Operation Panel

Operation Instruction Manual

1. Operation Panel Overview

Operation panel (as shown in fig. 1-1), the front surface is divided into two parts: LED Display Area and Push-button Area. And on upper right of operation panel, there is a thumb wheel which is available to be turned C.W and C.C.W.

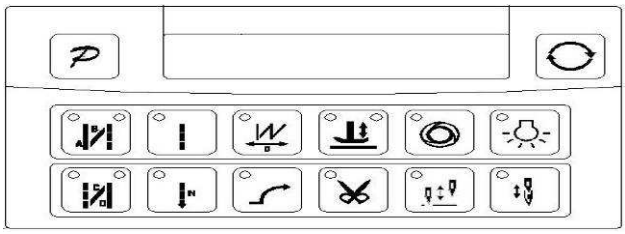


Fig. 1-1

The LED Display Area is on upper-center of the operation panel. The functional parameter display is made up for 6 LEDs. There is a push-button on each side of display area; they are the “Function Key”, “Cycle Key”. Under the display area, there are 12 push-buttons, with LED on upper right or left to show whether the function is on or off.

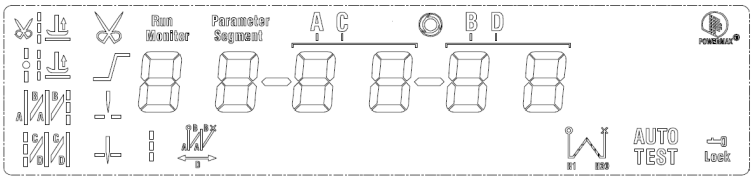


Fig. 1-2

Detailed description of each push-button is shown in table-1.

Table 1: Push-button description of operation panel

No.	Sign	Description
1		Function Key: Main function is to confirm operation and also can be used with other buttons for key-combinations;
2		Cycle Key: Change parameter position when configuration;
3		Front-end Back tacking Key: Cycle selection among the single, double, quadruple and none front-end back tacking. After selection, different combinations of upper left and right LEDs will show the current status;
4		Rear-end Back tacking Key: Cycle selection among the single, double, quadruple and none rear-end back tacking. After selection, different

		combinations of upper left and right LEDs will show the current status;
5		Free-sewing Mode Key: After this mode is selected, LED on upper left will be lighted;
6		Multi-section Sewing key: After this mode is selected, LED on upper left will be lighted;
7		W-type Sewing Key: Select W-type sewing mode. After selection, the upper left LED will be lighted;
8		Soft-start Key: Select soft-start mode. After selection, the upper left LED will be lighted;
9		Foot Lifting Key: Automatic foot lifting setting. Select foot lifting and mid-foot lifting functions. After selection, upper left and upper right LED combination will show the current status;
10		Trimming Key: Select/not select auto trimming. After selection, the upper left LED will be lighted;
11		Trigger Key: Select/not select trigger mode. After selection, the upper left LED will be lighted;
12		Needle Stop Position Key: Select up/down needle position. After the up needle position is selected, the upper left LED will be lighted;
13		Sewing Lamp Key: Select on/off the illumination lamp. After lamp on is selected, the upper left LED will be lighted;
14		Stitch Compensation Key: Compensation function is on when you press the key, the function will be off when you release it. After compensation function is selected, the upper left LED will be lighted;

2. User Mode Definition

2.1 Operator Mode

This mode is the default mode of operation panel; operation panel will enter this mode automatically after switched on. After entering this mode, the 6 decimal points of LED will move in couples (display likes ), this means HMI is in idle condition.

When doing any operation, if you don't press any button or turn thumb wheel for a long time, HMI will switch to idle mode automatically and the previous operation will not be executed!

2.1.1 Sewing Mode Set Up:

Free Sewing Mode: Press, LED displays, then if you press to confirm operation, LED display will recover to idle condition and upper left LED of will be lighted.

Multi-section Sewing Mode: Press, LED displays, this is the operation interface of multi-section sewing. You can use the thumb wheel to confirm N sewing sections according to your need, then press , to confirm parameters and quit the interface, or press , LED displays, entering the interface of stitch number set-up for each section. In this interface, you can use to choose the section which should be changed, then use thumb wheel to change stitch number, after operation is done, press to confirm the parameters and quit the interface, then LED display will recover to idle condition. So long as the multi-section sewing mode is on, upper left LED of will be lighted.

W-type Sewing Mode: Press , enter W-type sewing function, LED displays, this is W-type sewing interface. You can use to switch over A, B, D section, and use thumb wheel to change stitch number of each section. After confirmation, press, then LED display will recover to idle condition, and upper left LED of will be lighted.

2.1.2 Front-end/Rear-end Back tacking Setting:

When press or, LED enters front-end or rear-end back tacking setup mode.

When press , LED cycles among the single , double , quadruple , and none front-end back tacking interfaces. When press , LED cycles among the single, double, quadruple and none rear-end back tacking (fig. omitted). You can press to switch section A, B or C, D, and use thumb wheel to change stitch number of each section. After changing, press to confirm operation, LED display will recover to idle

condition. The two LEDs on front-end or rear-end back tacking key will be lighted to show corresponding conditions.

- When 2 LEDs on  are both off, means none back tacking;
- When upper left LED on  is on, upper right is off, means single back tacking;
- When upper left LED on  is off, upper right is on, means double back tacking;
- When 2 LEDS on  are both on, means quadruple back tacking.

Note: above instruction we provide pictures of front-end back tacking

2.1.3 Soft-start Set Up:

press  to select soft-start function, after selection, LED on upper left of  will be lighted. Press again can quit soft-start condition; LED on upper left of  will be off.

2.1.4 Foot Lifting Set Up:

Use  to choose foot lifting mode, there are four different modes:  , means no auto-foot-lifting;  , means auto-foot-lifting after trimming;  , means auto-foot-lifting when stop during sewing;  , means auto-foot-lifting after trimming and stop during sewing. Use  to cycle select among these four modes, after selection the LEDs will also show in corresponding conditions.

2.1.5 Trimming Set Up:

Use  : to choose auto-trimming mode. When it's auto-trimming, upper left LED of  will be lighted; when auto-trimming is off, upper left LED of  will be off.

2.1.6 Trigger Set Up:

Use  : to choose trigger mode. When it's in trigger mode, upper left LED of  will be lighted; when trigger mode is off, upper left LED of  will be off.

2.1.7 Needle Position Position Set Up:

Use  to choose up/down needle position. When down position is selected, upper left LED of  will be lighted; when up position is selected, upper left LED of  will be off.

2.1.8 Sewing Lamp Set Up:

Use  to turn on/off sewing lamp. When turn on the lamp, upper left LED of  is on; when turn off the lamp, upper left LED of  will be off.

2.1.9 Stitch Compensation Set Up:

Use  to activate stitch compensation function, when you release the button, the function will be deactivated. When the function is selected, upper left LED of  will be lighted, otherwise the LED of  will be off.

2.2 Technician Mode

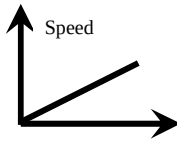
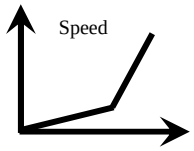
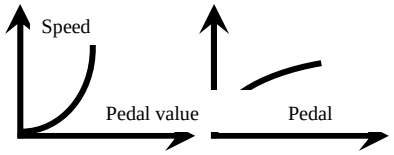
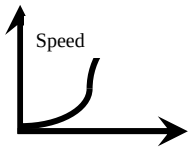
When HMI is in idle condition, press  first, then press  to enter technician interface, LED displays 0. 1.02.00. Then use thumb wheel to change value directly in the digit position with the flashing decimal point, you can use  to change position of the flashing decimal point. After confirmation, press  . If you don't press any button or turn thumb wheel within the certain time, HMI will recover to idle condition automatically.

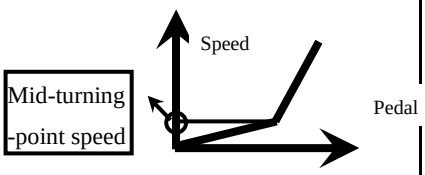
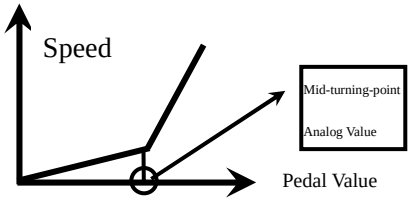
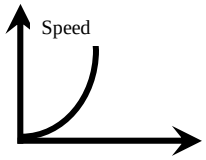
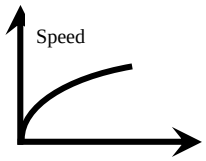
2：Parameter List of Technician Mode

Para. Type	Para. max	Para. min	Default Value	Value Range	Remark
Speed Para.	0	0	200	100 ~800	Start sewing speed
		1	2500	200 ~3000	Max. speed of free sewing mode(Max. speed limitation of overall situation)
		2	2500	200 ~3000	Max. speed of fixed-length sewing
		3	2500	200 ~3000	Max. speed limitation of manual backstitch
		4	200	100 ~800	Stitch compensation speed
		5	250	100 ~500	Trimming speed
		6	0	0 / 1	Slow-start mode:0; slow-start only after trimming,1:after trimming, sewing stop, both has slow-start
		7	2	1 ~9	Slow-start stitch number
		8	200	100 ~800	Slow-start speed

Para. Type	Para. max	Para. min	Default Value	Value Range	Remark
		9	20	1 ~20	System acceleration sensitivity(for direct drive, the value can be bigger; for belt drive, don't use big value, which will make more vibration and noise. This Para. Will not affect motor torque)
		A	20	1 ~20	System deceleration sensitivity (for direct drive, the value can be bigger; for belt drive, don't use big value, which will make more vibration and noise. This Para. Will not affect motor torque)
		B	800	200~1200	Medium speed value(RPM)
		C	50	25~200	Low speed value(RPM)
Back tacking Para.	1	0	800	200 ~2200	Front-end back tacking speed
		1	800	200 ~2200	Rear-end back tacking speed
		2	800	200 ~2200	W-type sewing speed
		3	26	0 ~70	Front-end back tacking, No.1 stitch compensation profile
		4	37	0 ~70	Front-end back tacking, No.2 stitch compensation profile
		5	26	0 ~70	Rear-end back tacking, No.1 stitch compensation profile
		6	37	0 ~70	Rear-end back tacking, No.2 stitch compensation profile
		9	200	1～999	Auto back tacking section stop time CT(ms)
		A	180	10~359	Stitch compensation reference angle(optimum actuation angle of backstitch electromagnet)
Back tacking Mode	**2**	0	0	0/1/2/3	Start back-tacking mode selection： 0；One shot sewing 1；Pedal control and motor can stop at middle way. 2；One shot sewing but motor stops at needle up by CT timer at end of each seam. 3；One shot sewing but motor stops at needle down by

Para. Type	Para. max	Para. min	Default Value	Value Range	Remark
					CT timer at end of each seam.
		1	0	0/1/2	At the end of Start back-tacking mode selection. 0；At the end of Start back-tacking ,machine continues sewing if pedal pressed or START signal on (standing operation) 1 ;At the end of Start Back-Tacking, machine stops and must re-start by pedal command. 2；Making the trimming cycle once the Start Back-Tacking finished. (Mini Bar tacking)
		2	0	0/1	Automatic sewing End mode selection 0；Start back-tacking 1；Active when motor stop，Invalid.
		3	0	0/1/2/3	End back-taking mode selection. 0；One shot sewing 1；Invalid 2；One shot sewing but motor stops at needle up by CT timer at end of each seam. 3；One shot sewing but motor stops at needle down by CT timer at end of each seam.
		4	0	0/1/2/3	Bar-tacking mode selection. 0；One shot sewing 1；Pedal control and motor can stop at middle way. 2；One shot sewing but motor stops at needle up by CT timer at end of each seam. 3；One shot sewing but motor stops at needle down by CT timer at end of each seam.
		5	0	0 ~99	Setting stitches C of End back-tacking
		6	0	0 ~99	stitches plus on Start back-tacking
		7	0	0 ~99	stitches plus on End back-tacking
		8	0	0 ~3	frequence of middle fixed length back tacking

Para. Type	Para. max	Para. min	Default Value	Value Range	Remark
		9	0	0 ~99	needle number of middle backing tacking
Pedal Para.	3	0	2	0 /1 / 2 / 3	Pedal speed-control profile mode: 0：Auto linear ramp(auto calculation according to max. speed)  1：Two-stage ramp (can be set up freely, use Para. No.31 and No.32)  2：Power law curve(use No.33)  3：S-type curve(first slow then quick, better operation in low speed) 

Para. Type	Para. max	Para. min	Default Value	Value Range	Remark
Pedal Para.	3	1	3000	200 ~4000	Sub-para. Of two-stage speed control: mid-turning-point speed RPM (two-stage ramp turning point speed), only valid when para. No.30's value is 1. 
Pedal Para.	3	2	800	0 ~1024	Sub-para. Of two-stage speed control ramp: Pedal analog value of mid-turning-point, valid when Para. No.30 is set to 1, the para. Value should be in the range from para. No.38 to para. No.39. 
		3	2	1 /2	Sub-para. Of power speed control curve: Valid when para. No.30 is 2. 1: Square(slow first, faster later, easy to control in low speed);  2：Radication(fast first, slower later, response fast); 

Para. Type	Para. max	Para. min	Default Value	Value Range	Remark
		4	150	0 ~1024	Trimming pedal-position set up, see fig. 2-1 (setting value should no bigger than Para. No.35)
		5	300	0 ~1024	Foot lifting pedal-position set up, see fig.2-1 (Setting value should be in the range of para.No.34 and para. No.36)
		6	460	0 ~1024	Pedal mid-homing position, see fig. 2-1. (Setting value should be in the range of para. No.35 and para. No.37)
		7	480	0 ~1024	Pedal forward running position, see fig. 2-1. (Setting value should be in the range of para.No.36 and para. No.38)
		8	680	0 ~1024	Pedal low speed running position (upper limitation), see fig. 2-1. (Setting value should be in the range of para.No.37 and para. No.39)
		9	960	0 ~1024	Pedal max. Analog value, see fig. 2-1. (Setting value should be no less than para.No.38)
		A	0	0 ~800	Pedal foot lifting confirming time
		B	0	0 / 1	After pedal back to homing position then trimming selection start: 0：off 1：on
		C	1	0 / 1	Foot lifting position, foot lifting function selection: 0: without 1:with
		D	1	0 / 1	Trimming position, foot lifting function selection: 0: without 1:with
		0	1	0 / 1	Auto upper needle stop position search after switch on: 0: function on 1: function off

Para. Type	Para. max	Para. min	Default Value	Value Range	Remark
Customize Set up	4	1	1	0 / 1	Auto back tacking function selection: (for machines without this function, we suggest to deactivated this function 0: function off 1:function on
		2	0	0 / 1	Function mode selection when manually push back tacking 0：Juki mode. During sewing or stop sewing both have this action. 1：Brother mode. Only acts during sewing.
		3	0	0 / 1 / 2 / 3	Special operation mode: 0: Operator selection 1: Simply sewing mode 2: Motor initial angle measurement (not necessary to remove the belt) 3: Ratio mode calculation (synchronize encoder is necessary and belt can not be removed)
		4	0	0—31	Motor torque increase function in low speed on & off: 0: Normal functions 1-31: low speed torque increase level
		5	1	0 / 1	Needle stop mode: 0: Constant speed idle mode (in belt drive mode, stop accuracy is not high) 1: Pull-back mode (PMX mode)
		6	100	0 ~800	Instruction execution time of half stitch compensation
		7	150	0 ~800	Instruction execution time of one stitch compensation
		8	0	0 / 1 / 2	Needle compensate:0.press time to control;1.half needle;2.one whole needle
		9	0		Running-Delay time setting after foot lift
		A	0	0~10	The larger the value the faster to up speed
Count	5	0	1	1～	Stitch counting proportion set up

Para. Type	Para. max	Para. min	Default Value	Value Range	Remark
Mode				100	
		1	1	1～9999	Stitch counting value set up
		2	0	0～4	Stitch counting mode selection: 0: no counting 1: Counting up according to stitch number, after reaching set value then restart. 2: Counting down according to stitch number, after reaching set value then restart. 3: Counting up according to stitch number, after reaching set value, then motor should stop automatically, recounting should be restart by S4 [152.INI] =CRS or the button A on operation panel. 4: Counting down according to stitch number, after reaching set value, motor should stop automatically, recounting should be restart by S4 [152.INI] =CRS or the button A on operation panel.
		3	1	1～100	Trimming counting proportion set up
		4	1	1～9999	Trimming counting value set up
		5	0	0～4	Trimming counting mode selection: 0: no counting 1: Counting up according to stitch number, after reaching set value then restart. 2: Counting down according to stitch number, after reaching set value then restart. 3: Counting up according to stitch number, after reaching set value, then motor should stop automatically, recounting should be restart by S4 [152.INI] =CRS or the

Para. Type	Para. max	Para. min	Default Value	Value Range	Remark
					button A on operation panel. 4: Counting down according to stitch number, after reaching set value, motor should stop automatically, recounting should be restart by S4 [152.INI] =CRS or the button A on operation panel.
Operation	6	0	0	0	Running time reset
		1	0	0 / 1 / 2	Para. transmission method: 0: no action; 1: Para. Download (from operation panel to controller); 2: Para. Upload (from controller to operation panel).
		2	2000	1, 2, 88	Recover to default para.
		3	0	1, 2	Save current para. As User custom para.(recoverable)
		Note: operation para. Of (6X) will not be save.			

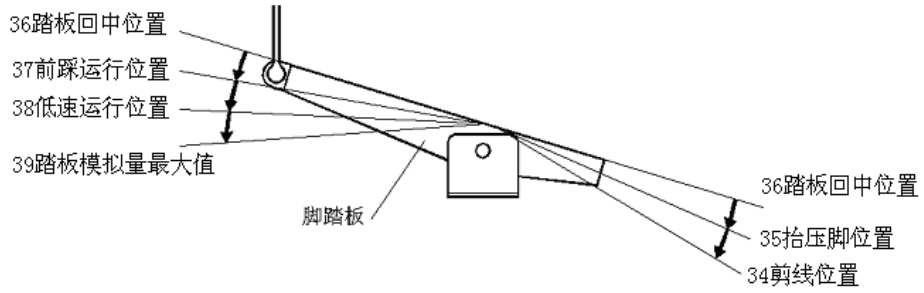


图 2-1 踏板动作参数各位置示意图

2.3 Administrator Mode

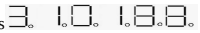
When HMI in idle mode, first press  , then press  , to enter administrator interface, LED displays  use thumb wheel to change value with the flashing radix point, and  can be used to change flashing point position. After the value is confirmed, you can switch to next para. Or press  to confirm modification. If you don't press any button or turn thumb wheel in a certain time, system will automatically switch to HMI idle condition.

Table 3: Para. List of Administrator mode

Para. Type	Para. No. max	Para. No. min	Default Value	Value Range	Remark
Trimming Mode	0	0	0	0 / 1	Motor running mode at trimming sequence 0: For general Lock-Stitch machines . 1：For general Cover stitch machines with under trimmer only.
		1	0	0～359	Mech. Angle when trimming finished
		2	1	0 / 1 / 2 / 3 / 4 / 5 / 6	Trimming time sequence selection: 0: [TS] set angle start trimming, until upper needle stop position is reached, then time delay to [T2] set value. 1: [TS] set angle start trimming, until [TE] set angle. 2: [TS] set angle start trimming, time delay to [T2] set value. 3: After lower needle stop position is reached, time delay to [T1] set value then start trimming, time delay to [T2] set value. 4: After upper needle stop position is reached, time delay to [T1] set value then start trimming, time delay to [T2] set value, most applications

Para. Type	Para. No. max	Para. No. min	Default Value	Value Range	Remark
					are for interlock machines.
					5: After lower needle stop position is reached then start trimming until to the upper position. Time delay to T1 set value then start T2 set trimming time. (Most applications are for flat sewing machines, and set value for T1 and T2 are mostly 0) 6: [TS] set angle start trimming until upper needle stop position. Time delay to T1 set value then start T2 set trimming time.
		3	10	5-359	Trimming start angle TS (relate to lower needle stop position angle)
		4	300	10-359	Trimming finish angle TE (relate to lower needle stop position angle, the value should be bigger than TS)

Para. Type	Para. No. max	Para. No. min	Default Value	Value Range	Remark
		5	10	1-999	Trimming start time delay T1（ms）
		6	60	1-999	Trimming finish time delay T2（ms）
		7	30	1～999	Lower needle stop position trimming time delay D1
		8	90	1～9999	Lower needle stop position trimming duration time D2
		9	120	1～999	Lower needle stop position trimming recover time D3
		A	20	10-70	Trimming torque increase angle (Reserved)
		B	0	0~999	trimming for short thread(0:off; other number:delay the closed time after finished one needle)
Thread slack/Thread sweeping/String nipping Mode	**1**	0	0	0 / 1 / 2 / 3 / 4 / 5 / 6	Thread slack electromagnet time sequence selection: 0: [LS] set angle is reached start thread slack, until upper needle stop position then time delay to [L2] set value. 1: [LS] set angle is reached start thread slack, until [LE] set angle. 2: [LS] set angle is reached start thread slack, time delay to [L2] set time. 3: Lower needle stop position

Para. Type	Para. No. max	Para. No. min	Default Value	Value Range	Remark
					is reached, time delay [L1] set time then start thread slack, until [L2] set time. 4: Upper needle stop position is reached, time delay [L1] set time then start thread slack, until [L2] set time.
					5: Lower needle stop position is reached then start thread slack until upper needle stop position. Time delay [L1] set time then start [L2] set thread lack time. 6: [LS] set angle is reached then start thread slack until upper needle stop position. And then time delay [L1] set time, then [L2] set thread lack time.
		1	30	5-359	Thread slack electromagnet start angle LS (relate to lower needle stop position angle)
		2	300	10-359	Thread slack electromagnet finish angle LE (relate to lower needle stop position, the value should bigger than LS)
		3	1	1-999	Thread slack electromagnet start time delay T1（ms）
		4	10	1～999	Thread slack electromagnet time delay T2(ms)after upper

Para. Type	Para. No. max	Para. No. min	Default Value	Value Range	Remark
					needle stop position is reached
		5	1	0 / 1	String sweeping function selection 0: off 1:on
		6	10	1～999	Thread wiping/Thread sweeping time delay ms
		7	30	1～9999	Thread wiping/Thread sweeping time delay ms
		8	50	1～999	Thread wiping/Thread sweeping recover time ms
		9	1	0 / 1	Thread nipping function selection 0: off 1: on
		A	100	10-359	Thread nipping initial angle
		B	190	11-359	Thread nipping finish angle
		C	0	0～9999	Air blow start time delay ms
		D	50	1～9999	Air blow duration time ms
		E	160	11-359	Lower angle after foot lifting when thread nipping
		F	160	11~359	the angle of presser foot lifting then drop down when thread clamping
Stop Mode	2	0	360	200～360	Stop position after trimming(can implement pull back function after trimming)
		1	0	0～240	Reverse angle before sewing start(enhance the ability over thick material)
		2	0	0 / 1	D axis current lock selection after stop

Para. Type	Para. No. max	Para. No. min	Default Value	Value Range	Remark
		3	300	1～3000	D axis current lock duration after stop (ms)
		4	0	0/1/2/3	Emergency Stop Mode: 0: Turn off the emergency stop function 1: Emergency stop at any position 2: Emergency stop at upper needle stop position 3: Emergency stop at lower needle stop position
		5	0	0～999	Continue stitch No. before emergency stop (according to different set speed and stitch No., the actual value might be bigger)
		6	0	0/1	Restart after emergency stop: 0: Can not be restart, it's necessary to restart the power. 1: When the alarm is canceled, can be restarted.
		7	360	200～360	Upper needle stop position adjustment when machine stop
		8	0	0/1/2	Needle cooling output power set up
		9	2500	1 - 2550 ms	Needle cooling time delay
		A	200	200 - 6000 rpm	Needle cooling start speed
		B	2	1～5	stitch of double needle automatic angle

Para. Type	Para. No. max	Para. No. min	Defaul t Value	Value Range	Remark
		C	0	0 / 1	Middle presser foot mode: 0: not associated with presser foot、backtacking and alternating quantity ; 1:associated with presser foot、backtacking and alternating quantity
Mode Selection	3	0	0	0 / 1	Foot lifting control mode 0: Push button jog switch: 1: Valid when button is pushed;
		1	0	0 / 1	Auto test mode selection: 0: With certain stitch number 1: With certain time
		2	300	0～1000	Safety alarm confirming time ms (for flat sewing machine safety tilting switch and overlock sewing machine safety knife protection switch are same, use the same solution)
		3	50	0～1000	Safety switch recover confirm time ms
		4	0	0 / 1	Motor resolving direction: 1: C.C.W 0: C.W.
		5	0	0 / 1 /2	Foot lifting signal speed

Para. Type	Para. No. max	Para. No. min	Default Value	Value Range	Remark
					control function: 0: off 1: analog signal 2: digital signal
		6	0	0～1023	Signal min.
		7	710	0～1023	Signal max.
		8	200	200～800	Signal speed control min.
		9	400	200～2500	Signal speed control max.
		A	0	0/1/2/3	Single side detector operation mode: 0: no use of detector 1: detector on when manual start mode 2: detector on when auto start mode 3: detector on when double trimming manual speed control mode
		B	50	10～3000	Auto start mode confirming time ms
		C	3	0～999	Stitch No. without response after start
		D	3	0～999	Stitch No. for first double trimming
		E	3	0～999	Continue stitch No. after signal invalid (according to different speed and stitch No., the actual value might be bigger)

Para. Type	Para. No. max	Para. No. min	Defaul t Value	Value Range	Remark
		F	0	0 / 1	Air-tight joint mode of auto back tacking 0: Hold current air-tight joint condition when auto back tacking; 1: Forced close air-tight joint when auto back tacking;
Machine Para.	**4**	0	1000	0～9999	Motor/machine ratio:0.001 (If ratio has been calculated automatically, the para. In the controller might be different with HMI)
		1	3500	0～5000	Max. speed limitation of machine
		2	0	0～359	Adjustment angle of upper needle stop position (relate to angle difference of upper needle stop position encoder)
		3	175	0～359	Mech. Angle of lower needle stop position
		4	200	0~800	Foot lifting release time delay (ms)
		5	9	0～359	Torque increase initial angle of over thick material
		6	57	0～359	Torque increase finish angle of over thick material
		7	0	0～2000	Oil refill time alarm (hour. 0: function deactivated)
		8	0	0～4000	Oil alarm, stop operation time (hour. 0: function deactivated)

Para. Type	Para. No. max	Para. No. min	Default Value	Value Range	Remark
		9	1000	200～2500	Machine signal B2 speed
		A	1500	200～2500	Machine signal B3 speed
		B	800	0～1023	No.1 Analog signal input threshold value
		C	800	0～1023	No.2 Analog signal input threshold value
Input Definition	5	0	1	0:Disable 1:Manual back tacking 2:Safety switch 3:Emergency stop 4:Material side detection 5:Pedal trimming input 6:Pedal foot lifting input 7:Stitch compensation 8:Front-end/rear-end back tacking reverse 9:Presser foot alternation lifting 10:Air-tight joint 11:Counter reset 12:OP input 13:Presser foot alternation input 1 14:Presser foot alternation input 2 15:Needle lifting lock 16:Edge joint presser	No.1 input definition
		1	1		No.1 active input level 0/1
		2	0		No.2 input definition
		3	0		No.2 active input level 0/1
		4	10		No.3 input definition
		5	1		No.3 active input level 0/1
		6	0		No.4 input definition
		7	0		No.4 active input level 0/1
		8	9		No.5 input definition
		9	1		No.5 active input level 0/1
		A	0		No.6 input definition
		B	0		No.6 active input level 0/1
		C	11		No.7 input definition
		D	1		No.7 active input level 0/1
		E	7		No.8 input definition
		F	1		No.8 active input level 0/1

Para. Type	Para. No. max	Para. No. min	Defaul t Value	Value Range	Remark
				foot control input17 ; double turn left 18 : double needle turn right	
Output Definition	6	0	1	0:Output disable 1:Trimming 2:Thread wiping 3:Back stitch 4:Foot lifting 5:Thread slack 6:Thread nipping 7:Air sucking 8:Air blowing 9:Needle cooling 10: Presser foot alternation lifting 11: Air-tight joint 12:Back tacking reverse hanging mode 13:Alternation lifting mode 14:Air-tight joint mode 15:OP output 16:Bottom thread counter full condition 17:Trimming short thread head output 18: Edge joint presser foot control output 19 : double needle left needle bar actuation ; 20 :	No.1 electromagnet output definition
		1	3		No.2 electromagnet output definition
		2	4		No.3 electromagnet output definition
		3	0		No.4 electromagnet output definition
		4	0		No.5 electromagnet output definition
		5	13		No.6 electromagnet output definition
		6	14		No.7 electromagnet output definition
		7	8		No.8 electromagnet output definition

Para. Type	Para. No. max	Para. No. min	Defaul t Value	Value Range	Remark
				double needle right needle bar actuation ; 21 : double needle keep left ; 22 : double needle keep right ;	
No.1 Electromagnet	7	0	50	1～500	No.1 electromagnet fully output time ms
		1	1	1～10	No.1 electromagnet chopping on time ms(Reserved)
		2	1	1～10	No.1 electromagnet chopping off time ms(Reserved)
		3	0	0～600	No.1 electromagnet protection time 100ms
		4	70	1～500	No.2 electromagnet fully output time ms
		5	1	1～10	No.2 electromagnet chopping on time ms(Reserved)
		6	1	1～10	No.2 electromagnet chopping off time ms(Reserved)
		7	0	0～600	No.2 electromagnet protection time 100ms
		8	150	1～500	No.3 electromagnet fully output time ms
		9	1	1～10	No.3 electromagnet chopping on time ms(Reserved)
		A	1	1～10	No.3 electromagnet chopping off time ms(Reserved)
		B	0	0～600	No.3 electromagnet protection time 100ms
		C	100	1～500	No.4 electromagnet fully output time ms

Para. Type	Para. No. max	Para. No. min	Default Value	Value Range	Remark
		D	1	1～10	No.4 electromagnet chopping on time ms(Reserved)
		E	1	1～10	No.4 electromagnet chopping off time ms(Reserved)
		F	0	0～600	No.4 electromagnet protection time 100ms
No.2 Electromagnet	8	0	40	1～500	No.5 electromagnet fully output time ms
		1	0	1～10	No.5 electromagnet chopping on time ms(Reserved)
		2	0	1～10	No.5 electromagnet chopping off time ms(Reserved)
		3	0	0～600	No.5 electromagnet protection time 100ms
		4	100	1～500	No.6 electromagnet fully output time ms
		5	0	1～10	No.6 electromagnet chopping on time ms(Reserved)
		6	0	1～10	No.6 electromagnet chopping off time ms(Reserved)
		7	0	0～600	No.6 electromagnet protection time 100ms
		8	100	1～500	No.7 electromagnet fully output time ms
		9	0	1～10	No.7 electromagnet chopping on time ms(Reserved)
		A	0	1～10	No.7 electromagnet chopping off time ms(Reserved)
		B	0	0～600	No.7 electromagnet protection time 100ms

Para. Type	Para. No. max	Para. No. min	Defaul t Value	Value Range	Remark
		C	100	1～500	No.8 electromagnet fully output time ms
		D	0	1～10	No.8 electromagnet chopping on time ms(Reserved)
		E	0	1～10	No.8 electromagnet chopping off time ms(Reserved)
		F	0	0～600	No.8 electromagnet protection time 100ms
Input Definition	9	0	0	0:Disable 1:Manual back tacking 2:Safety switch 3:Emergency stop 4:Material side detection 5:Pedal trimming input 6:Pedal foot lifting input 7:Stitch compensation 8:Front-end/rear-end back tacking reverse 9:Presser foot alternation lifting 10:Air-tight joint 11:Counter reset 12:OP input 13:Presser foot alternation input 1 14:Presser foot	No.9 analog input definition
		1	0		No.9 analog input active level 0/1
		2	0		No.10 analog input definition
		3	0		No.10 analog input active level 0/1
		4	0		No.11 analog input definition
		5	0		No.11 analog input active level 0/1
		6	8		No.12 analog input definition
		7	1		No.12 analog input active level 0/1
		8	0		No.13 analog input definition
		9	0		No.13 analog input active level 0/1
		A	0		No.14 analog input definition
		B	0		No.14 analog input active level 0/1
		C	0		No.15 analog input definition
		D	0		No.15 analog input active level 0/1

Para. Type	Para. No. max	Para. No. min	Default Value	Value Range	Remark
		E	0	alternation input 2	No.16 analog input definition
		F	0	15:Needle lifting lock 16:Edge joint presser foot control input 17；double turn left 18：double needle turn right	No.16 analog input active level 0/1
Output Definition	A	0	0	0:Output disable 1:Trimming 2:Thread wiping 3:Back stitch 4:Foot lifting 5:Thread slack 6:Thread nipping 7:Air sucking 8:Air blowing 9:Needle cooling 10: Presser foot alternation lifting 11: Air-tight joint 12:Back tacking reverse hanging mode 13:Alternation lifting mode 14:Air-tight joint mode 15:OP output 16:Bottom thread counter full condition 17:Trimming short	No. 1 electromagnet output definition
		1	0		No. 2 electromagnet output definition
		2	0		No. 3 electromagnet output definition
		3	0		No. 4 electromagnet output definition
		4	0		No. 5 electromagnet output definition
		5	0		No. 6 electromagnet output definition
		6	0		No. 7 electromagnet output definition
		7	0		No. 8 electromagnet output definition

Para. Type	Para. No. max	Para. No. min	Defaul t Value	Value Range	Remark
				thread head output 18: Edge joint presser foot control output 19：double needle left needle bar actuation；20：double needle right needle bar actuation；21：double needle keep left；22：double needle keep right；	

2.4 Research and Development Mode

When HMI is in idle condition, press  first, then press  to enter research and development interface, enter password, LED displays  . Then use thumb wheel to change value directly in the digit position with the flashing decimal point, you can use  to change position of the flashing decimal point. After confirmation, press  . If you don't press any button or turn thumb wheel within the certain time, HMI will recover to idle condition automatically.

Table 4: : Rresearch and Development Mode

Para. Type	Para. max	Para. min	Default Value	Value Range	Remark
motor hexadecimal	0	0	2	0/1/2/3/4	logarithm
		1	6000	1000~9999	(RPM) motor max speed
		2	200	0~359	the initial angle
		3	180	1~9999	line number of encoder
		4	5500	1000~9999	(RPM) forward direction max speed
		5	1000	200~2000	(RPM) reverse max speed
		6	311	150~700	rated voltage value(V)

Para. Type	Para. max	Para. min	Default Value	Value Range	Remark
		7	0	0/1/2/3	Encoder: 0,PMX;1. Hohsing direct drive(Index and synchronizer can be shared with Hohsing);2.Hohsing belt drive(with external synchronizer)
Motor decimal system	1	0	09C4	0～FFFF	electric current loop Kp
		1	005D	0～FFFF	electric current loop Ki
		3	2400	0～FFFF	current limiting value
		4	1000	0～FFFF	overload protection reference value
		5	2000	0～FFFF	high speed Kp
		6	0050	0～FFFF	high speed Ki
		8	0001	0～FFFF	low speed Kp
		9	0002	0～FFFF	low speed Ki
		11	0004	0～FFFF	position Kp
		12	0005	0～FFFF	position Ki
		14	0007	0～FFFF	motor magnetic flux linkage coefficients
		15	0008	0～FFFF	system inertia
Machine Para.	2	0	180	50～300	Stop position to enter min speed (for stopping)
		1	600	200～1500	Stop position to enter max speed (for stopping)
		2	20	1～300	stop position to enter min angle
		3	120	1～300	stop position to enter max angle
		4	25	1～300	angle for trimming and stopping position

Para. Type	Para. max	Para. min	Default Value	Value Range	Remark
		5	0	0～3000	load torque compensation 0.000 format
Ccontrol system Para	3	0	160	50～200	low voltage when motor froze(for under voltage detection)
		1	380	200～450	high voltage when motor froze (for under voltage detection)
		2	80	50～200	low voltage in running(for under voltage detection)
		3	440	300～450	overvoltage in running(for overvoltage detection)
		4	400	300～450	braking voltage (for brake resistance discharging control)

2.5Monitoring Mode

When operation panel is in idle condition, first press  and press  , then enter monitoring mode. Use thumb wheel to choose the para. Which you like to monitor.

Detail monitoring para. See table 4, if you don't push any button, then operation panel will back to idle condition automatically.

Table 4: Monitoring mode para. table

	Para. No. max	Para. No. min	Para. Unit	Remark
Monitoring Status	1	0	Time	Stitch counting
		1	Time	Trimming counting
	2	0	V	Line voltage
		1	RPM	Machine speed
		2	0.01A	Phase current
		3	degree	Initial angle
		4	degree	Mech. Angle
		5	——	Sample value of pedal voltage
		6	0.001	Ratio

		7	Hour	Motor total running time
		8	——	Sample value of machine speed signal
	3	0 - 7	——	8 history error codes

2.5 False alarm mode

When system detect an error, the operation panel will switch to false alarm mode automatically, LED displays E.r.r.-.0.0.. In this mode, operation panel is still possible to change Technician para., Administrator para. And other para., and monitoring mode is also valid. When you quit these modes, the operation panel will not return to idle mode, it'll still back to false alarm mode, after correcting system false, it's necessary to reset the main power then the machine can be used normally. For the most error codes and disposal methods, please check user's manual of controller.

2.6 Safety switch alarm mode

When control system detects safety switch action (normally being used for machine tilting safety switch, etc), then operation panel will turn to safety switch alarm mode, LED displays A.r.M.-.U.P.. In safety switch alarm mode, it's still possible to change technician para. And operation panel para., and entering monitor mode. After quitting these modes, operation panel will not back to idle condition, it'll still back to safety switch alarm mode.

(Safety switch input will be handled integrally; system will not distinguish machine tilting switch or knife protection switch.)

3. Operation after control system installation:

1 . After control system has been installed, before using, it's necessary to have a "Auto ratio calculation" (because the machining accuracy, hand wheel effective radius of different manufactures are different, even for direct drive system, the ratio is not always 1:1). Enter technician No.43 para., value set to 3. Step pedal to start, the system will run about 10 rounds in mid-speed then stop; the calculation result will save in controller directly. After that set para. No.43 to 0.

If the ratio value can be confirmed, then technician para. No.40 can be set directly. The actual ratio which saved in controller can be got by monitoring para. No.26.

2. For this software version and higher version, the down needle position, will no longer confirm by down needle position signal. Instead, the position will be confirmed by technician para. No.43, this parameter will ensure corresponding mech. Angle between down and up

needle position. The present mech. Angle can be showed by monitoring parameter No.24 to user, up needle position mech. Angle is 0.

(After power on, control system needs at least one time to go through the up needle position for calibration the mech. Angle. For instance: searching for upper position. Ratio value will influence mech. Angle calculation, we suggested that confirm the correct ratio first, then adjust lower needle position).

3. For this software version and higher version, all control systems have 5 electromagnet outputs, and use new software design. And No.2 and No.3 has output chopping current adjustment (default output is back stitch and foot lifting electromagnet), the other outputs have no chopping function. Before using, please confirm administrator para. No. 6x, ensure set up of all outputs are same to electromagnet connections; and it's also necessary to confirm administrator para. No.7x and No.8x, if not, the electromagnets may have insufficient power output. (Default para. Is set according to most manufactures' electromagnet connection definition)

4. Control system recovery set up:

4.1 Manufacture parameters recovery

Step 1: In operator mode, press and hold  , then press  , LCD display **PD** 0000, and password which set by technician is required.

Step 2: Use thumb wheel change the value with flashing decimal point, you can use  to change decimal point position, then go to technician para. No.62.

Step 3: Use thumb wheel change the value with flashing decimal point, you can use  to change decimal point position, and then change value to recover one.

Step 4: Confirm the parameters are correct, then press and hold  , until LED on operation panel start flashing, then release  , then operation panel and whole control system is recovered to default settings.

4.2 User's parameters recovery

Use operation panel para. No.63 can turn the current user settings to user-defined settings, operation method as follows:

Step 1: In operator mode, first press and hold  , then press  , LCD will display PD 0000, and password which set by technician is required.

Step 2: Use thumb wheel to change value with flashing decimal point directly, you can use  to change the decimal point position, to index value 63, the parameter value should be 1 or 2.

Step 3: Use thumb wheel to change value with flashing decimal point directly, you can use  to change the decimal point position, to parameter value which you want to recover.

Step 4: After confirming inputs are correct, press and hold  , until the operation panel LED start flashing, then release  ， then operation panel and whole system is recovered to default condition.

When system get error due to parameter settings, then the user can use user-definition parameter to recover, the operational method is same like “Default parameters recover”, set administrator parameter No.63 to 1 or 2, press and hold  for 5 seconds, then system will recover to user-definition parameter settings.

Notes:

1. After power on, operation panel will only download parameters in operator mode, it will not download technician and administrator parameter settings initiatively. If you want to download the whole parameters, you can use technician para. No.61 to download all current active parameters from operation panel to controller.
2. If you want to recover other parameters which saved in operation panel, it’s necessary to use technician para. No.62 to activate these parameter settings, then download them.
3. After changing one single para., operation panel need to compare the value difference between current para. And modified one, and then start downloading.
4. After recovering default parameter settings, we strongly recommend that to restart the system.

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