EcoDrive

QE3760/QE5540

CE

Type

DA104ED

Instruction manual

Part 2

QUICK-ROTAN Elektromotoren GmbH
Königstraße 154
67655 Kaiserslautern, Germany
Tel: +49 (0) 631 200 38 80
Fax: +49 (0) 631 200 38 62
E-mail: tech.supp@quick-rotan.com
www.quick-rotan.com

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Technical modifications reserved!

7. Description of the EcoDrive drive system

The EcoDrive drive system is an electronically commutated, brushless DC motor.

The drive system comprises the following main assemblies:

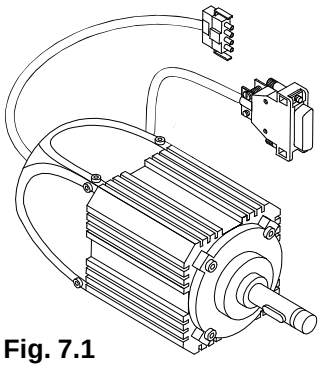


Fig. 7.1

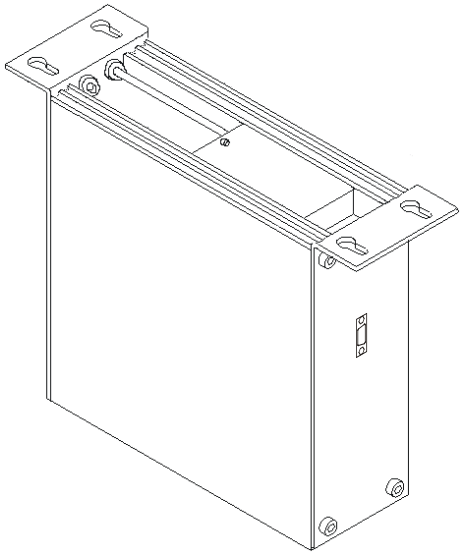


Fig. 7.2

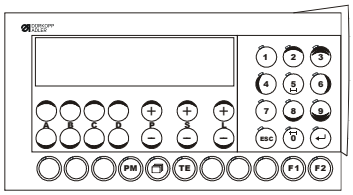


Fig. 7.3

Motor QE5540 (Fig. 7.1) with an integrated opto-electronic angular rotation sensor for commutation and positioning.

Control unit (Fig. 7.2) with
- mains connection with interference suppression circuit
- electronically controlled switched mode power supply (SMPS)
- d.c. link
- motor-guided inverter
- control electronics for the motor control unit and machine-specific functions

EcoTop II control panel (Fig. 7.3) with card reader on the right side of the housing.

7.1 QE5540 motor

The motor is a synchronous motor. It has a permanent-magnet rotor, an opto-electronic commutation transmitter (rotor position sensor) that is mounted on the fan side, and a stator with three-phase winding.
The rated output of the motor (shaft output) is 550W (QE5540) in S5 mode. The rated speed of the motor is 4000 rpm (QE5540), the maximum speed is 4500 rpm.

The motor has two connection cables
a) four-conductor with four-contact AMP special plug (X1) for connecting the stator windings to the control system
b) six-conductor shielded with nine-contact D-sub connector (X2) for connecting the commutation transmitter to the control system.

7.2 DA104ED control unit

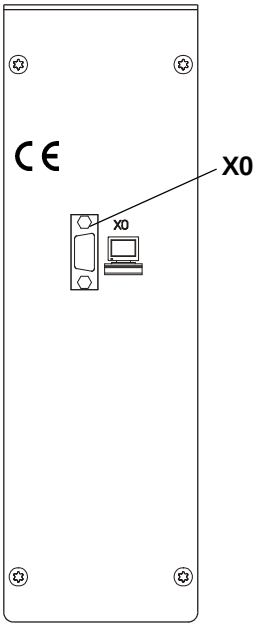


Fig. 7.5

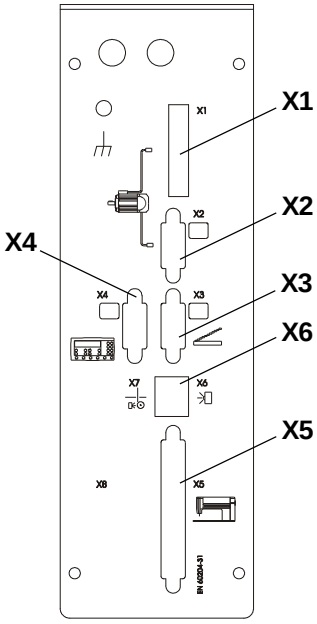


Fig. 7.6

The control system casing is suspended from below and screwed to the table top with four screws which are included with delivery.

The mains connection is single-phase via the three-conductor cable exiting from the back.

The control unit has peripheral function controls

on the front (Fig. 7.5):

X0 9-contact D-sub socket for data transfer

on the back (Fig. 7.6):

the connection sockets and plugs

X1 four-contact socket for connecting the stator windings of the motor

X2 nine-contact D-sub socket for connecting the incremental encoder of the motor

X3 nine-contact D-sub connector for connecting the speed control unit SCU2

X4 nine-contact D-sub connector for connecting the PicoTop control panel

X5 37-contact D-sub socket for connecting process controls (keys, switches, magnets, solenoid valves) to the machine

X6 six-contact Western socket for connecting a light barrier.

7.3 External EcoTop II control panel

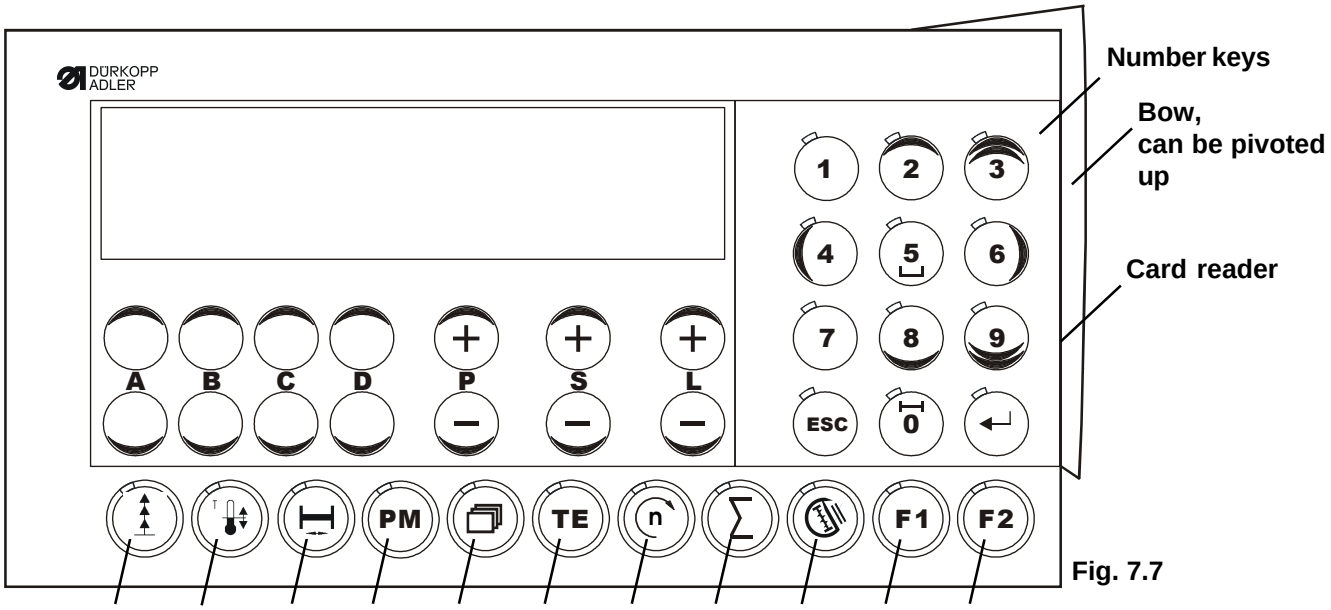


Fig. 7.7

The **EcoTop II** control panel (**Fig. 7.7**) has the following components:

- a **two-line display** with 16-digit LCD matrix
- an integrated **card reader** for SD memory card that is located on the right-hand side under a **bow** that can be pivoted up.
- **7** setting ranges: **A+ / A-, B+ / B-, C+ / C-, D+ / D-, P+ / P-, S+ / S-, L+ / L-**
- an **ESC key** to cancel entries and actions
- an **enter key** for confirming entries and actions
- **11** keys **(T1...T11)** for machine functions

Function of keys T1 … T8 for machine functions

- **T1** soft start (on / off)
- **T2** preheating (t-heat), if switched on + / - with key A
- **T3** acknowledgement for error 8 for bobbin and seam counters
- **T4** **PM key** seam programs on/off (operated with variable sewing speed).
- **T5** **page key** for changing the type of function e.g. backtack stitches, parameter values and speed.
- **T6** **TE key** for switching on the „Changing set values“ mode e.g. backtack stitches and parameter values.
- **T7** Speed change
- **T8** Totals of daily or seam counters
- **T9** quick access to parameter <942> for Release lower thread clamp
- **T10** **function key F1** for seam interruption
- **T11** function key F2, currently unallocated.

The **T1**to **T11 keys** and the **number keys** each have a signal light (**LED**).

Each **LED** gives an optical response regarding the switch status of the function allocated to the respective key.

If the function is **switched on**, **the LED** lights up! 

If the function is **switched off**, then the LED **is off!** 

7.4 Start-up the machine / control for the first time

1) Switch on the machine.

2) Display on the control panel is „PULLEY“
The transmission ratio must be learned.
Press the right pedal to lowering the clamps and start the machine with the left pedal.
The machine runs with reduced speed into the home position (see chap. 10.2).

3) Adjust the reference position with parameter <700>.
To adjust the parameters the provided sd-card must be inserted into the control panel (see chap. 8.11).
Therefor the level „C“ must be activated (see chap. 9).

The reference position from machine class 506-3 is „needle point into needle plate“.
- Press shortly left pedal
- With the hand wheel from the machine in rotating direction, bring the needle point into the needle plate
- Press shortly left pedal
- Press TE-key to leave the programming level (see also chap. 10.1).
- Display on the control panel is: ERROR 7

Press the right pedal to lowering the clamps and start the machine with the left pedal.
The machine runs with reduced speed into the home position.

The Stop-position at seam end is:
Thread take-up lever in the „upper position“ and the ejection of the bobbin must be possible.
If necessary with parameter <700> or <703> readjust the position at seam end.

4) Cam disk adjustment.
In delivery status of the control box the cam disk 9 with 84 stitches is preselected.
With parameter <821> you can select the correct cam disk (see chap. 8.4).

If it is not the correct cam disk adjusted, than following procedure:
- if the inserted cam disk has 116 stitches for example (or more than 84 stitches):
The machine runs with preselected speed, up to 84 stitches further with slow speed till the home position is reached.

- If the inserted cam disk has 72 stitches for example (less than 84 stitches):
The machine runs with preselected speed till the home position is reached.
The threads eventually will not be cutted from the burner at seam end.

8. Application

This **EcoDrive drive system** can **only be operated with an external EcoTop II** control panel.

Maximum speed
The maximum speed is set with the **EcoTop II** control panel using parameter <607>.

8.1 Speed menu

What is shown on the display (**Fig. 8.1**)

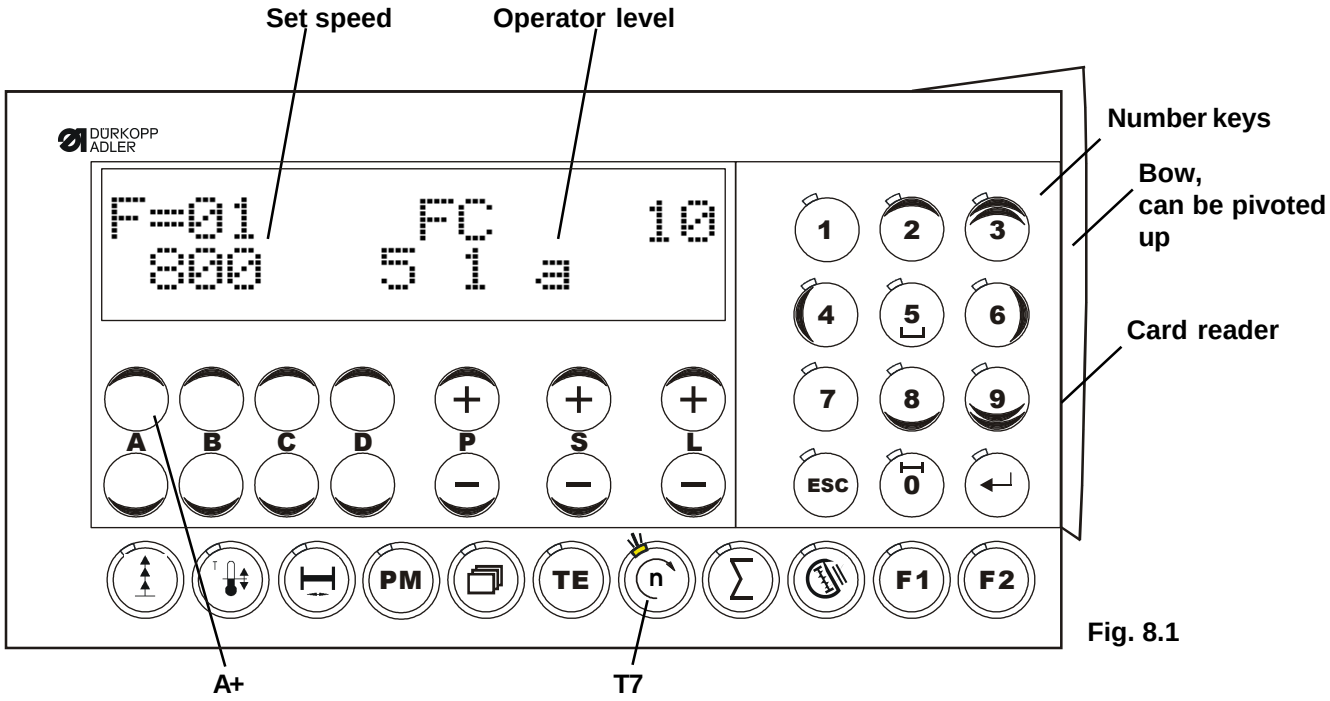


Fig. 8.1

Speed setting is only possible when the machine is at standstill:

Press **key T7**, **LED lights up**

with button **L +** (**increase**)

or

button **L -** (**decrease**)

Press **key T7**, **LED goes out**.

8.2 Heating duration in seconds menu

With the **paging** function (**T5**) on/active, use **P+** to reach the "**Heating duration**" menu.

What is shown on the display (**Fig. 8.2**)

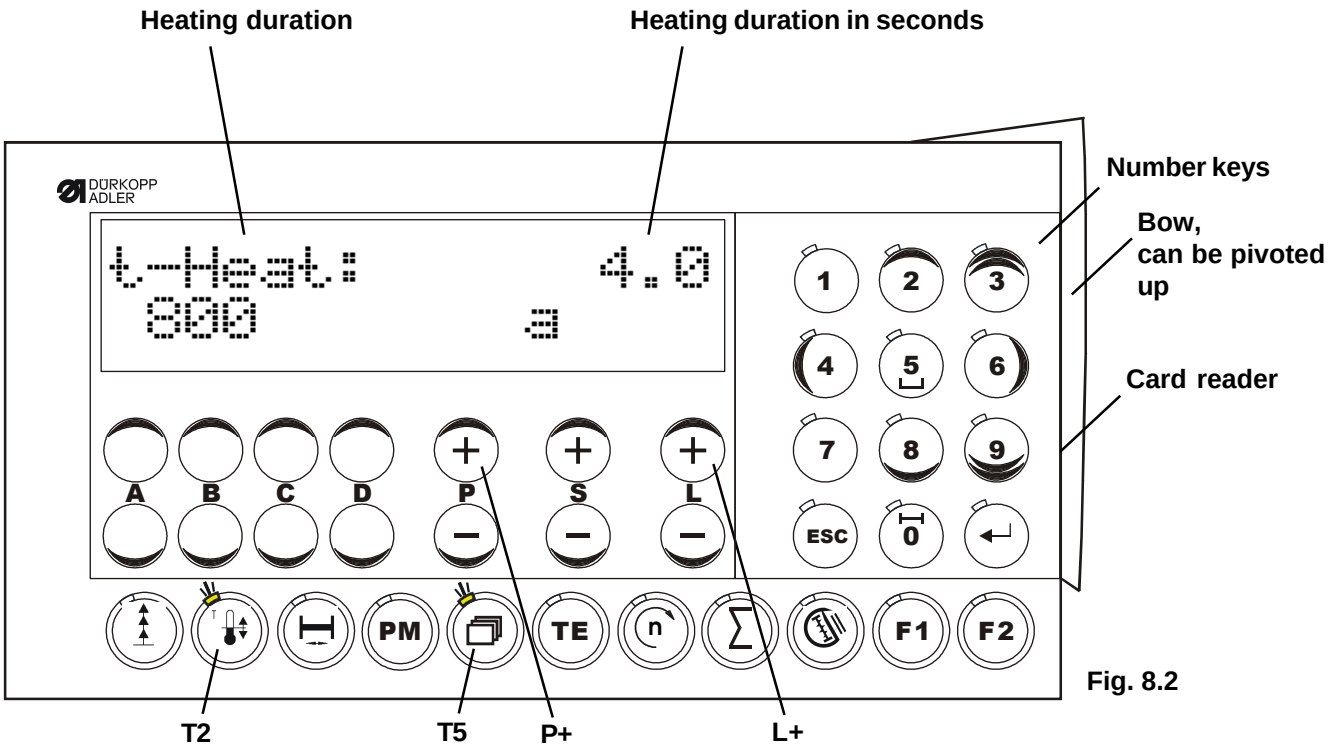


Fig. 8.2

Setting the **heating duration** in seconds is only possible when the machine is at standstill:

Press **key T2**, **LED lights up,** pre-heating on

with button **L +** (**increase**)

or

button **L -** (**decrease**)

Press **key T2**, **LED goes out**, pre-heating off.

8.3 Bobbin thread counter menu

With the **paging** function (**T5**) on/active, use **P+** to reach the "**Bobbin thread counter**" menu.

What is shown on the display (**Fig. 8.3**)

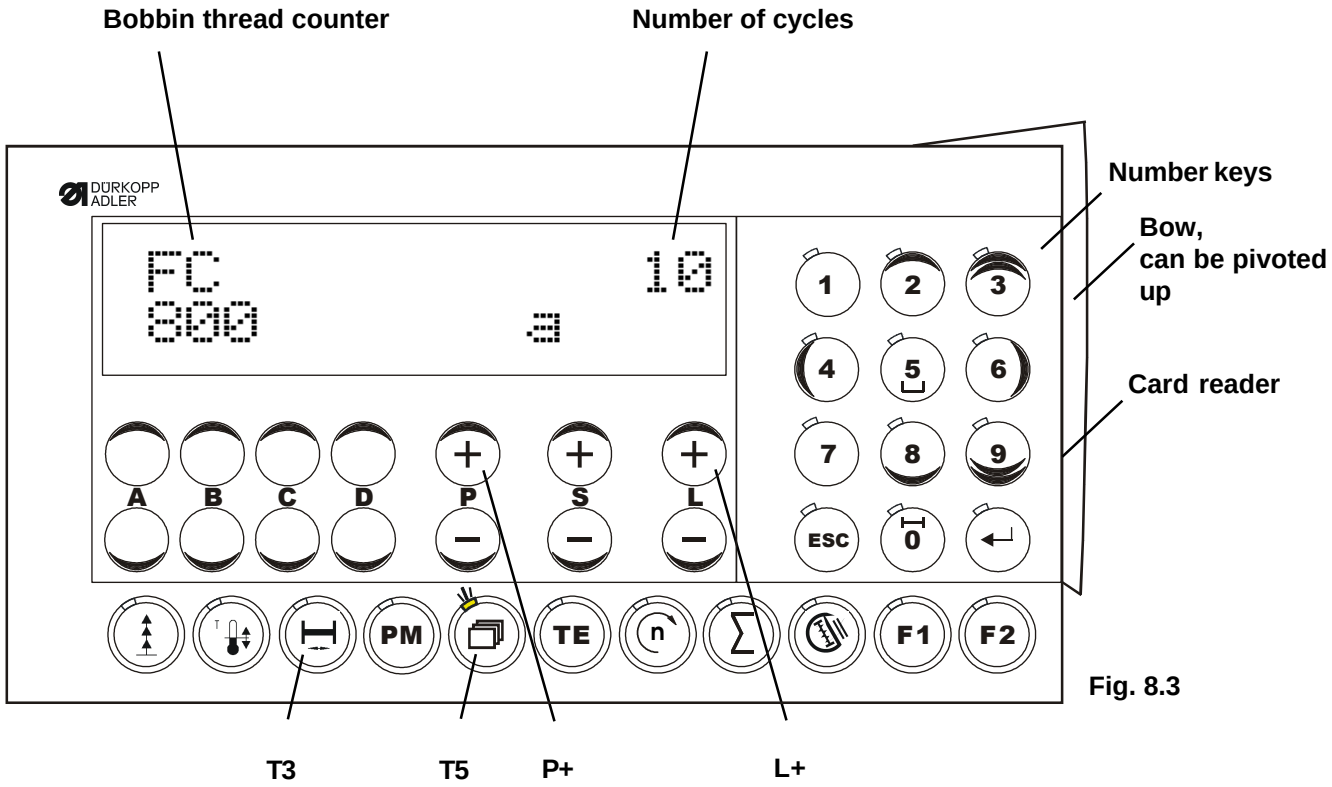


Fig. 8.3

Setting the **number of cycles** is only possible when the machine is at standstill:

with button **L + increase** the number of cycles

or

button **L - decrease** the number of cycles

Note:

1) With Error 8, confirmation is made using the **T3 key** or **S3 key** (bobbin changeover) on the machine

2) Bobbin changeover without **Error 8**:
With the **T3 key** bobbin thread reset
or
close the bobbin door and use the **S3 key** (bobbin changeover) at the machine.

8.4 Curve and seam pattern menu

With the **paging** on/active, use **P+** to reach the "**Curve and seam pattern**" menu.

What is shown on the display (**Fig. 8.4**)

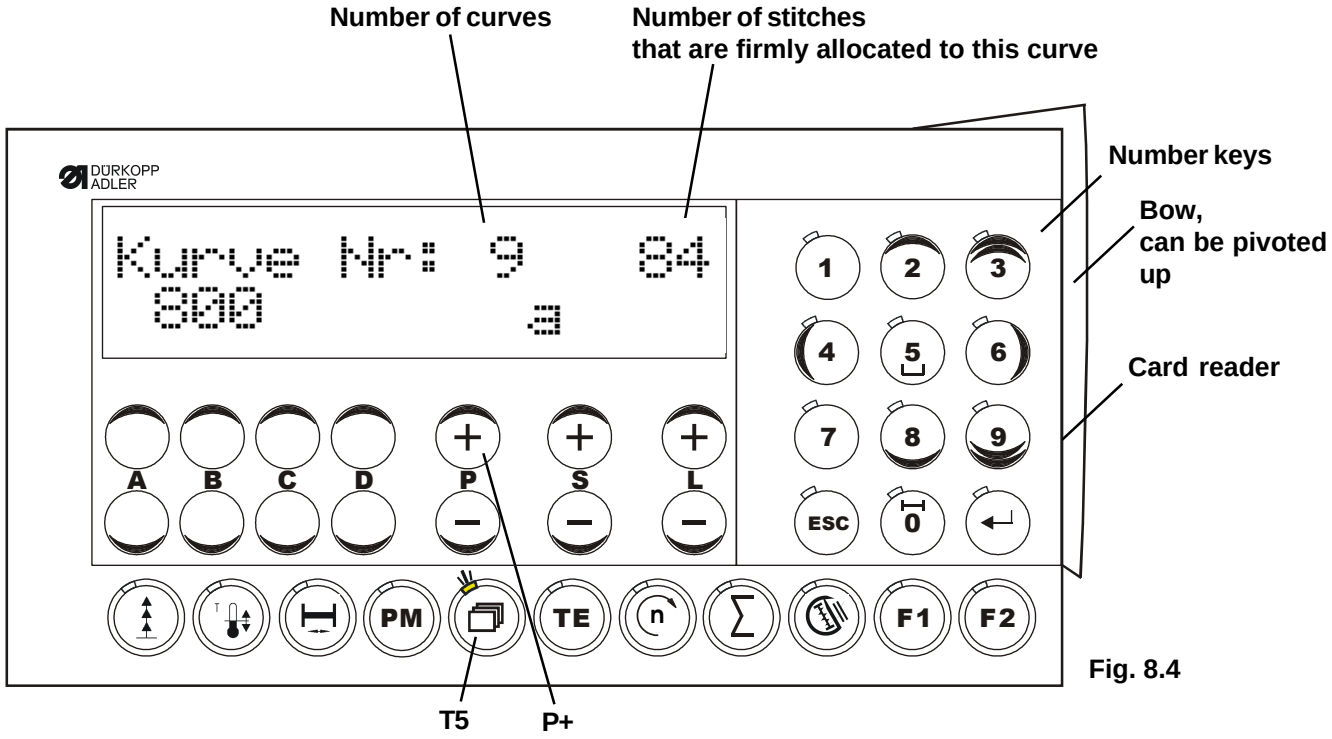


Fig. 8.4

Setting the **number of curves** is only possible when the machine is at standstill.

The desired **curves** are **selected** using **parameter** <**821**>, which is located on the **parameter level** "**c**" (**see** Setting parameters **Chp. 9.3**).

Curve No. 1 to **No. 12** are available.

In **parameter** <**821**> the **number of stitches** allocated **to the curves**:

1 = **14** stitches
2 = **21** stitches
3 = **24** stitches
4 = **29** stitches
5 = **36** stitches
6 = **42** stitches
7 = **58** stitches
8 = **72** stitches
9 = **84** stitches (default)
10 = **116** stitches
11 = **144** stitches
12 = **168** stitches

Note:
The displayed number of stitches allocated to the curve are predetermined and cannot be altered.

8.5 Entering soft stitches

This function is switched on by pressing the **T1 soft stitches key**;
the LED for this key lights up.

What is shown on the display (**Fig. 8.5**)

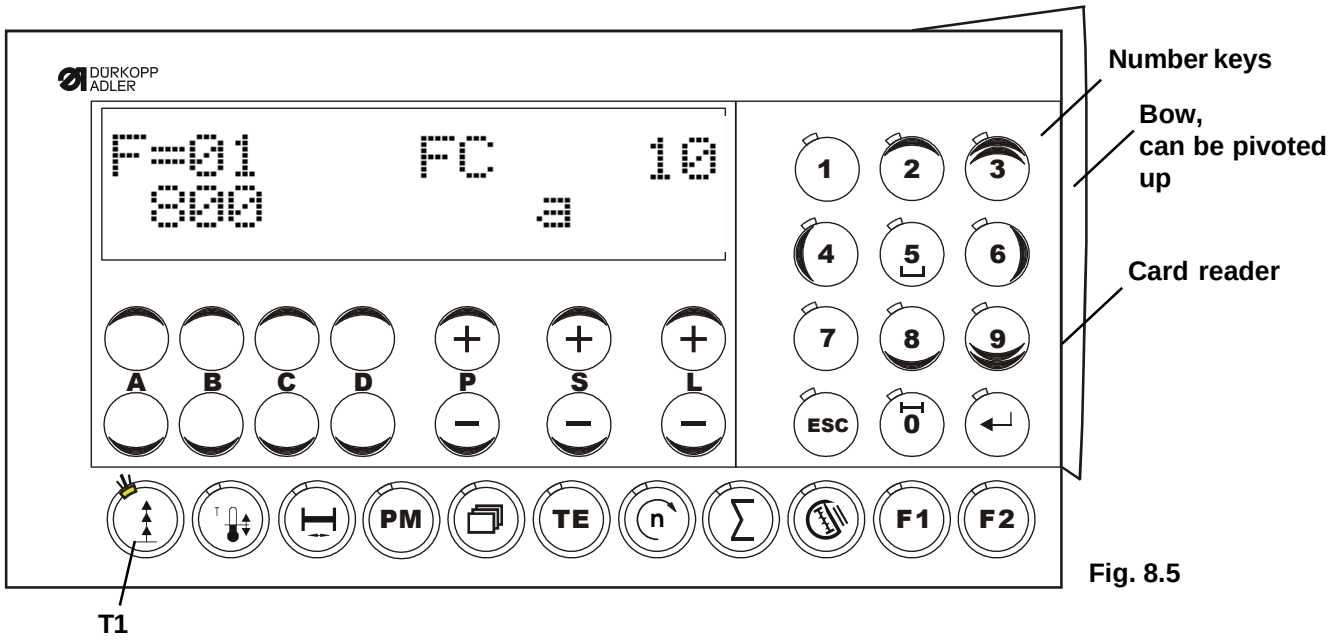


Fig. 8.5

The **number of soft stitches** is set with **parameter** <**116**>.

This function is switched off by pressing the **T1 soft stitches** key again;
the LED for this key goes out.

8.6 Display the totals of the daily/seam counter

This function is switched on by pressing the **T8 totals of daily/seam counters**; the LED for this key lights up.

What is shown on the display (**Fig. 8.6**)

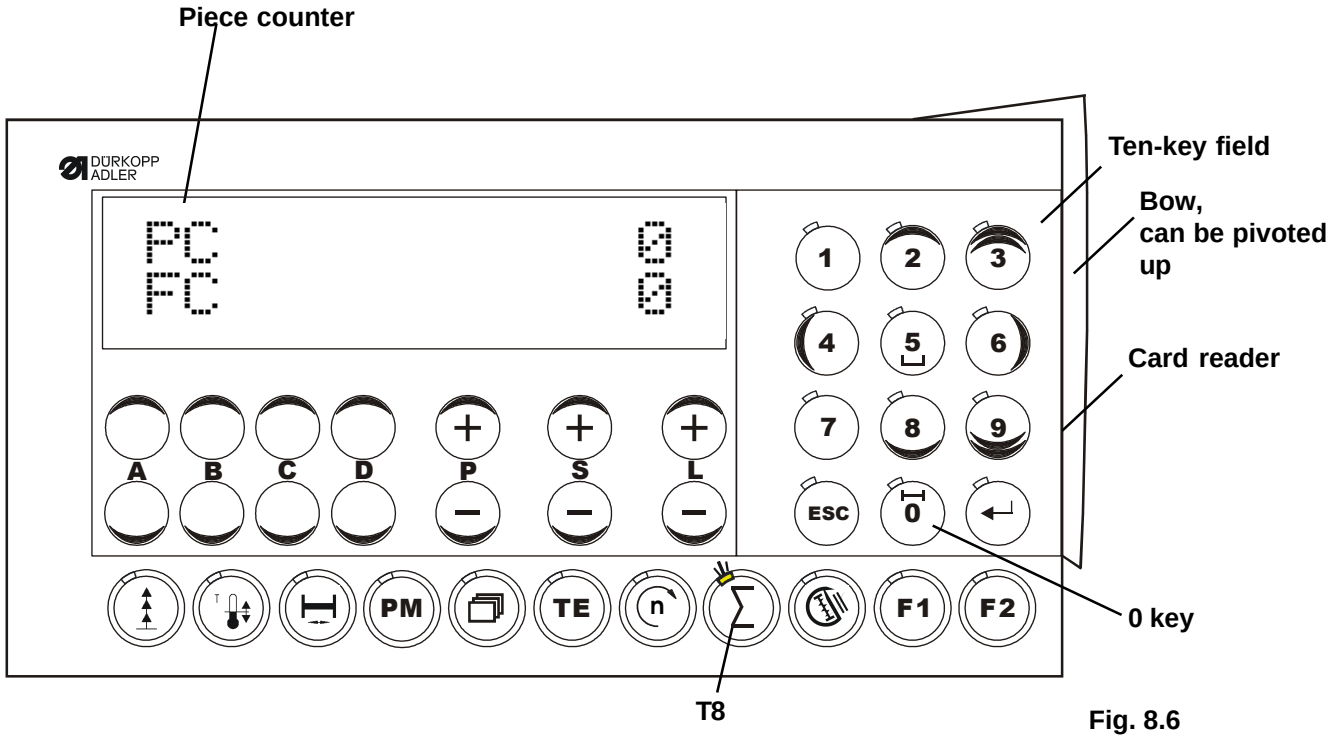


Fig. 8.6

This function is switched off by pressing the **T8 total of daily/seam counter** again; the LED for this key goes out.

The **daily/seam counter** (PC) is **reset** by pressing the **0 key** on the **ten-key field**.

8.7 Direct access to parameter <942> (angle of thread clamp)

This function is switched on by pressing the **T9 direct access to parameter 942 key**; the LED for this key lights up.

What is shown on the display (**Fig. 8.7**)

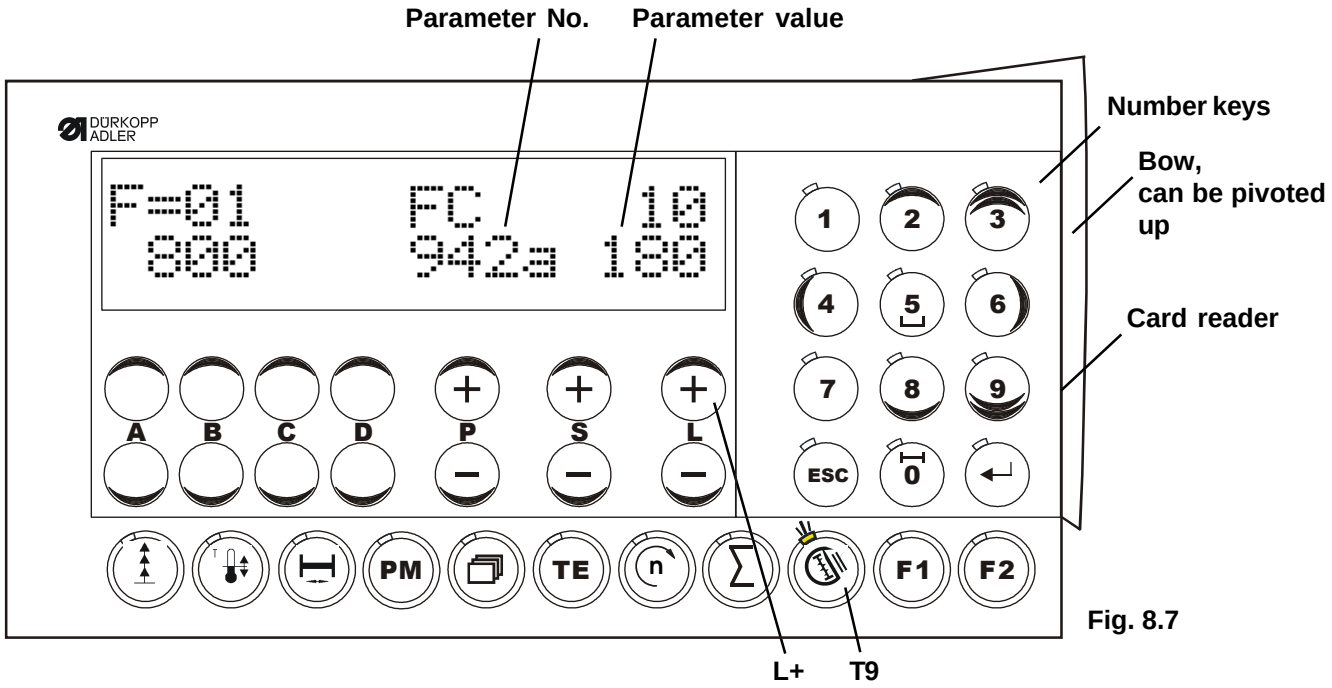


Fig. 8.7

Setting **parameter 942** is only possible when the machine is at standstill:

with button **L +** to **increase** the parameter value

or

button **L -** to **decrease** the parameter value

This function is switched off by pressing the **T9 direct access to parameter 942** key; the LED for this key goes out.

8.8 Interrupt seam by raising clamp without variable sewing speed

This function is switched on by pressing the **F1 key**; the LED for this key lights up.
The stitches set with **parameter <102>** can now be sewn; this is followed by a stop and the clamp lifts according to the mode that was preset with **parameter <424>**.
With the left pedal you can lower the clamps, the start will following automatically.

What is shown on the display (**Fig. 8.8**)

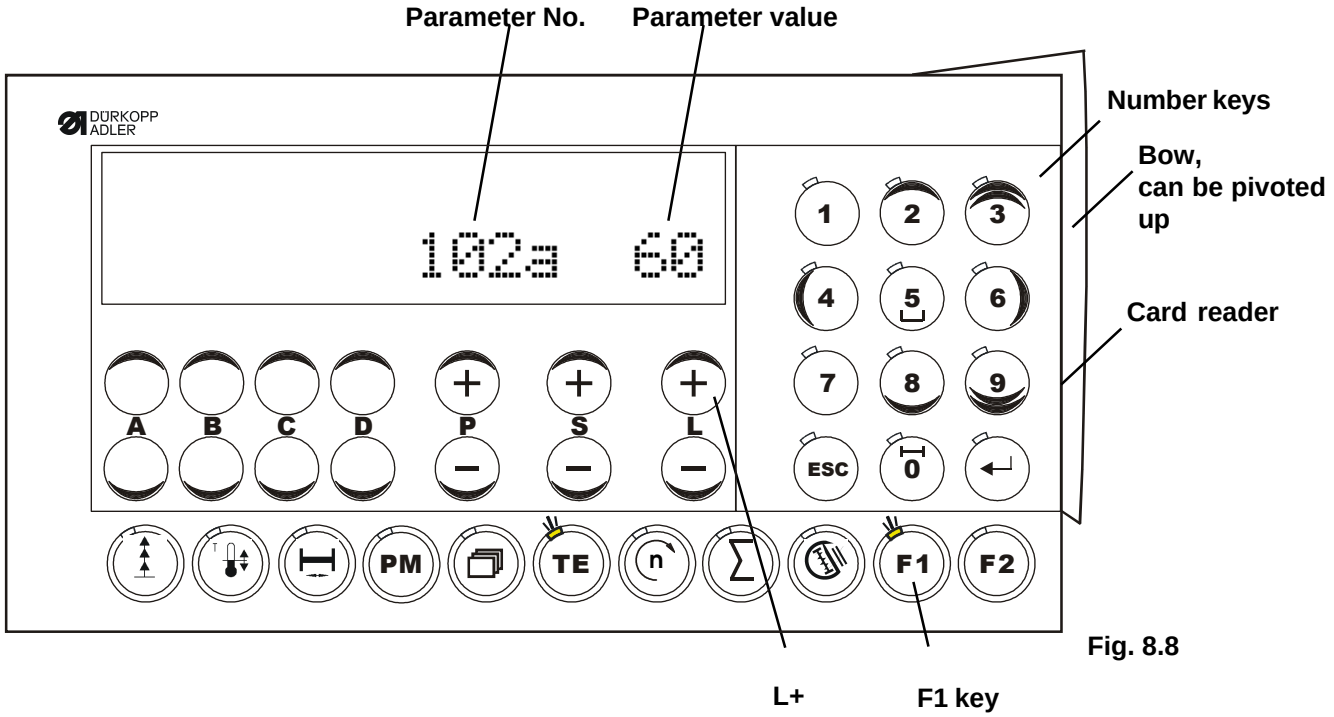


Fig. 8.8

Press the **TE key** to set **parameter <102>**; the LED lights up.
Parameter <102> is displayed and can be set as follows:

Parameter <102> can only be set when the machine is at standstill:

With button **L +** to **increase** the stitches (parameter value)

or

button **L -** to **decrease** the stitches (parameter value)

The “type of clamp lifting” can be set with **parameter <424>**,
1 = clamp left and right
2 = clamp left
3 = clamp right
4 = no clamp

See also Chp. 11.4, Parameter list, in section 3 of the operating manual.

To end parameter entry, press the **TE key** again; the LED goes out.

This function is switched off by pressing the **F1 key** again; the LED for this key goes out.

8.9 Interrupt seam with/without raising clamp with variable sewing speed

This function is switched on by pressing the **PM key**; the LED for this key lights up.
The display shows the **sewing speed**, the **number of sections, the selected sewing program** and the **current section**.
Teach in mode is started by then pressing the **TE key**.

What is shown on the display (**Fig. 8.9**)

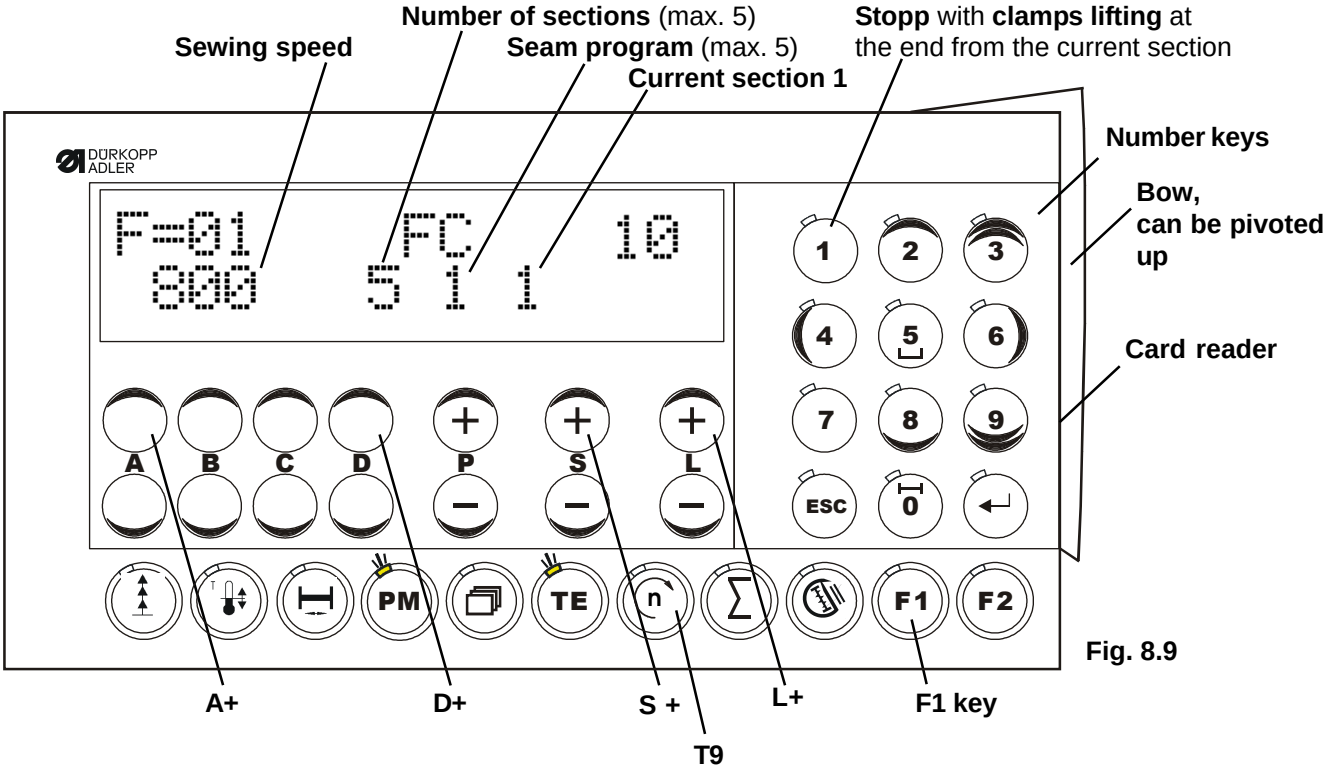


Fig. 8.9

Procedure:
Press the **PM key**,
the display then shows the **sewing speed**, the **number of sections, the selected seam program** and the **current section**.
Press the **TE key** to start **teach in mode**; the LED for the **TE key** flashes!
Select the number of sections (**1 - 5** possible) using the **D+** / **D-** key (only possible in teach in mode).

The program is selected using the **keys P+** / **P-** (this is possible in PM, sewing and teach in mode).

Sewing start
After lowering the clamp, hold the start treadle,
the machine runs at low speed.
On reaching the set stitch number for the section, release the treadle; the machine positions.
Switch to the next seam segment (section) using the **S+ key**; repeat the process for this seam section.
When home position is reached, the **teach in mode** is finished; the LED for the **TE key** goes out.
If necessary, the number of seam sections is corrected.
Because of the heating calculation, the entire clamp range must be sewn.
The heating is switched off during **teach in mode**.

Speeds
Activate speed mode by pressing the **T9 key** (LED lights up).
Select the section range with the **S+** / **S- key**.
Change the speed valid for this section using the **L+** / **L- key**.

Lift clamp
At the end of the section, the lift clamp function can be activated as under parameter <424>using the **1 key** (in the ten-key field).
Lowering the clamps with the left pedal, the machine will starting automatically.
This function is switched off by pressing the **PM key** again; the LED for this key goes out.

8.10 Treadle switch mode

The treadle switch mode can be selected with parameter 423.
Treadle switch mode 1 is set on delivery.

Mode 1
Both clamps are lowered together after pressing the right-hand treadle switch once.
Both clamps are raised again by pressing the right-hand treadle switch again.
When the clamps are lowered, the sewing process is started by pressing the left-hand treadle switch.

Mode 2
The left-hand clamp is lowered by pressing the left-hand treadle switch.
The right-hand clamp is lowered by pressing the right-hand treadle switch.
Only when one clamp half is lowered can it be raised again by pressing the corresponding treadle switch.
When both clamps are lowered, the sewing process is started by pressing the left-hand treadle switch.

Mode 3
The left-hand clamp is lowered by pressing the right-hand treadle switch.
The right-hand clamp is lowered by pressing the right-hand treadle switch again.
Both clamps are raised by pressing the right-hand treadle switch again.
When both clamps are lowered the sewing process is started by pressing the left-hand treadle switch.

8.11 Using the SD card

Note: All keys are **locked without** the SD card!
Exception: the **T3 key** (delete Error 8 bobbin counter) and **T5 key** (paging) remain active!

For this reason, before switching on the machine, the SD card must be inserted in the SD card slot on the control panel.
Precondition: The correct string (DA104ED.104) must be saved on the SD card.

Inserting the SD card:
Pivot the bow (**Fig. 8.11**) on the lower edge (see arrow) up.
This makes the SD card slot on the right accessible.
With the label on the SD card pointing forwards, carefully push the card into the SD card slot until the SD card noticeably clicks into place.

All keys are released again once the machine is switched on.
Access, e.g. to the parameters on the parameter level, is possible again.

Removing the SD card:
Pivot the bow (**Fig. 8.11**) on the lower edge (see arrow) up.
This makes the SD card slot on the right accessible.
Carefully press the SD card in a bit and release again.
The SD card is now unlocked and can be removed.
After switch on the machine without an SD card, all keys are **locked**,
exception: the **T3 key** and **T5 key**, for example: programing from the parameters is not possible!

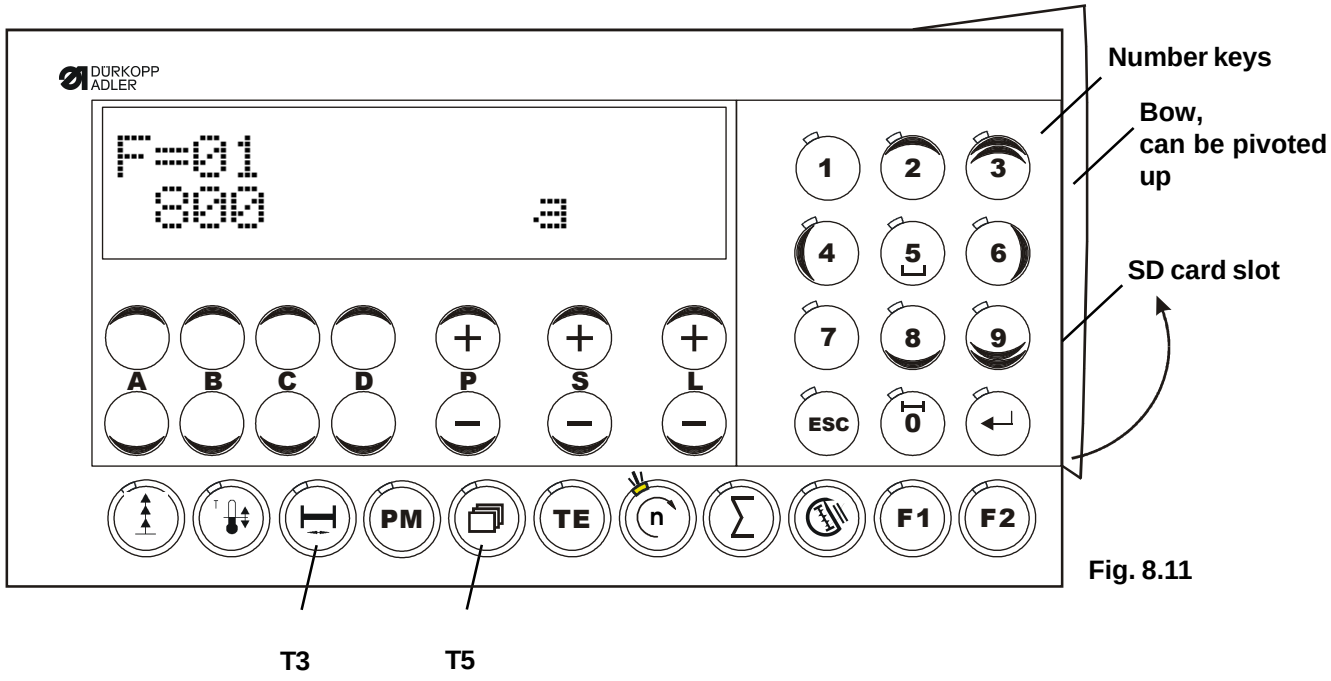
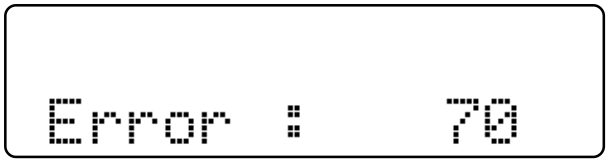


Fig. 8.11

8.12 Error messages (troubleshooting)

The drive control system carries out cyclical checks of its own functional capacity and the functional capacity of the entire drive system.

Malfunctions are shown via the external control panel display, **e.g.**.:



Summary of error numbers:

Error No.	Cause	Remedy
1	Treadle not at rest	Check the treadle
6	Clamp error reversible	Check air pressure, clamp limit switch and check treadle switch
7	Home position error	Check limit switch on cam
8	Bobbin error	Reset bobbin counter
9	Starting lock-out	Check limit switches on bobbin door, top cover and stop button
10	Wrong machine class	Check setting parameter <799> machine class
12	Section sensor	Check section sensor
17	Bobbin thread monitor	Check light barrier and if necessary clean, see also Dürkopp Adler manual
62	Short circuit on 24V (32V) direct voltage	Find and resolve short circuit. Switch drive system off and on again
63	Overload on 24V (32V) direct voltage, I > 4A.	Switch drive system off and on again Find consumer (magnet) that has caused the error. Reduce mark-space ratio of the magnet or replace magnet.
64	Mains voltage too low (U < 150V)	Have mains voltage checked.
65	Power electronics after switching on the mains switch not ready for operation.	Switch drive system off and on again; if error remains, then replace the control system.

Error No.	Cause	Remedy
66	Ground fault; motor or motor supply line has a protective earth short.	Replace motor.
68	Power electronics shut-down during operation because: a) Overcurrent or short circuit in motor b) Overvoltage, mains voltage > 300V Motor overloaded when braking c) Undervoltage	Remove cause
69	No increments	Replace motor and/or position sensor or control unit
70	Machine blocked, no increment from actual-value transmitter at maximum motor current.	Check machine for sluggishness or see Error 70
71	Actual-value transmitter not plugged in	Plug in actual-value transmitter
74	No external SYMA	Remove cause / PD3 missing
88	RAM defective	Replace control unit
173	Start-up error	Remove cause

9. Parameter programming

9.1 Programming level A (operator level)

At this level, the control parameters are programmed
that have a direct effect on the sewing process.

These are the parameters for the following functions:

- Soft start stitches speed parameter <117>

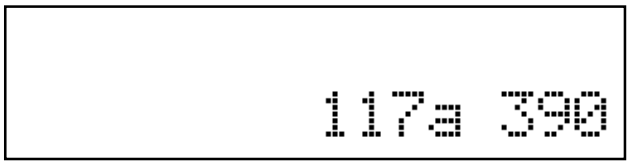
a) Switching programming level „a“ on

Mains switch on,
Drive system has not started

An „**a**“ appears on the display

Press the **T/E key**

Response:
T/E key lights up, the right-hand area of the display shows the first
parameter belonging to programming level „**a**“ (parameter number and parameter value)
Sewing is not possible



- Programming
  The parameter number is set with keys P+ or P- (hundreds in the parameter number) and keys S+ or S- (tens and ones of the parameter number). The parameter value is programmed with keys L+ or L-.

b) Switching programming level „a“ off

Press the T/E key

Response:
The T/E key goes dark, the starting display appears again.
Sewing is possible.

9.2 Programming level „b“ (mechanic level)

The control parameters which have to be altered or adjusted only exceptionally rarely or only for commissioning the drive system are programmed at this level.

a) Preparing to switch on programming level „b“

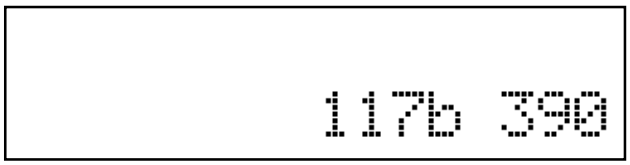
Turn off mains switch
Keep P/M and T/E keys pressed and
Switch on mains switch
Release keys

Response:
The letter „**b**“appears in the display
Sewing is possible

b) Switching programming level „b“ on

Press the T/E key (the LED lights up)

Response:
The right side of the display shows a parameter number (105 the first time, otherwise the last number that was activated) and the associated value.
Sewing is not possible.



Changing the parameter numbers:
Hundreds of the parameter number using the keys P+ or P-
Tens and ones of the parameter number using keys S+ or S-

Changing the parameter value:
using keys L+ or L-

c) Switching programming level „b“ off

Press the T/E key (the LED goes off)

Response:
The parameter display disappears and the starting display appears again
Sewing is possible.

9.3 Programming level „c“ (special level)

Attention!

The control parameters that only have to have their values changed in exceptional cases are stored at this level. This parameter may therefore only be corrected following consultation with the manufacturer.

Switching programming level „c“ on

a) Switch on programming level „**b**“ (see 9.2)

b) Call up parameters 798

c) Activate parameter value <798> = 1

d) Switch off mains switch, wait > 2 s

e) Switch on mains switch again

f) Press the T/E key (the LED lights up)

Response:
The right side of the display shows the first parameter of programming level C.
The letter „**c**“ appears on the display.

Other parameter numbers are called up and the parameter values are corrected in a similar way to that described for programming levels „**a**“ and „**b**“.

Switching programming level „c“ off

- Press the T/E key (the LED goes out)
- Switch off mains switch.

9.4 Resetting (-RESET-)

a) Resetting the parameter values (MASTER-RESET1)

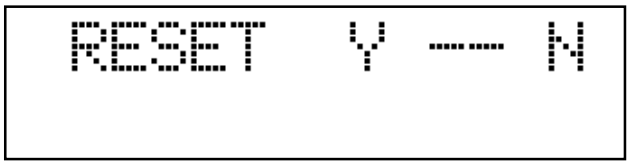
All parameter values which have been altered from their status on delivery (standard value) will be reset by this procedure to their standard value again.

Exceptions: Parameters 700, 799, 800 and some other parameters in the parameter list (section 3) marked with a „✱“ remain unaltered!
The values programmed by the user for these parameters remain the same even after carrying out a -reset-.

-RESET- procedure:

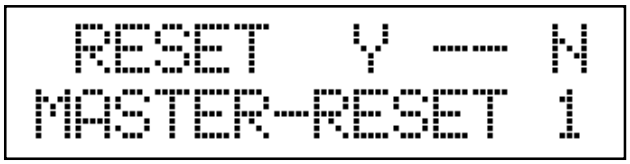
- Switch off mains switch
- Press keys P+ and L+ simultaneously and hold pressed
- Switch on mains switch
- Hold the two keys pressed until „RESET Y — N“ appears on the display, then release the keys.

Response: What appears on the display

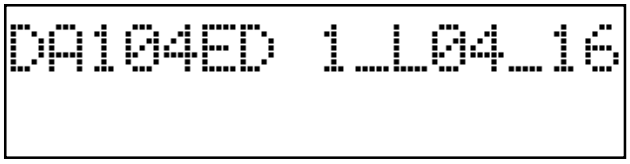


Now the reset function (-RESET-) can be carried out.
The P+ key is located beneath the Y (yes) display.
-RESET- is started by pressing the P+ key.
-RESET- is cancelled by pressing the L+ key!

After starting the -RESET- by pressing the P+ key, the following appears briefly on the display:



The the display shows the switch-on display for approx. 2 s,
for example:



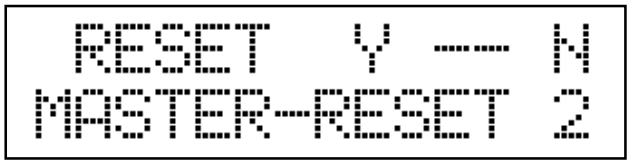
Then the display corresponding to the switched-on work mode, e.g.:

b) Resetting the sewing programs (MASTER-RESET 2)

The procedure for **RESETTING** the **sewing programs** is the same as under **a)**.

In order to reset the sewing program data to the starting values, first press the **T1** key and hold pressed, now press the **P+** key.

After RESET, the following appears briefly on the display:

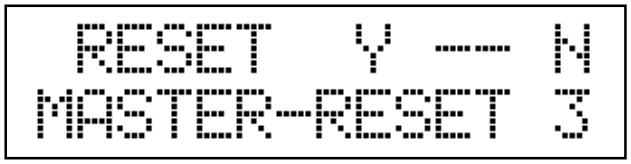


c) Resetting the parameter values and the sewing programs (MASTER-RESET 3)

The procedure for **RESETTING** the **parameter values including the sewing program data** is exactly the same as described under **a)** and **b)**.

In order to reset the parameter data and the sewing programs to the starting values, first press the **T3** key and hold pressed, now press the **P+** key.

After RESET, the following appears briefly on the display:



d) Resetting all variables to defined values (COLDSTART)

The procedure of **RESETTING** for the **COLDSTART** is exactly the same as described under **a), b)** and **b)**.

To execute a **COLDSTART**, first press the **5 number key** and hold pressed, now press the **P+** key.

After RESET, the following appears briefly on the display:

10. Commissioning

If the **EcoDrive** has been stored at temperatures <+5°C, it must be brought up to an operating temperature between +5°C to +45°C before commissioning.
There must be absolutely no moisture!

Before you can work with the machine, carry out the following:

a) Check the direction of rotation and the reference position of the needle bar
b) Check the needle positions
c) Check the maximum speed
d) If necessary, carry out the gear ratio teach process (see Chp.10.2).

10.1 Checking the direction of rotation and the reference position of the needle bar (needle position NP0)

a) Switch on programming level „**b**“ (mechanic level) (see Chp. 9.2. Programming level „**b**“).
b) Call up parameter 700
c) Press treadle forwards
   Response: Machine starts up and positions to a non-specified position
d) Is the direction of rotation correct?
   If yes, carry out the zero point adjustment, continue with e)
   If no, then set parameter number 800 and switch on value <800> (*0 → *1 or *1 → *0), then continue with b)
e) Turn the handwheel on the machine in the direction of movement until the **needle point (approaching from above)** reaches the level of the needle plate (= reference position).
f) Press treadle forwards
   Response: Machine makes one revolution and positions to the same position as was previously set by hand.
g) Set new parameter number or switch off programming level „**b**“; parameter value <700> is saved, the zero point adjustment is concluded.

Correct assembly of the timing belt (see Chp. 6.2 in Section 1) will mean that the zero position (reference position) of the machine shaft will match the zero position of the motor’s incremental encoder.

This ensures optimum running behaviour of the motor!

10.2 Teach process for the gear ratio

This is required if the motor drives the machine via a V belt,
or when there is an increase or reduction in ratio of motor to machine
(unequal 1:1).
Hardware prerequisite: Y-adapter, synchroniser PD3 or another sensor, that delivers precisely one impulse per revolution. After switching on for the first time or after a master reset,
the control unit recognises the connected Y-adapter.

„PULLEY“ is shown in the upper line of the display.
The teach phase is introduced by pressing the treadle forwards.
The drive system runs at low speed until the teach phase is concluded.
This process **cannot** be interrupted!

„PULLEY“ is deleted from the display.

Teaching in the angle adjustment program:
The teach process is repeated when setting the logical zero marks (parameter <700>).
There is no separate display shown.

Error message:
If no signal is recognised from an external sensor after sewing start and a wait period,
„ERROR 74“ is displayed; the drive system stops without position.
Remedy: Check the external sensor, replace if necessary.

10.3 Checking needle positions NP1/NP2

NP1 - needle down (<702>)
NP2 - thread lever up (<703>)

a) Switch on programming level „**b**“ (mechanic level) (see Chp. 9.2 „Programming level „**b**“)

b) Call up parameter 702

c) Press treadle forwards
Response: Machine starts up and positions according to <702>

d) Is the needle position correct?
If yes, then continue with g)
If no, then correct position by :
Turning the handwheel or
using keys L+ or DL– on the **EcoTop II**

e) Press treadle forwards
Response: Machine makes one revolution and positions to the same position.

f) Position can be corrected again.
If no further correction is required, then continue with g).

g) The last value set <702> is saved by calling up a new parameter number, e.g. 703.

h) Proceed in the same way with parameter 703 as described above for parameter 702.

i) Switch off programming level „**b**“. (See Chp. 9.2 Programming level „**b**“)

10.4 Checking the maximum speed

a) Switch on programming level B (see Chapter 9.2 Programming level „**b**“)

b) Call up parameter number 607

c) Check parameter value <607> and if necessary correct using
keys L+ and L– on the **EcoTop II**

d) Switch off programming level „**b**“ (see Chapter 9.2 Programming level „**b**“)

10.5 Hardware test

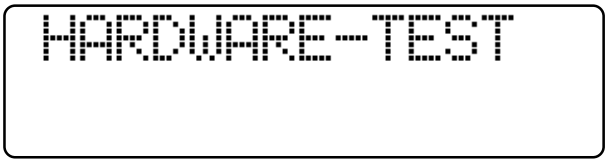
The **hardware test** is a test program that makes it possible with the aid of the **EcoTop II** control panel to check different drive components (of the control unit) and the machine installation.

Switching on the „Hardware test“ or „HW TEST“ test program

a) Switch on programming level „**b**“ and call up parameter <798>
b) Activate <798> = 1
c) Switch off mains switch
d) Turn mains switch back on again after approx. 2 sec.
e) Programming level „**c**“ is active, call up parameter <797>
f) Activate <797> = 1

Response: „HARDWARE-TEST“ or „HW-TEST“ appears for approx. 2 s on the display

EcoTop II display:

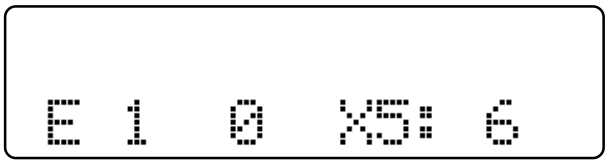
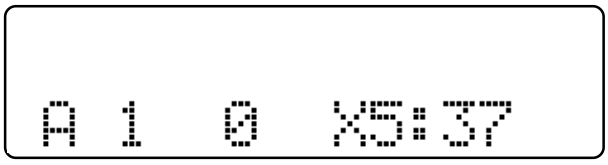
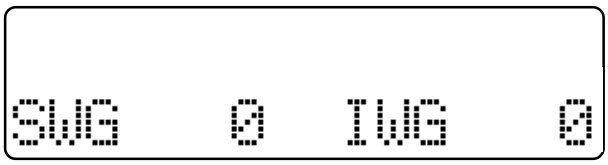
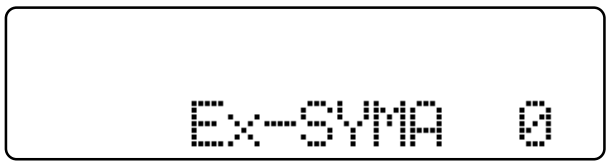


Then the display shows the first test block: Inputs
All keys on the **EcoTop II** that have LEDs light up.

The test blocks are called up (moving from test block to test block):

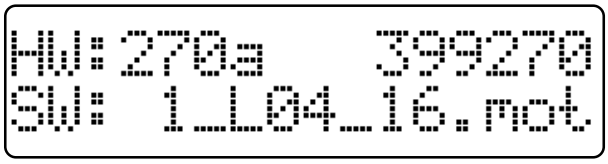
using the **A+** and **A- keys** with the **EcoTop II** control panel

Summary of test blocks

Test block	**Testing**	**EcoTop display:**
1	Inputs	
2	Outputs	
3	Speed control unit Actual-value transmitter	
4	External synchronous-marks	

Note: Outputs can be switched using the **D+key**!

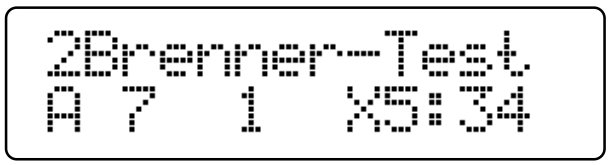
5 Hardware vers.
and software status



6 **1burner test**
(start burner test)

Press **D+ key**

7 **2burner test** = lower clamp

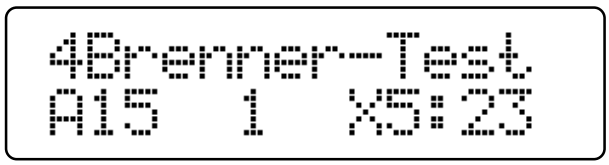


Press **D+ key**

8 **3burner test** = lower burner

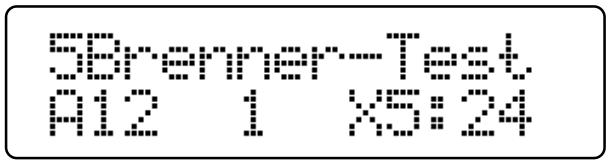
Press **D+ key**

9 **4burner test** = switch on thread deflector

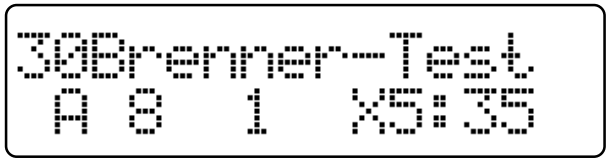


Press **D+ key**

10 **5burner test** = burner forward

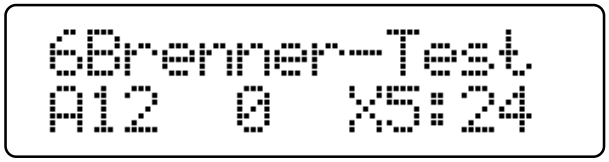


Press **C+ key**, **turn heating on** for 2 sec. (**only** possible in **5burner test** mode!)



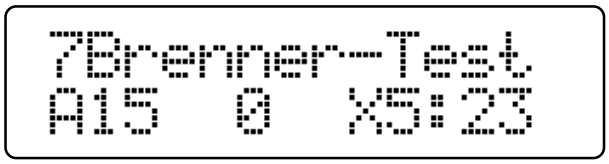
Press **D+ key**

11 **6burner test** = turn off heating, burner back



Press **D+ key**

12 **7burner test** = switch off thread deflector

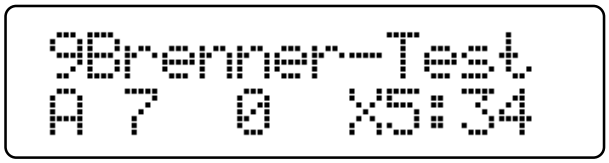


Press **D+ key**

13 **8burner test** = raise burner

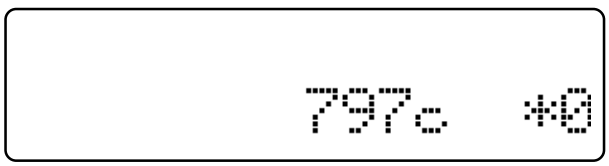
Press **D+ key**

14 **9burner test** = raise clamp, **burner test finished**!



The hardware test is switched off again by pressing the **ESC key**.

Display:



By pressing the **TE key**
the control unit returns to sewing mode.

Display:

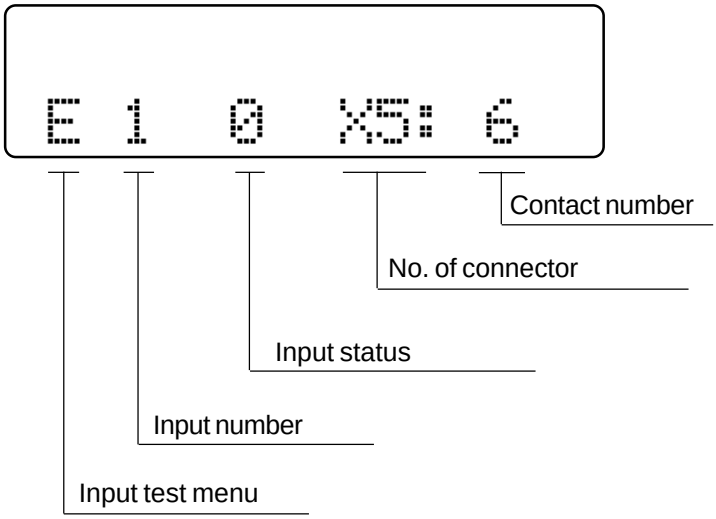
Note:
Only once the drive is **switched off and on again** does the parameter level change back from „**c**“ to level „**a**“.

Display:

Different function elements are called up in a test block, e.g. moving from input to input, by pressing keys B+ or B- on the **EcoTop II** control panel.

The set outputs are activated using key **D+** on the **EcoTop II** control panel.

Test block 1: Inputs
Display:



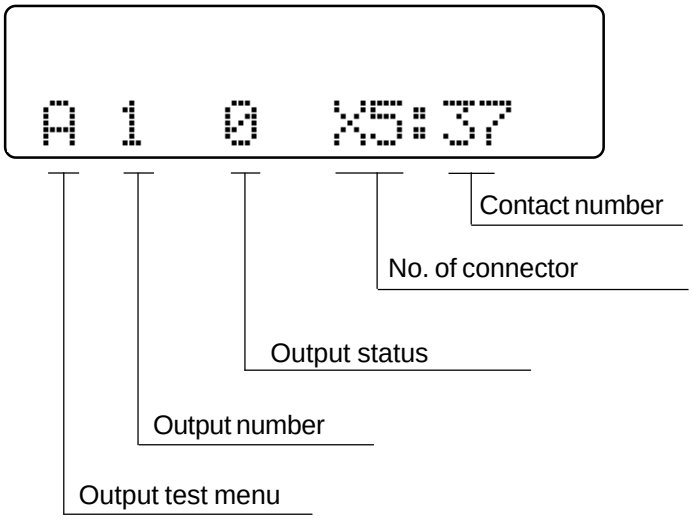
You will find the allocated functions of the inputs displayed in Chapter 12 „Connection diagram for plug panel“.

The menu designator E (for input) is located on the left side of the connector diagram. The keys or buttons allocated to the inputs are designated in the connection diagram with S and have the same numbering as the associated inputs, i.e.
Key S1 is connected to input E1,
Key S2 is connected to input E2,
The Sx key is connected to input Ex.

The switch status of the input is signalled at the 7th position of the display
Key/button open → Display: 0
Key/button closed → Display: 1

The right side of the display shows the connector and contact number to which the selected input is connected, as a type of control.

Test block 2: Outputs
Display:



You will find the allocated functions of the outputs displayed in Chapter 12 „Connection diagram for plug panel“.

The menu designator A (for output) is located on the left side of the connector diagram. The magnets/ solenoid valves allocated to the outputs are designated in the connection diagram with Y and have the same numbering as the associated outputs, i.e.
Magnet Y2 is connected to output A2,
Magnet Y3 is connected to output A3,
Magnet Yx is connected to output Ax.

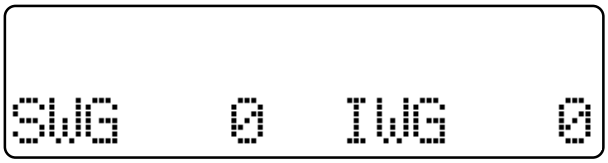
The switch status of the output is signalled at the 7th position of the display
Output is not switched on → Display: 0
Output is switched on → Display: 1

The output is switched on using key D+ on the **EcoTop II** . The output is switched off automatically after approx. 2.5 s or by pressing key D-.

The right side of the display shows the connector and contact number to which the selected output is connected, as a type of control.

Test block 3: Speed control unit (SCU)
e.g. display:

Test block 3



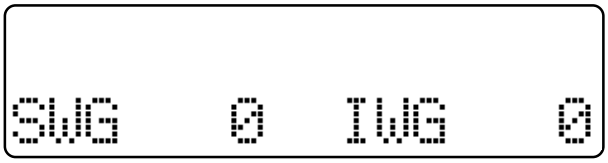
You can run through all 16 switch levels of the SCU by pressing the treadle.

The following displays appear at positions 5, 6, 7 and 8 of the display

-2 / -1 / 0 / +1 / 10 / 20 / ... / 120.

Test block 4: Actual-value transmitter (AVT)
e.g. display:

Test block 4



This test block is used to check the actual-value transmitted (incremental encoder).
The motor shaft is turned by hand.

The increments (impulses) of the AVT are counted and displayed via display positions 14, 15 and 16.
This display runs through a range from 0 … 255.

To deactivate the hardware test, switch off the machine or press the ESC key!