



TENSION TYPE COMPUTERIZED METERING DEVICE

OPERATION MANUAL



MODEL : MC 3



ENGLISH

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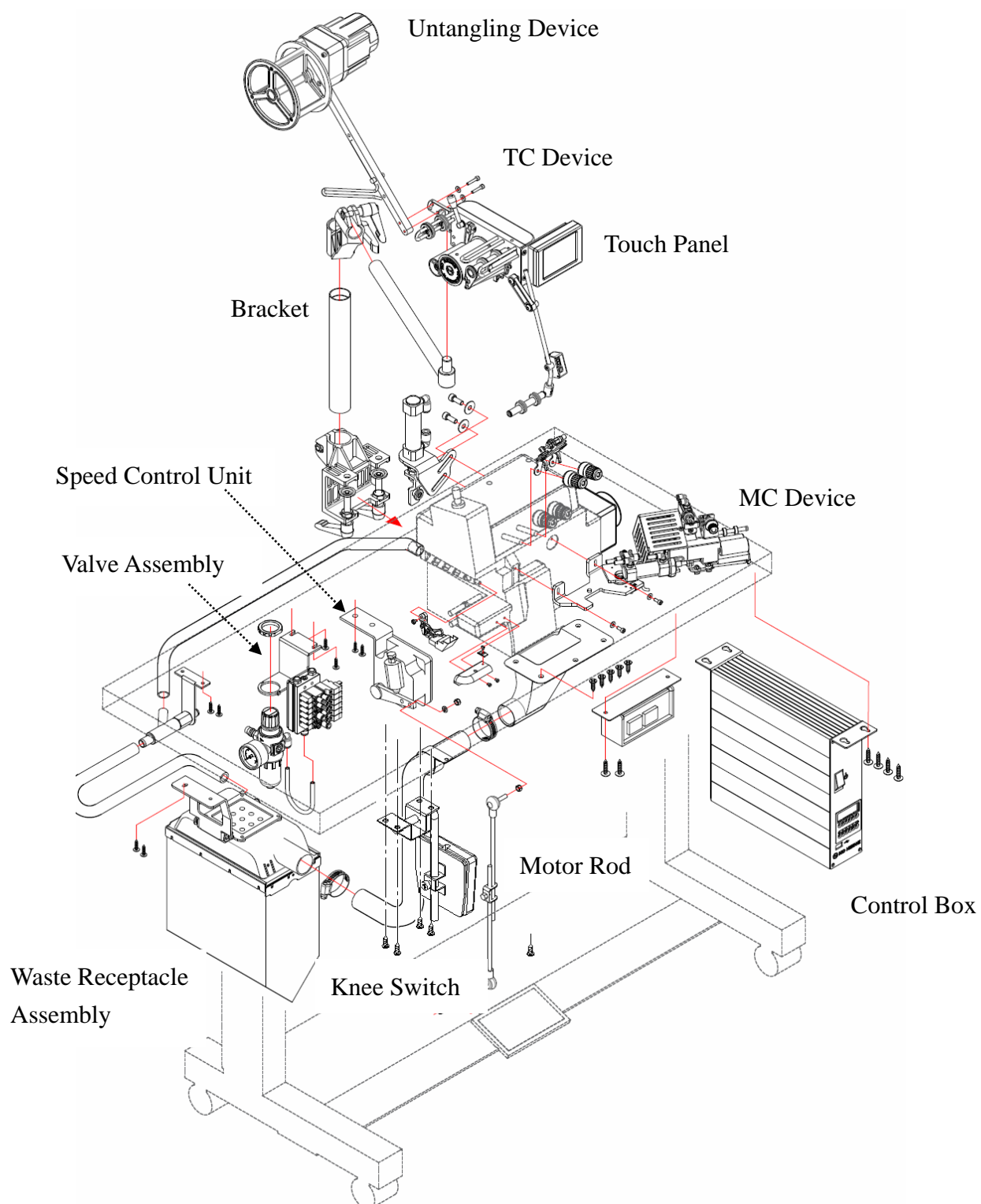
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1. Installation guide

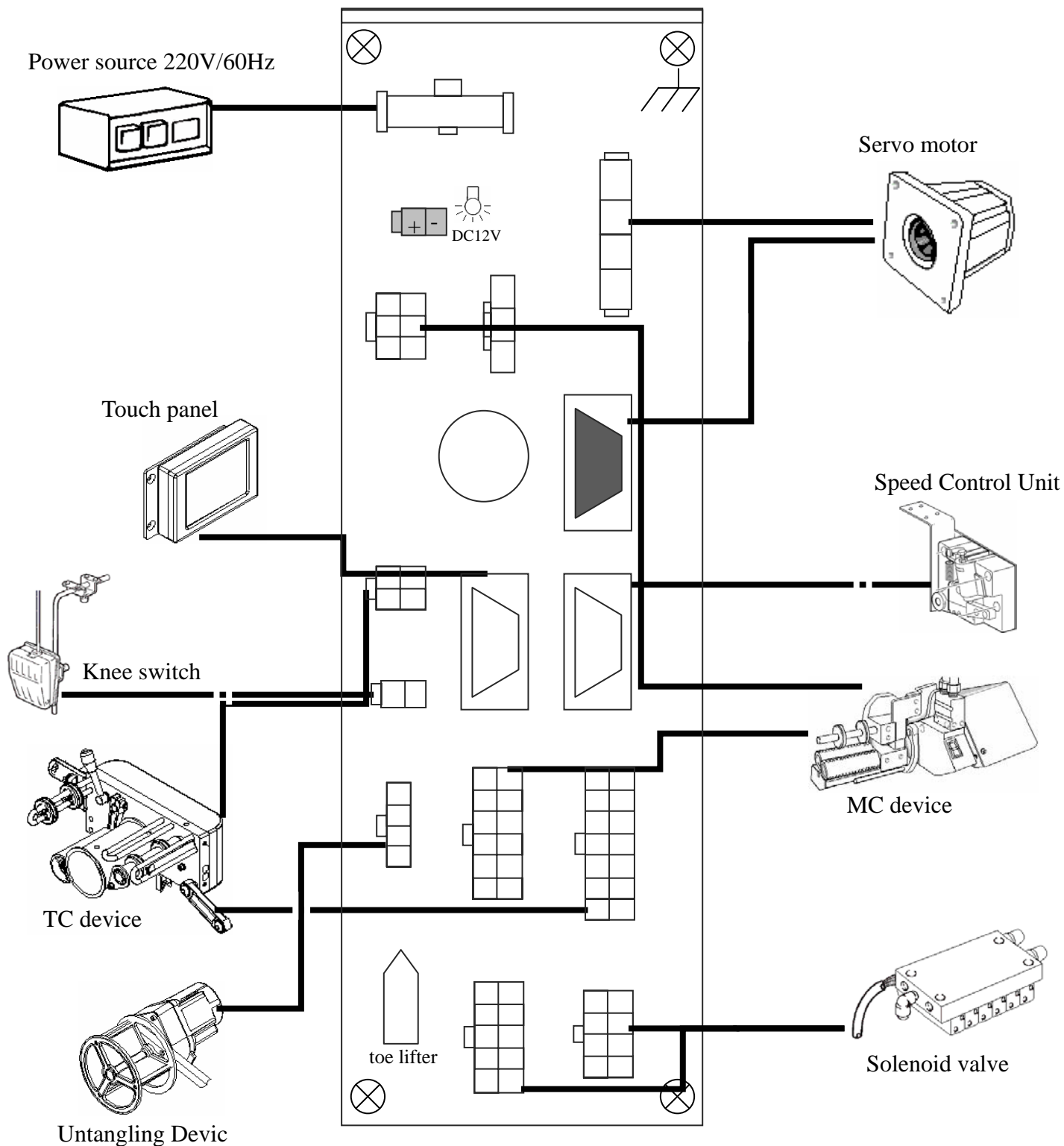


1-1. Description of control box

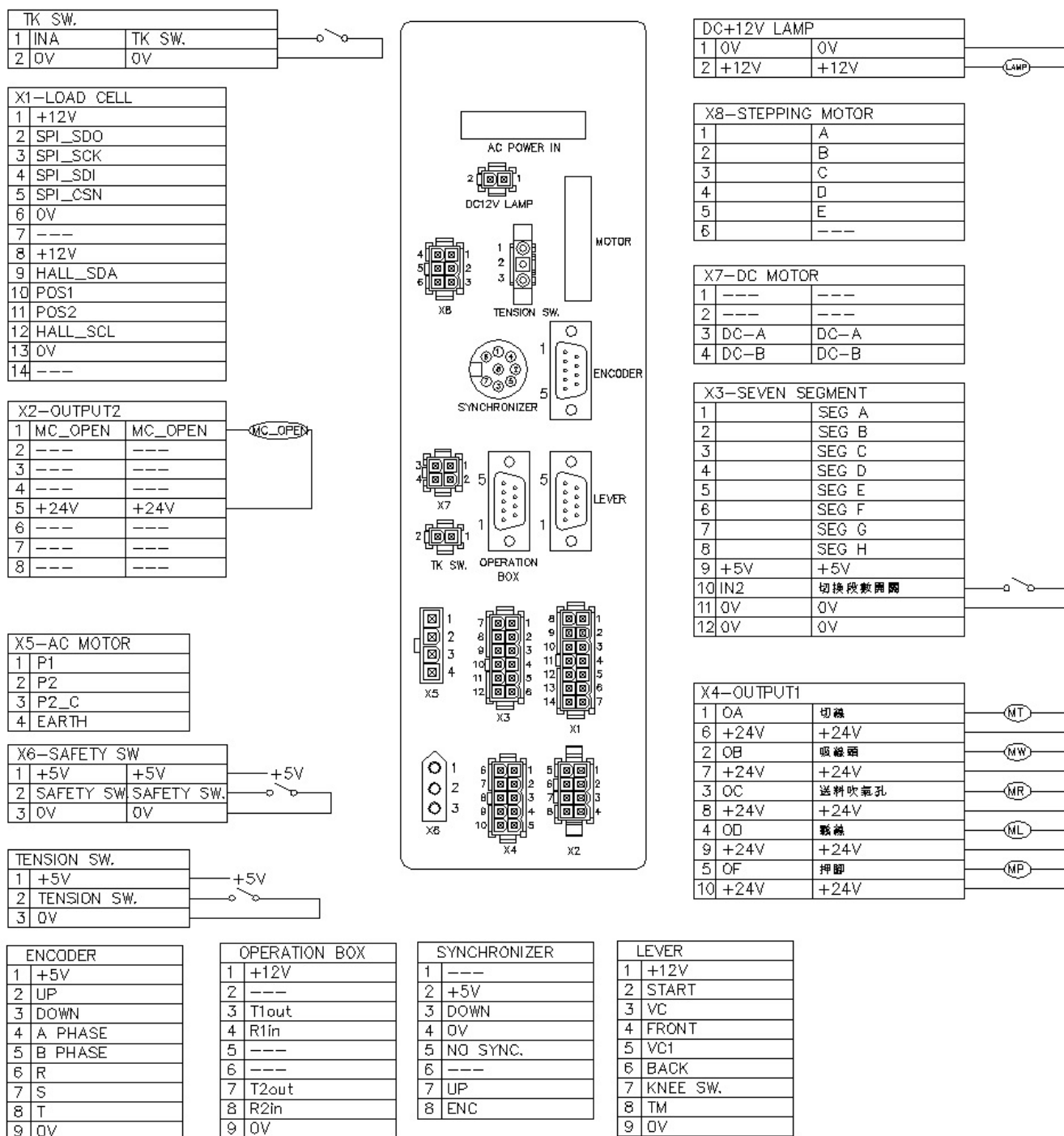


CAUTION

1. Only the authorized technicians are allowed to conduct the cable connections.
2. Always turn the power off and unplug the power cord before conducting or checking the connections.



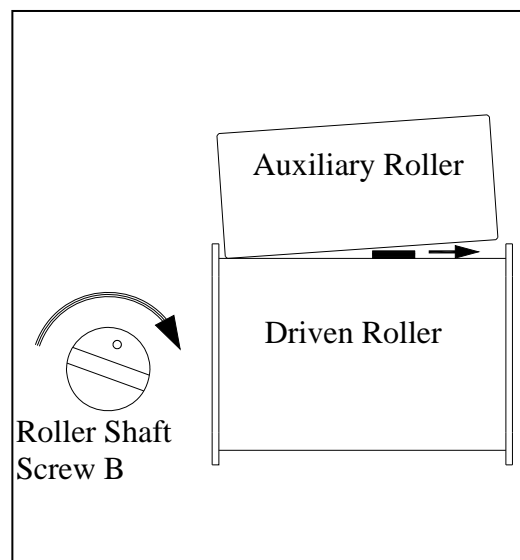
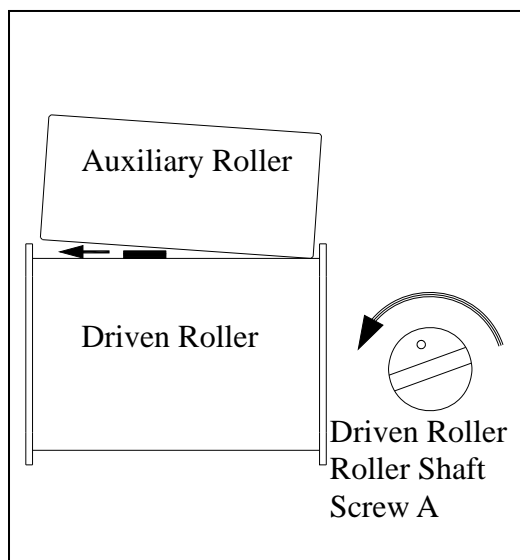
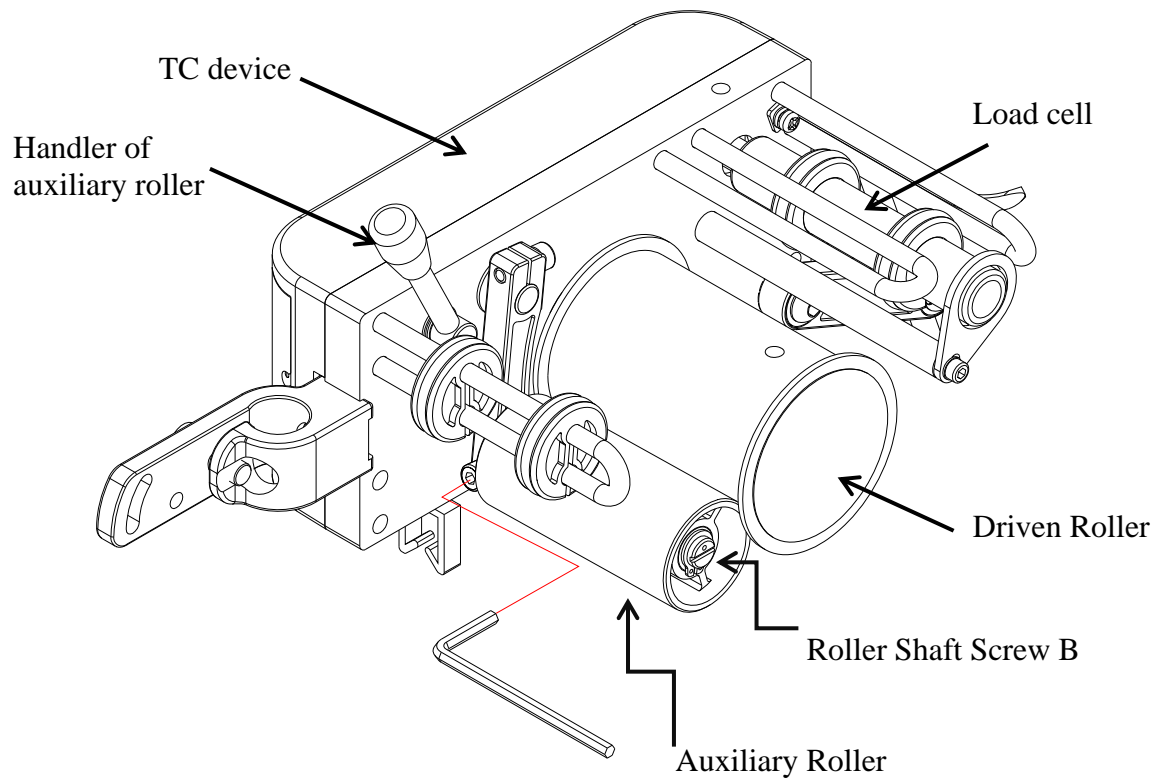
1-2. Connector diagram



2.Adjustments

2-1. Adjusting the feeding shift of tape

If the auxiliary roller is not parallel to the driven roller, the tape will be misaligned to the right or the left. To correct the misalignment, loosen screw A on the roller shaft, and turn the roller shaft screw B until the tape feeds straight and aligns perfectly.



3.Boot page










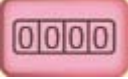









1. Main software Ver. xxx.yyy
Displays the current operating software version.
2. Touch panel Ver. xxx
Displays the software version of the touch panel.

4. Sewing operation mode

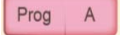
4-1. Sewing mode



Icon	Description
	Lock key at left side menu: 1. Press  to lock menu. 2. Press  then key in a correct password to unlock. 3. Functions on the left side menu are prohibited when it is locked.
	Press to pull down menu on the left/right side(please refer to 4-3)
	Fabric detected indication(No function without sensor), LED on : detected, LED off: not detected.


Icon	Description
	Press to change the sewing program no. Maximum of 9 sewing programs. A ~ I.
	stitch number: Press to copy the current display stitch number to the stitch field of the working sewing step.
	Piece counter , press and hold for 3 seconds to reset the counter. (to display or hide the piece counter please refer to 4.3)
	Free to change tension control :  with tension control,  free tension control.
	Step selector, press to move the selection bar.
	Step number: 1. Displays the Step number. 2. Press to activate TK setting, to set the stitch number of tape cut at start and end (please refer to 4-2 Step9)
	Press to adjust sensitivity. (please refer to 4-2)
	Press to set the stitches of current step. (please refer to 4-2)
	Press to adjust the tension range. (please refer to 4-2)
	Press to select Sewing mode. (please refer to 4-2)

4-2. Step data setting

Step 1. Press  to edit the Program A~I.

Step 2. The selection bar displays on the Step 1. Press  to pop up the keyboard .

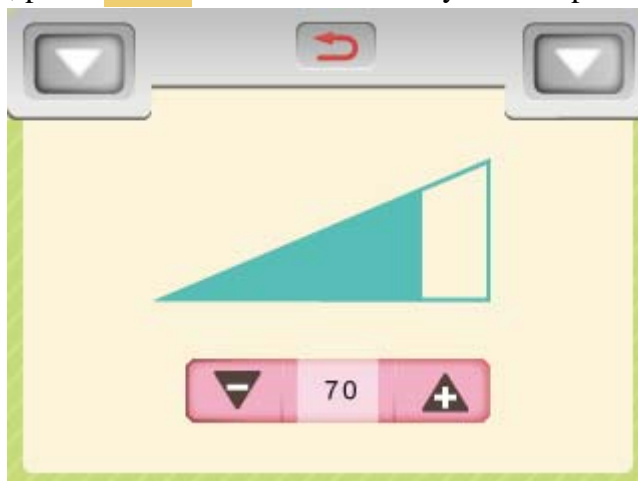



Step 3. Enter the required tension value. Then press the  to save the value and to close the keyboard.

Note: 1. Tension values range from 1 to 999. The smaller the value, the tighter the tension.

2. Press <Free> to set the free tension value.

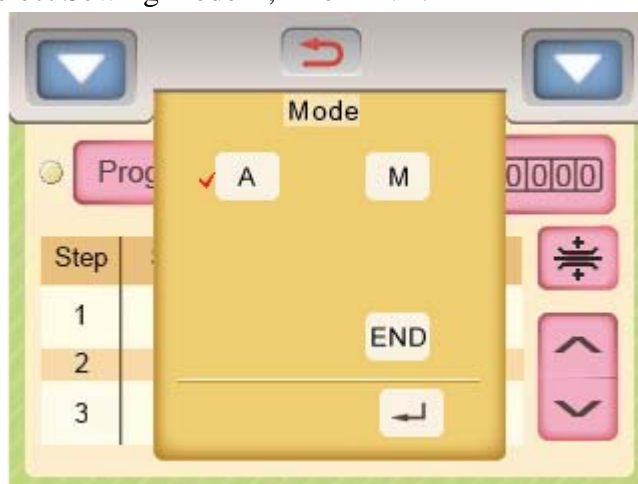
Step 4. If the tape vibrates, press **Sen.** to set the sensitivity of the tape.



Step 5. Reduce the value of the sensitivity until the vibration disappears. Then press  to return to the sewing mode.

NOTE: As long as the vibration of tape disappears, the larger the value of sensitivity, the more accurate the control of tension.

Step 6. Press **Mode** to select Sewing mode A, M or END.



NOTE:

1. Sewing mode selection:

A (automatic): The sewing steps of programs will run automatically and the stitches of steps will be completed sequentially as settings.


M (manual): The sewing steps of programs will run manually by an external Step change switch.


As(automatic2): The stitch counter of sewing steps will not count up unless a fabric is detected.

Aa(automatic sewing mode): The stitches of steps and programs will run automatically and the stitch counter of sewing steps will not count up unless a fabric is detected.

END(ending mode): Ends the current sewing program and prohibits sewing stitches in this step.

2. Setting the END mode in Step 1 is not allowed.

3. Press  to save the settings and back to the Sewing mode.

4. Press  to cancel the settings and back to the Sewing mode.

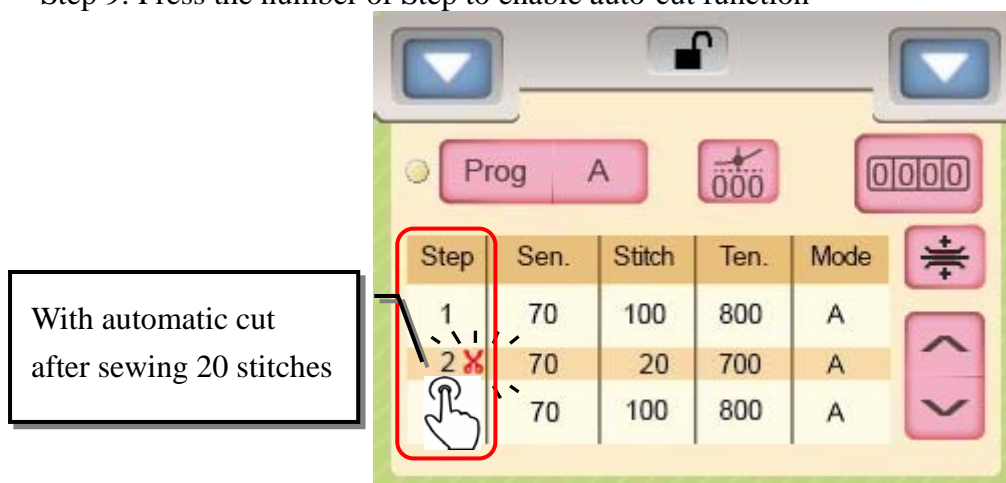
Step 7. The number of stitches must be entered when the sewing mode A is selected. Please press **Stitch** to pop up the keyboard.



Step 8. Enter the required the number of stitches, press Stop to display the number of stitches and additional 's' that machine stops immediately when the setting stitches are completed and the next sewing Step can start to run by toeing down the pedal unless the pedal returns to neutral position in advance.

Press **↩** to return to the Sewing mode

Step 9: Press the number of Step to enable auto-cut function



Step 10. Set all settings of Steps required for the corresponding Program (A~I) according to the instruction described in the procedure Step 1-9; finally, set the last Step as END mode.

Example:

Step 1: Sensitive:70, Stitch:100 then stop automatically, Tension:800, Mode:A.

Step 2: Sensitive:70, Stitch:20 then cut automatically, Tension:700, Mode:A.

Step 3: Sensitive:70, Tension:800, Mode:M.

Step 4: Mode:END.

Setting data as shown:

Step	Sen.	Stitch	Ten.	Mode
1	70	100 s	800	A
2 X	70	20	700	A
3	70		800	M
4				END

Step 11. The maximum number of Steps in one Program (A~I) is 8. In case of 13 Steps designed, the Step 9 in Program A allows you to continue the Steps to the next Program (Program B) by setting the Step 9 in Program A with the data "goto B" as shown below.

The system allows you to design a maximum number of 27 Steps in total for a specific project.

Example:

step 1: Sensitivity:70, Tension:900, Mode:M
 step 2: Sensitivity:70, Tension:850, Mode:M
 step 3: Sensitivity:70, Tension:800, Mode:M
 step 4: Sensitivity:70, Tension:750, Mode:M
 step 5: Sensitivity:70, Tension:700, Mode:M
 step 6: Sensitivity:70, Tension:650, Mode:M
 step 7: Sensitivity:70, Tension:600, Mode:M
 step 8: Sensitivity:70, Stitches:50, Tension:550, Mode:A
 step 9: Sensitivity:70, Stitches:50, Tension:500, Mode:A
 step 10: Sensitivity:70, Stitches:100, Tension:450, Mode:A
 step 11: Sensitivity:70, Stitches:100, Tension:400, Mode:A
 step 12: Sensitivity:70, Stitches:150, Tension:350, Mode:A
 step 13: Sensitivity:70, Tension:300, Mode:M





Setting data in Program A and B as shown:





Prog=A					
Step	Sen.	Stitch	Ten.	Mode	
1	70		900	M	
2	70		850	M	
3	70		800	M	
4	70		750	M	
5	70		700	M	
6	70		650	M	
7	70		600	M	
8	70	50	550	A	
9	70	goto	B		


Prog=B					
Step	Sen.	Stitch	Ten.	Mode	
1	70	50	500	A	
2	70	100	450	A	
3	70	100	400	A	
4	70	150	350	A	
5	70		300	M	
6				END	
7				(not set)	
8				(not set)	
9	70	goto	A		

4-3. Left side menu and right side menu



Left side menu	
	Press to pull down the left side menu
	Press to enter the parameter setting mode
	Press to enter the testing mode
	USB upload/download

Right side menu	
	Press to pull down right side menu
	Start/stop the tape feeding device
	Press to display/hide the piece counter.
	Group selection

NOTE: You can use left side menu when  is shown.

4-3-1. Start/stop the tape feeding:

Start: Stops tension control and untangling device for tape insertion or maintenance.

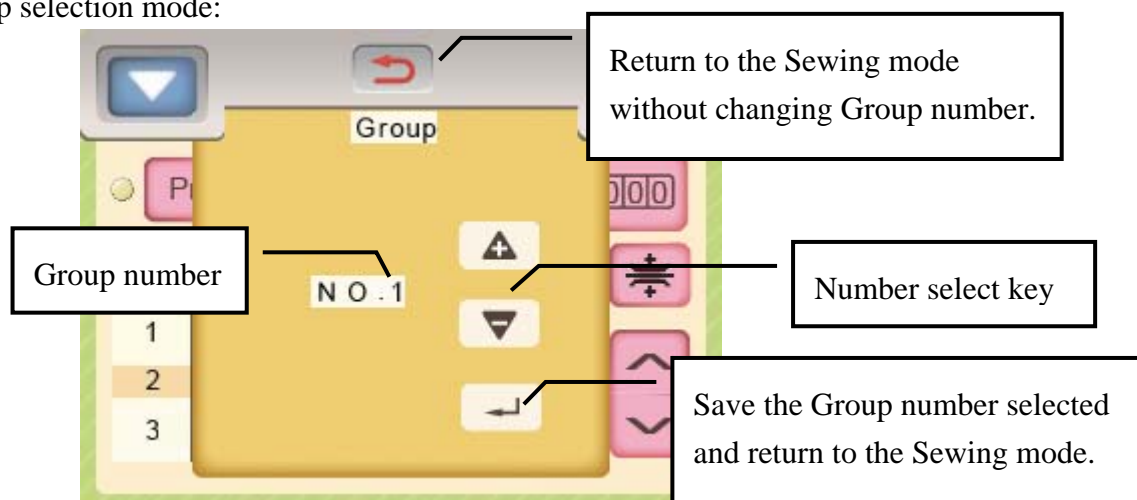
Stop: Start tension control and untangling device.

4-3-2. Display/hide the piece counter.

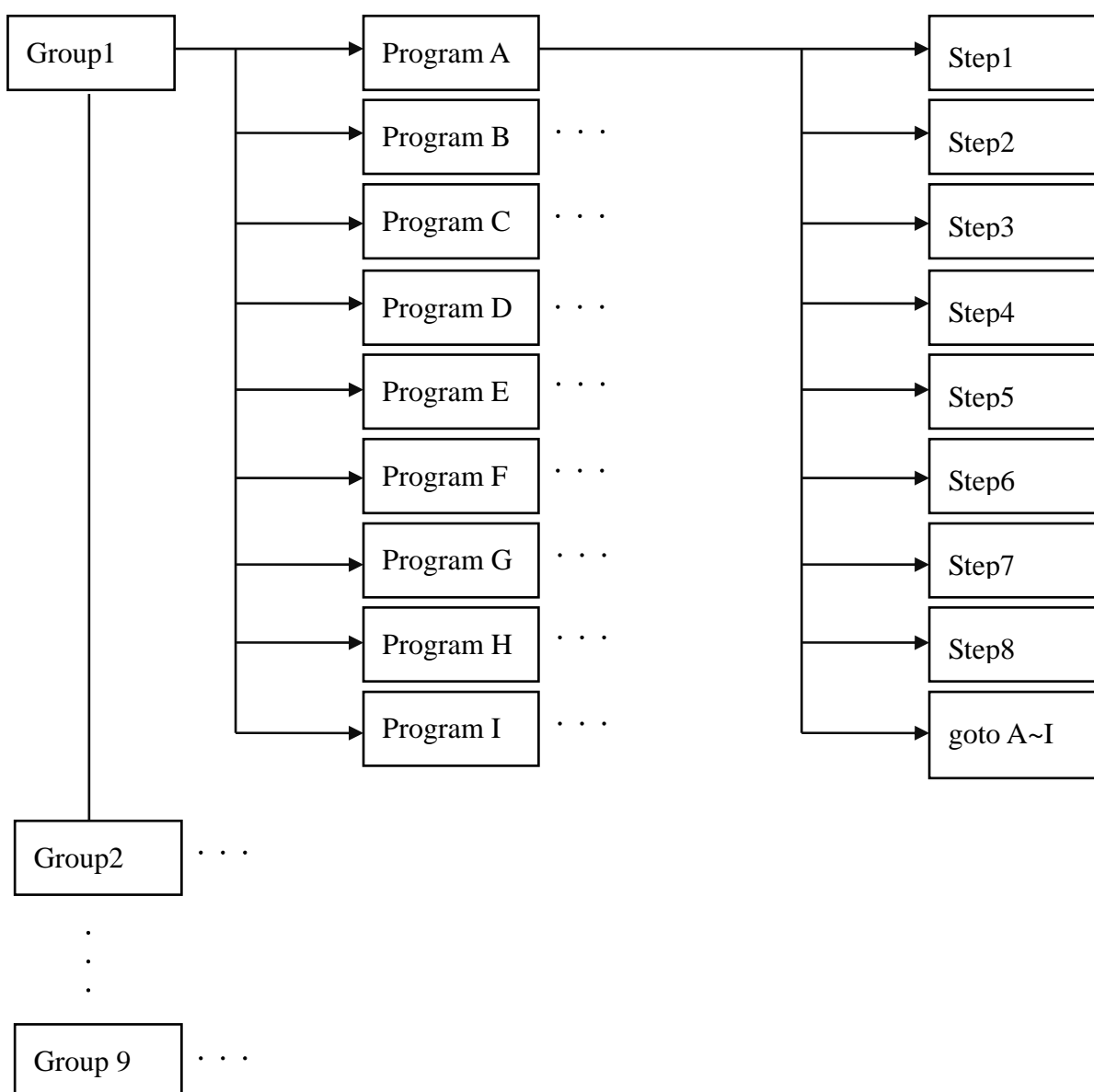
4-3-3. Group selection:

There are 9 selectable groups. Each group consists of 9 Programs (A~I) and each Program allows you to design 8 steps. Group selection page is shown as below.

Group selection mode:

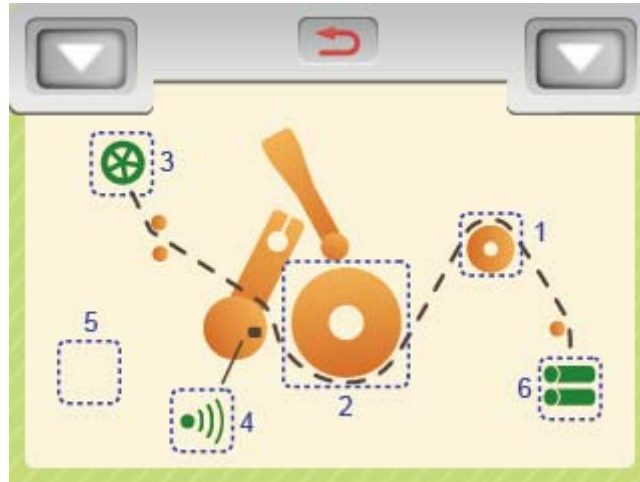








Group structure:




5. Testing mode

Press  at left side menu to enter the Testing mode, the following menu is shown.





Icon	Description	Icon	Description
	Reserved.		Tape thickness detector settings.
	Driven Roller test.		Reserved.
	Untangling device settings.		Accessory test.

5-1. Driven roller test


Press  to enter the driven roller test menu as shown below.

Caution: Ensure that no tape is on the driven roller.

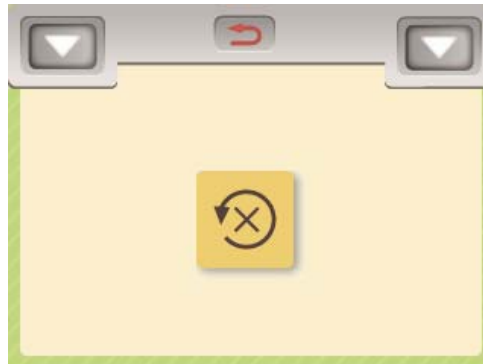


- Step 1. Press  and the driven roller will run clockwise for 2 seconds.
- Step 2. Press  and the driven roller will run counterclockwise for 2 seconds.

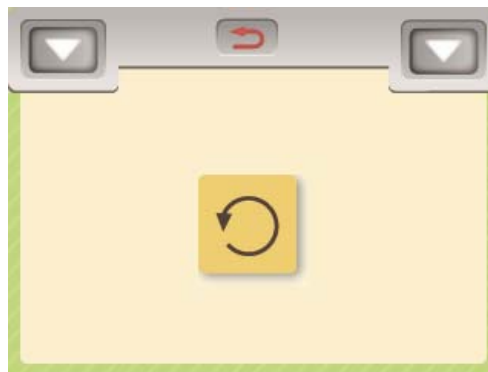
5-2. Untangling device setting mode

Press  to enter the untangling setting mode. There are 3 possible submodes in this mode.

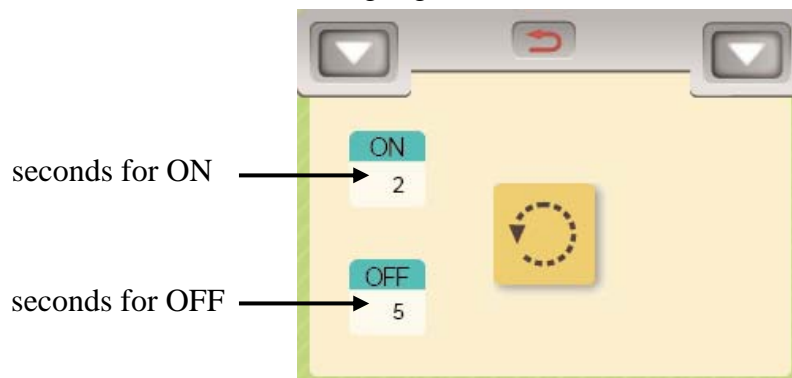
5-2-1. Off mode: Untangling device stops working.



5-2-2. Synchronous mod: The driven roller rotates synchronously with the untangling device.

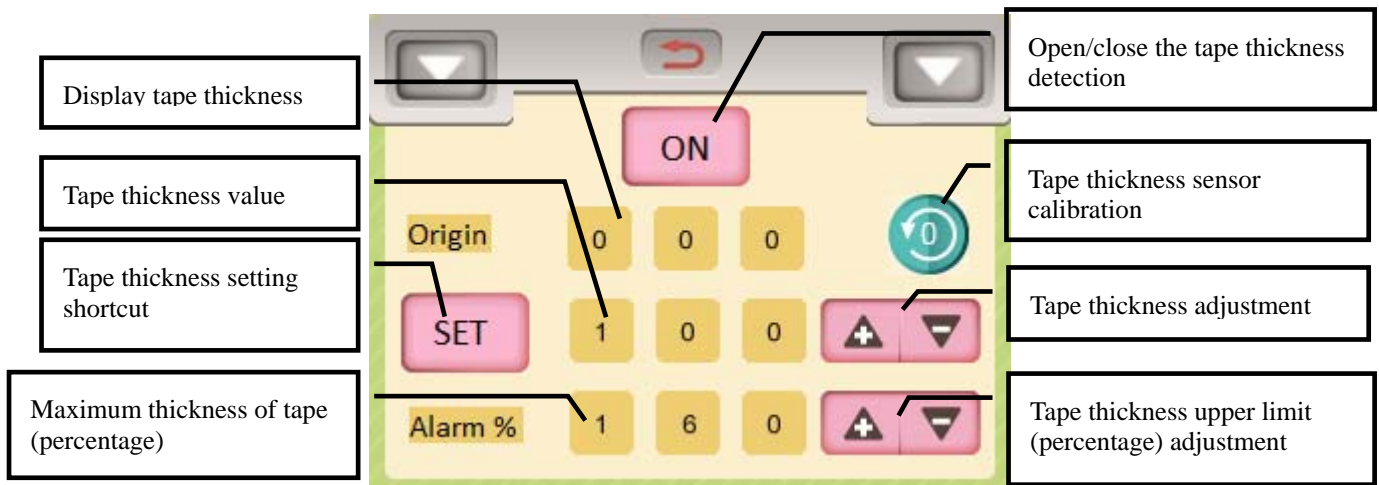


5-2-3. Intermittent mode: Press On/OFF to pop up the keyboard, then enter the seconds for ON/OFF the untangling device.



5-3. Thickness detecting mode

Press  4 to enter the Thickness detecting mode.






The setting steps are as follows:

Step 1. Press .

Step 2. Remove any tape from the driven roller and the auxiliary roller, then close the auxiliary roller handler. The value of thickness(Origin) should read between -5~+5. If the value of thickness is incorrect, refer to Step 3 for performing the calibration of thickness detecting sensor.


step 3. Press <Tape thickness sensor calibration>, menu shows. "N074:tape thickness sensor calibration OK". The value of thickness should read between -5~+5.

step 4. Place the tape over the driven roller and the auxiliary roller to get the value of tape thickness.

step 5. Press  to copy the tape thickness to  .






step 6. The alarm setting can be set to a maximum thickness of 200% and the system alarm "E075" alerts when the thickness of tape exceeds the maximum setting.




5-4. Accessory test



Press  6 to enter the Accessory test mode for the optional device.



Description of Accessory test:

- 5-4-1.  Feed motor forward test button.
- 5-4-2.  Feed motor reverse test button.
- 5-4-3.  Feed roller opening/closing test button
- 5-4-4.  MC cutter test button
- 5-4-5.  External switch and state display.
Used for an external switch activation status display.


Display	Description
	No external switch in use
	Used for an external knee switch activation status display
	Used for external Step change switch activation status display

- 5-4-6.  Reserved
- 5-4-7.  Reserved

6.Parameter setting mode



CAUTION Only authorized technicians are allowed to set the following parameters.


Press  to enter the parameter setting mode.

NO	name	value	range	description
1	MC insert tape	10	0~99	Meter of feeding; 00=35mm, increases 1=1mm, 99=134mm
2	MC insert speed	50	0~99	Feeding speed, 00=50mm, increase =1.9mm, 99=238.1mm
3	MC front cutter time	100	100~900	Time setting for MC cutter (ms)
4	MC clamp act time	10	0~900	Time setting for MC clamp (ms)
5	Free Tension func	norm	norm / tf	norm: Normal mode tf: TF device mode
6	TF feed timing	160	100~2500	TF feed time (ms)
7	TF speed	50	1~100	TF feed speed, 1:Slowest, 100:Fastest
8	TF sens	70	1~99	TF sensor sensitivity, 1:Most insensitive, 99:Most sensitive.
9	MC reverse length	0	0~100	After the cut, back material length adjustment
10	overload func	Off	Off / On	Load cell overload protection.
11	overload alarm	150%	120%~200%	Alarm is activated if overload occurs on the load cell.
16	buzzer on-off	On	Off / On	Buzzer switch.
18	restore default	nop	nop / run	Reset to 6-1 restore default setting.
19	lcd auto pwr off	off	off/logo/dark	off: Disable logo: LCD remains on for one minute, then shuts off. dark: LCD remains on for one minute, then shows logo.
20	lcd brightness	99	0~99	To set the brightness of the LCD.
29	free tape tension	999	1~999	Tension setting when in the tension-free mode.
30	Knee sw func	mct	off/tk/step /rele/mct/toe	Knee switch function(optional): off: Disable rele: Free tension tk: Reserved mct: Activate MC cutter step: Change to next step toe: Reserved
31	Ext key func	step	off/tk/step /rele/mct/toe	External switch function: off: Disable rele: Free tension tk: Reserved mct: Activate MC cutter step: Change to next step toe: Reserved
33	NCL on sti	5	0~98, all	Stitches for NCL on; all: Full time activation.
34	NCL off sti	25	0~99	Stitch for NCL stop.
36	ASL s-on sti	0	0~99	Reserved.
37	ASL s-off sti	0	0~99	Reserved.
43	pedal emg stop func	On	Off / On	Pedal heeling down for emergency stop in automatic sewing mode.
45	sewing counter	0	0~9999	Counter setting.

NO	name	value	range	description
46	synchronizer	inst	noth / inst	Synchronizer, noth: With sync., inst: Without sync.
64	MC cut off stitch	20	0~99	Stitch after cut off
65	MC v-off stitch	15	0~98, all	Sewing stitch after thread suction stop

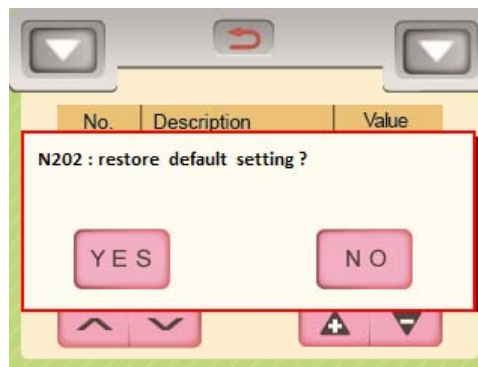
6-1.Restore default setting

The procedure to restore default settings is described as follows:

Step 1. Press  at left menu to enter restore default setting page.

Step 2. Shift the selection bar to 18.

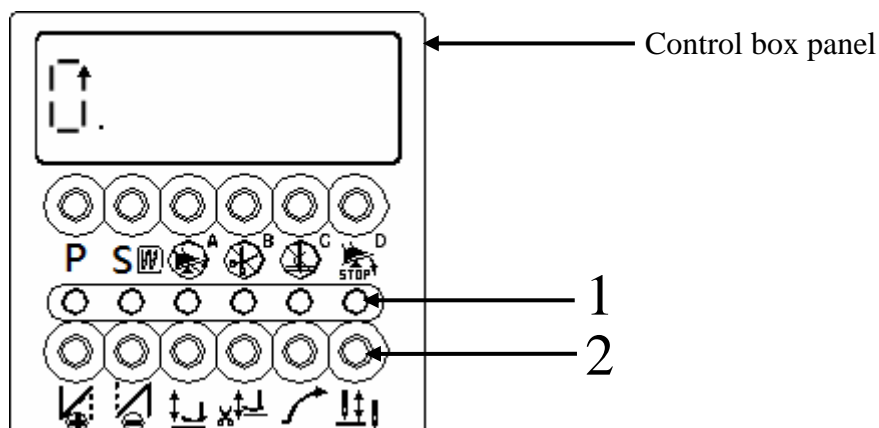
Step 3. Press '+' to pop up the following dialog box menu.



Step 4. Press "YES", then a prompt code shows "N099:Please reboot".

Step 5. Turn the power OFF then ON, the default settings are restored.

6-2.Setting needle Up/Down position at machine stop




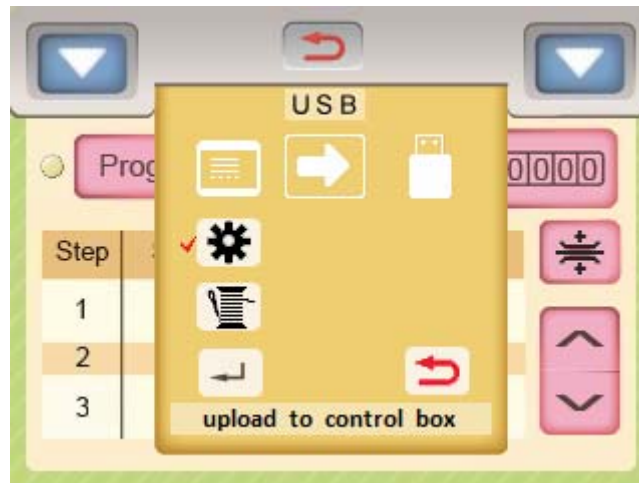
[Setting instruction]












Needle stops at Down position: Press Button 2 and ensure that Light 1 is OFF.

Needle stops at Up position: Press Button 2 and ensure that Light 1 is ON.

7. USB upload/download

Press  at left side menu to enter USB upload/download page.




Icon	Description
	Press to select upload or download.    Upload: Upload the parameter or Program data from USB flash drive to MCU.    Download: Download the parameter or Program data from MCU to USB flash drive.
	Parameter data: Press this key, then a check mark will appear with it. The Upload/Download action includes parameter data.
	Group data: Press this key, then a check mark will appear with it. The Upload/Download action includes the data of 9 selectable groups.
	Press to start Upload/Download.
	Return to the Sewing mode menu.


7-1. Download:

The procedure to download the parameter and Program data from MCU to USB flash drive is described as follows:

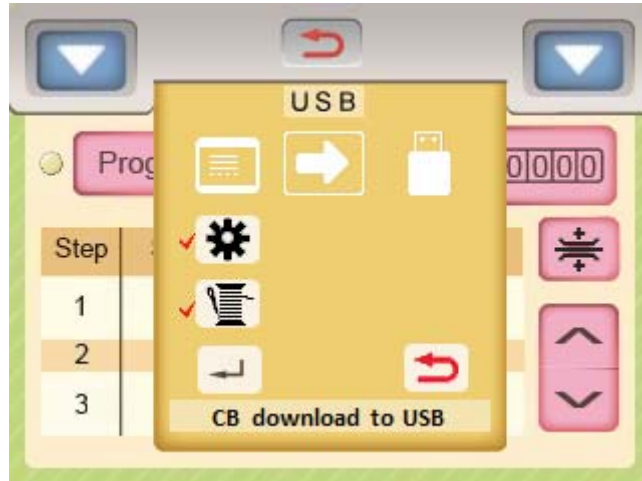
Step 1. Select download mode.


Step 2. Plug a USB flash drive to Control box and make a beep.

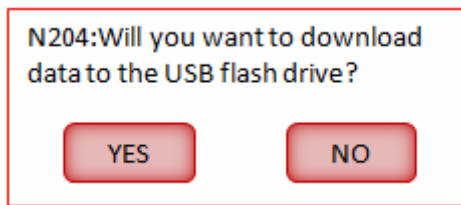
Step 3. Press  to check mark and to enable the download of parameter settings.

Step 4. Press  1 ~ 9 to check mark and to enable the download data of 9 selectable groups.

The menu is shown as below.



Step 5. Press  to pop up the dialog box menu as shown. Press "YES" to download the parameter settings and Program data from MCU to the USB flash drive. The parameter file "TCPARAME.TCD" and the Program data file "TCPROCES.TCD" will be stored in the root directory of the USB flash drive.



Step 6. The following prompt message shown on the menu indicates the completion of Download operation.

N045:Control box params download to USB OK.

N047:Control box sewing data download to USB OK.


NOTE: If The parameter file "TCPARAME.TCD" and the Program data file "TCPROCES.TCD" exist in the root directory of the USB flash drive before Download operation, "TCPARAME.TCD" will be saved as "TCPARME.BA1" and "TCPROCES.TCD" will be saved as "TCPROCES.BA1". Next, the new Download operation can proceed.


7-2. Upload:

The procedure to upload the parameter and Program data from USB flash drive to MCU is described as follows:

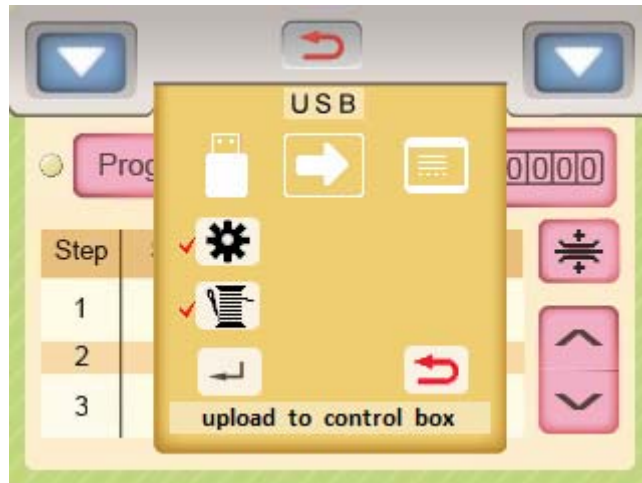
Step 1. Select Upload mode.


Step 2. Plug a USB flash drive to Control box and make a beep.

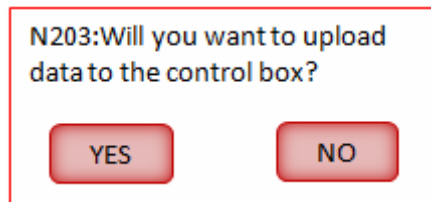
Step 3. Touch  to check mark and to enable the upload of parameter settings..

Step 4. Touch  to check mark and to enable the upload data of 9 selectable groups.

The menu is shown as below.





Step 5. Press  to pop up the dialog box menu as shown. Press "YES" to upload the parameter settings and Program data from the USB flash drive to MCU. The parameter file "TCPARAME.TCD" and the Program data file "TCPROCES.TCD" stored in the root directory of the USB flash drive will be uploaded to MCU.



Step 6. The following prompt message shown on the menu indicates the completion of upload operation.

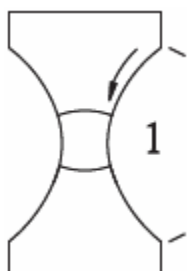
N044:USB param Upload to control box OK.Please reboot.

N046:USB sewing data upload to control box OK.please reboot.

NOTE:  disappears automatically if the parameter file "TCPARAME.TCD" is not in the root directory of the USB flash drive; Similarly,  disappears automatically if the parameter file "TCPROCES.TCD" is not in the root directory of the USB flash drive.

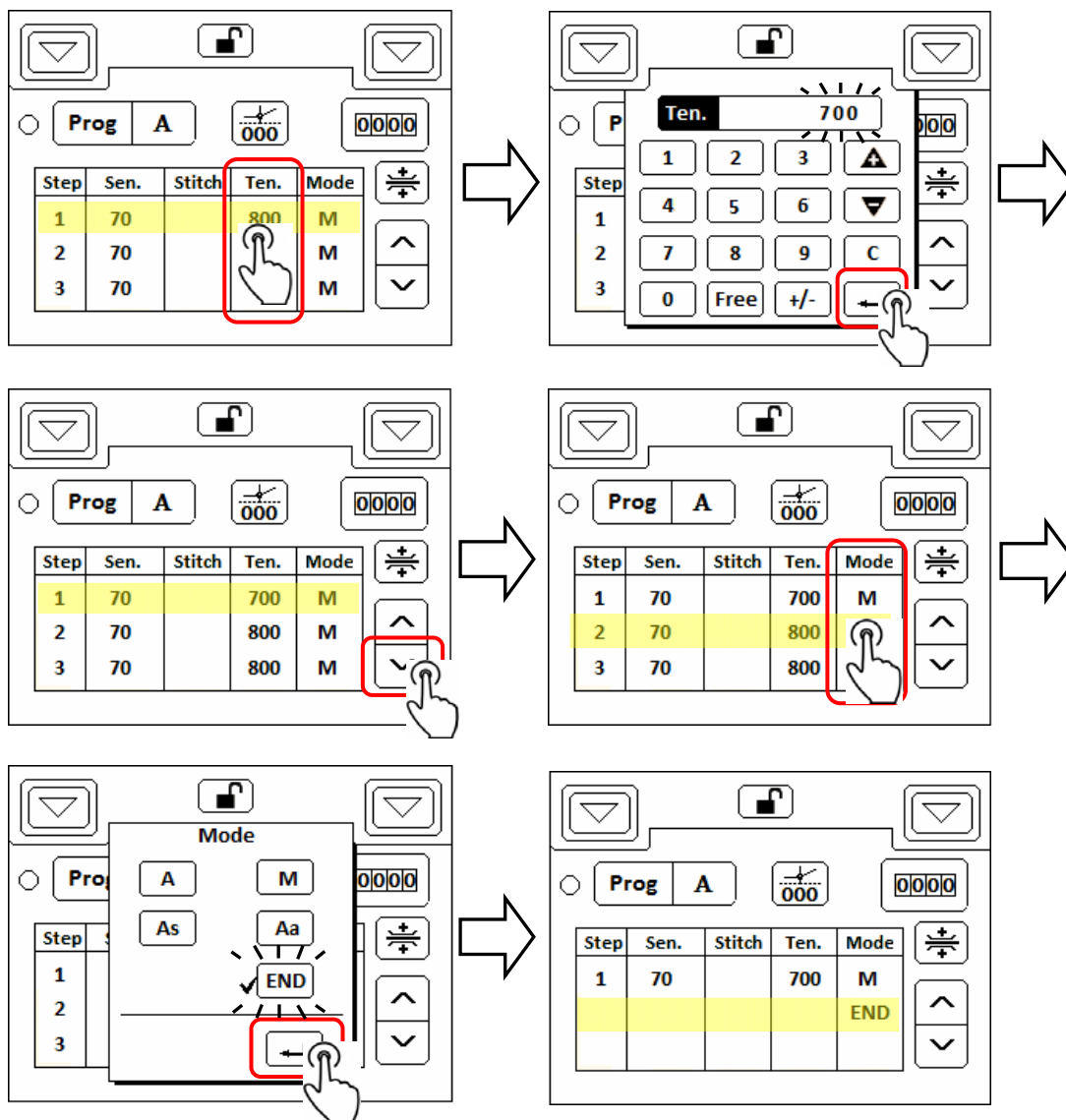
8. Operation instruction

Example1. Single step program with the tension value 700.



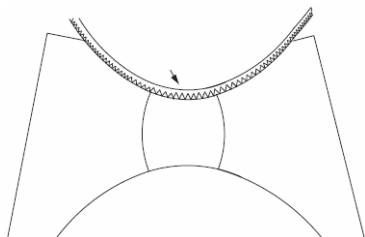
Tension value=700

The procedure is illustrated as follows:

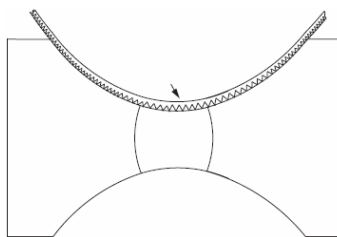


Comparison of tension values adjusted:

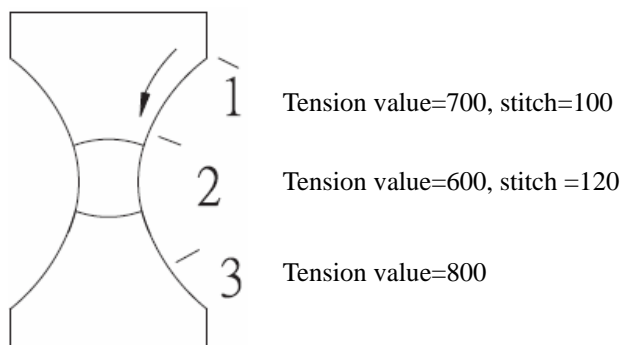
A small tension value



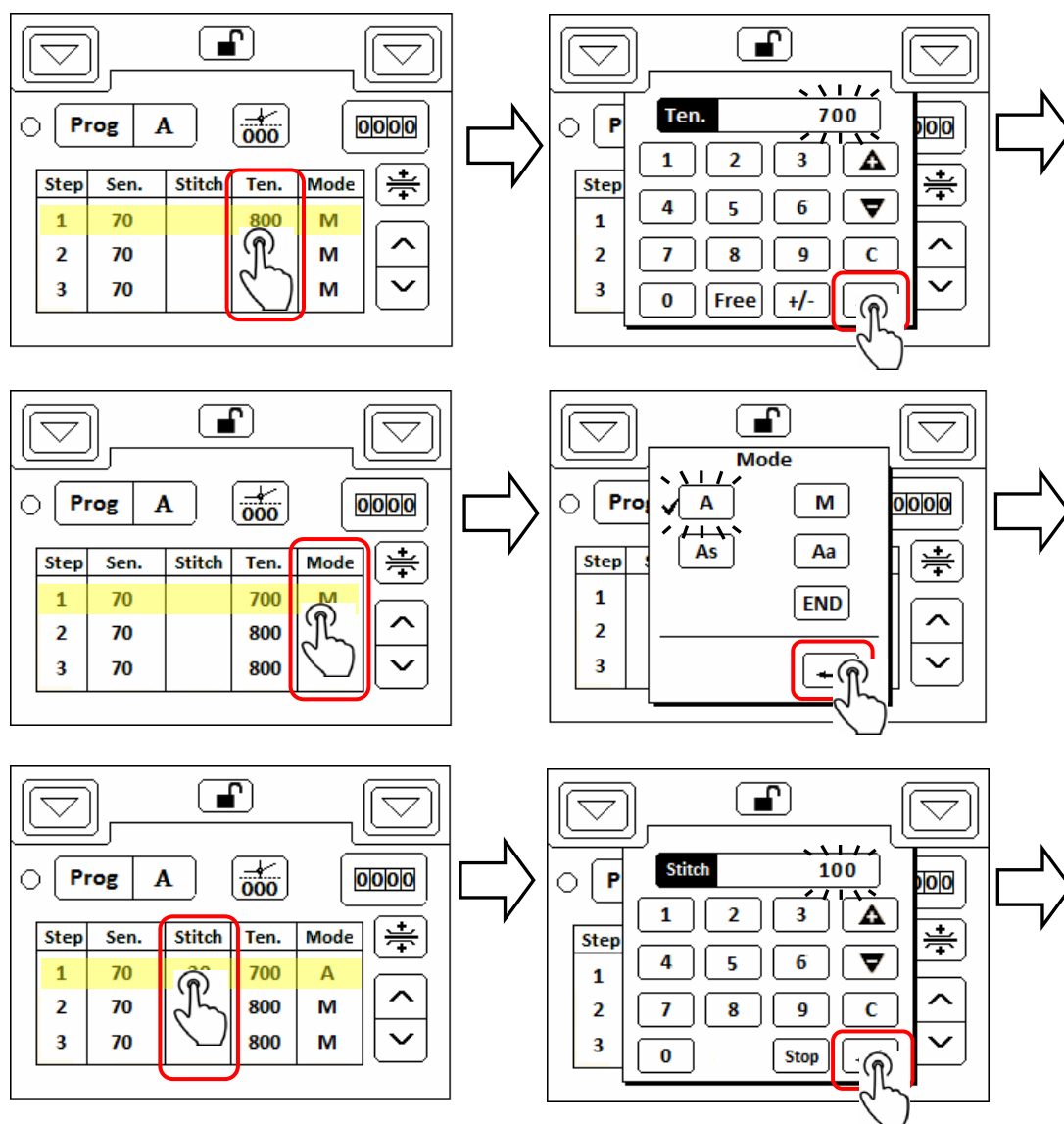
A large tension value

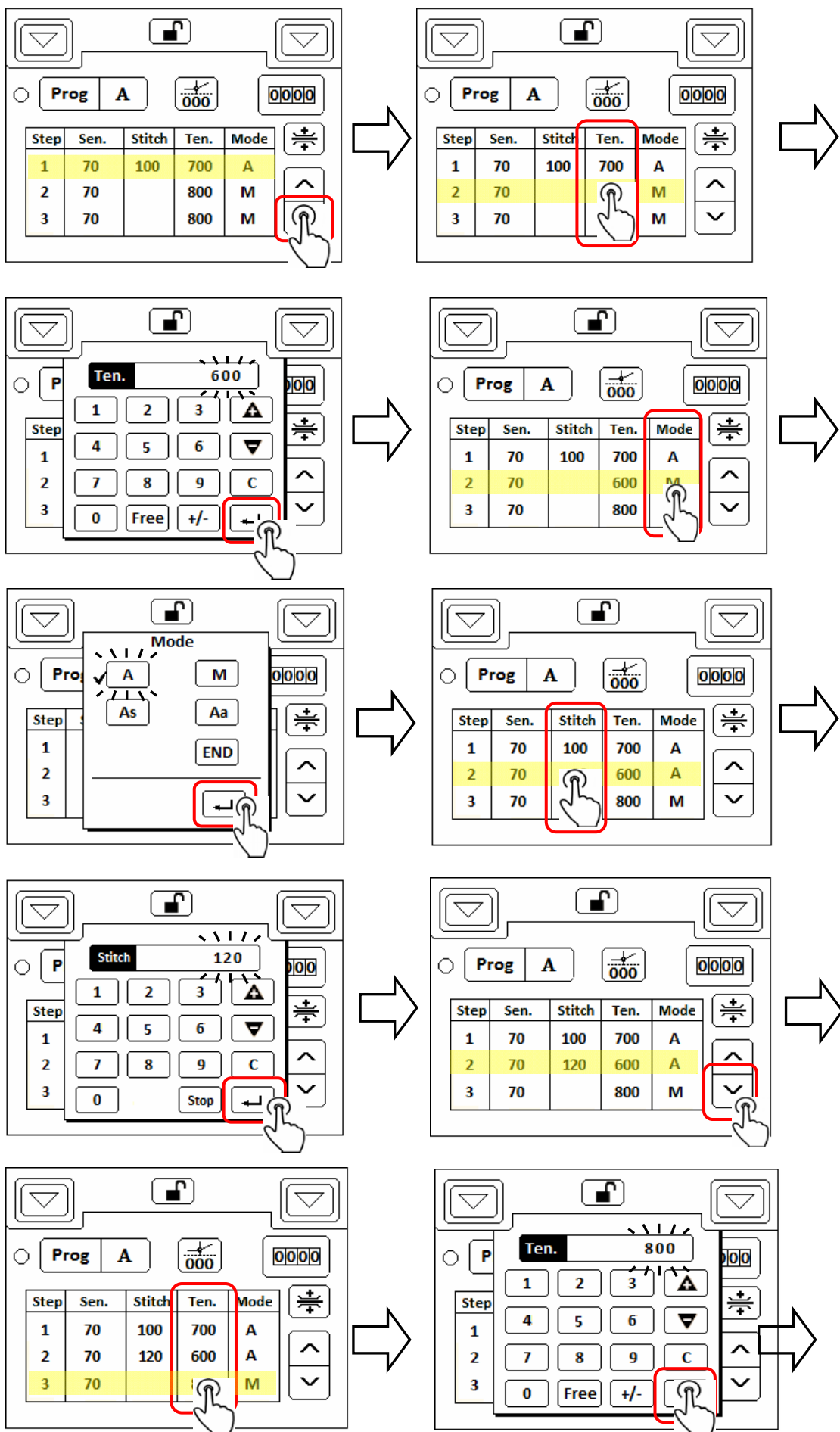


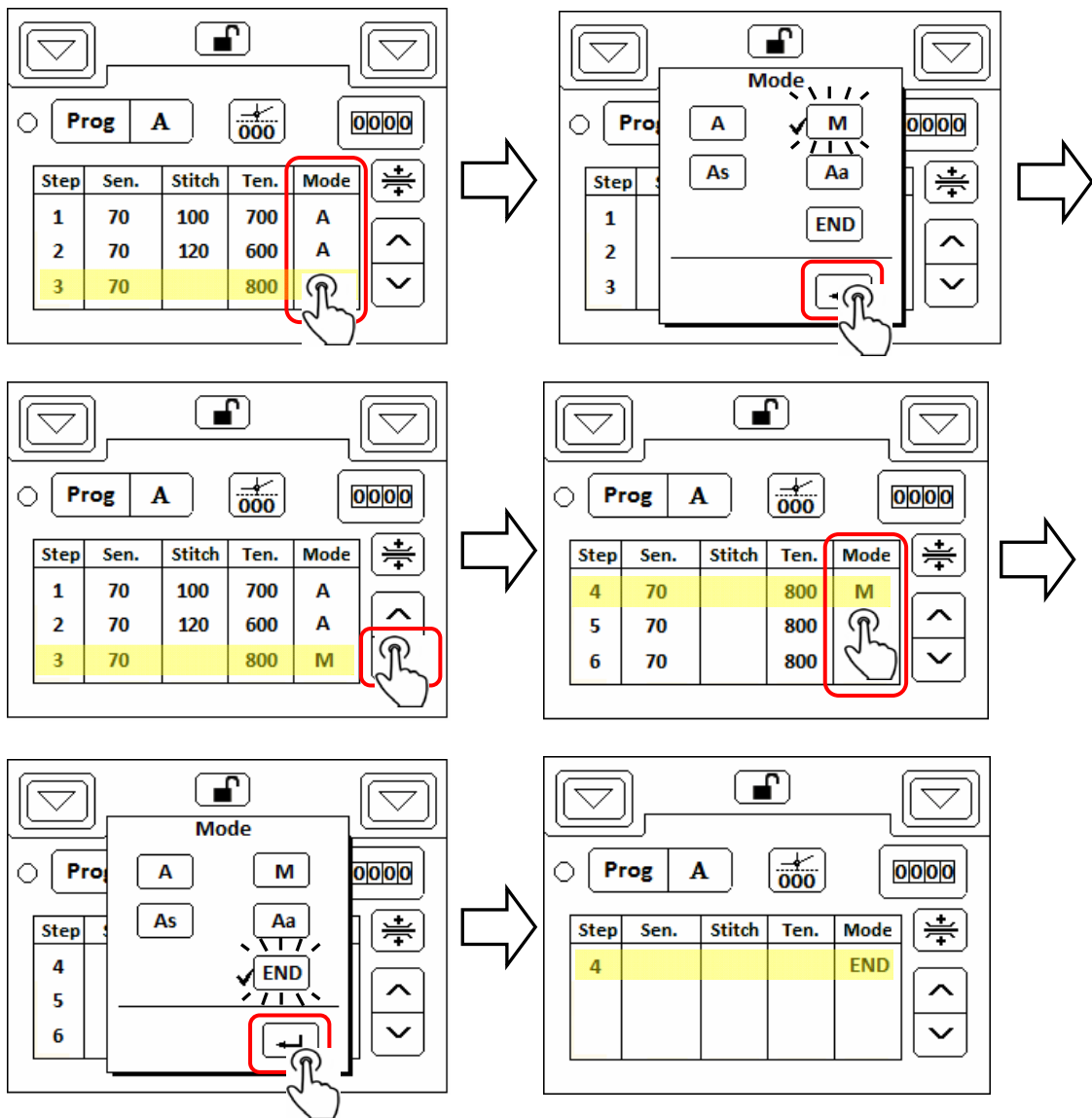
Example2. Program of 2 steps changed automatically with the tension values and stitches set as shown.



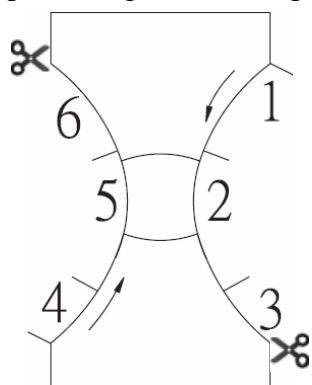
The procedure is illustrated as follows:





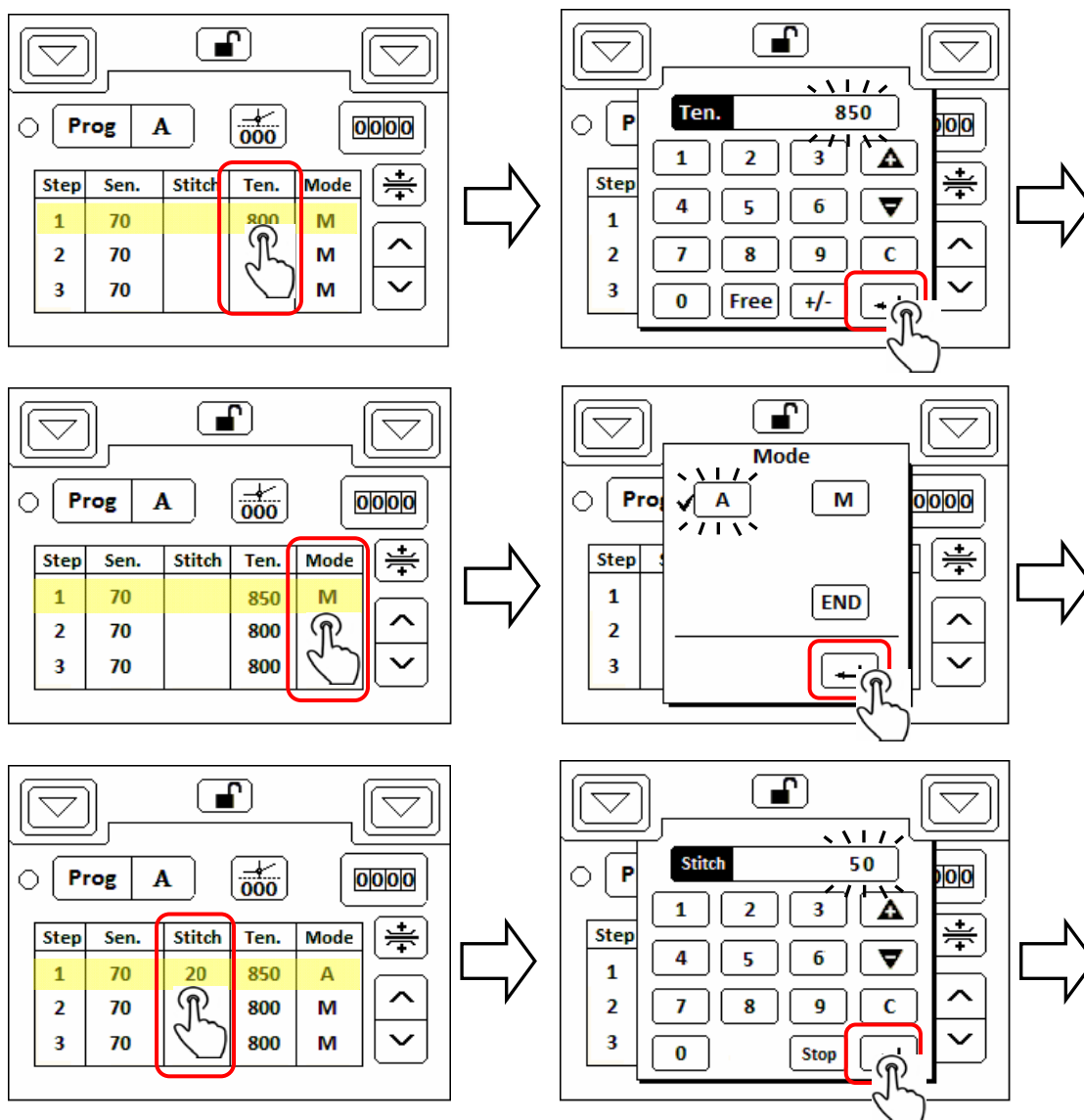


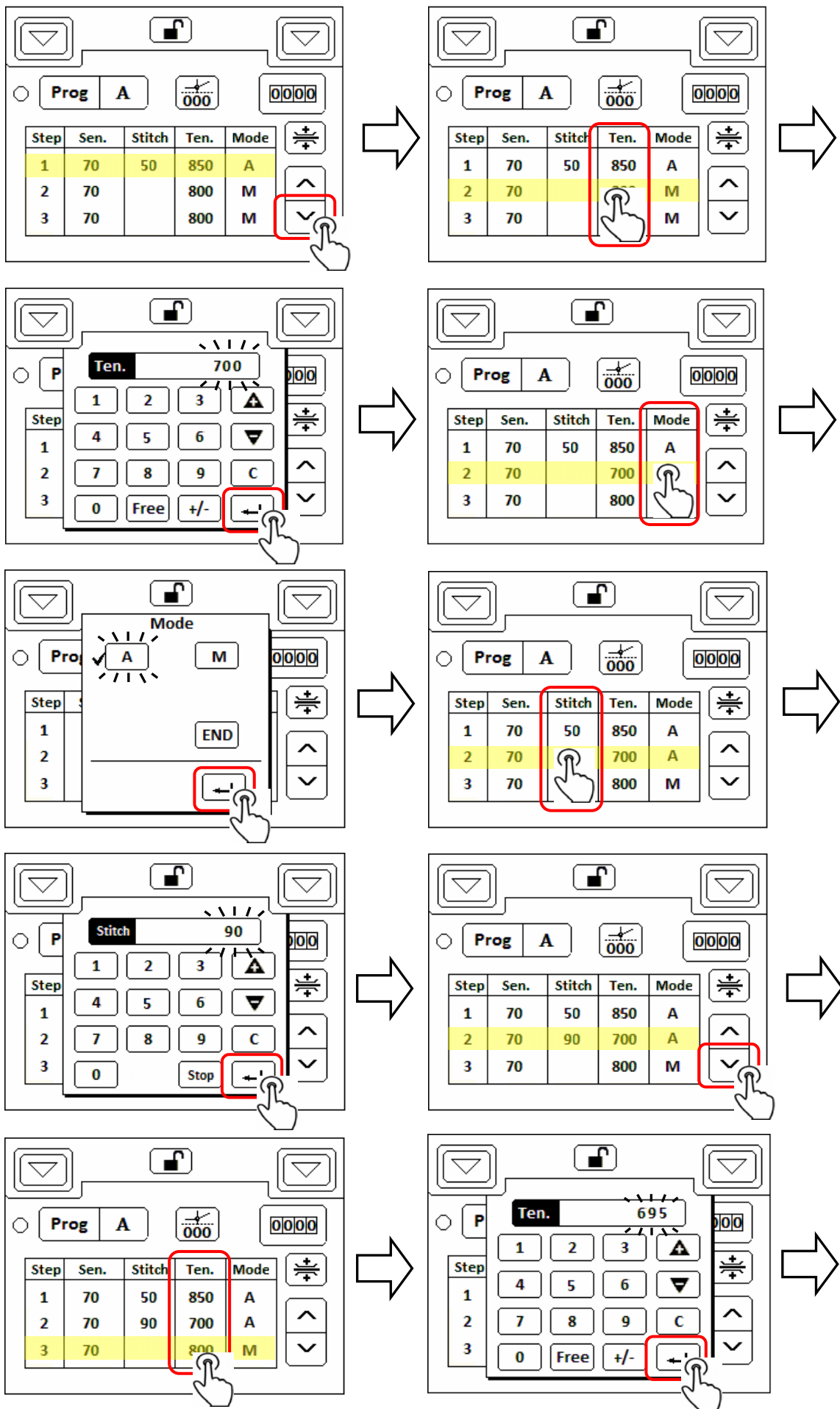
Example3. Program of 6 steps is designed as shown.

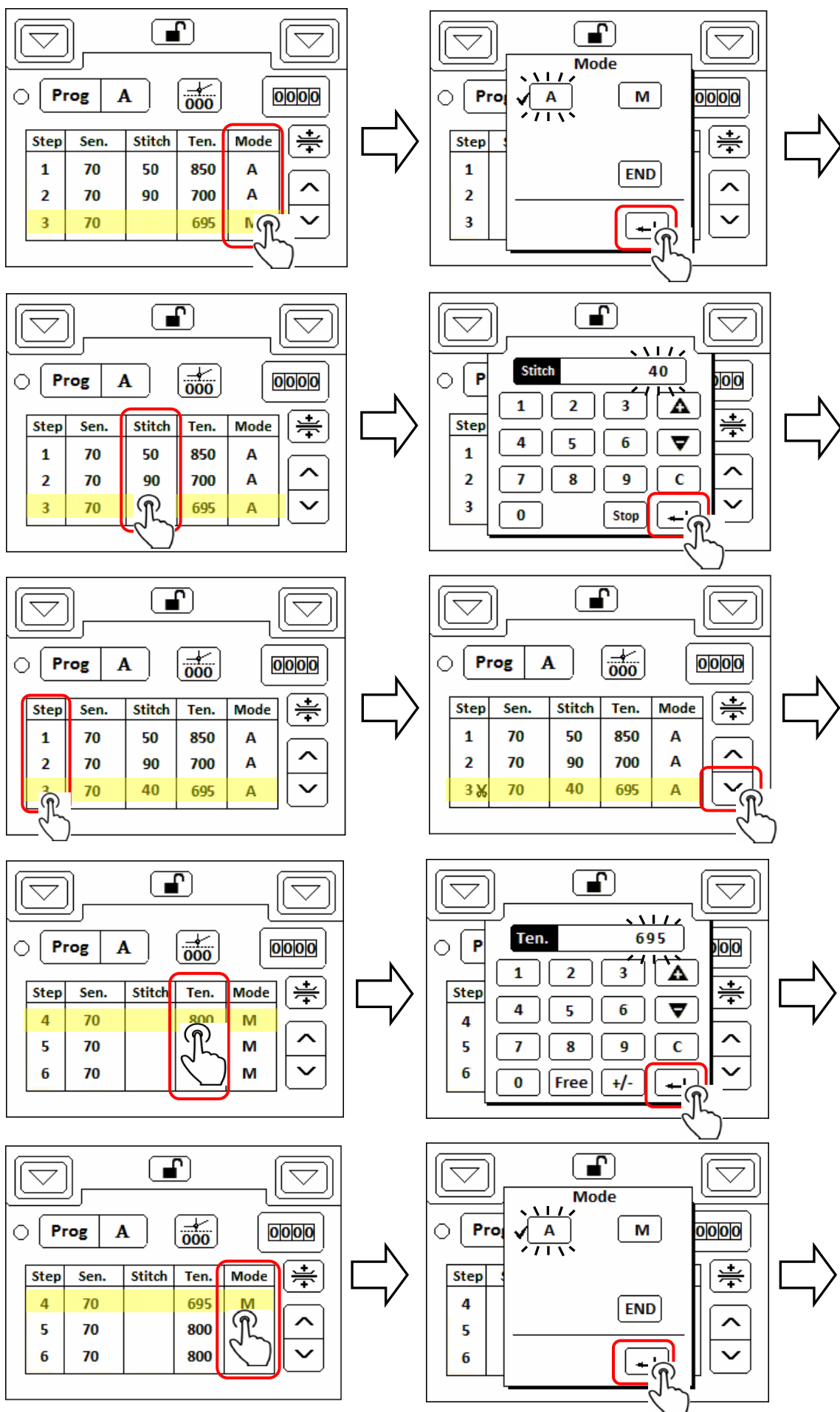


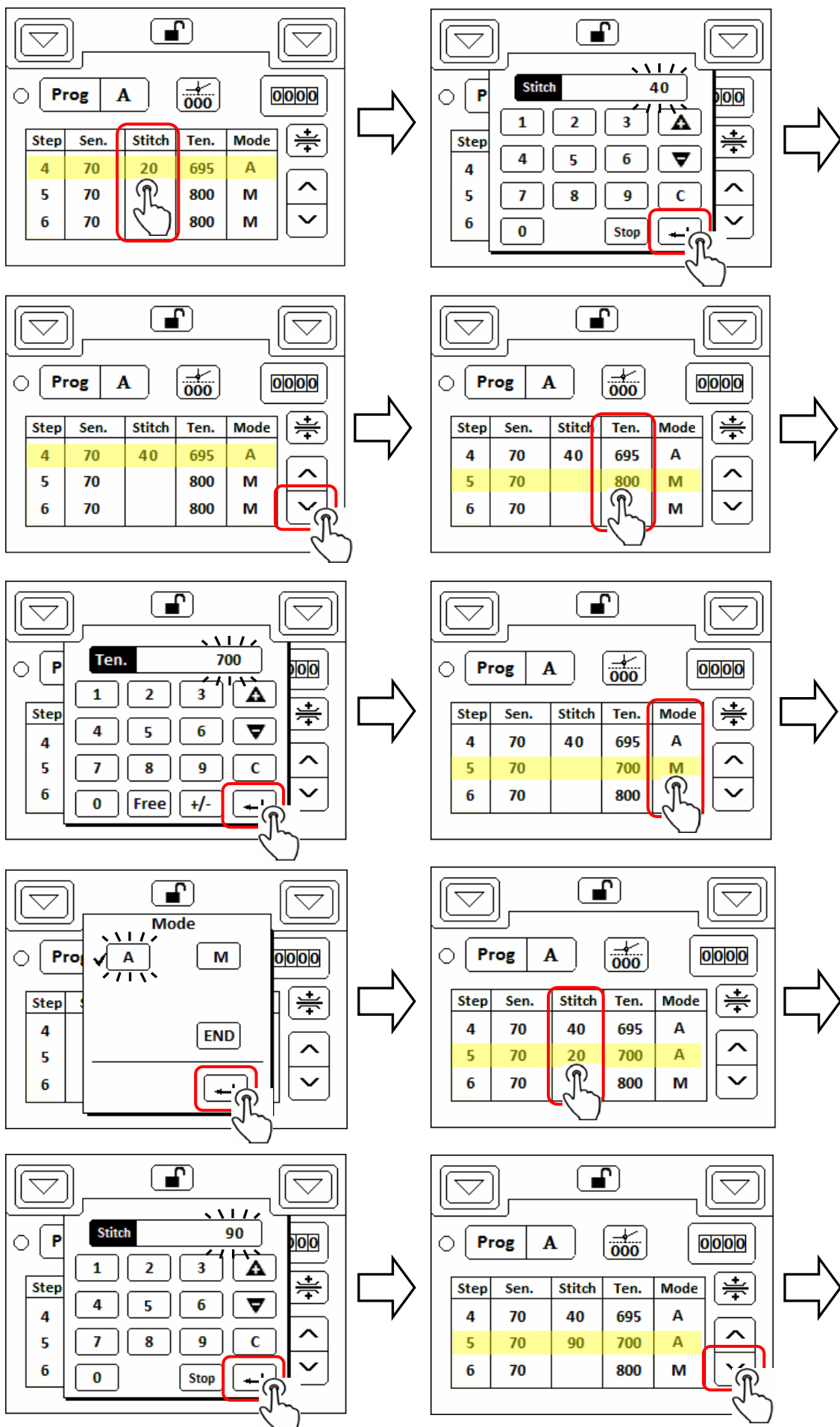
Step	Cut function	stitch	Tension	Mode
1		50	850	A
2		90	700	A
3		40	695	A
4		40	695	A
5		90	700	A
6	manual		850	M
7				END

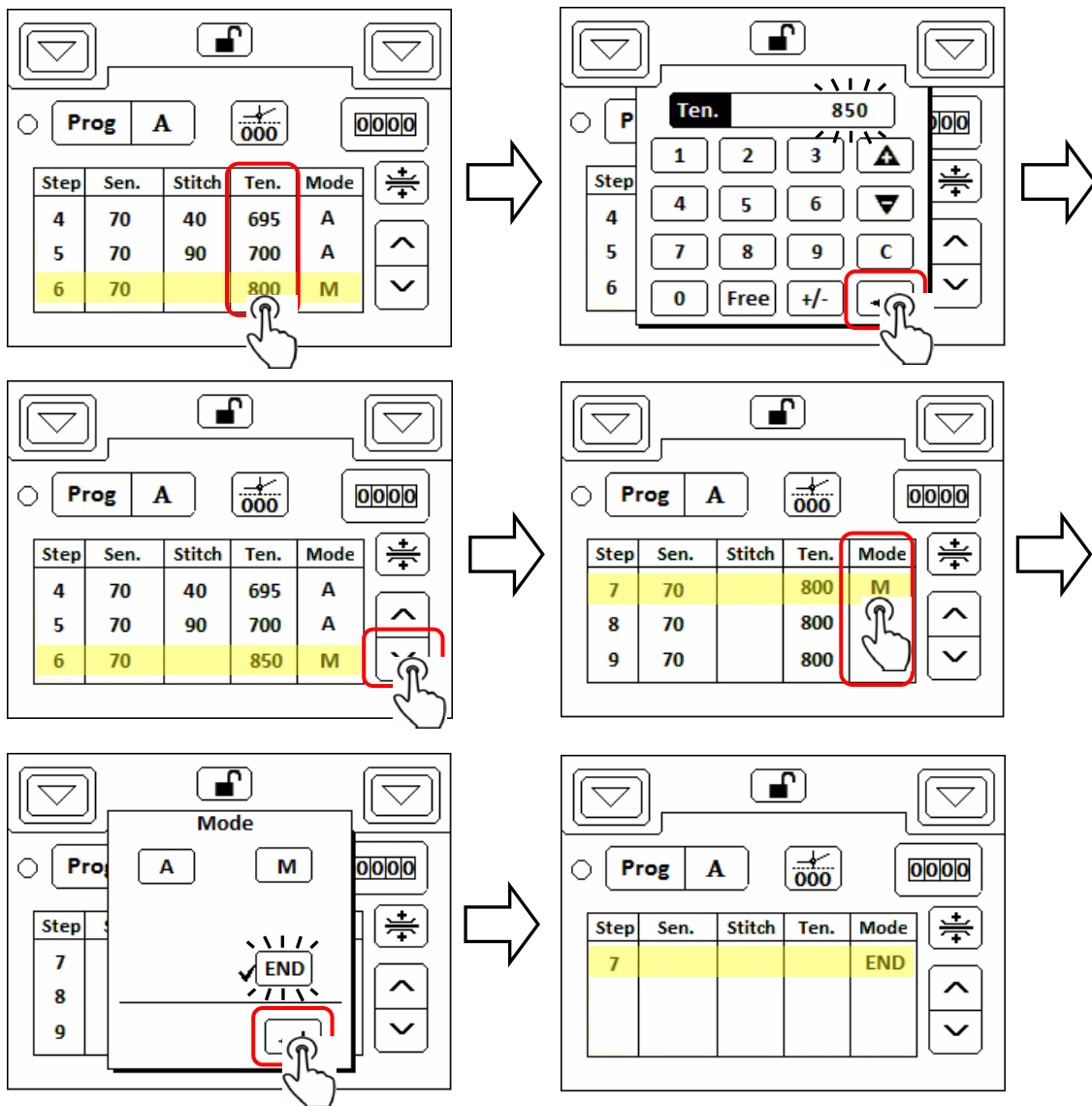
Operation guide:











9. Prompt code and error code

9-1. Prompt code

Prompt codes are Arabic numerals with a character 'N' at the beginning. There are used to prompt user the next action to do or the feedback message from the previous action.

Code	Prompt message	Description
N044	USB params Upload to control box OK.Please reboot.	USB parameters upload to control box is successful .
N045	Control box params download to USB OK	Control box parameters download to USB is successful.
N046	USB sewing data upload to control box OK.please reboot.	USB Program data upload to control box is successful.
N047	Control box sewing data download to USB OK	Control box Program data download to USB is successful.
N064	Load cell calibration OK	Load cell 0kg calibration is successful.
N065	Load cell calibration OK	Load cell 1.8kgs calibration is successful. Please remove the 1.8kgs weight.
N066	Pls remove tape and weights on the load cell then press any key...	Please remove the fabric and weights on the load cell, then press any key.
N067	Pls hang 1.8KG of weights on the load cell then press any key...	Please hang the 1.8 kg weight onto the load cell.
N074	tape thickness sensor calibration OK	Tape thickness sensor calibration is successful.
N076	Pls remove tape on the auxiliary roller and handle bar back to original position then press any key...	Please remove any tape on the auxiliary roller and handler back to original position, and then press any key...
N098	Save parameters ok	Restoring the default setting is successful.
N099	Please reboot	Turn the power OFF, then turn it ON.
N200	Reset system? all params will be lost	Confirm message for "Reset".
N201	Power Off	Power off.
N202	restore default setting?	Confirm message for "restore". Press "YES" to restore the default value.
N203	Will you want to upload data to the control box?	Confirm message for "upload". Press "YES" to upload.
N204	Will you want to download data to the USB flash drive?	Confirm message for "download". Press "YES" to download.
N205	Auxiliary roller handle is opened	Auxiliary roller handler is opened.

9-2. Error code

Error codes are Arabic numerals with a character 'E' at the beginning. There are used to alert user the system malfunctions occur. Further actions should be taken to conduct the troubleshooting.

Code	Error and failure	Troubleshooting
E040	USB params upload to control box failure	USB parameter upload to control box is failed. 1. Unplug and replug the USB flash drive.. 2. Use a new USB flash drive. 3. Check if the parameter file "TCPARAME.TCD" is damaged.
E041	Control box params download to USB failure	Control box parameter download to USB is failed. 1. Unplug and replug the USB flash drive. 2. Check if the storage capacity of USB flash drive is insufficient. 3. Use a new USB flash drive.
E042	USB sewing data upload to control box failure	USB Program data upload to control box is failed. 1. Unplug and replug the USB flash drive. 2. Use a new USB flash drive. 3. Check if the Program data file "TCPPROCES.TCD" is damaged.
E043	Control box sewing data download to USB failure	Control box Program data download to USB is failed. 1. Unplug and replug the USB flash drive. 2. Check if the storage capacity of USB flash drive is insufficient. 3. Use a new USB flash drive.
E050	memory read error	Ask a qualified technician.
E051	memory write error	Ask a qualified technician.
E052	Calibration value read error	Check the cable connection between Control box and Tension device.
E053	Calibration value write error	Check the cable connection between Control box and Tension device.
E060	Load cell calibration fail	Check the cable connection between Control box and Tension device.
E061	Load cell calibration fail	Load cell free calibration failed. 1. Check the cable connection between Control box and Tension device.. 2. Remove the tape on load cell.
E062	Load cell calibration fail	Load cell 1.8kg calibration failed. 1. Check the cable connection between Control box and Tension device.. 2. Hang the 1.8Kg weight on load cell.. 3. Ensure no mechanical obstacle of load cell movement.
E063	Read tension fail	Check the cable connection between Control box and Tension device.
E071	tape thickness sensor calibration fail	1. Check the cable connection between Control box and Tension device. 2. Remove the tape on the auxiliary roller. 3. Close the handler of untangling device.
E073	Read tape thickness fail	Check the cable connection between Control box and Tension device.
E075	Detect abnormal thickness of the tape	1. Ensure that the tape is properly winding around the Driven and Auxiliary roller. 2. Check if a correct value is set (refer to 5-4.)

Code	Error and failure	Troubleshooting
E077	Load cell overload warning	<ol style="list-style-type: none"> 1. Ensure that the tape is properly winding around the Driven and Auxiliary roller. 2. Increase the setting value of parameter 11.
E100	TP and MB link fail	Check the cable connection between Control box and Touch panel.

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