


QD222B Series Control System Instruction Manual V 4.2.00

No. 10404070

Safety Instructions

- 1) Before installing or using this product, users must read this instruction manual carefully.
- 2) This product must be installed or operated by properly trained personnel. All power must be turned off during installation; never operate while the power is on.
- 3) All  instructions marked with symbols must be carefully followed and executed in accordance with the instruction manual to avoid unnecessary damage.
- 4) For safety reasons, it is prohibited to use an extension cord as a power socket to supply more than two electrical products.
- 5) When connecting the power cord, you must ensure that the operating voltage meets the rated voltage value specified in the product label.
- 6) Do not operate in places with direct sunlight, outdoors, or in places where the temperature is above 45°C or below 0°C.
- 7) Do not operate near heaters (electric heaters), in places with dew, or in places with relative humidity below 10% or above 90%.
- 8) Do not operate in dusty places, places with corrosive substances, or places with volatile gases.
- 9) Please ensure that all power lines, signal lines, grounding wires, etc. are not compressed or excessively twisted during wiring to ensure safe use.
- 10) The grounding terminal of the power cord must be connected to the system ground of the manufacturing plant with an appropriate size wire and connector, and this connection must be permanently fixed.
- 11) All rotatable parts must be protected from exposure by the provided parts.
- 12) After installation and powering on for the first time, turn off the thread cutting function and operate the sewing machine at low speed to check whether the rotation direction is correct and whether the operation is stable.
- 13) Before performing the following operations, please turn off all power:
 1. When plugging or unplugging any connectors on the control box and motor.
 2. When threading a needle.

3. When flipping the sewing machine head.
 4. When repairing or making any mechanical adjustments.
 5. When the machine is not in use.
- 14) Repairs or high-level maintenance work can only be performed by trained electromechanical technicians.

All repair parts must be approved by our company before they can be used.

- 15) When using this product, please keep it away from high-frequency electromagnetic waves and radio wave transmitters, so as to avoid the electromagnetic waves generated from interfering with the servo drive device and causing malfunctions.
- 16) Please do not strike or bump this product and its devices with inappropriate objects.

Warranty period

This product is covered by a one-year warranty from the date of purchase or a two-year warranty from the month of manufacture.

Warranty coverage

Under normal use and without human error, this product will be repaired free of charge during the warranty period to enable normal operation.

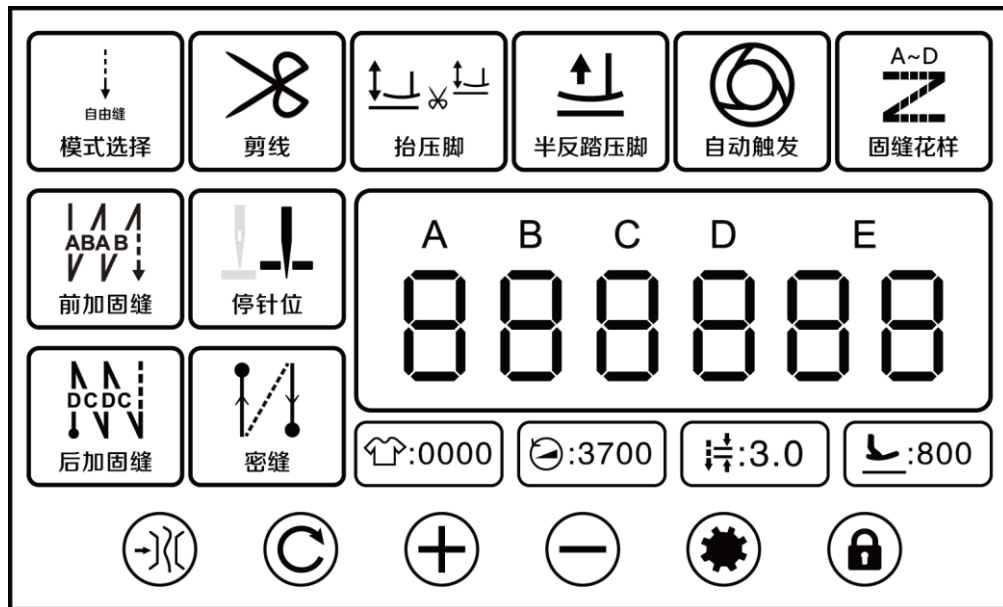
However, repair fees will be charged in the following situations during the warranty period:

1. Improper use includes incorrectly connecting to a high-voltage power source, using the product for other purposes, disassembling, repairing, or altering it, or using it outside of specifications, allowing water or oil to enter, or inserting foreign objects into the product.
2. Damage caused by fire, earthquake, lightning, windstorm, flood, salt corrosion, dampness, abnormal voltage and other natural disasters or unsuitable locations.
3. Damage caused by the customer dropping the product after purchase, or by the customer's own transportation (or entrusting a transportation company).











* We strive to achieve high quality and stability standards in the production and testing of this product. However, external electromagnetic or electrostatic interference or an unstable power supply may still affect or damage this product. Therefore, the grounding system of the operating site must be properly installed, and we recommend that users install fail-safe protection devices (such as residual current devices).



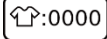
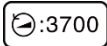
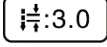
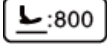
1. Button display and operation instructions

1.1 Main Interface Description

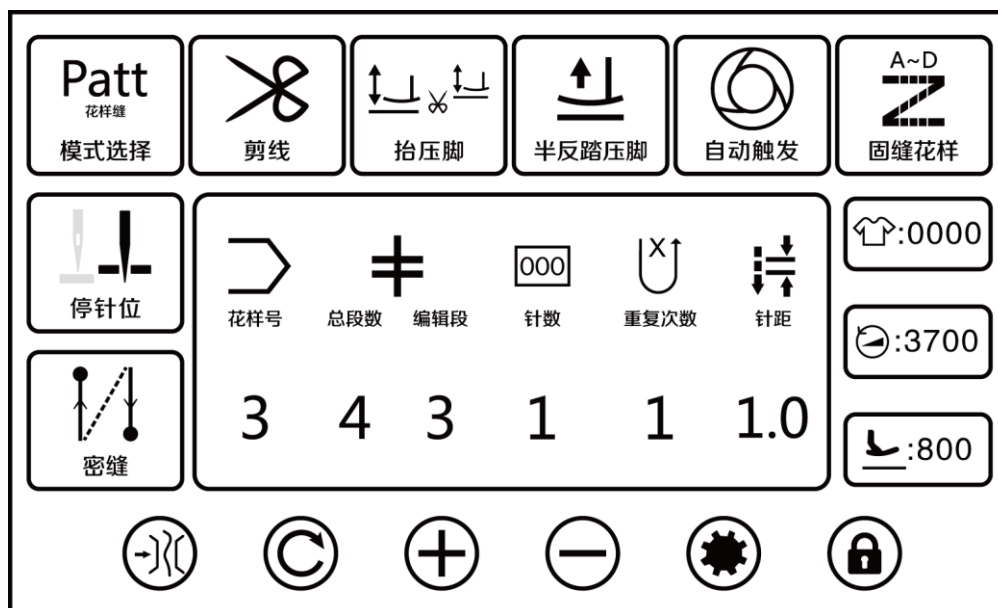


name	button	Note
Clamp key		If clicked, you can set whether to use or disable the clamping function.
Multi-segment fixed stitch switch key		In fixed-needle stitch mode, clicking will switch the display of stitch count and segment count.
Add key		Click to add data. If you press and hold, the data will be added continuously.
Decrease		Click to reduce data. If you press and hold, the data will be continuously reduced.
Set key		If you click, you will enter the parameter settings interface.
Lock screen button		If you tap, switch between lock screen and unlock.






Mode selection key		If you click, you can switch between free stitch mode, continuous backstitch mode, fixed stitch mode and patterned free stitch mode in sequence.
Front reinforcement key		If clicked, the program will switch between closing the reinforcement, performing reinforcement of section B, performing reinforcement of sections A and B once, or performing reinforcement of sections A and B twice. If you press and hold, you will be taken to the reverse seam settings interface.
Post-reinforcement joint key		If clicked, the sequence will switch between closing the backstitch, executing the backstitch in section C, executing the backstitch (sections C and D) once, and executing the backstitch (sections C and D) twice. If you press and hold, you will be taken to the reverse seam settings interface.
Cut key		If clicked, you can set whether to use or disable the tangent function.
Stop button		If you click, you can switch the stop position of the needle after sewing (upper stop position/lower stop position).
Tight-fitting key		If you click, you can switch between turning off the tight seam function, turning on the tight seam start function, turning on the tight seam stop function, and turning on the tight seam start and tight seam stop functions in sequence. If you long press, you can switch to the tight-fitting function settings interface.
Automatic presser foot release button		If you click, you can switch between the following functions in sequence: automatically raising the presser foot when the motor stops during sewing, automatically raising the presser foot after cutting the thread, automatically raising the presser foot both when the motor stops and after cutting the thread, and canceling the automatic presser foot raising function.
Half-reverse pedal lift presser foot button		If you click, you can set whether to use or disable the semi-reverse pedal lift function.
Auto trigger key		In the fixed-needle stitch mode, clicking it will enable or disable the automatic trigger function.
Seam fixing pattern		If you click, you can set whether to use or disable the seam fixing pattern function.

Slow seam start key		If clicked, you can set whether to use or disable the slow start-up function.
Advanced parameter settings		Double-clicking will take you to the advanced settings interface.
Tangent count display		Displays the tangent count value. Double-clicking will reset the count to zero.
Sewing speed display		Displays the sewing speed in the current mode. If you click to select this data, you can adjust the data using the plus and minus keys.
Sewing stitch length display		Displays the stitch length for the current pattern. If you click to select this data, you can adjust the data using the plus and minus keys.
Maximum presser foot height display		Displays the maximum presser foot height. If you click to select this data, you can adjust the data using the plus and minus keys.

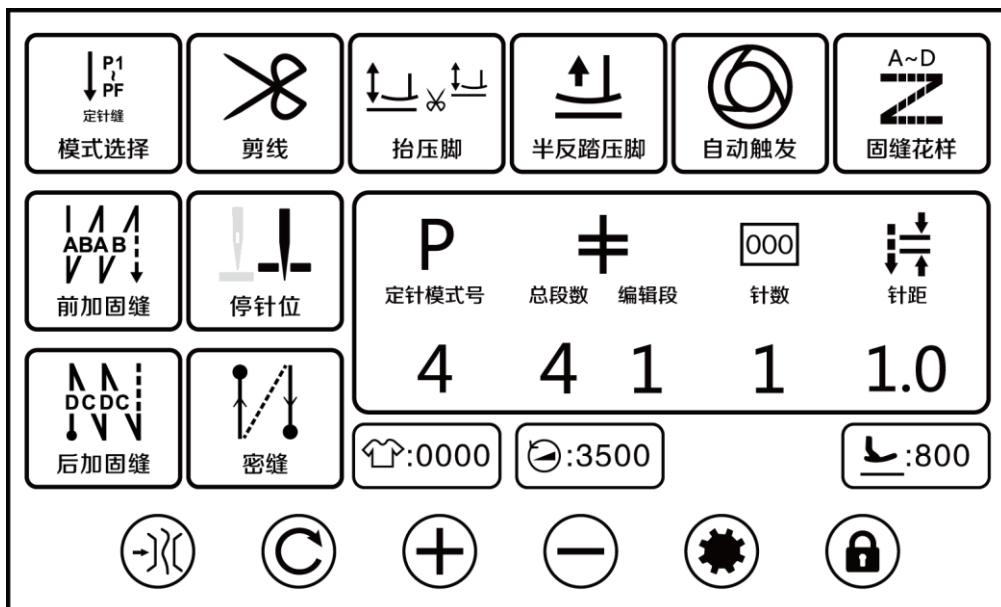
1.2 Pattern Sewing Interface Instructions







No.	show	scope	initial value	Instructions and Notes
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1	 花样号	1-9		"3" represents the pattern number. As shown in the figure, it represents pattern number 3.
2	 总段数 编辑段	1-10		"4" represents the total number of segments in the pattern. If you click on it, you can select the total number of segments. "3" represents which section of the pattern. As shown in the figure, pattern number 3 has a total of 4 segments. The figure shows the data for its 3rd segment.
3	 针数	1-99		"1" represents the number of stitches in the pattern. As shown in the figure, the number of stitches in the third section of pattern number 3 is 1.
4	 重复次数	1-9		"1" represents the number of back-and-forth movements in the pattern. As shown in the figure, the number of back-and-forth movements in the third segment of pattern number 3 is 1.
5	 针距	0-5.0		"1.0" represents the stitch length of this section of the pattern. As shown in the figure, the stitch length of the third section of pattern number 3 is 1.0 mm.

1.3 Description of fixed stitch interface



No.	show	scope	initial value	Instructions and Notes
1	 定针模式号	1-10		"4" represents the number of fixed stitch segments. The figure shows 4 fixed stitch segments.
2	 总段数 编辑段	1-4		"4" represents the total number of stitches. If you click on it, you can select the total number of stitches. "1" represents the number of segments stitched with a fixed needle. The figure shows the data for the first segment of a 4-segment fixed-stitch seam.
3	 针数	0-99		"1" represents the number of stitches in this fixed-stitch section. As shown in the figure, the fourth segment of the four fixed-stitch sections has 1 stitch.
4	 针距	0-5.0		"1.0" represents the stitch length of this fixed-stitch section. As shown in the figure, the stitch length of the fourth fixed-stitch section is 1.0 mm.

1.4 Debugging Interface Description


Long press the settings button on the main screen  to display the debugging interface.

No.	show	scope	initial value	Instructions and Notes	parameter
1	Spindle motor zero point calibration				P92
2	Quick adjustment of position				P72
3	Zero point calibration of the reverse sewing motor	-100~100	0		P129
4	Straight stitch length compensation	-100~100	0		P74
5	Backstitch spacing compensation	-100~100	0		P75

6	High-speed positive stitch length compensation	-100~100	- 6		P144
7	High-speed reverse stitch length compensation	-100~100	- 6		P145
8	Overall compensation for backstitching	-20~20	0		P11
9	Overall compensation for large stitch spacing backstitch	-20~20	0		P244

2. User parameter settings interface

If you are in the interface of free stitch, pattern stitch, continuous backstitch, etc., click

the setting button  to enter the parameter user parameter setting interface. The parameter setting interface directory is as follows.

No.	Table of contents
1	Spindle motor settings
2	Seam sealing function settings
3	Back seam setting
4	Counter settings
5	Slow seam setting
6	Head switch settings
7	Wire clamping and loosening function settings
8	Interface settings
9	Layer joint setting (invalid)
10	No Bird's Nest Function Settings

No.	show	scope	initial value	Instructions and Notes	parameter
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2.1 Spindle Motor Settings					
2101	Automatically locates the device after powering on.	OFF/ON	OFF		P56
2.2 Seam-tight function settings					
2201	Initial tight seam				
2202	Termination of tight seal				
2.2.1 Initial Seam Seaming					
22101		0-12	2	When the stitch count is 0, the initial close-stitch mode is turned off.	P108
22102		0-5.0	0.5	Stitch	P99
22103		100-2000	1800	speed	P107
22104		CW/CCW	CW	direction	P100
2.2.2 Termination of Seam Seaming					
22201		0-12	2	When the stitch count is 0, the closed tight-stitch mode is turned off.	P160
22202		0-5.0	0.5	Stitch	P153
22203		100-2000	1800	speed	P154
22204		CW/CCW	CW	direction	P159
2.3 Backstitch Setting					
2301	Initial backstitch speed	200-3200	2000		P04
2302	Termination of backstitch speed	200-3200	2000		P05
2303	Continuous backstitching motion mode selection	OFF/ON	ON		P08
2304	Select whether to automatically execute the backstitch termination function	OFF/ON	ON		P10

	during fixed-stitch sewing.				
2305	Starting and closing motion mode selection	OFF/ON	ON		P12
2306	Start and end point operation mode selection	OFF/ON	ON		P13
2307	Initial seam compensation 1	0-200	160		P18
2308	Initial seam compensation 2	0-200	160		P19
2309	Termination of seam return compensation 3	0-200	160		P25
2310	Termination of seam compensation 4	0-200	160		P26
2311	Continuous back seam compensation 5	0-200	16 0		P32
2312	Continuous back seam compensation 6	0-200	16 0		P33
2313	Initial seam compensation 11	0-200	160		P237
2314	Initial seam compensation 12	0-200	160		P238
2315	Termination of seam return compensation 13	0-200	160		P239
2316	Termination of seam return compensation 14	0-200	160		P240
2317	Continuous backstitch compensation 15	0-200	160		P241
2318	Continuous back seam compensation 16	0-200	160		P242
2319	Pattern seam compensation 1	0-200	160		P235
2320	Pattern seam compensation 2	0-200	160		P236
2.4 Counter Settings					
2401	Counter Selection	0-2	1	0: The counter is not counting. 1: Sewing counter (increments by 1 for each thread cut; the counter is displayed on the	

				screen once the current value matches the set value.) 2: Subtraction Sewing Counter (The counter decreases by 1 for each thread cut; the counter is displayed on the screen after the current value becomes 0.)	
2402	Counter current value / set value	0-9999	0/9999	The current value is the actual value; the set value is a reference value.	
2403	Sewing counter slit count	0-50	1		
2.5 Slow seam setting					
2501	Slow seam opening switch	ON / OFF	OFF		P14
2502	Slow start stitch count	1 - 15	2		P08
2503	Slow start stitch speed	200-1500	4 00		P90
2504	Slow start stitch second stitch speed	200-1500	10 00		P91
2505	Slow start stitch after the second stitch speed	200-1500	15 00		P07
2.6 Head switch settings					
2601	Configure the function of manual switch A	0-6	5	0: Function off 1: Add half a dose 2: One more injection 3: Continuously administer half a dose. 4: Administer one injection consecutively. 5: It has a reverse sewing action when sewing is in progress or when the process is stopped. 6: Seamless seam function	P15
2602	Configure the manual switch B function	0-6	3	0: Function off 1: Add half a dose 2: One more injection 3: Continuously administer half a dose. 4: Administer one injection consecutively.	P174

				5: It has a reverse sewing action when sewing is in progress or when the process is stopped. 6: Seamless seam function	
2603	Configure the manual switch C function	0-6	0	0: Function off 1: Add half a dose 2: One more injection 3: Continuously administer half a dose. 4: Administer one injection consecutively. 5: It has a reverse sewing action when sewing is in progress or when the process is stopped. 6: Seamless seam function	P175
2604	Set the function of manual switch D.	0-6	0	0: Function off 1: Add half a dose 2: One more injection 3: Continuously administer half a dose. 4: Administer one injection consecutively. 5: It has a reverse sewing action when sewing is in progress or when the process is stopped. 6: Seamless seam function	P176
2605	The function selection of the manual backstitch button in the pattern stitch mode	0-1	1	0: If clicked, clears the current number of stitches in the pattern and restarts, used to avoid protruding stitches when sewing at corners; 1: If you press and hold , you can sew patterns backwards.	P118
2.7 Setting the Wire Clamping and Loosening Function					
2701	Thread loosening force setting	1-80	3 5		P103
2702	Thread release function when lifting presser foot	ON/OFF	OFF		P35
2703	Wire pulling/clamping force setting	0-11	8	0: Off; 1: Cable disconnection function; 2-11: Cable clamping function, the higher the value, the stronger the action.	P37

2704	Loose cord function switch	ON/OFF	ON		P36
2705	The height of the foot when the knee is lifted and the leg is released to begin the movement.	0-300	75		P30
2706	Knee-lifting and foot-pressing release function switch	0-1	0	0: OFF; 1: ON;	P31
2.8 Interface Settings					
2801	brightness	5-100	80	The higher the value, the brighter the light.	
2802	The main interface automatically locks the time.	0-900	60		
2803	Factory reset				
2804	Voice settings	Chinese/English	Chinese		
2805	Logo light brightness	0-3	0		
2.9 Layer joint setting (invalid)					
2901	Layer seam mode switch	ON / OFF	OFF		P119
2.10 No Bird's Nest Function Settings					
21001	No Bird's Nest Function Switch	ON / OFF	OFF		P111

3. Advanced parameter settings interface

In the Freehand Stitch, Pattern Stitch, or Continuous Backstitch interfaces, double-clicking



will take you to the advanced parameter settings interface. The parameter settings interface directory is as follows.

No.	Table of contents
1	Tangent settings
2	Cable clamping settings

3	Presser foot settings
4	Loose wire settings
5	Pedal settings
6	Safety protection settings
7	Backstitch step stitch distance setting
8	Test mode
9	Status information
10	Spindle motor settings
11	No Bird's Nest Function Settings
12	Layer joint setting
13	Other settings
14	Spindle motor seam opening speed limit setting

No.	show	scope	initial value	Instructions and Notes	parameter
3.1 Tangent Settings					
3101	Tangential step return speed	20 - 400	150		P140
3102	tangent first segment velocity	20-400	300		P142
3103	Second segment velocity of the tangent	20-400	250		P141
3104	Tangent motion time	10-990	200		P55
3105	First infeed angle of the tangent	0-359	40		P80
3106	Tangential second infeed angle	0-359	175		P82
3107	First tangent distance	0-200	90		P137
3108	Second tangent distance	0-200	120		P134
3109	Tangent step return	10-990	100		P110

	time				
3110	tangent process spindle motor speed	100-500	300		P49
3111	Tangential first feed stop angle	100-250	130		P81
3.2 Cable clamping settings					
3201	Starting angle of the clamp line	10-359	4 0		P78
3202	End angle of the clamp	10-359	16 0		P79
3203	Wire-picking action time	10-990	220		P55
3204	Delay time before dialing	5-990	5		P109
3.3 Presser foot settings					
3301	Press down the foot and put down the time	10-990	120		P52
3302	When the pedal returns to the middle pedal position during sewing, the presser foot height is compensated.	0-160	80	With 80 as the zero compensation, increasing the compensation is positive compensation, which raises the presser foot height; decreasing the compensation is negative compensation, which lowers the presser foot height.	P125
3303	Maximum presser foot height	0-300	8 5		P136
3304	presser foot speed	20-400	150		P146
3305	zero-point calibration of presser foot motor	-100~100	0		P130
3306	Holding current of presser foot motor	10-100	20		P150
3307	Maximum current of press foot motor	10-100	55		P152
3308	Electronic knee rest minimum pressure foot height	0-200	20		P135
3309	Electronic knee rest maximum pressure foot height	0-200	130		P126

3310	Maximum presser foot height limit	0-300	150		P172
3311	Knee-assisted start AD value	0-1023	400		P122
3312	Presser foot motor rotation direction	0-1	0		P147
3313	Knee support function selection	0-2	1	0: Off 1: Effective when the spindle motor stops 2: Effective both when the spindle motor is running and stopping.	P127
3314	During sewing, the electronic knee rests at the highest presser foot height.	0-300	100		P148
3.4 Loose Wire Function Settings					
3401	Loosening angle	1-359	3 0		P101
3402	End angle of slack line	1-359	180		P102
3403	The periodic signal (%) of the first stage of the slack line output action.	1-100	35		P211
3404	The first stage of the slack line exertion time	1-100	20		P212
3.5 Pedal-related settings					
3501	Acceleration curve adjustment (%)	1 0 -100	80		P02
3502	Pedal front pedal voltage	30-1000	520		P21
3503	pedal midpoint voltage	30-1000	420		P22
3504	Pedal half-reverse point voltage	30-1000	270		P23
3505	Pedal counter-push point voltage	30-1000	130		P24
3506	Semi-reverse delay time	10-900	100		P93

3.6 Safety Protection Settings					
3601	Head protection switch testing	0-2	1	0 : No detection; 1 : Detect zero signal; 2: Detect positive signal.	P66
3602	Low oil level protection	OFF/ON	OFF		P120
3603	Input high voltage protection value settings	850-1023	880	When the detected value of the external input AC voltage converted to DC voltage exceeds the set value, the system will issue an alarm E01 and stop working.	P89
3604	Loose wire electromagnet protection time	1-60	5	Electromagnet operating protection time (s)	P57
3605	Wire protection switch	OFF/ON	OFF		P67
3.7 Advanced Settings for the Reverse Sewing Stepper Motor					
3701	Zero point calibration of the reverse sewing motor	-100~100	0		P129
3702	Normal stitch length	0-6.0	3.0		P131
3703	Needle spacing reference value setting				
3704	Straight stitch length compensation	-100~100	0		P74
3705	Backstitch spacing compensation	-100~100	0		P75
3706	First stitch length compensation for termination of backstitch	0-200	0		P243
3707	Holding current of the reverse-slit stepper motor	1-100	6		P149
3708	Maximum current of the reverse-slit stepper motor	1-100	12		P151
3709	Manual close stitch spacing	0-6.0	2.0		P132
3710	Manual button A's stitch spacing	0-6.0	0		P71

3711	Manual button B's stitch spacing	0-6.0	0		P170
3712	Manual button C for additional stitch spacing	0-6.0	0		P171
3713	Manual button D's stitch spacing	0-6.0	0		P173
3714	Maximum stitch length limit	0-8.0	5.0		P123
3715	Timing of backstitch response when free stitching terminates and backstitches are closed	20-350	125		P77
3716	Large stitch spacing setting	0-8.0	5.5		P245
3717	Speed limits for starting backstitch, ending backstitch, and continuous backstitch when stitch length is large.	200-3000	0		P246
3718	Backstitch corner stitch length compensation 1	-100~100	0		P247
3719	Backstitch corner stitch length compensation 2	-100~100	0		P248
3720	Large stitch length, high-speed forward stitch, overall stitch length compensation	-100~100	0		P254
3721	Large stitch length, high-speed reverse stitch, overall stitch length compensation	-100~100	0		P25 5
3722	Reverse stitch stepper motor speed	50-1000	550		
3.7.3 Setting the needle pitch reference value					

Front seam	Stitch	Backstitch	Stitch		
1mm		1mm			
2mm		2mm			
3mm		3mm			
4mm		4mm			
5mm		5mm			
6mm		6mm			
7mm		7mm			
8mm		8mm			
3.8 Test Mode					
3801	Test mode switch	ON-OFF	OFF (Execute a cycle of start - sewing - stop - thread cutting functions according to the test speed)		
3802	Output Function Single Item Test				
3803	Test mode settings				
3.8.2 Output Function Individual Test					
	Cut the thread				
	presser foot				
3.8.3 Automatic Test Execution Mode					
cycle	Test speed (if the test speed is 0, the current cycle will not be executed)	Runtime (0.1s)	Stop time (0.1s)	Motor running direction	Total running time (m) (unlimited 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 Status Information					

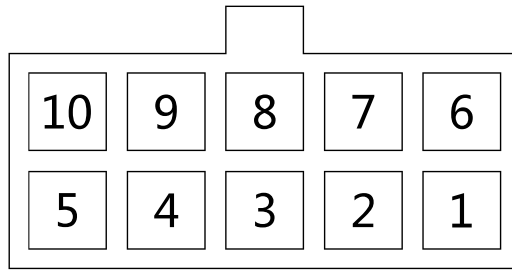
3901	Version number				
3902	Motor speed display			Displays the current motor speed.	
3903	Needle position angle value			Display the current motor angle of the machine head.	
3904	Speed controller AD value			Displays the current AD value of the pedal.	
3905	Bus voltage detection AD value				
3906	Oil level sensor AD value				
3907	Knee position sensor AD value				
3908	Tangent position sensing AD value				
3909	Presser foot height sensor AD value				
3910	grating signal				
Version number 3.9.1					
39101	Electronic control version number				
39102	Electronic control sub-version number				
39103	Display panel version number				
39104	Stepper driver version number				
39105	Electronic control version number 2				
3.10 Spindle Motor Settings					
31001	Maximum speed limit of spindle motor	0-5000	3700		
31002	Spindle motor zero point calibration				P129
31003	Quick adjustment of position				P72
31004	Quick adjustment of bottom positioning				P73

31005	Manual backstitching speed limit	0-3200	0		P16
31006	After cutting the thread, select the reverse needle lifting function.	ON/OFF	OFF		P46
31007	After cutting the thread, reverse the adjustment of the lifting needle angle.	10-50	40		P47
31008	Upper positioning value	0-359	190		P58
31009	Lower positioning value	0-359	0		P59
31010	Low speed (positioning speed)	100-500	210		P48
31011	Mid-journey stopping strength	1-45	16		P44
31012	Stopping force after tangent	1-50	20		P29
31013	Up and down positioning distance values	0-359	170	In the quick settings interface for the upper and lower stop needle positions, when saving the upper positioning value, the lower positioning value will be automatically calculated based on the upper and lower positioning distance values.	P86
31014	Spindle motor rotation direction setting	CCW/CW	CCW	CW : Clockwise CCW : counterclockwise	P43
31015	Maximum current of spindle motor (A)	0-20	10		P94
31016	Spindle motor stall current (A)	0-20	10		P96
31017	Normal current of the spindle motor (A)	0-20	16		P106
31018	Spindle motor encoder type selection	No magnetic ring/with magnetic ring	No magnetic ring		P111
3.11 Bird's Nest-less Mode					

31101	No bird nest hook line pre-delay	0-990	60		P112
31102	No bird nest hooking action time	0-990	70		P113
31103	No bird nest hook return time	0-990	30		P114
31104	No bird nest hook line duty cycle	1-100	70		P11 5
31105	No bird nest inhalation time	0-5000	500		P11 6
31106	Duty cycle without Bird's Nest support line	0-100	70		P117
3.12 Layer joint setting (invalid)					
31201	Layered mode too thick rotation speed	200-3700	2000		
31202	Fabric thickness sensing AD threshold	0-1023	530		
31203	Layer ratio	1-100	10		
31204	Layer stitch spacing limitation	0-5.0	4.0		
3.13 Other Settings					
31301	Model Selection	1-50	35		P70
3.14 Spindle motor seam start-up speed limit setting					
31401	Speed limit for the first stitch	0-1500	0	Invalid when the parameter value is 0	P205
31402	Speed limit for the second stitch of the sewing	0-2000	0	Invalid when the parameter value is 0	P206

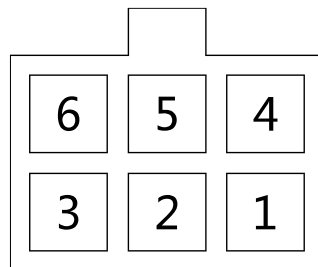
4. Schematic diagram of integrated port

10P port diagram



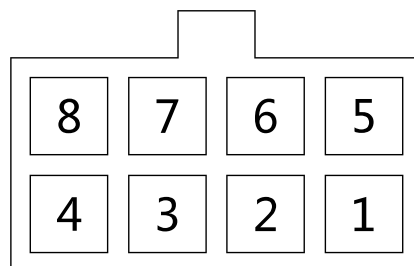
1. No bird's nest suction: 1, 6 (+24V)
2. No bird's nest hook line: 2, 7 (+24V)
3. Cable clamping (sweeping) / No bird's nest cable support: 3, 8 (+32V)
4. Loosen the wires: 4, 9 (+32V)
5. Trim wires: 5, 10 (+32V)

6P port diagram



1. Manual button A: 1
2. Manual button B: 2
3. Manual button C: 3
4. Sewing machine lights: 4 (+5V), 6 (DGND)
5. Manual button D: 5

8P port diagram



1. Logo lights: 1, 5 (+5V)

2. Oil level sensor: 2 (signal) , 3 (DGND), 6 (+S5V)

3. Press-off foot sensor: 4 (signal) , 7 (DGND), 8 (+S5V)