel** (onboard module) + **Display** (4-digit 7-segment display)
Key	
P	Call or exit programming mode
E	Start backtack single / double / off Enter key for modifications in the programming mode
+	End backtack single / double / off In the programming mode - increase of the value indicated
>>	Basic position 1 or 2 In programming mode as shift key
–	Automatic sewing foot lifting at stop in the seam On/Off Automatic sewing foot lifting after thread trimming On/Off In the programming mode - decrease of the value indicated
The upper vertical segments of the 4 digit 7 -segment display indicate the switching states of foot lifting and basic position.	
1	Single start backtack
2	Double start backtack
3	Single end backtack Tape cutter at the start of the seam ON/OFF (mode 7)
4	Double end backtack Tape cutter at the seam end ON/OFF (mode 7)
5	Basic position “needle position 1“
6	Basic position “needle position 2“
7	Automatic sewing foot lifting at stop in the seam
8	Automatic sewing foot lifting after the thread trimming operation
Connector	
B20	USB Memory Stick



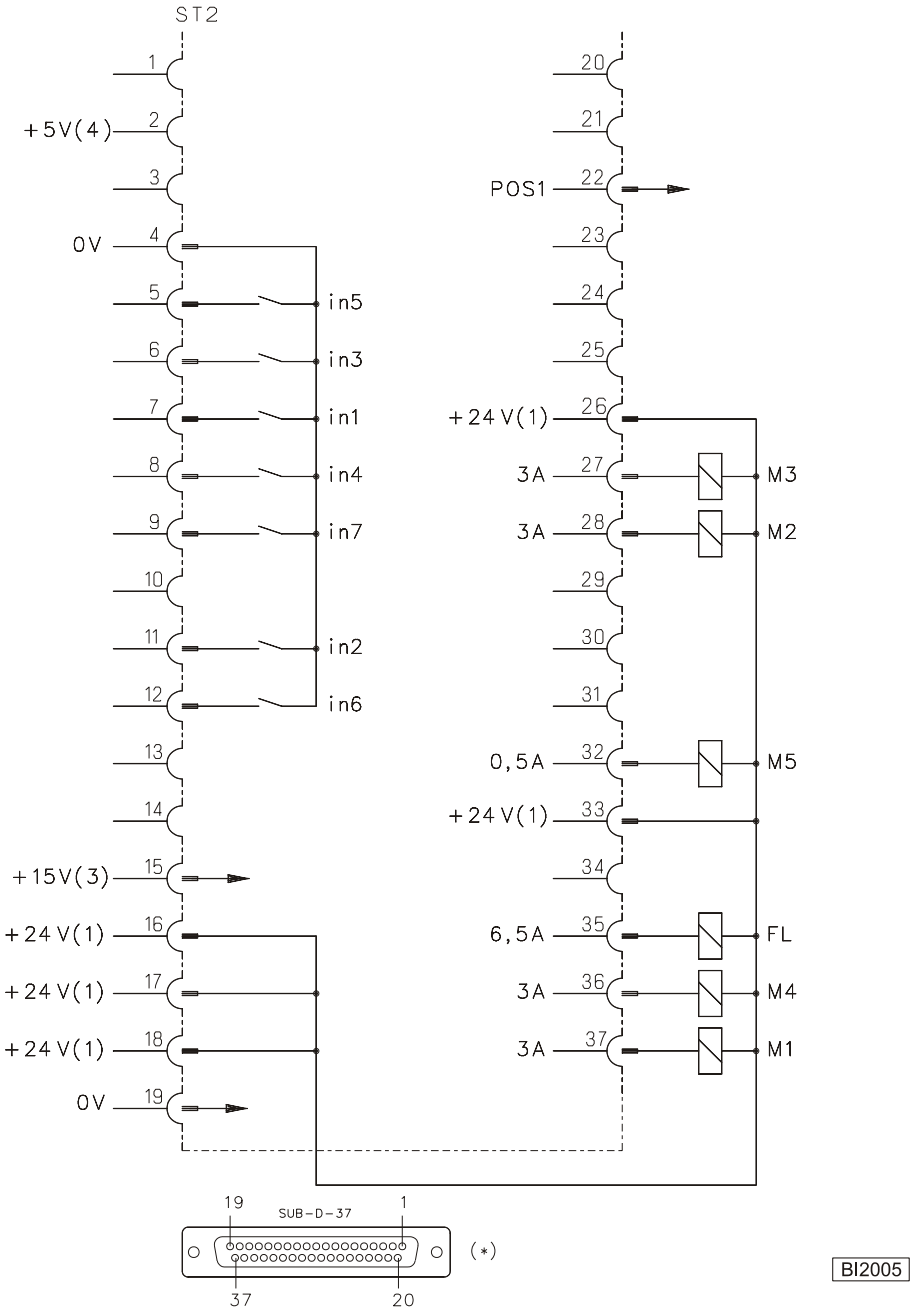
9.2 Positions of the rear side

Connector	
B2	Commutation transmitter
B18	Light barrier module LSM002 - Hall sensor module HSM001 - Pulse encoder IPG001 *(Adapter cord 1113229 in case of multiple assignment)*
B41	Motor power supply
B80	Actuator
ST2	Socket for inputs and outputs e. g. solenoids, solenoid valves, displays, keys and switches
KN19	Knee switch



9.3 Connection Diagrams

Inputs switched to 0V

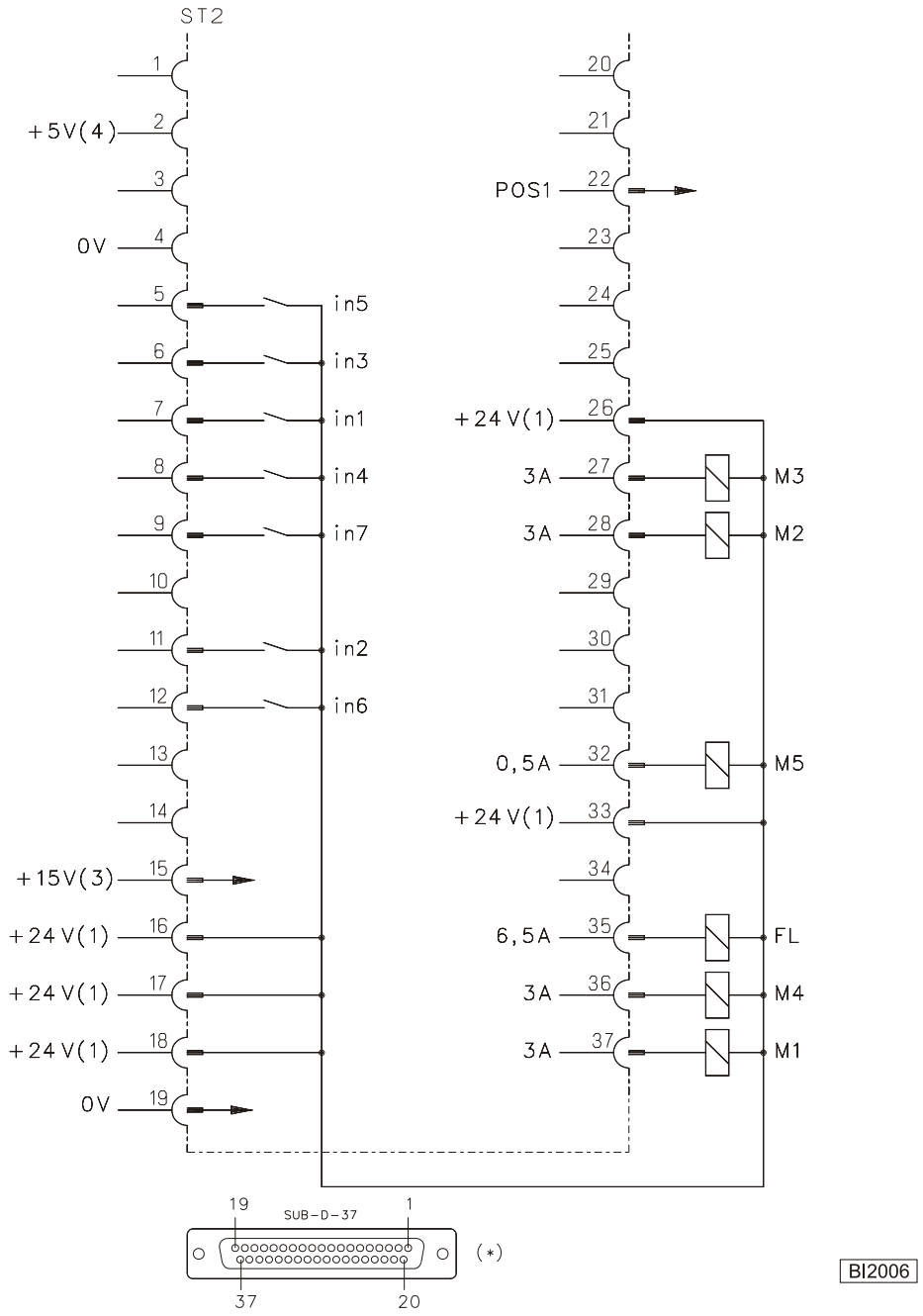


ATTENTION

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

in1	Input 1	M1	Output 1
in2	Input 2	M2	Output 2
in3	Input 3	M3	Output 3
in4	Input 4	M4	Output 4
in5	Input 5	M5	Output 5
in6	Input 6	FL	Sewing foot lifting
in7	Input 7	POS1	Position 1

Inputs switched to +24 V



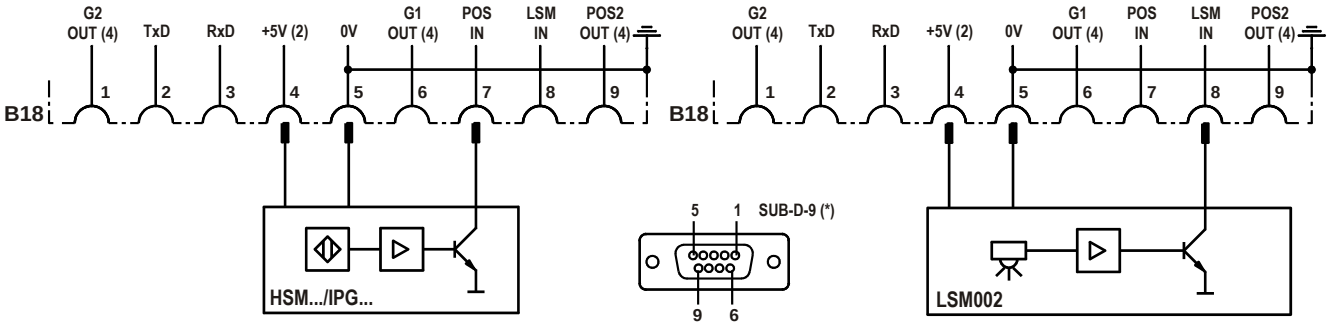
ATTENTION

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

1) Nominal voltage +24 V, no-load voltage max. +30 V momentarily after power on
2) Transistor output with open collector max. +40 V, I_{max} 10 mA
3) Nominal voltage +15 V, I_{max} 30 mA
4) Nominal voltage +5 V, I_{max} 20 mA
**) View: Front view of the control (component side) and/or rear view of the outgoing connecting cable*

Connection of a HSM001 Hall sensor module or an IPG001 pulse encoder

Connection of a light barrier module LSM002

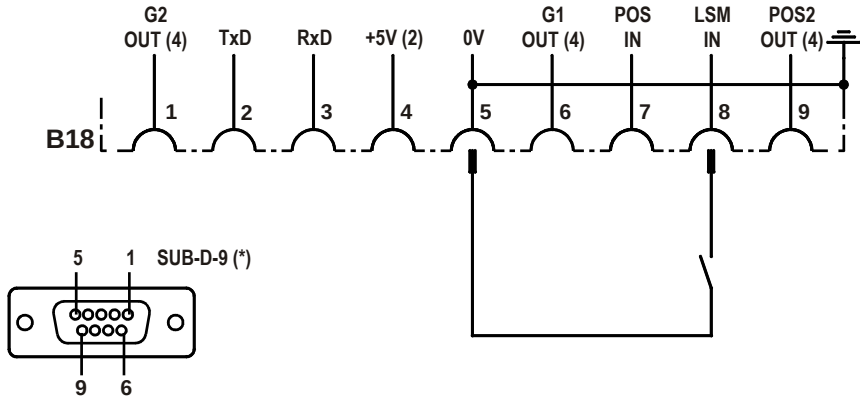


BI1174a

Adapter cord 1113229 in case of multiple assignment of socket B18!

POS2 OUT	Output for position 2	LSM IN	Possibility of connecting a light barrier module to socket B18/8
POS IN	Input for positions (e. g. connection of a sensor)	LSM002	Reflection light barrier module
G1/G2 OUT	Output of generator impulses	HSM001	Hall sensor module
TXD/RXD	Serial transmission lines	IPG	Pulse encoder

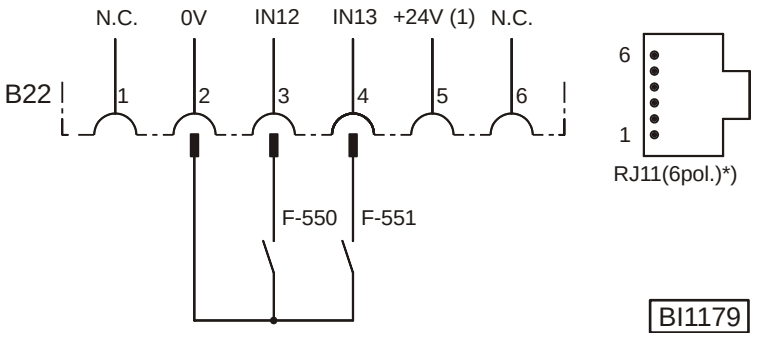
If parameter 239 is set to >0, it is possible to operate a key at the input of the B18/8 connector.



BI1159a

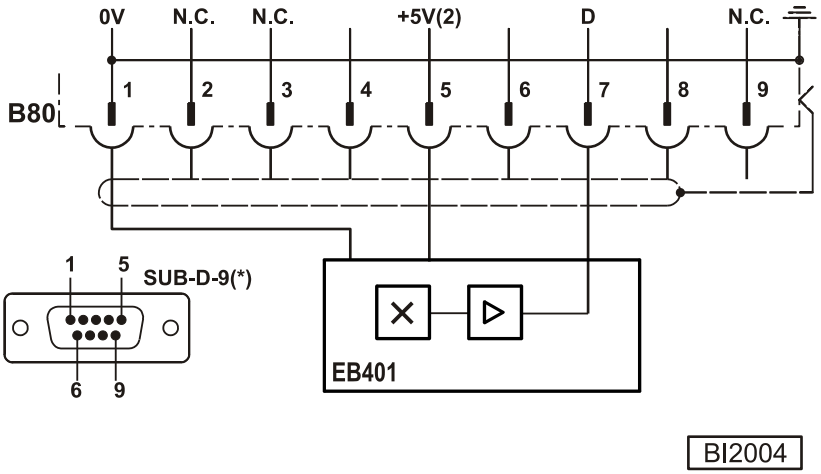
There is a supply voltage of +5 V on the B18/4 socket for external devices. This voltage can be switched to +15 V using parameter 362.

2) Nominal voltage +5V, I_{max} 100 mA (switchable to +15 V, I_{max} 100 mA)
4) Logic level output +5 V, I_{max} 5 mA
**) View: Front view of the control (component side) and/or rear view of the outgoing connecting cable*



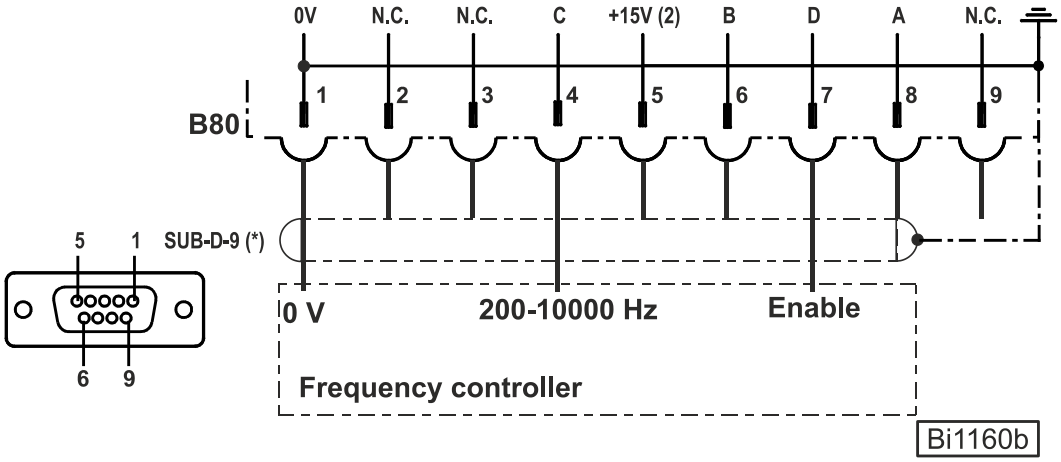
IN12	Input 12, function programmable using parameter 550	IN13	Input 13, function programmable using parameter 551

Connecting the analogous actuator EB401



EB.. = Actuator

Connection for frequency run



Connections: 0 V on Pin 1
Frequency output on Pin 4
Frequency controller output on Pin 7

In order to introduce motor running 0V must be applied to pin 7

Frequency rates: 0-5 V / 200-10000 Hz
Min. speed 50 min^{-1}
Max. speed F-111

Parameter F-396 =0 Frequency Off
F-396 =1 Frequency On

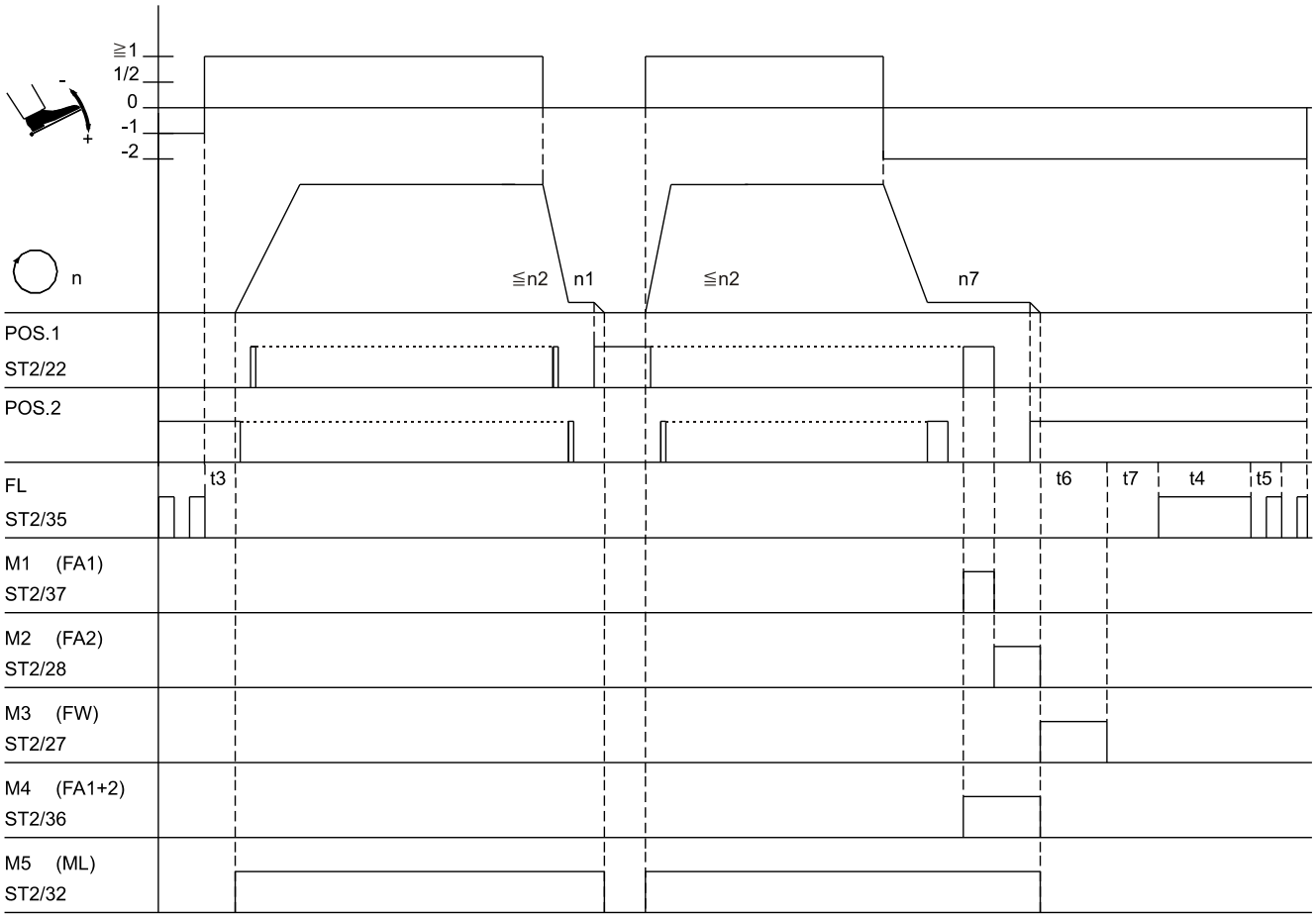
Plug B80 input signal

Pin8 "A"	Pin6 "B"	Pin4 "C"	Pin5 "D"	Motor state
X	X	X	Deactivated.	Stop
X	X	Frequency < 60 Hz	Activated (0V)	Stop
X	X	Frequency > 60 Hz	Activated (0V)	Running
X	X	Frequency > 60 Hz	Deactivated.	Stop
0 V	0 V	X	Deactivated.	Trimmer

1) Nominal voltage +24 V, no-load voltage max. +30 V momentarily after power on
2) Nominal voltage +5 V, I_{max} 20 mA
**) View: Front view of the control (component side) and/or rear view of the outgoing connecting cable*

10 Timing Diagrams

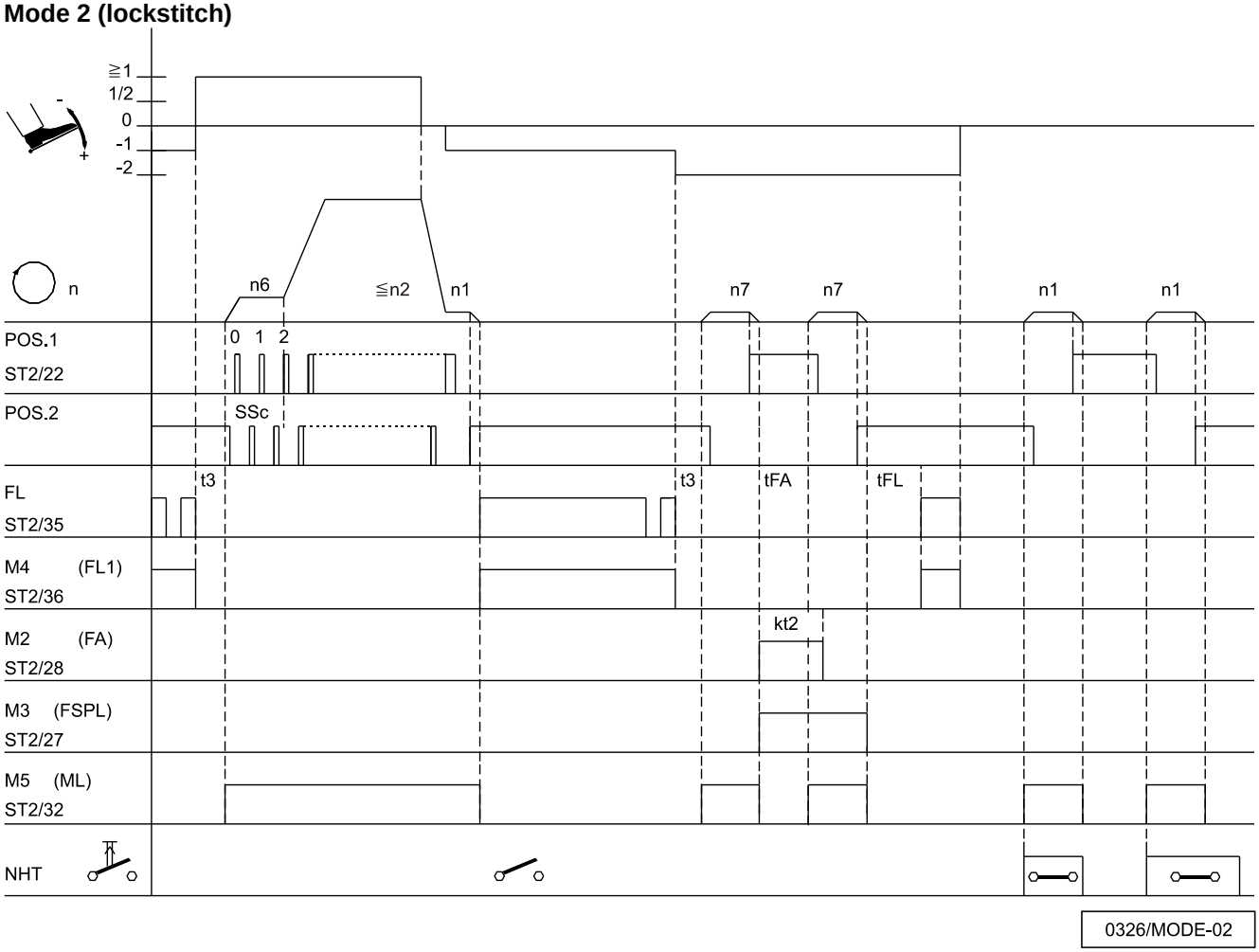
Mode 0 (lockstitch)



0326/MODE-00

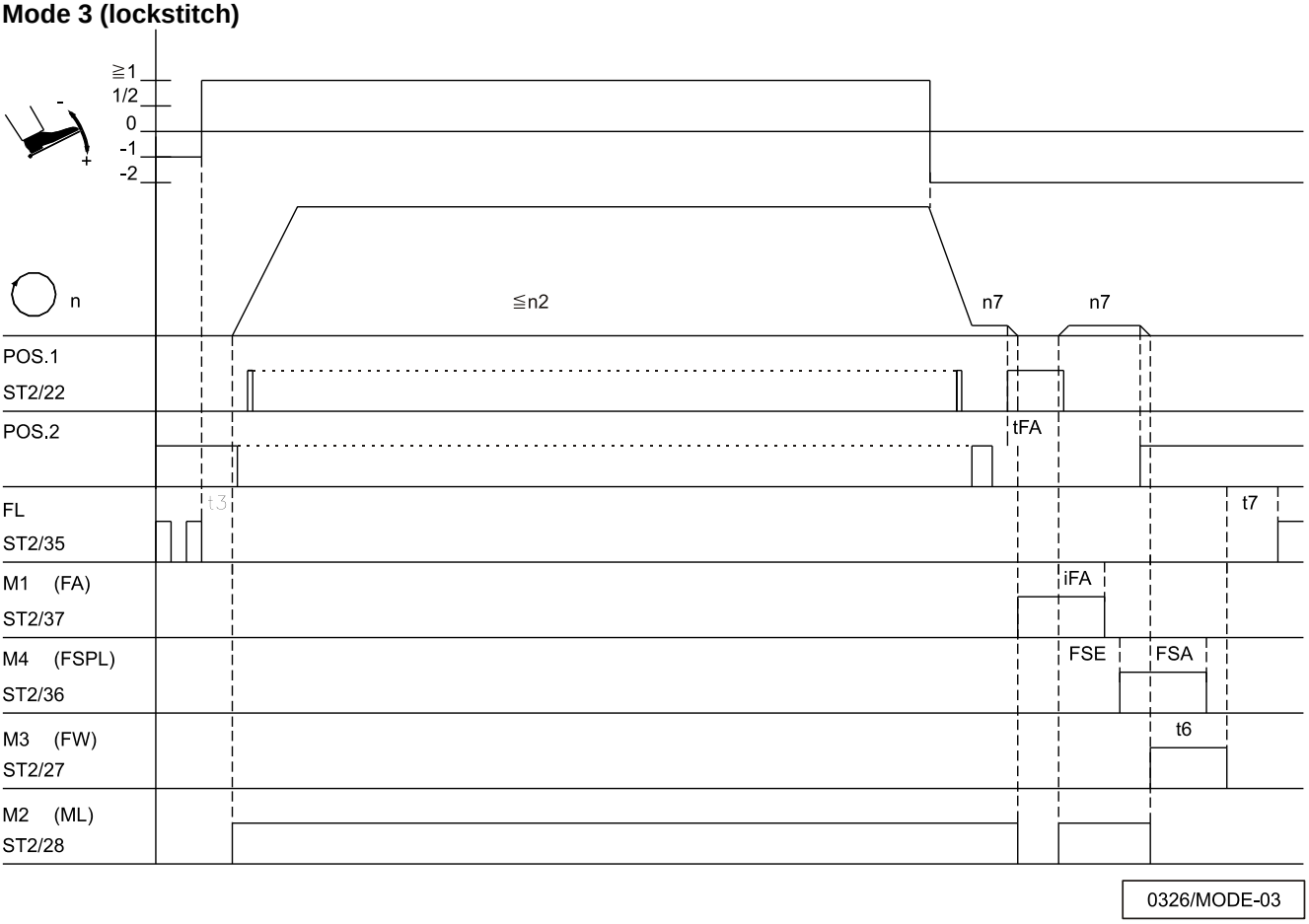
Mark	Function	Parameter	Control		
FAm	Mode 0	290 = 0			
n1	Positioning speed	110			
n2	Maximum speed	111			
n7	Trimming speed	116			
t3	Start delay from lifted sewing foot	202			
t4	Full power of sewing foot lifting	203			
t5	Pulsing of sewing foot lifting	204			
t6	Thread wiper ON period	205			
t7	Sewing foot switch-on delay after thread wiper	206			

Mode 2 (lockstitch)



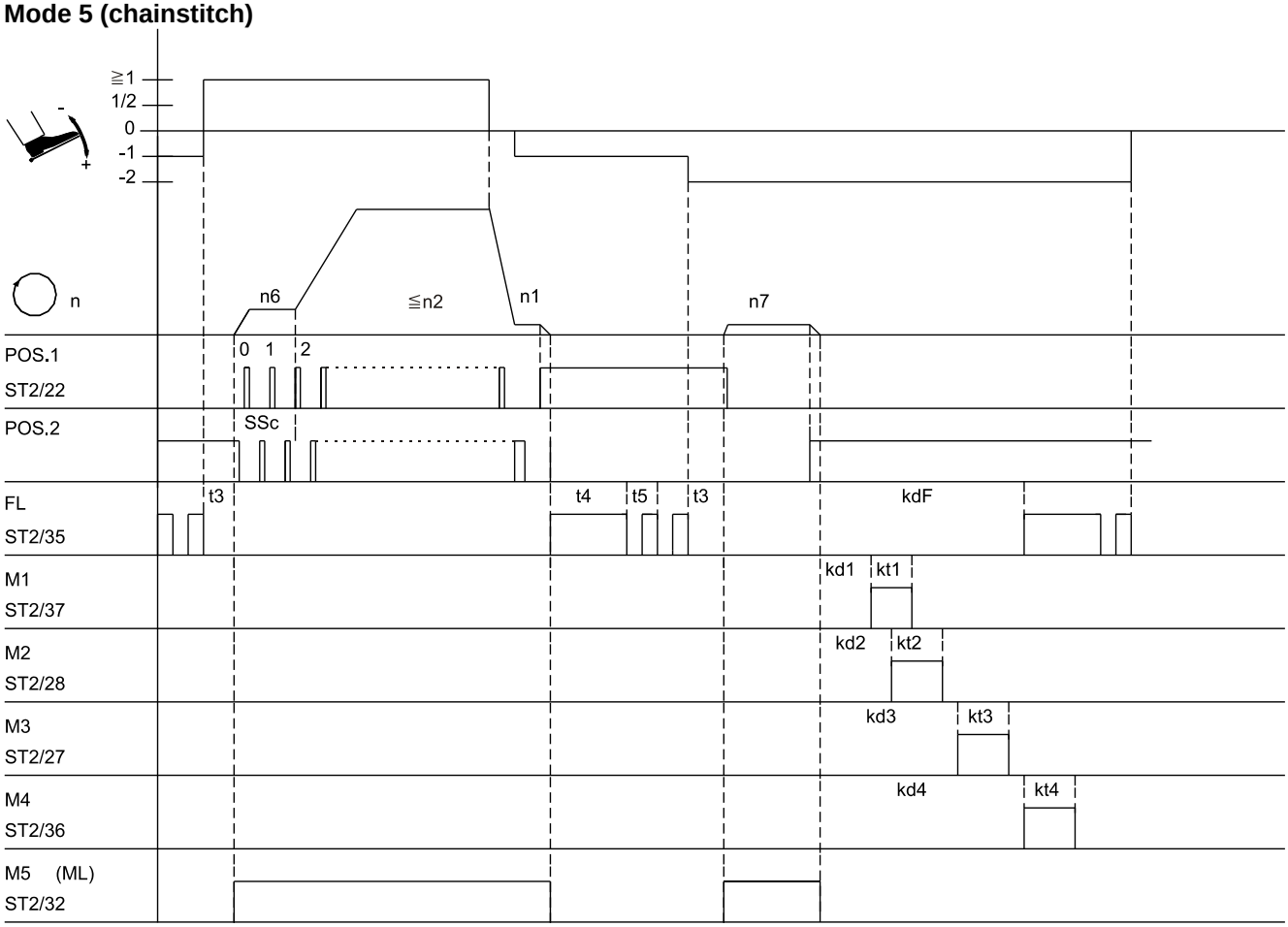
Mark	Function	Parameter	Control		
FAm	Mode 2	290 = 2			
SSt	Softstart	134 = 1			
n1	Positioning speed	110			
n2	Maximum speed	111			
n6	Softstart speed	115			
n7	Trimming speed	116			
SSc	Softstart stitches	100			
t3	Start delay from lifted sewing foot	202			
tFL	Switch-on delay of sewing foot lifting	211			
tFA	Stop time for thread trimmer	253			
kt2	Thread trimmer ON period	283			

Mode 3 (lockstitch)



Mark	Function	Parameter	Control		
FAm	Mode 3	290 = 3			
n2	Maximum speed	111			
n7	Trimming speed	116			
t6	Thread wiper ON period	205			
t7	Sewing foot switch-on delay after thread wiper	206			
iFA	Activation angle of the thread trimmer	250			
FSA	Switch-off delay of thread tension release	251			
FSE	Switch-on delay angle of thread tension release	252			
tFA	Stop time for thread trimmer	253			

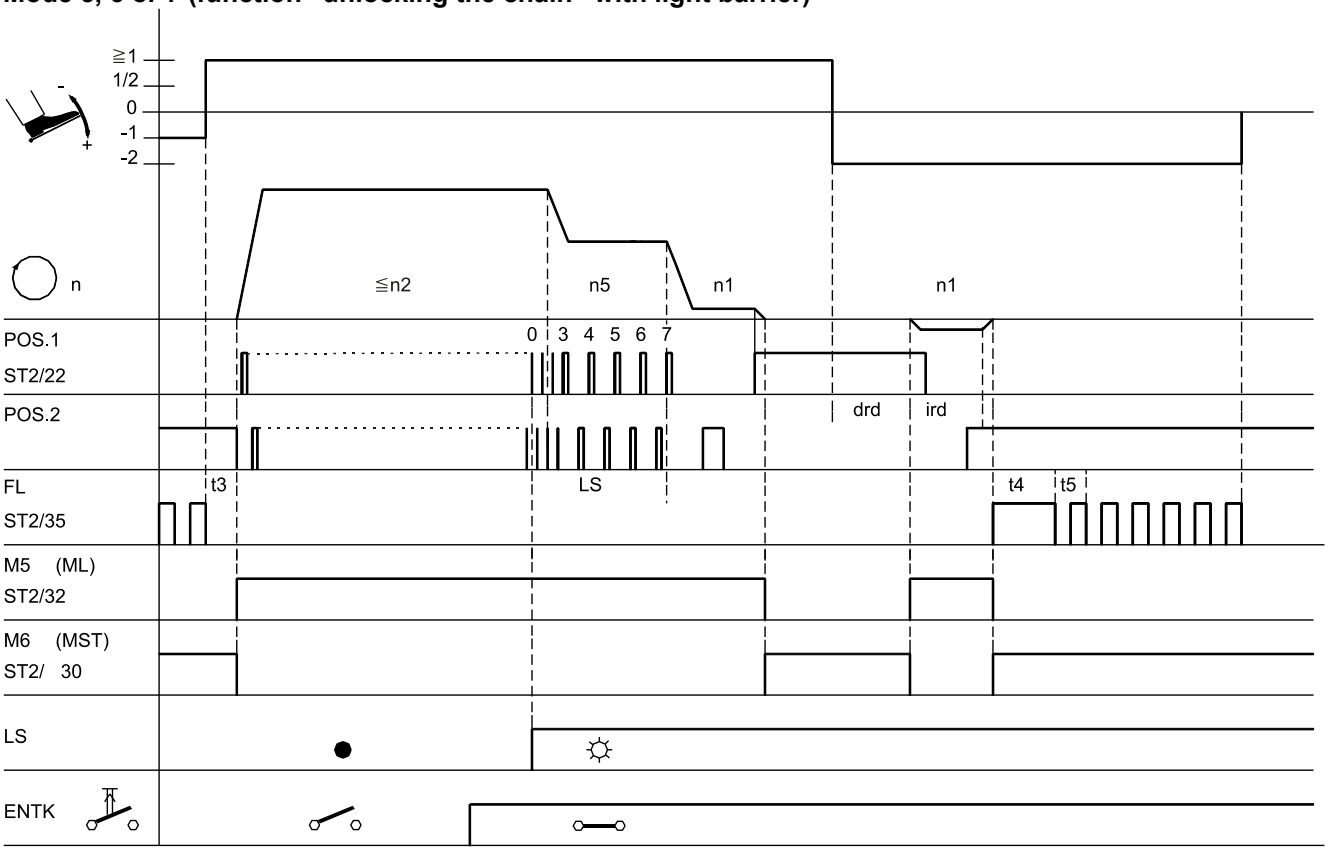
Mode 5 (chainstitch)



0326/MODE-05

Mark	Function	Parameter	Control		
FAm	Mode 5	290 = 5			
SSt	Softstart	134 = 1			
n1	Positioning speed	110			
n2	Maximum speed	111			
n6	Softstart speed	115			
n7	Trimming speed	116			
SSc	Softstart stitches	100			
t3	Start delay from lifted sewing foot	202			
t4	Full power of sewing foot lifting	203			
t5	Pulsing of sewing foot lifting	204			
kdF	Switch-on delay of sewing foot lifting	288			
kd1-kd4	Delay times of outputs M1...M4	280/2/4/6			
kt1-kt4	ON periods of outputs M1...M4	281/3/5/7			

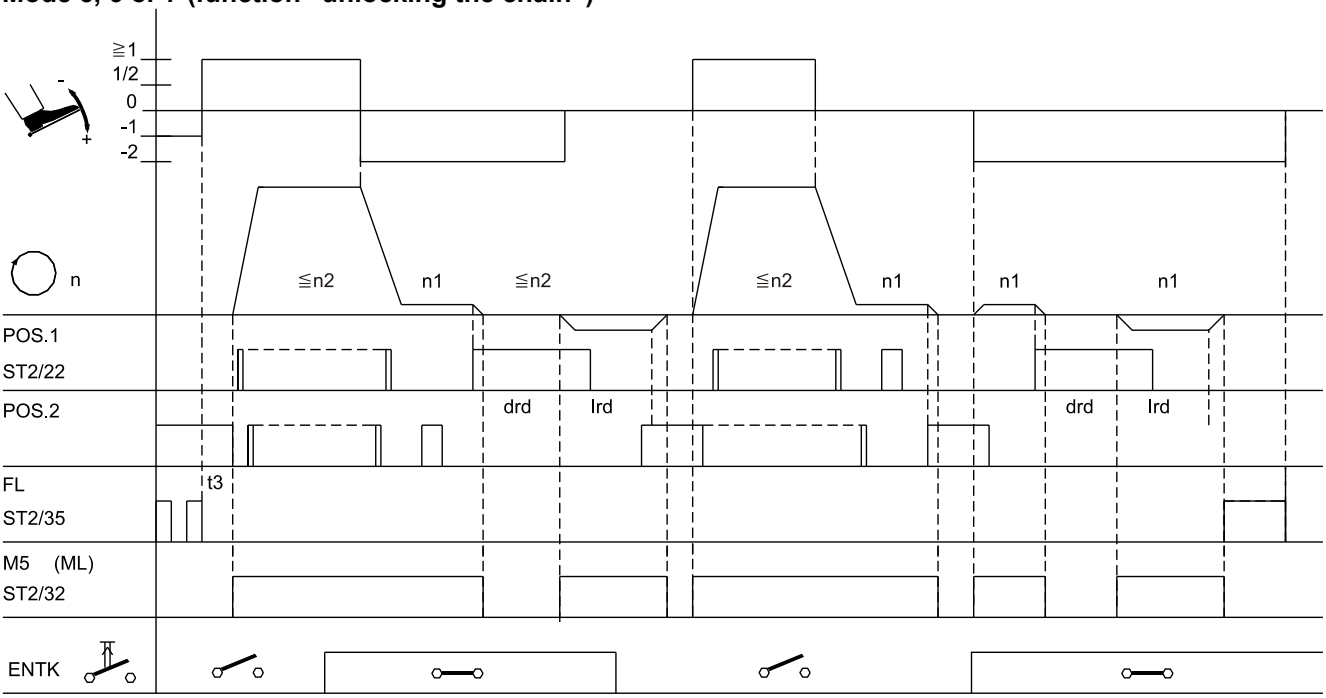
Mode 5, 6 or 7 (function “unlocking the chain” with light barrier)



Mark	Function		Parameter	Control		
FAm	Mode 5		290 = 5			
drE	Direction of motor rotation	Clockwise	161 = 0			
Frd	Reverse motor rotation		182 = 1			
	Basic position 2	On		Key **>>**		
	Thread trimmer *)	On				
LS	Light barrier		009 = 1			
mEk	Unlock the chain automatically with light barrier		190 = 2			
in..	Assign the function “unlocking the chain” to an input		2..			
n1	Positioning speed		110			
n2	Maximum speed		111			
n5	Speed after light barrier sensing		114			
LS	Light barrier compensating stitches		004			
ird	Number of reversing increments		180			
drd	Switch-on delay of reverse motor rotation		181			
t3	Start delay from lifted sewing foot		202			
t4	Full power of sewing foot lifting		203			
t5	Pulsing of sewing foot lifting		204			

**) When unlocking the chain, the function “thread trimmer” is suppressed!*

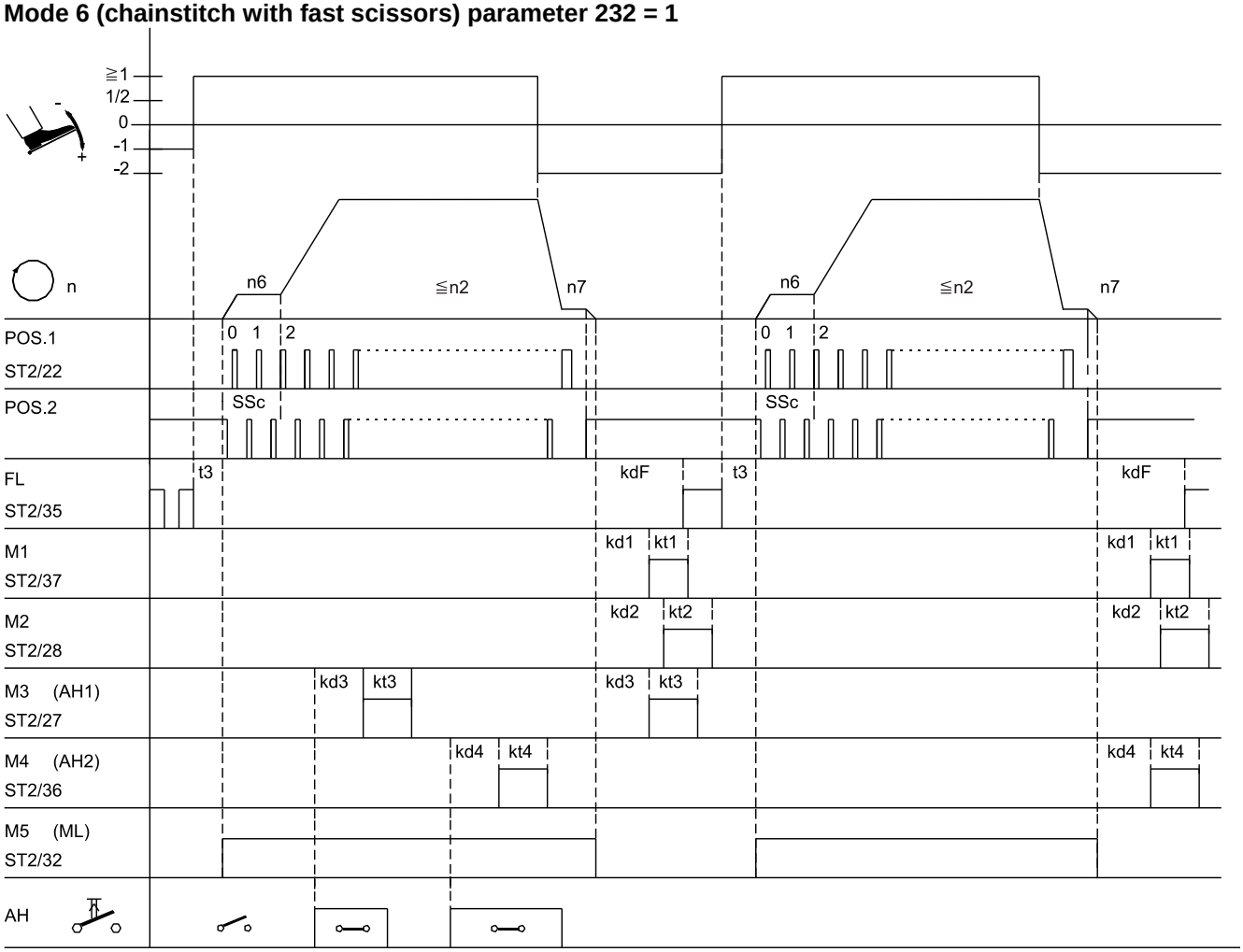
Mode 5, 6 or 7 (function “unlocking the chain”)



Mark	Function		Parameter	Control		
FAm	Mode 5		290 = 5			
drE	Direction of motor rotation	Clockwi	161 = 0			
Frd	Reverse motor rotation	se	182 = 1			
	Basic position 2			Key **>>**		
	Thread trimmer *)	On				
in..	Assign the function “unlocking the chain” to an input	On	2..			
n1	Positioning speed		110			
n2	Maximum speed		111			
ird	Number of reversing increments		180			
drd	Switch-on delay of reverse motor rotation		181			
t3	Start delay from lifted sewing foot		202			
t4	Full power of sewing foot lifting		203			
t5	Pulsing of sewing foot lifting		204			

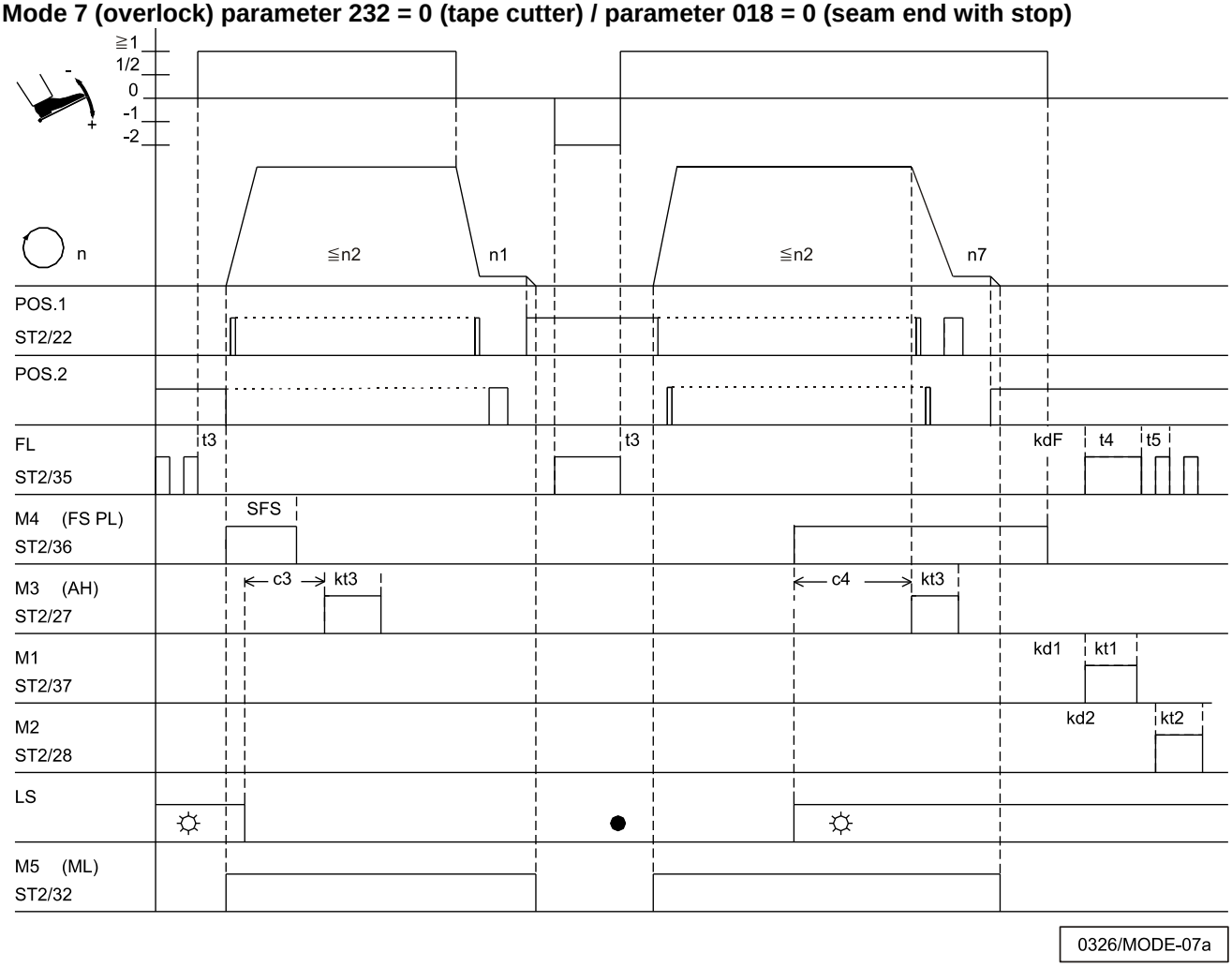
**) When unlocking the chain, the function “thread trimmer” is suppressed!*

Mode 6 (chainstitch with fast scissors) parameter 232 = 1



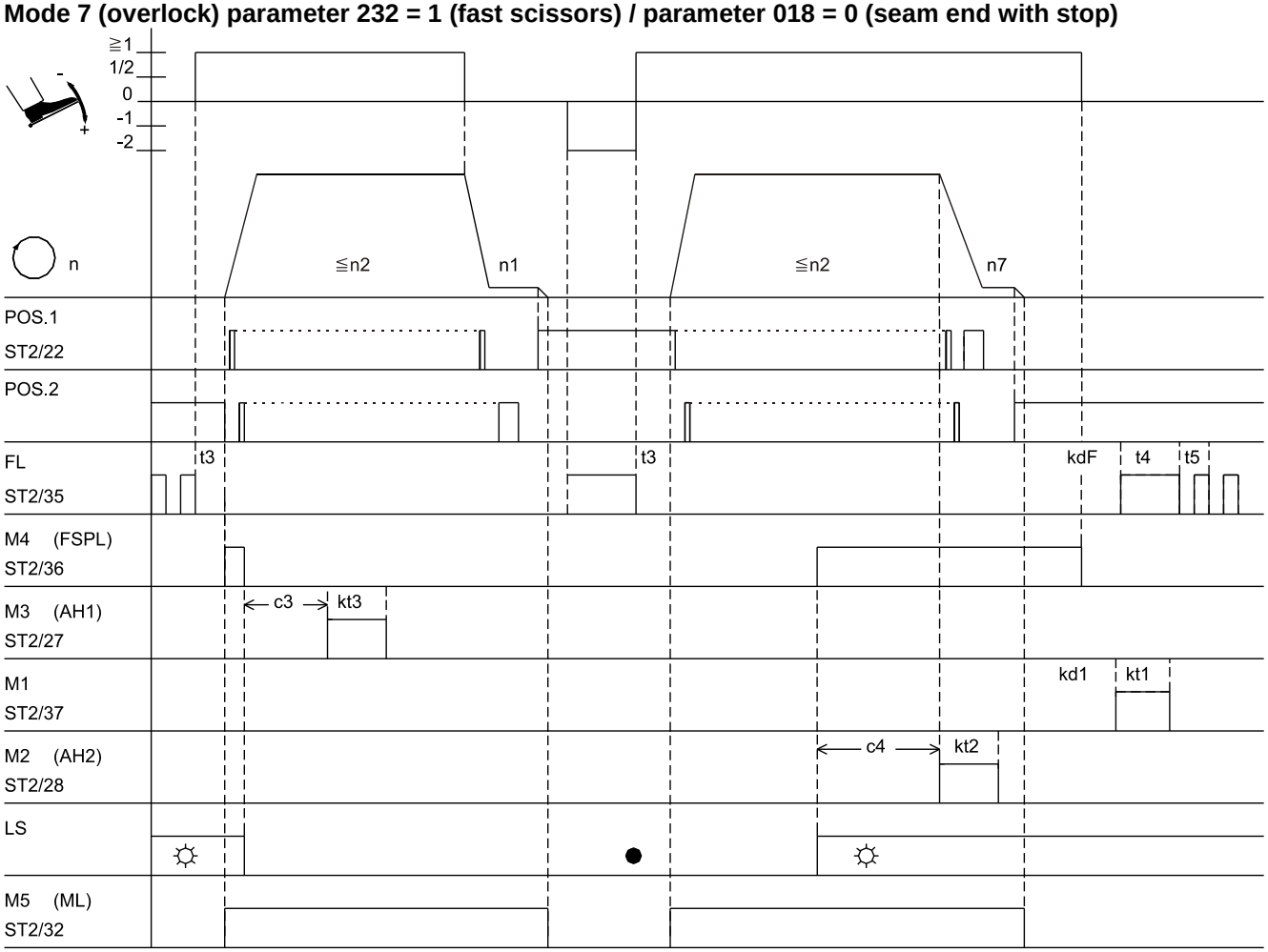
Mark	Function	Parameter	Control		
FAm SSt USS	Mode 6 Softstart Chainstitch with fast scissors M3/M4	290 = 6 134 = 1 232 = 1			
n2 n6 n7	Maximum speed Softstart speed Trimming speed	111 115 116			
SSc t3 kd1/kd2 kt1/kt2 kd3/kd4 kt3/kt4 kdF	Softstart stitches Start delay from lifted sewing foot Delay times of outputs M1/M2 ON periods of outputs M1/M2 Delay times of outputs M3/M4 (AH1/AH2) ON periods of outputs M3/M4 (AH1/AH2) Switch-on delay of sewing foot lifting	100 202 280 / 282 281 / 283 284 / 286 285 / 287 288			

Mode 7 (overlock) parameter 232 = 0 (tape cutter) / parameter 018 = 0 (seam end with stop)



Mark	Function	Parameter	Control		
FAm	Mode 7 Sewing foot lifting at the seam end On	290 = 7	Key -		
LS	Light barrier	009 = 1			
UoS	Sequence “overlock mode with stop”	018 = 0			
-Pd	Function “pedal in pos. –2” blocked	019 = 2			
tFS	Beginning of thread tension release at the start of the seam	025 = 0			
LSS	Start blockage with light barrier uncovered	132 = 0			
PLS	Speed n5 after light barrier sensing	192 = 0			
USS	Tape cutter function	232 = 0			
n1	Positioning speed	110			
n2	Maximum speed	111			
n5	Speed after light barrier sensing	114			
n7	Trimming speed	116			
c3	End counting for chain suction	002			
c4	Start counting for chain suction	003			
LS	Start counting for tape cutter	004			
SFS	Stitches from light barrier uncovered until end of thread tension release (M4)	157			
kd1/kd	Delay times of outputs M1/M2	280/282			
kt1/kt2	ON periods of outputs M1/M2	281/283			
kt3	ON period of tape cutter	285			
kdF	Switch-on delay of sewing foot lifting	288			

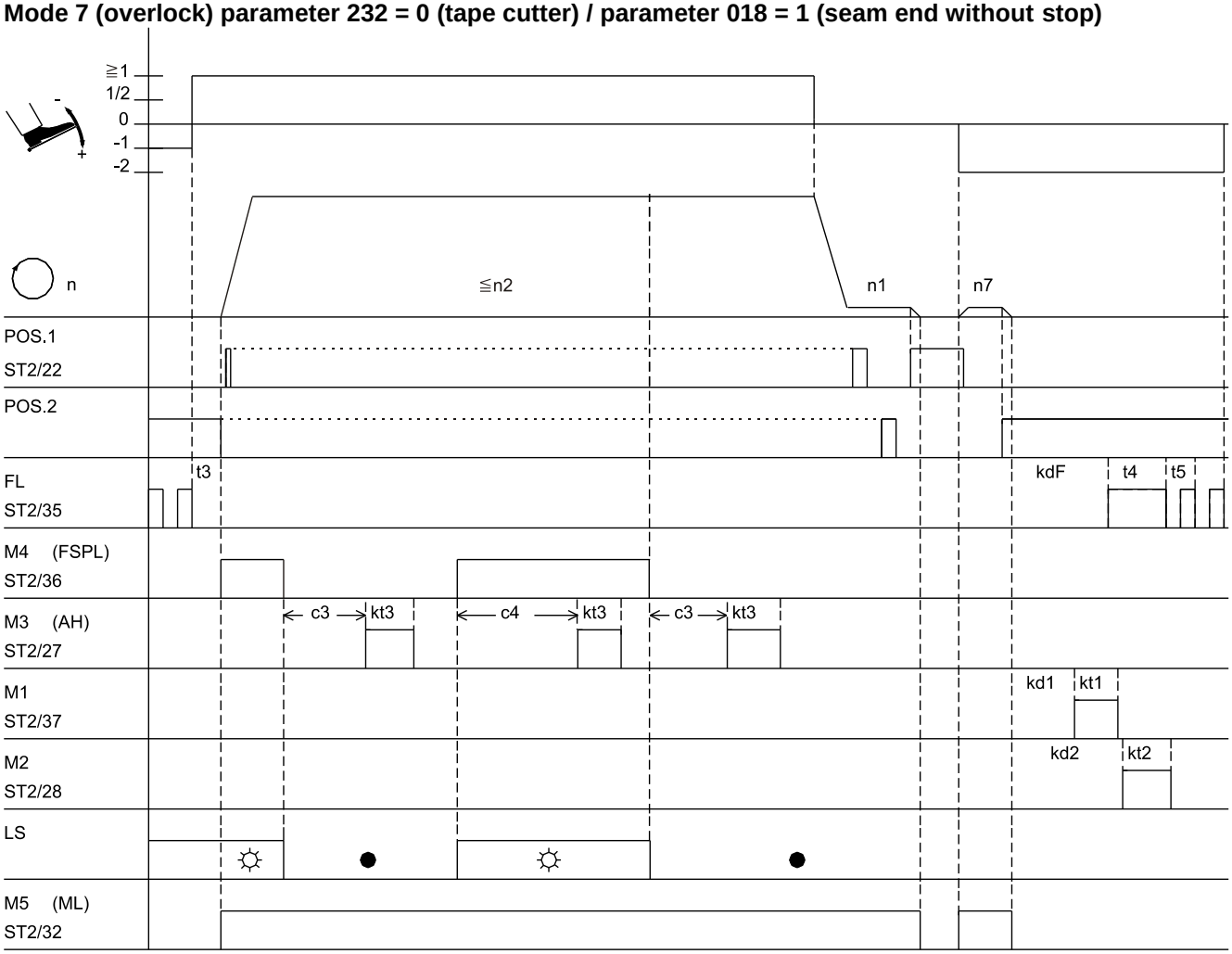
Mode 7 (overlock) parameter 232 = 1 (fast scissors) / parameter 018 = 0 (seam end with stop)



0326/MODE-07c

Mark	Function	Parameter	Control		
FAm	Mode 7	290 = 7			
	Sewing foot lifting at the seam end On		Key -		
LS	Light barrier	009 = 1			
UoS	Sequence “overlock mode with stop”	018 = 0			
-Pd	Function “pedal in pos. –2” blocked	019 = 2			
LSS	Start blockage with light barrier uncovered	132 = 0			
PLS	Chain suction On after light barrier compensating stitches	192 = 0			
USS	Function “fast scissors”	232 = 1			
n1	Positioning speed	110			
n2	Maximum speed	111			
n5	Speed after light barrier sensing	114			
n7	Trimming speed	116			
c3	Start counting for tape cutter	002			
c4	End counting for tape cutter	003			
LS	Light barrier compensating stitches	004			
kd1	Delay time of output M1	280			
kd2	Delay time of output M2	282 = 0			
kt1/kt	ON periods of outputs M1/M2	281/283			
kt3	ON period of tape cutter	285			
kdF	Switch-on delay of sewing foot lifting	288			

Mode 7 (overlock) parameter 232 = 0 (tape cutter) / parameter 018 = 1 (seam end without stop)

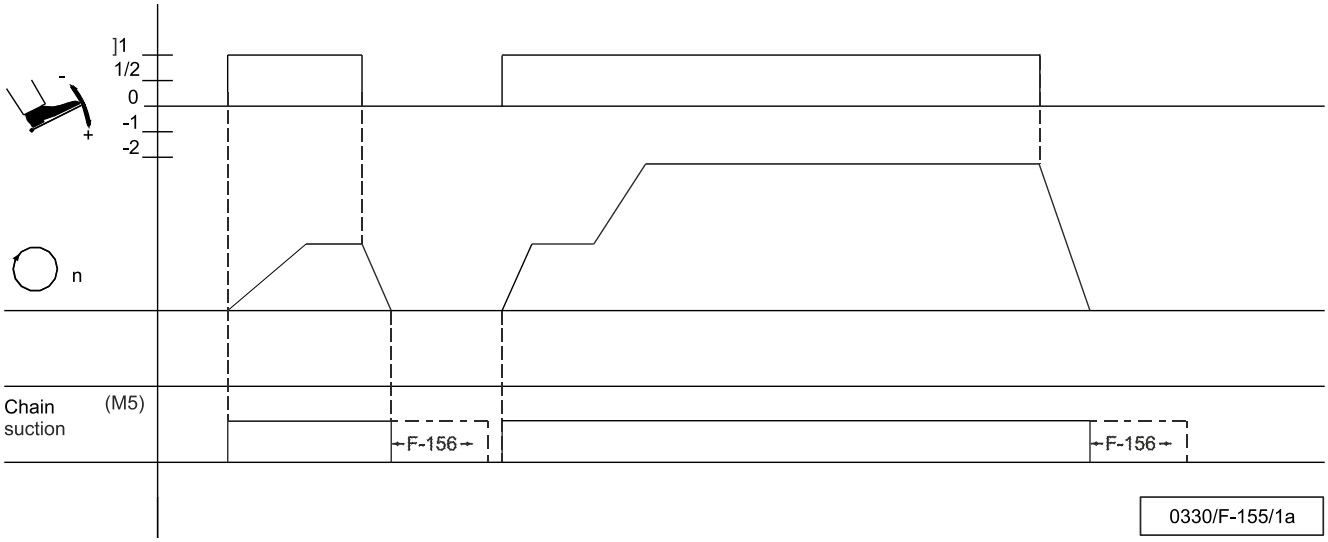


0326/MODE-07b

Mark	Function	Parameter	Control		
FAm	Mode 7	290 = 7			
LS	Light barrier compensating stitches	004 = 0			
LS	Light barrier	009 = 1			
UoS	Sequence “overlock mode at the seam end without stop”	018 = 1			
-Pd	Function “pedal in pos. –1/–2” activated in the seam	019 = 3			
SPO	Chain suction at the seam end until pedal in pos. 0	022 = 1			
kSA	Stitch counting at the start of the seam at fixed speed n3	143 = 1			
kSE	Stitch counting at the seam end at fixed speed n4	144 = 1			
USS	Tape cutter function	232 = 0			
n1	Positioning speed	110			
n2	Maximum speed	111			
n7	Trimming speed	116			
c3	Start counting for tape cutter	002			
c4	End counting for tape cutter	003			
t3	Start delay from lifted sewing foot	202			
kd1/kd2	Delay times of outputs M1/M2	280/282			
kt1/kt2	ON periods of outputs M1/M2	281/283			
kt3	ON period of tape cutter	285			
kdF	Switch-on delay of sewing foot lifting	288			

Mode 7 (overlock) chain suction permanent signal

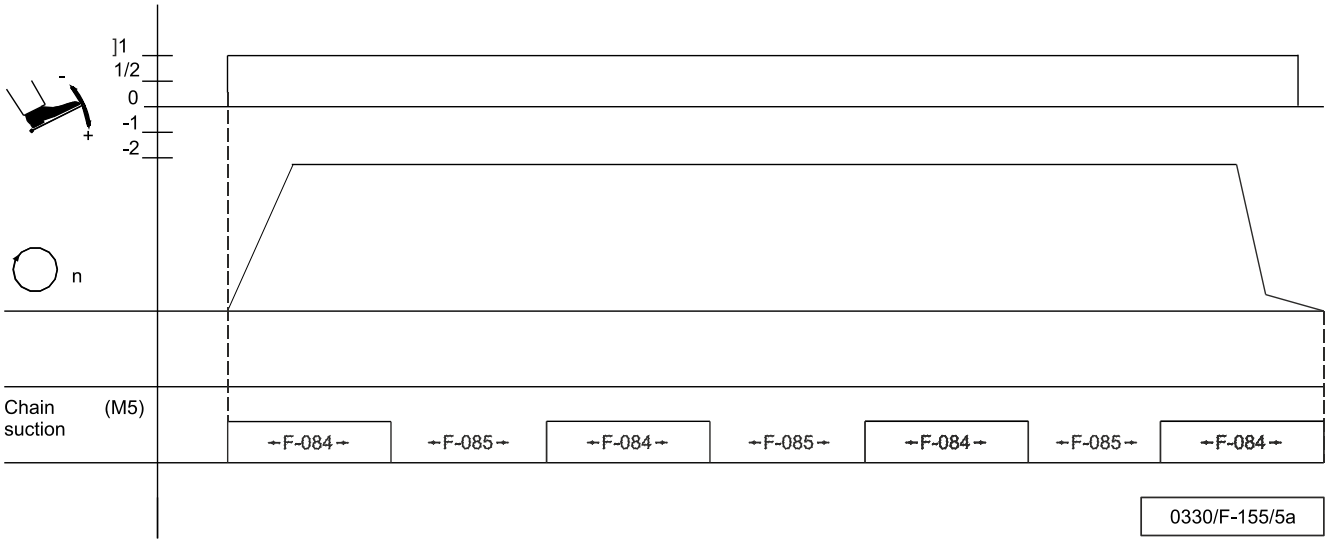
Parameter F-155= 1
Parameter F-156= 200 ms
Suction always On if motor running signal



Mark	Function	Parameters			
M5 n F-156	Chain suction Speed Switch-off delay for M2	155 = 1 156 = 200ms			

Mode 7 (overlock) chain suction via stitch count (Ecco)

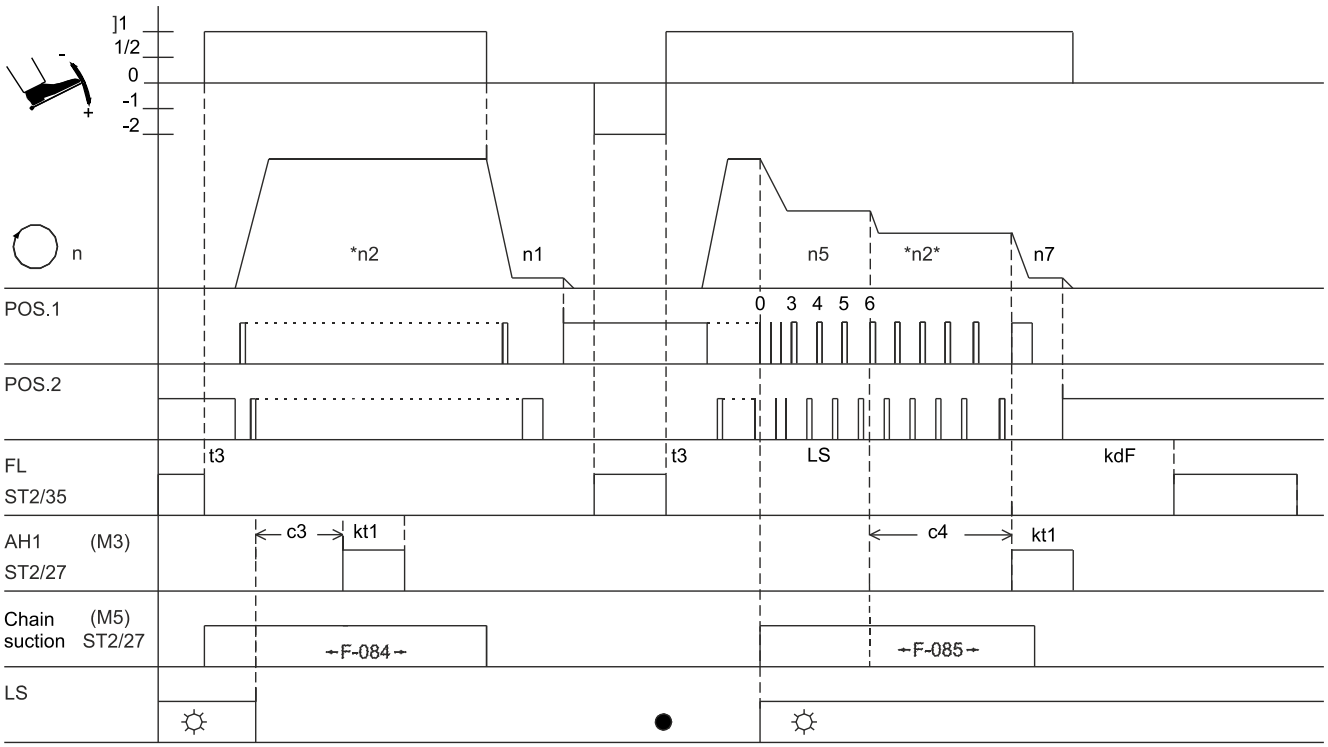
Parameter F-155= 5
Parameter F-084= 5
Parameter F-085= 4



Mark	Function		Parameters		
M5	Chain suction		155 = 5		
n	Speed				
Mle	Stitches for motor run Ecco On		084 = 5		
Mla	Stitches for motor run Ecco Off		085 = 4		

Mode 7 (overlock) Chain suction controlled via light barrier

Parameter F-155= 6

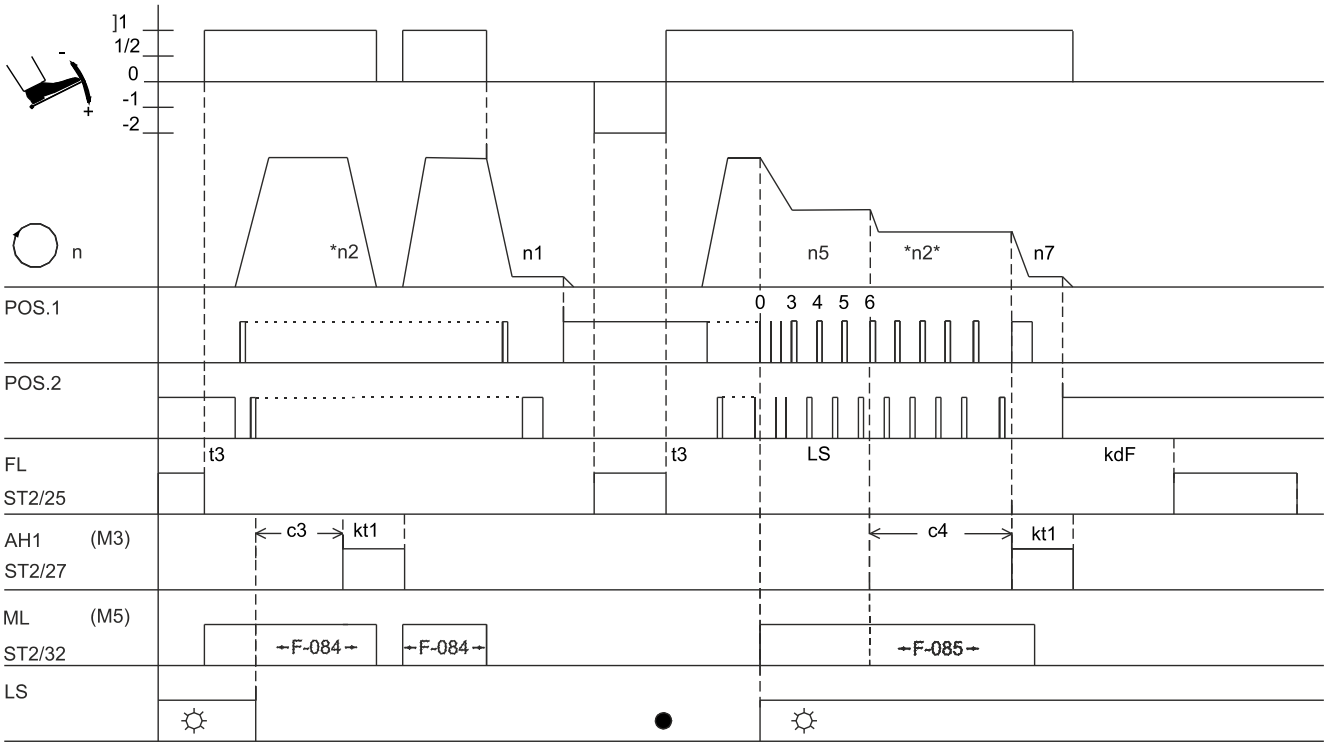


0330/F-155/6a

Mark	Function	Parameters	Control		
	Sewing foot lifting at the seam end On				
LS	Light barrier	009 =1	Key -		
UoS	Sequence “overlock mode with stop”	018 =0			
-Pd	Function “pedal in pos. –2” blocked	019 =2			
LSS	Start blockage with light barrier uncovered	192 =0			
PLS	Speed n5 after light barrier sensing	232 =0			
USS	Tape cutter function				
n1	Positioning speed	110			
n2	Maximum speed	111			
n5	Speed after light barrier sensing	114			
n7	Trimming speed	116			
c3	Start counting for tape cutter	002			
c4	End counting for tape cutter	003			
LS	Light barrier compensating stitches	004			
kt1	ON period of tape cutter	281			
kdF	Switch-on delay of sewing foot lifting	288			
Mle	Run-out stitch chain suction on seam start	084			
Mla	Run-out stitch chain suction on seam end	085			

Mode 7 (overlock) chain suction controlled via light barrier and chain suction signal interrupted during stop

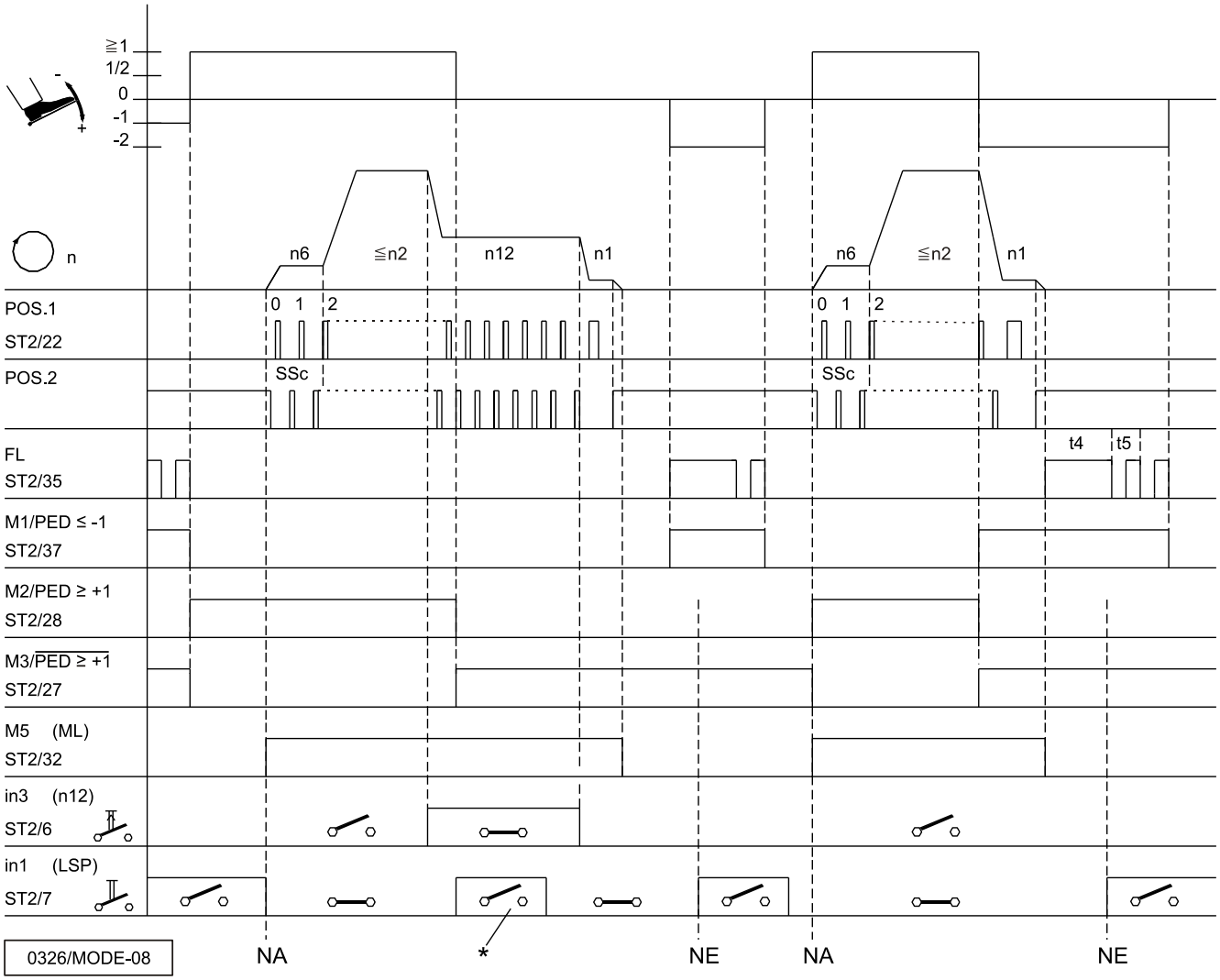
Parameter F-155= 7



0330/F-155/7a

Mark	Function	Parameters	Control		
	Sewing foot lifting at the seam end On				
LS	Light barrier	009 =1	Key -		
UoS	Sequence “overlock mode with stop”	018 =0			
-Pd	Function “pedal in pos. –2” blocked	019 =2			
LSS	Start blockage with light barrier uncovered	192 =0			
PLS	Speed n5 after light barrier sensing	232 =0			
USS	Tape cutter function				
n1	Positioning speed	110			
n2	Maximum speed	111			
n5	Speed after light barrier sensing	114			
n7	Trimming speed	116			
c3	Start counting for tape cutter	002			
c4	End counting for tape cutter	003			
LS	Light barrier compensating stitches	004			
kt1	ON period of tape cutter	281			
kdF	Switch-on delay of sewing foot lifting	288			
Mle	Run-out stitch chain suction on seam start	084			
Mla	Run-out stitch chain suction on seam end	085			

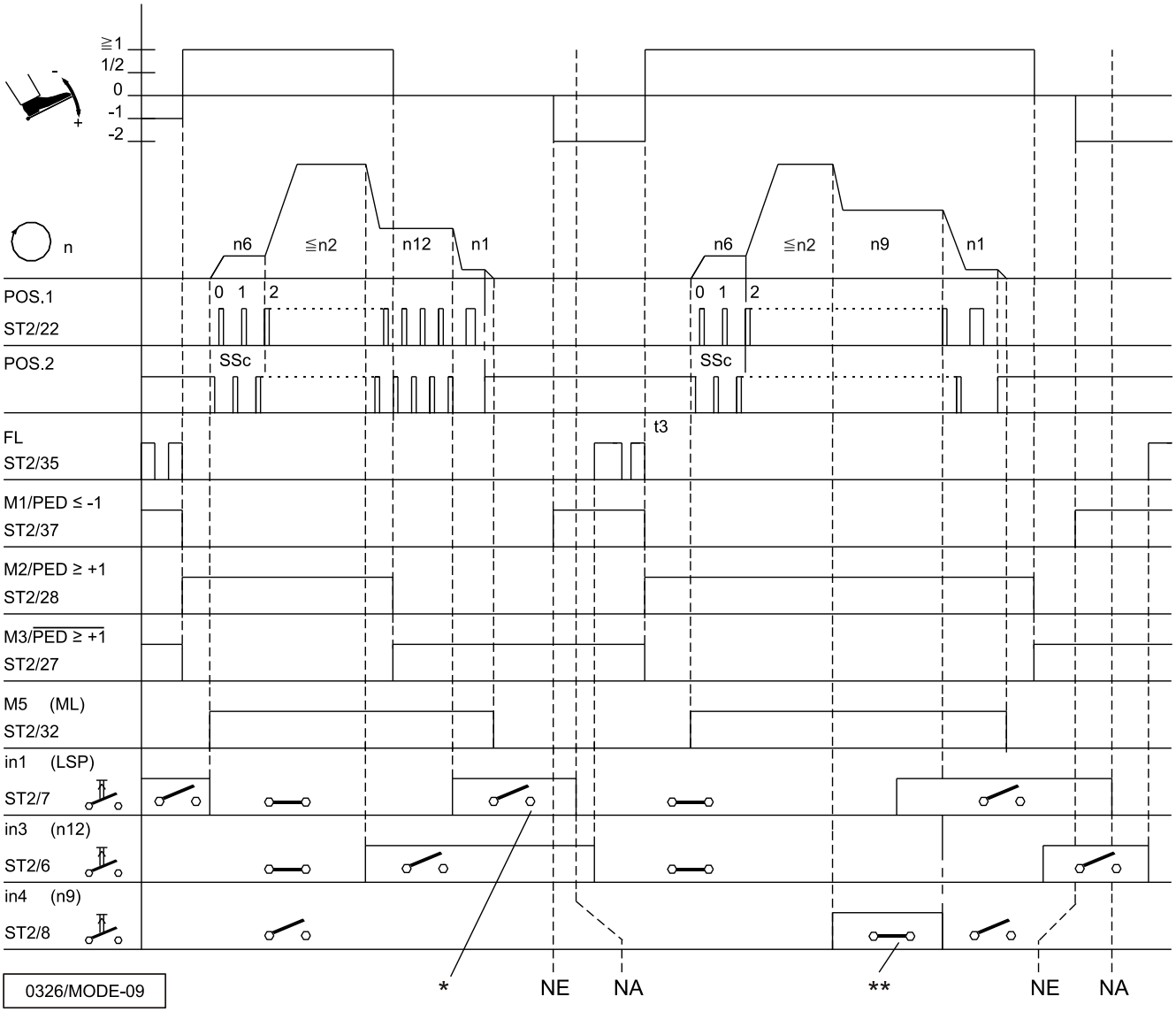
Modus 8 (Backlatch Pegasus)



Mark	Function	Parameter	Control		
FAm	Mode 8	290 = 8			
	Basic position 2 On		Key >>		
SSt	Softstart	134 = 1			
in1	Machine run blockage activated with open switch	240 = 6			
in3	n-Auto with closed switch	242 = 10			
n1	Positioning speed				
n2	Maximum speed				
n6	Softstart speed				
n12	Automatic speed				
SSc	Softstart stitches				
t4	Full power of sewing foot lifting				
t5	Pulsing of sewing foot lifting				

**) Solange die Automatikdrehzahl eingeschaltet ist, hat die Laufsperre keine Wirkung!*
NA Nahtanfang
NE Nahtende

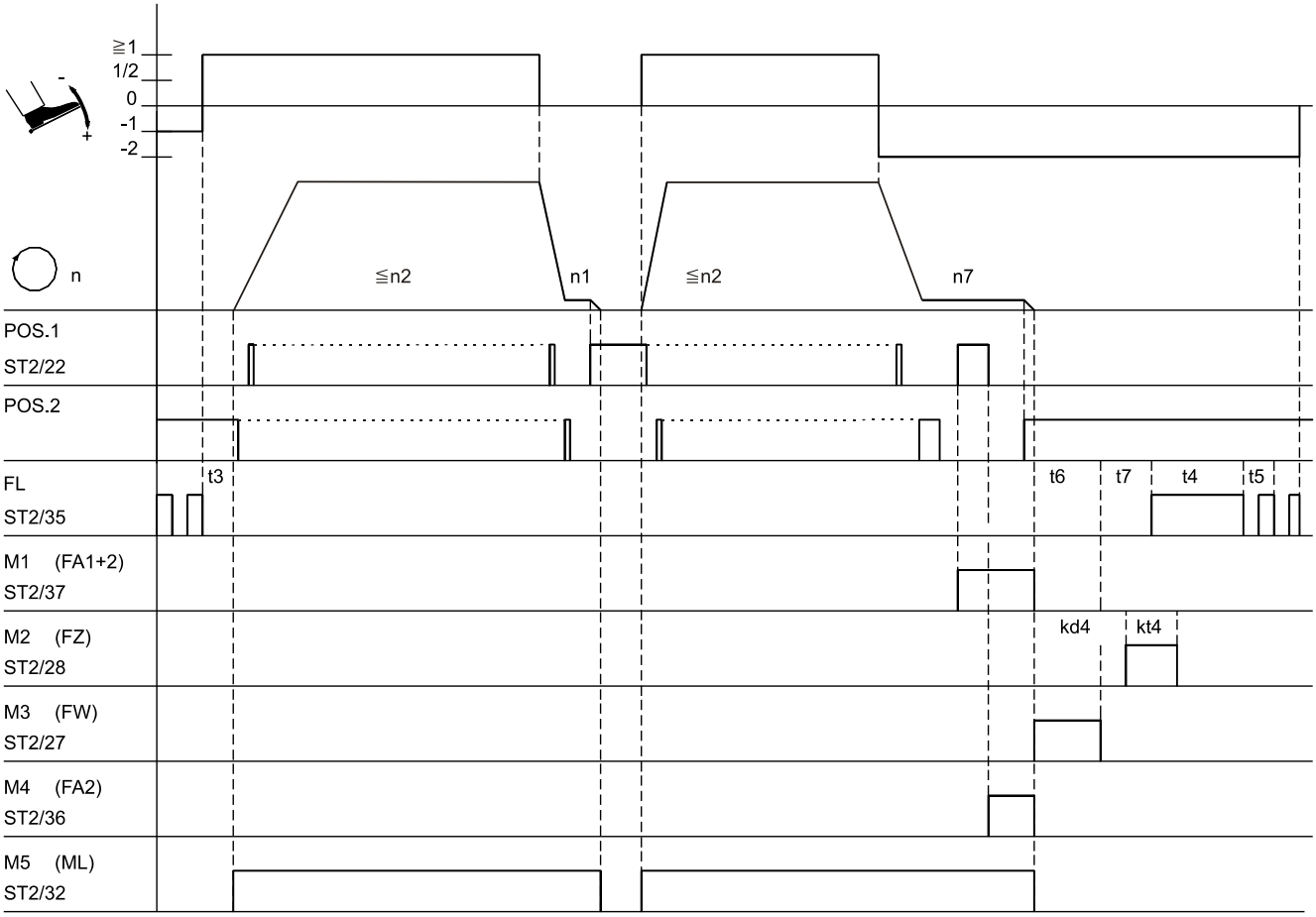
Modus 9 (Backlatch Yamato)



Mark	Function	Parameter	Control		
FAm	Mode 9	290 = 9			
	Basic position 2 On		Key **>>**		
SSt	Softstart	134 = 1			
in1	Machine run blockage activated with open switch	240 = 6			
in3	Automatic speed with open switch	242 = 10			
	(the function of input 3 is inverted in mode 9)				
PGm	Setting an external sensor to position 2	270			
	(A sensor must be connected!)				
n1	Positioning speed	110			
n2	Maximum speed	111			
n6	Softstart speed	115			
n9	Limited speed n9	122			
n12	Automatic speed	118			
SSc	Softstart stitches	100			
t3	Start delay from lifted sewing foot	202			
t4	Full power of sewing foot lifting	203			
t5	Pulsing of sewing foot lifting	204			

**) Bei dieser Einstellung hat die Laufsperre Vorrang vor der Automatikdrehzahl!*
***) Die automatische Drehzahl n9 hat Vorrang vor der Laufsperre!*
NA Nahtanfang
NE Nahtende

Modus 14 (Steppstich)



0326/MODE-14

Mark	Function	Parameter	Control		
FAm PGm	Mode 14 Setting an external sensor to position 1 (An external sensor must be connected!)	290=14 270=3			
n1 n2 n7	Positioning speed Maximum speed Trimming speed				
t3 t4 t5 t6 t7 kd4 kt4	Start delay from lifted sewing foot Full power of sewing foot lifting Pulsing of sewing foot lifting Thread wiper ON period Switch-on delay of the sewing foot after thread wiper Delay time output M2 ON period output M2	202 203 204 205 206 286 287			

11 Parameterlist

11.1 Operator Level

The preset values indicated apply to mode 0 (Parameter 290 = 0).
For preset values applicable to other modes see table in chapter 11.1 »Preset Values Depending on Mode«.

Parameters		Designation	Unit	Max	Min	Preset	Ind.
000	c2	- Number of stitches of start backtack forward - Number of stitches of start stitch condensing without stitch regulator - Number of stitches of end counting chain suction	Stitches	254	0	2	
001	c1	- Number of stitches of start backtack backward - Number of stitches of start stitch condensing with stitch regulator - Number of stitches of start counting chain suction	Stitches	254	0	4	
002	c3	- Number of stitches of end backtack backward - Number of stitches of end stitch condensing with stitch regulator - Number of stitches of tape cutter at the start of the seam	Stitches	254	0	2	
003	c4	- Number of stitches of end backtack forward - Number of stitches of end stitch condensing without stitch regulator - Number of stitches of tape cutter at the seam end	Stitches	254	0	2	
004	LS	Light barrier compensating stitches	Stitches	254	0	7	
005	LSF	Number of stitches of the light barrier filter for knitted fabrics	Stitches	254	0	1	
006	LSn	Number of light barrier seams		15	1	1	
007	Stc	Number of stitches for the seam with stitch counting	Stitches	999	0	20	
008	-F	A parameter from the technician level is assigned to key 9 1 = Softstart On/Off 2 = Ornamental backtack On/Off 3 = Start of sewing blocked with light barrier uncovered On/Off 4 = Unlocking the chain On/Off 8 = Backtack repetition On/Off 9 = Multi-backtack / standard backtack		9	1	1	
009	LS	Light barrier On/Off		1	0	0	
010	SrM	Strobel backtack in mode F-290 =56 0 = End backtack off 1 = Single end backtack on2 = Double end backtack on 3 = Double start and double end backtack on 4 = Simple start backtack and simple end tack on		4	0	0	F
013	FA	Thread trimmer On/Off		1	0	0	
014	Fw	Thread wiper On/Off		1	0	0	
015	StS	Stitch counting On/Off		1	0	0	
017	SAb	Stop for tape cutting at the seam end On/Off (Function only when overlock mode is active).		1	0	0	
018	UoS	0 = Sequence “overlock mode with stop” 1 = Sequence “overlock mode without automatic stop. When the command “run” is given, the drive runs at the pre-selected speed. With **pedal in pos. 0** or **light barrier covered**, the program switches to the next start of a seam without issuing signals M1/M2. 2 = As with setting “1”. But with **pedal in pos. 0** signals M1/M2 will be issued, and the program switches to the next start of a seam. 3 = As with setting “1”. But with **pedal -2** signals M1/M2 will be issued, and the program switches to the next start of a seam. Intermediate stop and sewing foot lifting with pedal in **pedal -1** is possible. 4 = If the light barrier is covered during the end count for chain suction, the program switches immediately to the next start of a seam. If the end count has been completed and the light barrier remains uncovered, the drive stops. 5 = Tape cutting at the start of the seam with stop		5	0	0	

Parameters	Designation	Unit	Max	Min	Preset	Ind.
019 -Pd	0 = Pedal in pos. -1 blocked in the seam. But with pedal in pos. -2 sewing foot lifting is possible in the seam (function active whenever the light barrier is On) 1 = With pedal in pos. -1 sewing foot lifting is blocked in the seam. 2 = Pedal in pos. –2, thread trimming disabled. (Function only if parameter 009 = 1) 3 = Pedal in pos. –1 and –2 enabled in the seam. 4 = Pedal -1 and -2 locked in the seam (function only when parameter 009 =1) 5 = Start seam end by with pedal -1		5	0	3	
020 kLm	Clamp at the seam end On/Off		1	0	0	
021 ckL	Run-out stitches clamp at the start of the seam	Stitches	254	0	2	
023 AFL	Automatic sewing foot lifting with pedal forward at the seam end, if light barrier or stitch counting is On. 0 = Automatic foot lifting off 1 = Automatic foot lifting On		1	0	1	
024 FSP	Coupled thread tension release and sewing foot lifting. The function can be activated only with a thread trimmer that depends on the angle. 0 = No coupling 1 = Coupled thread tension release and sewing foot at the seam end with thread trimmer off 2 = Coupled thread tension release and sewing foot in the seam and at the seam end with thread trimmer off 3 = Coupled thread tension release and sewing foot always effective		3	0	0	
025 tFS	Start counting (pa. 157) for thread tension release at the start of the seam 0 = Start counting at the start of the seam 1 = Start counting when the light barrier is covered		1	0	1	
026 APd	Characteristic of the "analog pedal" 0 = Analog function off 1 = 12-level, like previous pedal function 2 = continuously variable 3 = 24-level 4 = 60-level 5 = 48-level 6 = 48 level / standing operation (SOP; foot control 304)i		6	0	4	
027 plu	Area for setting + 1/2 of the analog pedal in percent		80	10	30	
028 epd	0 = Function Off 1 = Pedal 2 release only from Pos. 1		0	1	0	
030 rfw	Bobbin thread monitor 0 = Off 1 = Active with stop 2 = Active without stop 3 = Active with stop and start blockage after thread trimming 4 = As 1, but with display of remaining stitches 5 = As 2, but with display of remaining stitches 6 = As 3, but with display of remaining stitches		6	0	B	
031 cfw	Number of stitches for bobbin thread monitor. (The 3-digit value must be multiplied by 100).		255	0	B	

Parameters	Designation	Unit	Max	Min	Preset	Ind.
041 EZP	Special pedal function Single stitch / Full stitch 0 = Function Off 1 = Single stitch (assuming needle up to needle down). Afterwards alas a complete hand wheel rotation in speed n9) 2 = Full stitch (a complete hand wheel rotation in speed n9) 3 = Speed limitation up to F-042		2	0	0	
042 GrP	Pedal travel forwards for detection of the special pedal function	%	100	0	40	
051 dPd	Time for detection of the special pedal function	ms	2550	0	100	
084 Mle	Stitches for motor ECO On	Stitches	254	0	5	
085 Mla	Stitches for motor ECO runs down	Stitches	254	0	5	
086 vct	Counted forward section in manual ornamental backtack On/Off		1	0	1	
087 chr	0 = Manual backtack at speed n13 (Parameter 109) 1..255 = Manual ornamental backtack at speed n9 (Parameter 122)	Stitches	255	0	0	
088 kla	Stitches for clamping the seam start (mode 68)	Stitches	20	0	3	
090 wAr	Repetition of the start/ multiple backtack		255	0	3	
091 wEr	Repetition of the final/multiple backtack		255	0	3	
092 Fwr	1 = Backtack repetition On/Off 2 = Repetition of the start backtack with automatic cutting. No end backtack is done.		2	0	0	

11.2 Technical level (Code no. 1907)

Parameters	Designation	Unit	Max	Min	Preset	Ind.
100 SSc	Number of softstart stitches	Stitches	254	0	2	
101 EvA	Switch-on delay for the backtacking solenoid in the initial backtack	ms	255	0	43	
102 AvA	Power-off delay for the backtacking solenoid in the initial backtack	ms	255	0	4	
103 EvE	Switch-on delay for the backtacking solenoid in the final backtack	ms	255	0	43	
104 AvE	Power-off delay for the backtacking solenoid in the final backtack	ms	255	0	5	
108 PEr	Stop position of the ornamental backtack 1 = Position 1 leading 2 = Position 2 leading 3 = Position 1 trailing 4 = Position 2 trailing 5 = Position 3 leading 6 = Position 3 trailing		6	1	1	
109 n13	Speed of manual backtack	RPM	9900	200	1500	
110 n1	Positioning speed for threading (mode 66)	RPM	390	70	200	
111 n2	Upper limit setting range of the maximum speed	RPM	9900	n2_	5000	
113 n4	End backtacking speed	RPM	9900	200	1200	
114 n5	Speed after light barrier sensing	RPM	9900	200	1200	
115 n6	Softstart speed	RPM	9900	70	500	
116 n7	Trimming speed	RPM	700	70	200	
117 n10	High lift for walking speed limitation	RPM	9900	400	1000	
118 n12	Automatic speed for stitch counting	RPM	9900	400	3500	
119 nSt	Speed stage graduation 1 = Linear 2 = Slightly progressive 3 = Highly progressive		3	1		
121 n2	Lower limit setting range of the maximum speed	RPM	n2_	200	400	
122 n9	Limited speed n9	RPM	9900	200	2000	
128 ASd	Start delay, when command “start” is given by covering the light barrier (see parameter 129)	ms	2000	0	0	
129 ALS	Machine start by covering the light barrier (only in conjunction with parameter 132 = 1) 0 = Function Off 1 = Light barrier covered ➔ pedal forward (>1) ➔machine run pedal controlled. 2 = Pedal forward (>1) ➔ light barrier covered machine run ➔ pedal controlled. 3 = Light barrier covered ➔ machine run at automatic speed n12 (without pedal) 4 = Pedal forward (>1) ➔ light barrier covered machine run ➔pedal controlled. 5 = Light barrier covered ➔ machine run at automatic speed n12 (without pedal) **Attention!** If 129 = 3, the machine starts immediately after covering the light barrier without influence by the pedal! It can be stopped only by uncovering the light barrier or by machine run blockage! If machine run blockage is disabled, the machine starts immediately even if the light barrier is still covered! 6 = The same as 3, run without pedal when covering the light curtain, however start up only when FI is lowered.		3	0	0	
130 LSF	Light barrier filter for knitted fabrics		1	0	0	
131 LSd	0 = Light barrier sensing “covered” 1 = Light barrier sensing uncovered		1	0	1	
132 LSS	0 = Machine start possible with light barrier uncovered or covered. 1 = Machine start blocked with light barrier uncovered if parameter 131 = 1.Machine start blocked with light barrier covered,		1	0	1	

Parameters	Designation	Unit	Max	Min	Preset	Ind.
133 LSE	Thread trimming operation, when completing the seam after light barrier sensing On/Off		1	0	1	
134 SSt	Softstart On/Off		1	0	0	
135 SrS	Ornamental backtack On/Off		1	0	0	
136 FAr	0 = Trimming stitch backward Off 1 = Trimming stitch backward On with single end backtack 2 = Trimming stitch or positioning stitch always backward at the seam end		2	0	0	

Parameters	Designation	Unit	Max	Min	Preset	Ind.
137 hP	High lift for walking foot function activated/deactivated		1	0	0	
139 nIS	Display of machine speed On/Off		1	0	0	
140 dnE	Delay of seam end with pedal in pos. -2	ms	2550	0	0	
141 SGn	Speed status for the seam with stitch counting 0 = Speed controllable by the pedal up to the set maximum speed (Parameter 111) 1 = Fixed speed (Parameter 118) without influence by the pedal (machine stop by 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 -2 4 = At fixed speed (Parameter 110) can be interrupted by full heelback -2		4	0	0	
142 SFn	Speed status for the free seam and for the seam with light barrier 0 = Speed controllable by the pedal up to the set maximum speed (Parameter 111) 1 = Fixed speed (Parameter 118) without influence by the pedal (machine stop by 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 (only for seams with light barrier).		3	0	0	
143 kSA	Stitch counting at the start of the seam (e. g. chain suction) 0 = Speed controllable by the pedal up to the set maximum speed (Parameter 111) 1 = Fixed speed (Parameter 112) 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 112) 3 = At fixed speed (Parameter 112), can be suspended or interrupted depending on the setting of parameter 019.		3	0	0	
144 kSE	Stitch counting at the seam end (e. g. chain suction) 0 = Speed controllable by the pedal up to the set maximum speed (Parameter 111). Fixed speed (Parameter 113) without influence by the pedal (machine stop by pressing the pedal to the basic position). 1 = Limited speed controllable by the pedal up to the set limit (Parameter 113) 2 = At fixed speed (Parameter 113), can be suspended or interrupted depending on the setting of parameter 019.		3	0	0	
145 Shv	Speed status for the manual backtack 0 = Speed controllable by the pedal up to the set maximum speed (Parameter 111) 1 = Fixed speed (Parameter 109) 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 109)		2	0	0	
150 t8	Stitch correction of the double start backtack (prolongation of the stitch regulator ON period /not effective with ornamental backtack)	ms	500	0	0	
151 t9	Stitch correction of the double end backtack (prolongation of the stitch regulator ON period / not effective with ornamental backtack)	ms	500	0	0	
153 brt	Braking power at machine standstill		50	0	15	

Parameters	Designation	Unit	Max	Min	Preset	Ind.

155	LSG	Mode signal run 0 = Signal Off. 1 = Signal run On. 2 = Signal “run” enabled when the speed is >3000 RPM. 3 = Signal with pedal <> 0. 4 = Signal enabled only after motor synchronization (one rotation at positioning speed after power On). 5 = Motor runs Eco with setting F-84 and F-85 6 = Motor runs the same as chain suction at the seam start / end with counter F-084 and F-085 7 = The same as 6, however chain suction at the start of the seam can be interrupted and with switch-off delay F-156		7	0	1	
156	t05	Switch-off delay for the signal “run” or signal with pedal in pos. 0 (neutral)	ms	2550	0	0	
157	SFS	Stitches until thread tension release Off after light barrier covered at the start of the seam (Only in mode 7)	Stitches	254	0	0	
161	drE	Direction of motor rotation 0 = Clockwise rotation 1 = Counterclockwise rotation		1	0	1	
162	n2A	Start backtack speed whenever the backtack can be interrupted by pedal in pos. 0 (neutral) (Parameter 164)	RPM	9900	200	600	
163	n2E	End backtack speed whenever the backtack can be interrupted by pedal in pos. 0 (neutral) (Parameter 164)	RPM	9900	200	600	
164	StP	Start and end backtack can be interrupted by pedal in pos. 0 (neutral) On/Off		1	0	0	
170	Sr1	Setting the reference position: - Press the E key - Press the >> key. - Turn handwheel until symbol on display goes off. Then set the handwheel to the reference position. - Press the P key twice					
171	Sr2	Setting the needle positions: 1E = Start position 1 2E = Start position 2 1A = End position 1 2A = End position 2	Degrees	359	0	 26 319 200 355	
172	Sr3	Display on the control: Pos. 1 to 1A (LED segment 5 lights up) Pos. 2 to 2A (LED segment 6 lights up)					
173	Sr4	Testing of signal inputs and outputs **Inputs** By actuating the switches connected to the control, the function of these switches is checked and displayed on the control. With the switch open, **OFF** appears (only in the control panel of the control) and with the switch closed, the corresponding input **in1...in7, i11 (LSM), i12, i13** appears. **Outputs** ▪ Select the desired output using the **+/-** keys. ▪ With the button **>>** the corresponding output is switched on, as long as it is connected and functional.				OFF	

Output	Socket
Backtacking	ST2/34
Sewing foot lifting	ST2/35
M1	ST2/37
M2	ST2/28
M3	ST2/27
M4	ST2/36
M5	ST2/32
POS1	ST2/22

Parameters	Designation	Unit	Max	Min	Preset	Ind.
176 Sr6	Service routine for total operating hours display. The process is as with display example of parameter 177.					
177 Sr7	Service routine for display of hours since the last service. **Display example for the operator control panel:** Press the E key ➔ Display Sr7= Press the >> key ➔ Display h t Press the E key ➔ Display 0000 Press the >> key ➔ Display h h Press the E key ➔ Display 0000 Press the E key ➔ Display Min Press the E key ➔ Display 00 Press the E key ➔ Display SEc Press the E key ➔ Display 00 Press the E key ➔ Display MS Press the E key ➔ Display 000 Press the E key ➔ Display rES Press the E key again to restart routine, or press the P key twice to return to operational status					
179 Sr5	Display of control program number with index and more identification numbers. The data is displayed in sequence by keystroke. **Display example for the operator control panel:** Press the E key ➔ Display Sr5= Press the >> key ➔ Display e.g. 5030 (Prog. No.) Press the E key ➔ Display e.g. A (Index) Press the E key ➔ Display e.g. 06 (Year) Press the E key ➔ Display e.g. 10 (Month) Press the E key ➔ Display e.g. 24 (Day) Press the E key ➔ Display e.g. 16 (Hour) Press the E key ➔ Display e.g. -- Press the E key ➔ Display e.g. ---- Press the E key again to restart routine, or press the P key twice to return to operational status					

Parameters	Designation	Unit	Max	Min	Preset	Ind.
180 rd	Reversing angle	Degrees	359	0	175	
181 drd	Switch-on delay of reverse motor rotation	ms	990	0	10	
182 Frd	Reverse motor rotation On/Off		1	0	0	
184 c6	Number of run-out stitches when unlocking the chain	Stitches	254	0	20	
190 mEk	Function “unlock the chain” in modes 5, 6 and 7 (Parameter 290) 0 = Unlocking off 1 = Unlocking the chain manually (with pedal in pos. –2 without cutting at the seam end) 2 = Unlocking the chain automatically - By means of light barrier or - pedal in pos.-2 (Parameter 019) without cutting at the seam end 3 = Unlocking the chain automatically - By means of light barrier or - Pedal in pos. –2 (Parameter 019) with cutting and run-out stitches (Parameter 184) at the seam end, then unlocking the chain (only if parameter 290 = 7) 4 = Unlocking only with pedal 2 No unlocking the chain at the seam end by means of light barrier, cutting and run-out stitches.		4	0	1	
191 mhE	Seam end for overlock mode through End count c2 or c4 0 = Seam end after count c4 – Tape cutter 1 = Seam end after count c2 – chain suction		1	0	0	
192 PLS	Speed of the light barrier compensating stitches 0 = Speed n5 after light barrier sensing 1 = Speed pedal controlled		1	0	0	
193 kSL	Enable chain suction signal and thread tension release 0 = Thread tension release and chain suction after the light barrier compensating stitches 1 = Chain suction from light barrier uncovered onwards and thread tension release after the light barrier compensating stitches		1	0	0	
198 Bag	Functions with chainstitch machines e. g. bag sewing machine (Parameter 290 = 37) 0 = Function “thread trimming” or “hot thread chain cutting” and sewing foot lift using the pedal. 1 = Function “thread trimming” or “hot thread chain cutting” using the knee switch, and sewing foot lift using the pedal. 2 = Function “thread trimming” or “hot thread chain cutting” using the pedal and sewing foot lift using the knee switch.		2	0	0	
199 FSn	Thread tension release at the seam end On/Off. 0 = Thread tension release Off at the seam end for pedal in pos. 0. 1 = Thread tension release On at the seam end for pedal in pos. 0. 2 = Thread tension release at the seam end and after power on and pedal in position 0 On.		2	0	0	

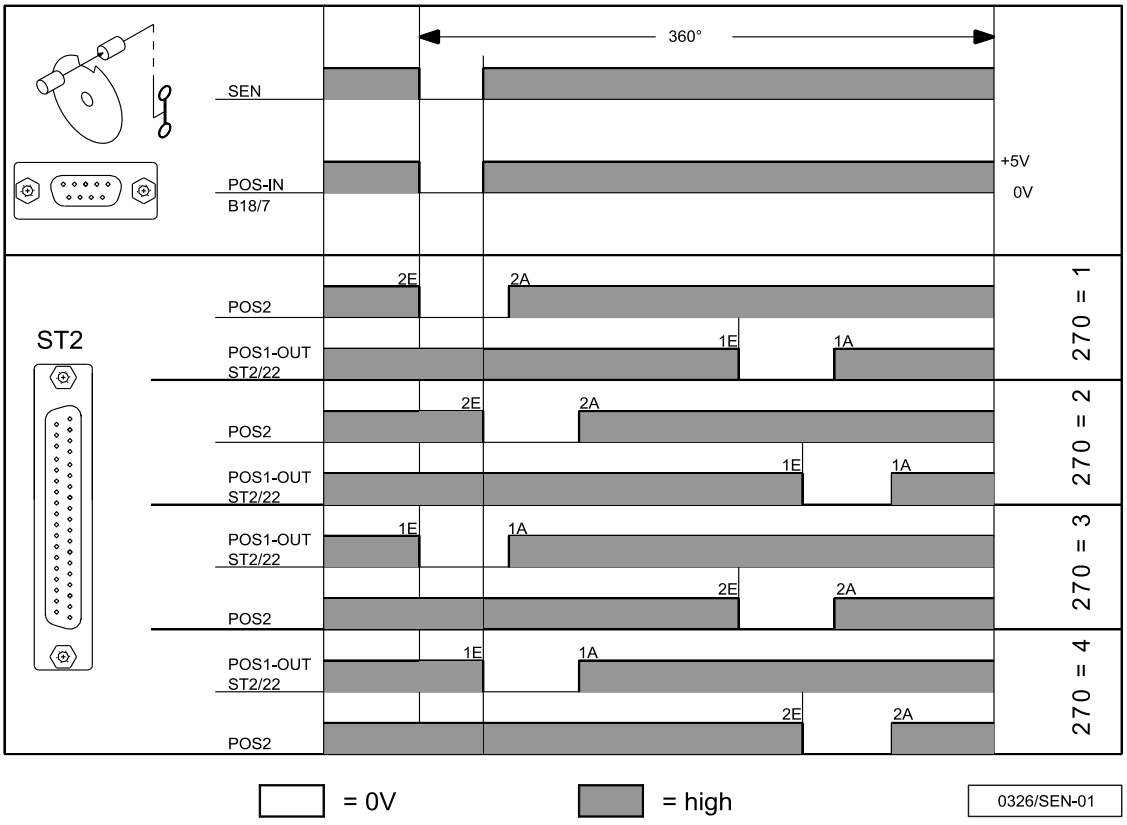
11.3 Supplier level (Code No. 3112)

Parameters	Designation	Unit	Max	Min	Preset	Ind.
200 t1	Delay until speed release after start backtack	ms	500	0	100	
201 t2	Sewing foot switch-on delay after thread wiper with half heelback	ms	2550	20	80	
202 t3	Start delay after disabling the sewing foot lifting signal	ms	500	0	50	
203 t4	Time of full power of sewing foot lifting	ms	600	0	500	
204 t5	Holding power for sewing foot lifting 1...100% 1%➔ low holding power 100%➔ high holding power	%	Pa.254	1	40	
205 t6	Thread wiper time	ms	2550	0	120	
206 t7	Delay from end of thread wiper until sewing foot lifting On	ms	800	0	40	
207 br1	Braking effect when varying the preset value ≤ 4 stages (indicated values only with transmission ratio 1:1)		55	1	15	
208 br2	Braking effect when varying the preset value ≥ 5 stages (indicated values only with transmission ratio 1:1)		55	1	20	
209 dFw	Thread wiper switch-on delay	ms	2550	0	0	
210 tSr	Stop time for switching the stitch regulator in the ornamental backtack	ms	500	0	140	
211 tFL	Sewing foot lifting switch-on delay with thread wiper off	ms	500	0	60	
212 t10	Time of full power of backtacking or thread trimmer forward	ms	600	0	500	
213 t11	Holding power for backtacking or thread trimmer backward 1...100% 1%➔ low holding power 100%➔ high holding power	%	Pa.255	1	40	
215 Zrv	0 = Last counted forward segment in start backtack OFF 1 = Last counted forward segment in start backtack On		1	0	0	
217 Sr	Number of operating hours before service in steps of 10 (operating hours recording enabled if set at “0”).	Std	99900 ***)	00000	00000	
218 SkL	Select custom machines 0 = No custom machine 1 = Model 204 2 = Big Bag		2	0	0	
219 br3	Braking ramp for n < 350 $^{min^{-1}}/_{ms}$ when drive stopped		55	1	4	
220 ALF	Accelerating power of the drive (indicated values only with transmission ratio 1:1)		55	1	35	
221 dGn	Speed gate 1	RPM	990	50	100	
222 tGn	Speed gate damping period	ms	990	0	20	
225 br4	Setting the braking curve for the light barrier and machine run blockage (values only with transmission ratio 1:1)		55	1	20	
229 dP2	Delay of heelback (-2)	ms	2000	0	0	
232 USS	Overlock with fast scissors On/Off		1	0	0	
233 c	Thread tension release switch-on delay	Stitches	254	0	0	
234 pdo	Restart after machine run blockage via pedal 0 position		1	0	1	B
236 FLP	0 = FI always permitted 1 = FI only permitted in position 2 2 = FI after cutting stored pedal plus ½ lifts storing, pedal minus 1 switches stored FI on. 3 = Storage for standing actuation FBxxx 4 = FI generally deactivated 5 = Stored foot lifting at the seam end can be deactivated with pedal plus ½ and pedal minus 1.		5	0	0	B
237 tkS	Switch-off delay for chain suction at the seam end, if parameter 022 = 2.	ms	2550	0	0	
238 EnP	Software debouncing for all inputs: 0 = No debouncing 1 = Debouncing		1	0	1	
239 FEL	Selection of the input function on socket B18/8 0 = Light barrier function, if 009 =1 All other functions as with parameter 240.		112	0	0	

***) *The 4-digit value displayed must be multiplied by 10.*

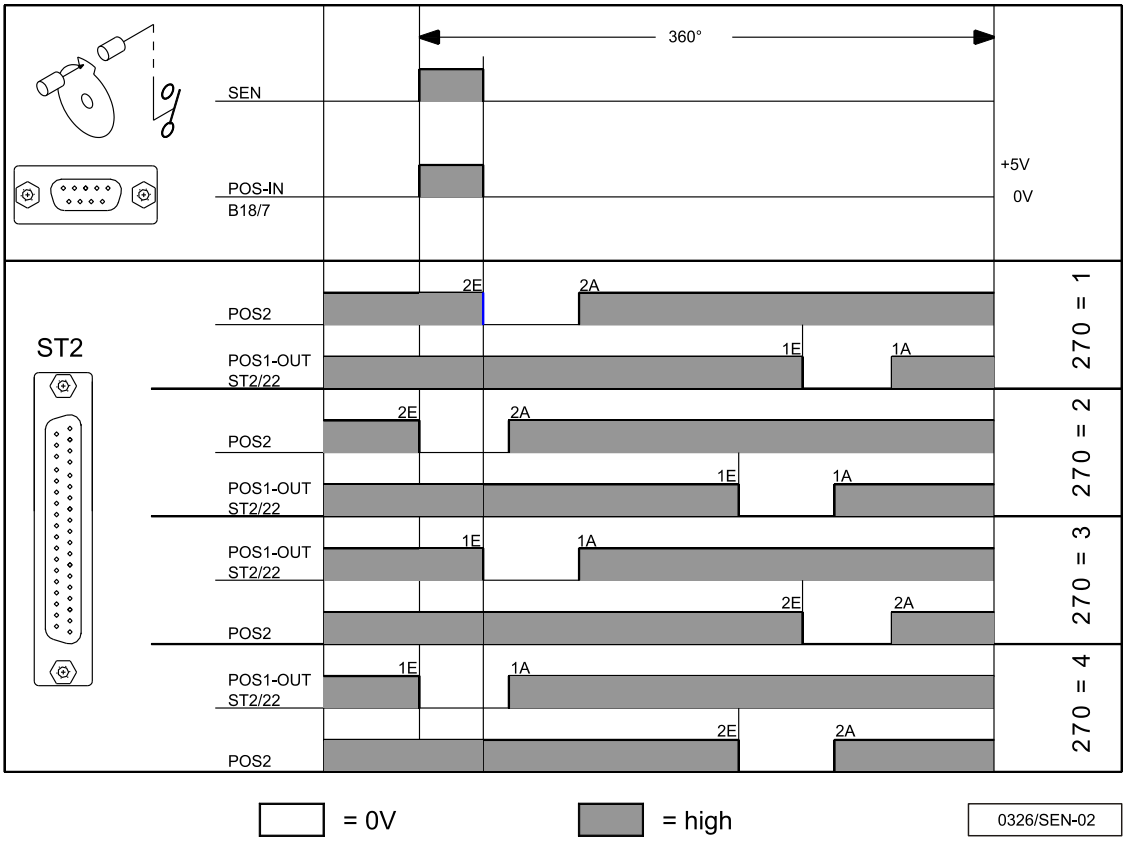
Parameters	Designation	Unit	Max	Min	Preset	Ind.
240 in1	Selection of the input functions on socket ST2/7 for input 1 0 = No function 1 = Needle up/down 2 = Needle up 3 = Single stitch (basting stitch) 4 = Full stitch 5 = Needle to position 2 6 = Machine run blockage effective with open contact 7 = Machine run blockage effective with closed contact 8 = Machine run blockage unpositioned effective with open contact 9 = Machine run blockage unpositioned effective with closed contact 10 = Automatic speed n12 without pedal (N.O. contact) 11 = Limited speed n12 pedal controlled 12 = Sewing foot lifting with pedal in position 0 (neutral) 13 = High lift for walking foot with speed limitation n10 (operational mode not stored) 14 = “High lift walking foot” with speed limiting n10. Set parameter 137 to 1 15 = tape cutter/fast scissors: Function only in chainstitch and overlock mode 16 = Intermediate backtack / intermediate stitch condensing 17 = Stitch regulator suppression / recall 18 = Unlocking the chain: Can be activated by pressing the key , but will be executed only at the seam end 23 = No function 24 = Needle to position 2 (see instruction manual) 27 = Unlocking the chain: Function is performed upon pressing the key 28 = External light barrier (according to setting of parameter 131) 30 = High lift for walking foot, if sewing foot is On 31 = Function “speed limitation bit0” (speed n11) 32 = Function “speed limitation bit1” (speed n10) (bit0 + bit1 = speed n9) 33 = Speed n9 pedal controlled 34 = Automatic speed n9 can be suspended by pressing the pedal to pos. 0 (neutral) 37 = Speed n12 pedal controlled (break contact) 38 = Automatic speed n12 without pedal (break contact [N.C.]) 41 = Tape cutting only at machine standstill 42 = Enable hot thread chain cutting or sewing foot lifting. Function only effective in mode 37 43 = No function 44 = Seam end the same as with pedal 2 45..81 =No function 91 = Threading mode 66 101 = AFF1 Bsp.2.Fadenspannungr 103 = AFF3 example of an edge guide 104 = Manual lock automatic 109 = Part lift mode 66 111 = Machine run blockage in Pos. 2 at the seam end close 112 = Foot lifting FlipFlop 113 – 117 No function 118 = Flipflop for running in nmax		112	0	0	
241 in2	Selection of input function on socket ST2/11 for input 2 0 = No function All other functions of the keys as with parameter 240		112	0	0	
242 in3	Selection of input function on socket ST2/6 for input 3 0 = No function All other functions of the keys as with parameter 240		112	0	0	
243 in4	Selection of input function on socket ST2/8 for input 4 0 = No function All other functions of the keys as with parameter 240		112	0	0	
244 in5	Selection of input function on socket ST2/5 for input 5 0 = No function All other functions of the keys as with parameter 240		112	0	0	
245 in6	Selection of input function on socket ST2/12 for input 6 0 = No function All other functions of the keys as with parameter 240		112	0	0	

246	in7	Selection of input function on socket ST2/9 for input 7 0 = No function All other functions of the keys as with parameter 240		112	0	0	
250	iFA	Thread trimmer activation angle	Degrees	359	0	180	
251	FSA	Switch-off delay of thread tension release	ms	990	0	50	
252	FSE	Switch-on delay angle of thread tension release	Degrees	359	0	0	
253	tFA	Stopping time for thread trimming	ms	500	0	70	
254	EF-	Upper limit (Pa.204) clocking the sewing foot lifting switch on period (ED) 1...100 %	%	100	1	100	
255	Ev-	Upper limit (Pa.213) clocking the sewing foot on period (ED) 1...100 %1...100	%	100	1	100	
259	FAE	Activation delay angle of the thread trimmer	Degrees	359	0	0	
267	Abc	Overlock mode: Interrupt the start count And seam end initiation by light barrier uncovered	1	0	0		267
269	PSv	Positioning shift	Incr.	100	0	10	269
270	PGm	Mode of a position sensor with **normally open function** (N.O.).	6	0	0		270
		6 = The positions are generated using the transmitter incorporated in the motor and can be set using parameter 171 *) 7 = Setting the sensor to position 2. Set position 1 with parameter 171 *) Measured from leading edge position 2. 8 = Setting the sensor to position 2. Set position 1 with parameter 171 *) Measured from trailing edge position 2. 9 = Setting the sensor to position 1. Set position 2 with parameter 171 *) Measured from leading edge position 1. 10 = Setting the sensor to position 1. Set position 2 with parameter 171 *) Measured from trailing edge position 1. 11 = No position sensor available. The drive stops unpositioned. The thread trimmer function is suppressed with this setting. 12= The positions are determined by preset values. The reference position must be correctly set for this purpose. In machines with position sensors incorporated in the handwheel the reference position is determined by mechanical adjustment. In all other cases the reference position must be set (see chapter “Setting the Reference Position”) in order for the angles preset by machine select for positions 1 and 2 to be correct. If necessary, the preset values can be adapted as described in chapters “Setting the Positions”.					



The angles between positions 1 and 2, incoming and outgoing, can be configured using Parameter 171.
*) Alternatively, the positions can be configured using the fast-installation routine.

Parameters	Designation	Unit	Max	Min	Preset	Ind.
270 PGm	Mode of a position sensor with a **normally closed function** (N.C.). 0 = The positions are generated using the transmitter incorporated in the motor and can be set using parameter 171 *) 1 = Setting the sensor to position 2. Set position 1 with parameter 171 *) Measured from trailing edge position 2. 2 = Setting the sensor to position 2. Set position 1 with parameter 171 *) Measured from leading edge position 2. 3 = Setting the sensor to position 1. Set position 2 with parameter 171 *) Measured from trailing edge position 1. 4 = Setting the sensor to position 1. Set position 2 with parameter 171 *) Measured from leading edge position 1. 5 = No position sensor available. The drive stops unpositioned. The thread trimmer function is suppressed with this setting. 6 = The positions are determined by preset values. The reference position must be correctly set for this purpose. In machines with position sensors incorporated in the handwheel the reference position is determined by mechanical adjustment. In all other cases the reference position must be set (see chapter “Setting the Reference Position”) in order for the angles preset by machine select for positions 1 and 2 to be correct. If necessary, the preset values can be adapted as described in chapters “Setting the Positions”.		6	0	0	



The angles between positions 1 and 2, incoming and outgoing, can be configured using Parameter 171.
*) Alternatively, the positions can be configured using the fast-installation routine.

Parameters	Designation	Unit	Max	Min	Preset	Ind.
272 trr	Transmission ratio between motor shaft and machine shaft (calculation formula see instruction manual!) **The transmission ratio should be determined and indicated as precisely as possible!**		40000	150	1000	

Parameters	Designation	Unit	Max	Min	Preset	Ind.
280 kd1	Delay time output M1	ms	5000	0	0	
281 kt1	ON period output M1	ms	5000	0	100	
282 kd2	Delay time output M2	ms	5000	0	100	
283 kt2	ON period output M2	ms	5000	0	100	
284 kd3	Delay time output M3	ms	5000	0	200	
285 kt3	ON period output M3	ms	5000	0	100	
286 kd4	Delay time output M4	ms	5000	0	300	
287 kt4	ON period output M4	ms	5000	0	100	
288 kdF	Delay time until sewing foot On	ms	5000	0	380	
290 FAm	Selection of machine specific **mode** 0 = **Lockstitch:** (FA1, FA2, FA3, FA1+FA2): e.g. BrotherDürkopp Adler, Mitsubishi, Pfaff, Toyota 2 = **Lockstitch:** e.g. Singer (212 UTT) 3 = **Lock stitch (medium duty, general):** e.g. Dürkopp Adler, Juki, Pfaff, Sunstar, Golden Wheel 4 = **Chainstitch** Union Special 34000, 36200 5 = **Chainstitch general:** M1, M2, M3 and M4 parallel sequence 6 = **Chainstitch** with **tape cutter** and **Fast scissors** and **M1 / M2** at the seam end 7 = **Overlook** 8 = **Backlatch:** Pegasus 9 = **Backlatch:** Yamato 10 = Union Special Lockstitch (63900AMZ) 14 = **Lockstitch:** Juki (5550-6, 5550-7) 17 = **Chainstitch:** Pegasus Stitchlock 25 = **Lockstitch:** Juki (LU2210/LU2260) 37 = **Union Special Bag Machine** 38 = **Lockstitch:** HonYu Klasse HY-4410 53 = **Lockstitch:** Juki (LU2810-6) 55 = **Chainstitch with UTQ:** Yamato 56 = **Strobe**l replacement St220 as mode 5 with end backtack 57 = **Lock stitch:**Typical Kl. TW1-591 snaplock 58 = **Lockstitch:** Juki PLC 2760 59 = **Lockstitch:** DA class 768 60 = **Lockstitch:** Typical class 1245 61 = **Lockstitch:** Kaiser class 570/590 62 = **Lockstitch:** Typical/Mauser Klasse 335 63 = **Lockstitch:** Juki DNU 1541-7 65 = **Chainstitch:** Sagitta 66 = **Chainstitch:** Strobel VTD 410EV 67 = **Chainstitch:** Hengtai MP500 68 = **Lockstitch:** Typical/Mauser Klasse 333 69 = **Lockstitch:** Juki class 1760 Other modes are selectable, however have the same functions as mode 0.		30	0	0	B B B B B B B B B B B B B C C D
297 mSO	**Custom signal** 0 =Function Off1 = Signal is switched on whenever the light barrier is uncovered (Pa.131 =1) or covered (Pa 131 =0) 2 =Signal is switched on whenever the light barrier is covered (Pa.131 =1) or uncovered (Pa 131 =0) 3 =Signal switches on from the light barrier to the seam end.		3	0	0	
328 ob	Changing function keys on the control panel 0 = All keys are locked 1 = All keys are released, key **E** + start backtack, key + end backtack (except mode 7)		6	0	1	

		2 = All keys are released, button **E** affects chain suction, button + impacts tape cutter (only in mode 7) 3 = Button E and button + no function 4 = 4 = Button E, + and – no function 5 = Button E affects soft start, button + impacts tape cutter and wiper 6 = Button E affects soft start, button + impacts tape cutter seat start /end					
340	1L	Lower switching threshold of input IN1	%	100	0	30	
341	1L	Upper switching threshold of input IN1	%	100	0	80	
342	2L	Lower switching threshold of input IN2	%	100	0	30	
343	2h	Upper switching threshold of input IN2	%	100	0	80	
344	3L	Lower switching threshold of input IN3	%	100	0	30	
345	3h	Upper switching threshold of input IN3	%	100	0	80	
346	4L	Lower switching threshold of input IN4	%	100	0	30	
347	4h	Upper switching threshold of input IN4	%	100	0	80	
348	5L	Lower switching threshold of input IN5	%	100	0	30	
349	5h	Upper switching threshold of input IN5	%	100	0	80	
350	6L	Lower switching threshold of input IN6	%	100	0	30	
351	6h	Upper switching threshold of input IN6	%	100	0	80	
352	7L	Lower switching threshold of input IN7	%	100	0	30	
353	7h	Upper switching threshold of input IN7	%	100	0	80	
360	11L	Lower switching threshold of input LSM	%	100	0	50	
361	11h	Upper switching threshold of input LSM	%	100	0	70	
362	15V	Switch +5V/+15V on B18 0 = +5V 1 = +15V		1	0	0	
363	Evr	Ratchet mech. Interlock on /off (F-290 = 58)	1	0	0		B
364	EWi	Ratcheting bracket mech. Interlock (F290 =58)	Degrees	100	0	10	B
365	K4S	Switching Strobel class (F-290 =56) 0 = Standard Strobel machines 1 = Class 45 2 = VEB100-7 band cutter fixture		2	0	0	B
370	n2	Direct input of maximum speed	RPM	F-111	F-121	Display	
374	nrd	Reset speed	rpm	390	70	100	B
377	tFl	Time monitoring foot lifting	sec	250	0	0	B
400	rSt	Reset to mode 5 if <> 93	255		93	B	400 rSt
401	EEP	Immediate storage of all changed data - Input code number 3112 after power On - Press the E key - -Input parameter 401 - Press the E key - Set display from 0 to 1 - Press the E or P key - All data are stored		1	0	0	
467	MOT	Selection of motor 1 = Efka, DC1500 2 = Efka, DC1550 3 = Efka, DC1200 ; 4 = Efka, DC1250 5 = Quick, QE3760 (Quick Rotan) 6 = Quick, QE5540 (Quick Rotan) 7 = - 8 = - 9 = Efka, DC1210 10 =Efka DC1230		2	1	1	
500	Sir	Recall of Fast Installation Routine (SIR) (see chapter “Fast Installation Routine (SIR)”					
510		Transfer parameter settings from control to Memory Stick					
511		Transfer parameter settings from Memory Stick to control					
512		Compare control and Memory Stick parameter settings					
513		Delete parameter setting file from Memory Stick					
527		Transfer control software from Memory Stick to control					

Parameters		Designation	Unit	Max	Min	Preset	Ind.
550	in12	Selection of input function on socket B22/3 for input 12 0 = No function		42	0	0	

		All other functions of the keys as with parameter 240					
551	in13	Selection of input function on socket B22/4 for input 13 0 = No function All other functions of the keys as with parameter 240		42	0	0	
552	12L	Lower switching threshold of input IN12	%	100	0	30	
553	12h	Upper switching threshold of input IN12	%	100	0	80	
554	13L	Lower switching threshold of input IN13	%	100	0	30	
555	13h	Upper switching threshold of input IN13	%	100	0	80	
939	EnF	Storage for threading function F-290 =66		1	0	0	C

12 Error Displays

On the control	Signification
General Information	
A1	Pedal not in neutral position when turning the machine on
A2	Machine run blockage
A3	Reference position is not set
A6	Light barrier monitoring
A7	Bobbin thread monitor
A9	No thread trimming mode available in parameter 290
A10	Security code missing
A11	High lift foot for walking - measurement of the potis not permitted
A12	The maximum speed configured cannot be reached at this transmission ratio
A500	Max. number of files (99) on Memory Stick exceeded
A501	File not found on Memory Stick
A503	Data on Memory Stick and in the control is not equal
C1	Operating hours counter has reached or exceeded the service time
C2	Fatal exception error
C3	Program error
C4	C4-001 10h test runs have elapsed, release missing
USB error	
D1	USB Info
Programming Functions and Values (Parameters)	
Returns to 0000 or to last parameter number	Wrong code or parameter number input
Serious Condition	
E1	The external pulse encoder e.g. IPG... is defective or not connected
E2	Line voltage too low, or time between power Off and power On too short
E3	Machine blocked or does not reach the desired speed
E4	Control disturbed by deficient grounding or loose contact
E5	Motor end level over-temperature
E7	24 V power supply unit overload
E8	Too much data for the EEPROM or flash memory
E9	EEPROM or flash memory defective.
E10	End phase transistor short circuit(Output FL, VR, M1, M2, M3, oder M4)
E11	Thermal overload of output stage transistor
E12	Short-circuit on output M5
E13	Thread trimmer does not reach the end position
E14	Power voltage too high: The power voltage is greater than 290 V eff. (The DC motor cannot be started; if running, the motor is stopped without positioning. The motor is passively braked (runs down)!
E15	Internal communications error with intermediate circuit
E16	Power voltage too low: The power feed voltage was less than 120 V eff. (The DC motor cannot be started, and the 24 V is turned off.)
E17	Charging PTC too warm. The intermediate circuit could not be charged to the voltage needed. Possible cause: Switching the controller on/off to many times within a short time. Correction: Turn off controller and allow it to cool. (The duration of the cooling off phase depends on the ambient conditions and can take several minutes).

E18	Intermediate circuit voltage greater than 450 V, braking resistance possibly failed
E19	No motor connected, inverter defective, motor phase failed
E20	Speed too high
E21	Error in the 5 V power supply
E22	EB401: Analog value outside the range

Programming and Data Transfer	
F1	Parameter unavailable; wrong code number
F7	RS232 Time out
F8	RS232, error in data transfer, NAK received
Hardware Disturbance	
H1	Commutation transmitter cord or frequency converter disturbed
H2	Processor disturbed

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