⚠Safety Instruction

1. Users are required to read the operation manual completely and carefully before installation or operation.
2. This product must be installed or operated by properly trained personnel. All power must be turned off during installation, and remember not to operate with power.
3. All the instruction marked with sign ⚠ must be observed or executed; otherwise, bodily injuries might occur.
4. For perfect operation and safety, it is prohibited that using extension cable with multi-outlet for power connection.
5. When connecting power supply cords to power sources, it is necessary to make sure that the power voltage matches the rated voltage ±20% indicated on the motor's name plate.
6. Do not operate in direct sun light, outdoors area and where the room temperature is over 45°C or below 0°C.
7. Please avoid operating near the heater at dew area or at the humidity below 10% or above 90%.
8. Do not operate in area with heavy dust, corrosive substance or volatile gas.
9. Avoid power cord being applied by heavy objects or excessive force, or over bend.
10. The earth wire of power cord must be connected to the system ground of the production plant by proper size of conductions and terminals. This connection should be fixed permanently.
11. All the moving portions must be prevented to be exposed by the parts provided.
12. Turing on the machine in the first time, operate the sewing machine at low speed and check the correct rotation direction.
13. Turn off the power before the following operation：
    1. Connecting or disconnecting any connectors on the control box or motor.
    2. Threading needle.
    3. Raising the machine head.
    4. Repairing or doing any mechanical adjustment.
    5. Machines idling.
14. Repairs and high level maintenance work should only be carried out by electronic technicians with appropriate training.
15. All the spare parts for repair must be provided or approved by the manufacturer.
16. Don't use any objects or force to hit or ram the product.

Guarantee Time

Warranty period of this product is 1 year dated from purchasing, or within 2 years from ex-factory date.
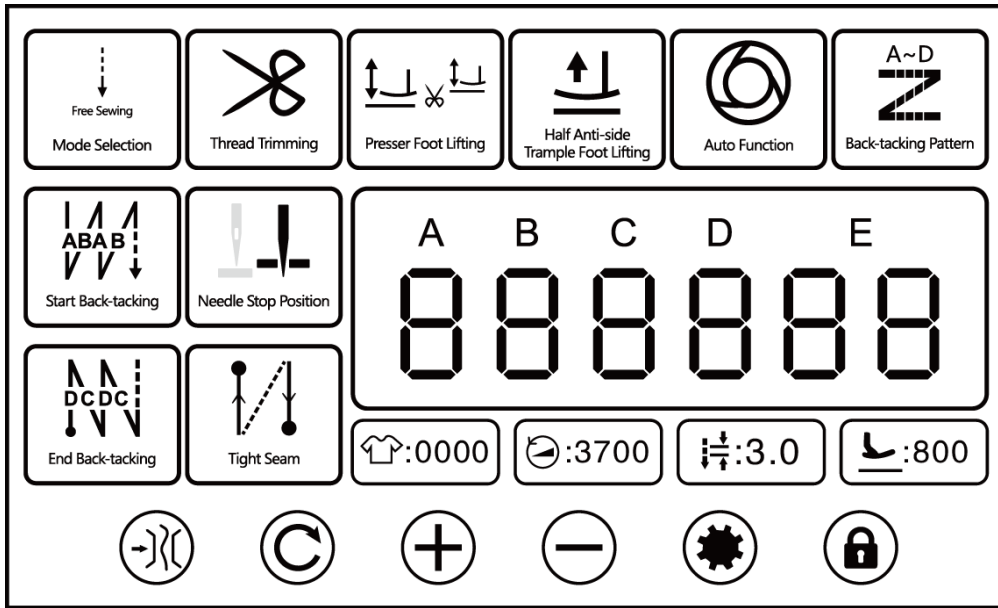
Warranty Detail

Any trouble found within warranty period under normal operation, it will be repaired free of charge. However, maintenance cost will be charged in the following cases even if within warranty period:

1. Inappropriate use, including: wrong connecting high voltage, wrong application, disassemble, repair, modification by incompetent personnel, or operation without the precaution, or operation out of its specification range, or inserting other objects or liquids into the product.
2. Damage by fire, earth quake, lighting, wind, flood, salt corrosive, moisture, abnormal power voltage and any other damage cause by the natural disaster or by the inappropriate environments.
3. Dropping after purchasing or damage in transportation by customer himself or by customer's shipping agency
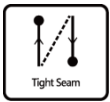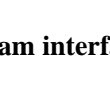
Note: We make our best effort to test and manufacture the product for assuring the quality. However, it is possible that this product can be damaged due to external magnetic interference and electronic static or noise or unstable power source more than expected; therefore the grounding system of operate area must guarantee the good earth and it's also recommended to install a failsafe device (such as residual current breaker).

1. Interface and operation instructions

1.1 Main interface description

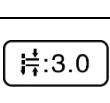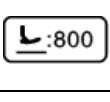| Name	Key	Indicate
Clamp function setting		If click, set used or cancelled clamp function.
Constant stitch sewing switching key		In constant stitch sewing mode, if click, switch to stitch numbers and segments display interface.
Parameter increase		If click, it can increase parameters. If long-press, it can continuously increase parameters.
Parameter decrease		If click, it can decrease parameters. If long-press, it can continuously decrease parameters.
Set key		If click, enter the parameter setting interface.
Lock screen key		If you click, switch the lock screen and unlock.
Mode selection		If click, shift to free sewing, continuous back seam mode, constant stitch sewing and pattern seam mode.
Start back-tacking		If click, executions starting back seam B segment, execution starting back seam (A, B segment) 1 time or execution starting back seam (A, B segment) 2 times. If long-press, switch to back-tacking setting.
End back-tacking		If click, execution terminates back seam C segment, execution terminates back seam (C, D segment) 1time or execution terminates back seam (C, D segment) 2 times. If long-press, switch to back-tacking setting.
Thread trimming		If click, set used or cancelled trimming function.

Needle stop position		If click, switch the needle stop position after sewing (up position / down position).
Tight seam		If click, switch between function OFF, starting tight seam function ON, ending tight seam function ON and full function in turn. If long-press, switch to tight seam function setting.
Presser foot lifting		If click, switch between automatic presser foot lifting after pause, automatic presser foot lifting after trimming, full function and function off in turn.
Half anti-side trample foot lifting		If click, set used or cancelled half anti-side trample foot lifting function.
Auto function		In constant stitch sewing mode, If click, set used or cancelled auto function.
Back-tacking pattern		If click, set used or cancelled back-tacking pattern function.
Slow launch setting		If click, set used or cancelled slow launch function.
Advanced parameter settings		If double click, enter the advanced parameter setting interface.
Trimming count display	:0000	The trimming count value is displayed. If double click, the count is cleared.
Sewing speed display	:3700	The sewing speed of the current mode is displayed. If click, select this data, and you can adjust the data by parameter increase and decrease keys.
Sewing stitch length display	:3.0	The stitch length of the current mode is displayed. If click, select this data, and you can adjust the data by parameter increase and decrease keys.
The highest presser foot height display	:800	The highest presser foot height is displayed. If click, select this data, and you can adjust the data by parameter increase and decrease keys.

1.2 Pattern seam interface description

No.	Items	Range	Default	Description
1	Pattern No.	1-9		"3" stands for the number of the pattern. The figure represents the 3rd pattern.
2	Total Number of Segments Edit Segment	1-10		"4" represents the total number of segments of the pattern. If you click, you can select the total number of segments. "3" represents the segment No. of the pattern. As shown in the figure, there are 4 patterns in the 3rd pattern. The figure is the data of the 3rd segment.
3	000 Stitch Numbers	1-99		"1" represents the stitch numbers of the pattern. As shown in the figure, the number of stitches in the 3rd segment of the 3rd pattern is 1.
4	Repeat Times	1-9		"1" represents the repeat times of the pattern. As shown in the figure, the repeat times for the 3rd segment of the 3rd pattern is 1.
5	Stitches Length	0-5.0		"1.0" represents the stitches length of this pattern. As shown in the figure, the stitches length of the 3rd segment of the 3rd pattern is 1.0 mm.

1.3 Constant stitch sewing interface description

No.	Items	Range	Default	Description
1	**P** Constant Stitch Mode No.	1-10		"4" represents the number of constant stitch sewing mode. As shown in the figure, it represents 4th constant stitch sewing mode.
2	Total Number Edit Segment of Segments	1-4		"4" represents the total number of segments of the constant stitch sewing mode. If clicked, the total number of segments can be selected. "1" represents the segment No. of constant stitch sewing. As shown in the figure, it represents the data of the 1st segment of the 4 segments.
3	000 Stitch Numbers	0-99		"1" represents the number of stitches in this segment. As shown in the figure, the number of stitches in the 1st segment of the 4 segments is 1.
4	Stitches Length	0-5.0		"1.0" represents the stitches length of the constant stitch sewing mode. As shown in the figure, the stitches length of the 1st segment of the 4 segments is 1.0mm.

1.4 Debug interface description

Long press on the main screen, the debugging interface will be displayed.

No.	Items	Range	Default	Description	Parameter
1	Main shaft motor zero-point correction				P92
2	Up position quick adjustment				P72
3	Back-tacking motor zero-point correction	-100～100	0		P129
4	Tacking stitch length compensation	-100～100	0		P74

5	Back-tacking stitch length compensation	-100～100	0		P75
6	Tacking stitch length compensation in high speed	-100～100	-2		P144
7	Back-tacking stitch length compensation in high speed	-100～100	-2		P145
8	Back-tacking stitch overall compensation	-20～20	0		P11
9	Large stitch length back-tacking stitch overall compensation	-20～20	0		P244

2. User parameter setting interface

Click ✹ in the interface of free sewing, pattern seam, or W sewing to enter user parameter setting interface.

The parameter setting interface catalog is as follows.

No.	Setting
1	Main shaft motor setting
2	Tight seam function setting
3	Back-tacking setting
4	Counter setting
5	Soft start setting
6	Machine switch setting
7	Clamp & tension setting
8	Interface display
9	Layer seam setting
10	Clamp function without any thrum

No.	Items	Range	Default	Description	Parameter
				2.1 Main shaft motor setting	
2101	Needles goes up automatically as power turned on	OFF/ON	OFF		P56
				2.2 Tight seam function setting	
2201	Starting tight seam				
2202	Ending tight seam				
				2.2.1 Starting tight seam	
22101	000	0-12	2	When the value is 0, the starting tight seam mode is turned off.	
22102		0-5.0	0.5	Stitches length	
22103		100-2000	1800	Speed	
22104	∪	CW/CCW	CW	Direction	
				2.2.2 Ending tight seam	

22201	000	0-12	2	When the value is 0, the ending tight seam mode is turned off.	
22202	⇅	0-5.0	0.5	Stitches length	
22203	⏲	100-2000	1800	Speed	
22204	↺	CW/CCW	CW	Direction	
2.3 Back-tacking setting					
2301	Start back-tacking speed	200-3200	2000		P04
2302	End back-tacking speed	200-3200	2000		P05
2303	Mode selection for bar-tacking	OFF/ON	ON		P08
2304	The constant-stitch whether can execute end back-tacking sewing function selection	OFF/ON	ON		P10
2305	Star back-tacking mode selection	OFF/ON	ON		P12
2306	Mode selection at the end of start back-tacking	OFF/ON	ON		P13
2307	Start back-tacking stitch compensation 1	0-200	160		P18
2308	Start back-tacking stitch compensation 2	0-200	160		P19
2309	End back-tacking stitch compensation 3	0-200	160		P25
2310	End back-tacking stitch compensation 4	0-200	160		P26
2311	Back-tacking stitch compensation 5	0-200	162		P32
2312	Back-tacking stitch compensation 6	0-200	162		P33
2313	Start back-tacking stitch compensation 11	0-200	160		P237
2314	Start back-tacking stitch compensation 12	0-200	160		P238
2315	End back-tacking stitch compensation 13	0-200	160		P239
2316	End back-tacking stitch compensation 14	0-200	160		P240
2317	Back-tacking stitch compensation 15	0-200	160		P241
2318	Back-tacking stitch compensation 16	0-200	160		P242
2319	Pattern sewing compensation 1	0-200	160		P235
2320	Pattern sewing compensation 2	0-200	160		P236
2.4 Counter setting					
2401	Counter selection	0-2	1	0: Counter does not count 1: Count up sewing counter (Each time the thread is cut, the count is increased by 1; the current value and the set value are the same, and the count screen is displayed.) 2: Count-down sewing counter (1 counts each time the thread is trimmed; the count screen is displayed after the current value becomes 0)	

2402	Counter current value /setting value	0-9999	0/9999	The current value is the current actual value; the setting value is a reference value	
2403	Sewing counter trimming time	0-50	1		
2.5 Soft start setting					
2501	Soft start switch	ON/OFF	OFF		P14
2502	Stitch numbers for soft start	1-15	2		P08
2503	Soft start first stitch speed	200-1500	400		P90
2504	Soft start second stitch speed	200-1500	1000		P91
2505	Soft start speed after second stitch	200-1500	1500		P07
2.6 Machine switch setting					
2601	Manual switch A setting	0-6	5	0: OFF 1: Half stitch 2: One stitch 3: Continuous half stitch 4: Continuous one stitch 5: Back-tacking when machine stop or pause 6: Tight seam function	P15
2602	Manual switch B setting	0-6	3	0: OFF 1: Half stitch 2: One stitch 3: Continuous half stitch 4: Continuous one stitch 5: Back-tacking when machine stop or pause 6: Tight seam function	P174
2603	Manual switch C setting	0-6	0	0: OFF 1: Half stitch 2: One stitch 3: Continuous half stitch 4: Continuous one stitch 5: Back-tacking when machine stop or pause 6: Tight seam function	P175
2604	Manual switch D setting	0-6	0	0: OFF 1: Half stitch 2: One stitch 3: Continuous half stitch 4: Continuous one stitch 5: Back-tacking when machine stop or pause 6: Tight seam function	P176
2605	Manual back-tacking function selection under pattern sewing	0-1	1	0: If click, it will clear the current number of pattern stitches and restart. It is used for corner sewing to avoid protruding one stitch. 1: If you press it for a long time, you can sew the pattern backwards.	P118

2.7 Clamping & tension setting					
2701	Tension strength setting	1-80	30		P103
2702	With or without tension while foot lifting action	ON/OFF	OFF		P35
2703	Wiping / clamping strength setting	0-11	8	0: OFF 1: Wiping function 2～11: Clamping function, the higher the value, the stronger the action.	P37
2704	Tension function switch	ON/OFF	ON		P36
2705	The foot lift height of thread tension release start action when knee-control foot lift	0-300	75		P30
2706	Thread tension release function switch when knee-control foot lift	0-1	0		P31
2.8 Interface display					
2801	Brightness	5-100	80	The larger the value, the higher the brightness.	
2802	Main interface locked automatically	0-900	60		
2803	Restore factory defaults				
2804	Language	Chinese / English	Chinese		
2805	Brightness of Logo light	0-3	0		
2.9 Layer seam setting					
2901	Layer seam mode switch	ON/OFF	OFF		P119
2.10 Clamp function without any thrum					
21001	Clamp function without any thrum switch	ON/OFF	OFF		P111

3. Advanced parameter setting interface

Double-click ◯ in the interface of free sewing, pattern seam, or W sewing to enter the advanced parameter

setting interface. The parameter setting interface catalog is as follows.

No.	Setting
1	Trimming function setting
2	Clamp function setting
3	Foot lifting setting
4	Tension setting
5	Pedal setting
6	Safety protection setting
7	Stitch length setting of stepping back-tacking
8	Testing mode
9	State information
10	Main shaft motor setting

11	Clamp function without any thrum
12	Layer seam setting
13	Other settings
14	Speed limit setting of main shaft motor start sewing

No.	Items	Range	Default	Description	Parameter
3.1 Trimming function setting					
3101	Trimming step return speed	20-400	150		P140
3102	Trimming first section speed	20-400	300		P142
3103	Trimming second section speed	20-400	250		P141
3104	Trimming action time	10-990	200		P55
3105	The angle of trimming first infeed	0-359	40		P80
3106	The angle of trimming second infeed	0-359	175		P82
3107	First trimming distance	0-200	90		P137
3108	Second trimming distance	0-200	125		P134
3109	Trimming step return time	10-990	100		P110
3110	Main shaft motor speed when trimming	100-500	300		P49
3111	The stopping angle of trimming first infeed	100-250	130		P81
3.2 Clamp function setting					
3201	Clamp start angle	10-359	100		P78
3202	Clamp end angle	10-359	270		P79
3203	Wiper thread action time	10-990	220		P55
3204	The delay time before wiper thread	5-990	5		P109
3.3 Presser foot setting					
3301	Presser foot lay down time	10-990	120		P52
3302	Presser foot lift highness compensation when pedal return to intermediate step at sewing stop	0-160	80	Set 80 as 0 compensation, go to the major adjustment for positive compensation, the height of the presser foot will increase, go to the minor adjustment for the negative compensation, the height of the presser foot will decrease.	P125
3303	The highest of presser foot lift highness	0-300	105		P136
3304	Presser foot speed	20-400	150		P146
3305	Zero correction of foot lifting motor	-100～100	0		P130
3306	Presser foot step motor steady current	10-100	20		P150
3307	Presser foot motor maximum current	10-100	55		P152
3308	Electronic knee-control device the lowest presser	0-200	20		P135

	foot lift height				
3309	Electronic knee-control device the highest presser foot lift height	0-200	130		P126
3310	The highest of presser foot lift highness limit	0-300	150		P172
3311	Kneeling device starting AD value	0-1023	400		P122
3312	Rotation direction of the presser foot motor	0-1	0		P147
3313	Knee-control function selection	0-2	1	0: OFF 1: Valid when the main shaft motor stops 2: Valid when the main shaft motor runs and stops	
3314	The highest presser foot lift height of electric knee-control in sewing	0-300	100		
3.4 Tension setting					
3401	Tension starting angle	1-359	30		P101
3402	Tension ending angle	1-359	180		P102
3403	Periodic signal of the first thread tension release output action (%)	1-100	35		P211
3404	Thread tension release the first output action time	1-100	20		P212
3.5 Pedal setting					
3501	Speed curve adjustment (%)	10-100	80		P02
3502	The voltage of forward step pedal point	30-1000	520		P21
3503	The voltage of intermediate step pedal point	30-1000	420		P22
3504	The voltage of half heeling pedal point	30-1000	270		P23
3505	The voltage of heeling pedal point	30-1000	130		P24
3506	Delay time of half heeling pedal	10-900	100		P93
3.6 Safety protection setting					
3601	Machine protection switch testing	0-2	1	0: OFF 1: Testing zero signal 2: Testing positive signal	P66
3602	Oil level lower protection testing	OFF/ON	OFF		P120
3603	Setting high voltage protection value	850-1023	880	When the external input AC voltage is converted into DC voltage and the value exceeds the set value, the system will alarm E01 and stop working.	P89
3604	Tension electromagnet protection time	1-60	5	Electromagnet working protection time (S)	P57
3605	Trimming protection switch	OFF/ON	OFF		P67
3.7 Stitch length setting of stepping back-tacking					
3701	Back-tacking motor zero-point correction	-100～100	0		P129

3702	Normal stitch length	0-6.0	3.0		P131
3703	Stitch length reference value setting				
3704	Tacking stitch length compensation	-100～100	0		P74
3705	Back-tacking stitch length compensation	-100～100	0		P75
3706	Back-tacking stitch compensation	0-200	0		P243
3707	Back-tacking step motor steady current	1-100	6		P149
3708	Back-tacking step motor maximum current	1-100	12		P151
3709	Manual close stitches distance	0-6.0	2.0		P132
3710	Correction stitches distance of manual button A	0-6.0	0		P71
3711	Correction stitches distance of manual button B	0-6.0	0		P170
3712	Correction stitches distance of manual button C	0-6.0	0		P171
3713	Correction stitches distance of manual button D	0-6.0	0		P173
3714	Maximum stitch length limit	0-8.0	5.0		P123
3715	Back-tacking response time when after free sewing end back-tacking start	20-350	125		P77
3716	Large stitch length setting	0-8.0	5.5		P245
3717	Speed limit of start back-tacking, end back-tacking and bar-tacking when in large stitch length setting	200-3000	1600		P246
3718	Back-tacking corner stitch compensation 1	-100～100	0		P247
3719	Back-tacking corner stitch compensation 2	-100～100	0		P248
3720	Large stitch length tacking stitch length compensation in high speed	-100～100	0		
3721	Large stitch length back-tacking stitch length compensation in high speed	-100～100	0		
3722	Back-tacking step motor speed	50-1000	550		

3.7.3 Stitch length reference value setting

Forward	Stitch length	Backward	Stitch length
1mm		1mm	
2mm		2mm	
3mm		3mm	
4mm		4mm	
5mm		5mm	

|	6mm			6mm	
	7mm			7mm	
	8mm			8mm	

			3.8 Testing mode		
3801	Testing mode switch	ON/OFF	OFF	(Perform the cycle of start-sewing-stop-thread trimming at the test speed)	
3802	Output function single testing				
3803	Testing mode setting				

		3.8.2 Output function single testing			
	Trimming				
	Presser foot				

			3.8.3 Autorun test mode		
Period	Testing speed (when the test speed is 0,the current cycle is not executed)	Running time (0.1s)	Stop time (0.1s)	Motor running direction	Periodic time (m) (No limit when time is 0)
1	3500	30	10	CCW	0
2	0	0	0	CCW	0
3	0	0	0	CCW	0
4	0	0	0	CCW	0
5	0	0	0	CCW	0

		3.9 State information			
3901	Version number				
3902	Motor speed display			Display current motor speed	
3903	Needle position angle value			Display the current motor angle of the machine	
3904	Pedal AD value			Display the current AD value of the pedal	
3905	Busbar voltage AD value				
3906	Oil level sensor AD value				
3907	Knee moving position sensor AD value				
3908	Trimming position sensor AD value				
3909	Presser foot lift highness sensor AD value				
3910	Grating signal				

		3.9.1 Version number			
39101	Control box version number				
39102	Control box vice version number				

39103	Display board version number				
39104	Step drive version number				
39105	Control box version number 2				
3.10 Main shaft motor setting					
31001	Main shaft motor maximum speed limit	0-5000	3700		
31002	Main shaft motor zero-point correction				
31003	Up position quick adjustment				
31004	Down position quick adjustment				
31005	Speed limit of manual back-tacking	0-3200	0		
31006	Reverse angle function selection after trimming	ON/OFF	OFF		
31007	Adjustment of reverse angle after trimming	10-50	40		
31008	Up position value	0-359	190		
31009	Down position value	0-359	0		
31010	Low (positioning) speed	100-500	210		
31011	Stopping strength as half-way	1-45	16		
31012	Stopping strength after trimming	1-50	20		
31013	Up / down needle position distance value	0-359	170	In the quick setting interface of the needle position for the upper and lower stops, when the upper positioning value is saved, the lower positioning value will be automatically calculated based on the upper and lower positioning distance values.	
31014	Main shaft motor rotation direct setting	CCW/CW	CCW	CW: Clockwise CCW: Counterclockwise	
31015	Main shaft motor maximum current (A)	0-20	10		
31016	Main shaft motor lockedrotor current (A)	0-20	10		
31017	Main shaft motor normal current (A)	0-20	16		
31018	Main shaft motor encoder type selection	No magnetic ring / With magnetic ring	No magnetic ring		
3.11 Clamp function without any thrum					
31101	The delay time before hook thread with clamp function without any thrum	0-990	60		
31102	The hook thread action time with clamp function without any thrum	0-990	70		
31103	The return back time of hook thread with clamp	0-990	30		

|	function without any thrum				
31104	Duty cycle for hook thread with clamp function without any thrum	0-100	70		
31105	The suction time for clamp function without any thrum	0-5000	500		
31106	Duty cycle for pull thread with clamp function without any thrum	0-100	70		
3.12 Layer seam setting					
31201	Layer seam mode rotation speed over thick	200-3700	2000		
31202	Fabric thickness sensor AD value	0-1023	530		
31203	Layer seam proportion	1-100	10		
31204	Layer seam stitch length limit	0-5.0	4.0		
3.13 Other setting					
31301	Type selection	1-50	35		P70
3.14 Speed limit setting of main shaft motor start sewing					
31401	First stitch speed limit of start sewing	0-1500	0	It is invalid when the parameter value is 0.	P205
31402	Second stitch speed limit of start sewing	0-2000	0	It is invalid when the parameter value is 0.	P206

4. Port diagram
10P function port description

| 10	9	8	7	6
5	4	3	2	1
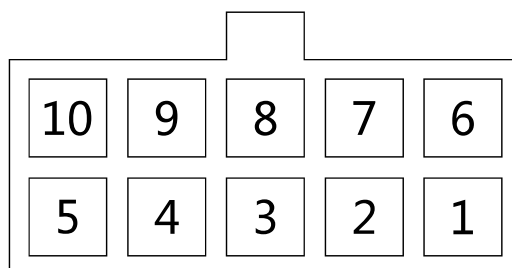
1. Suction with clamp function without any thrum: 1, 6(+24V)

2. Hook thread with clamp function without any thrum: 2, 7(+24V)

3. Thread clamping (thread wiping)/ Pull thread with clamp function

without any thrum: 3, 8(+32V)

4.Thread tension release: 4、9(+32V)

5. Trimming: 5, 10(+32V)

6P function port description

6	5	4
3	2	1
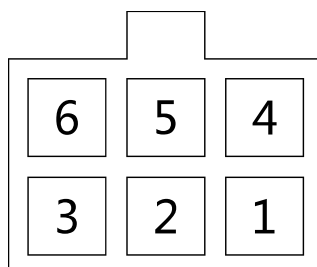
1. Manual button A: 1

2. Manual button B: 2

3. Manual button C: 3

4. LED light: 4(+5V), 6(DGND)

5. Manual button D: 5

8P function port description

```
      8   7   6   5
      4   3   2   1
```
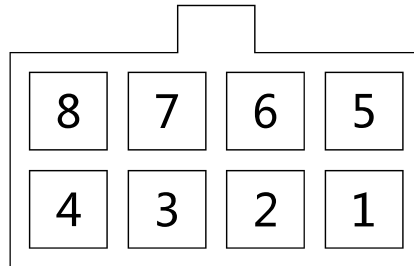
1. LOGO light: 1, 5(+S5V)

2. Oil level sensor: 2, 6(+S5V)

3. GND: 3, 7

4. Presser foot sensor: 4, 8(+S5V)