

△Safety Instruction

- Users are required to read the operation manual completely and carefully before installation or operation.
- All the instruction marked with sign △ must be observed or executed; otherwise, bodily injuries might occur.
- The product should be installed and pre-operated by well trained persons.
- For perfect operation and safety, it is prohibited that using extension cable with multi-outlet for power connection.
- When connecting power supply cords to power sources, it is necessary to make sure that the power voltage is lower than 250 VAC and matches the rated voltage indicated on the motor's name plate.
 △ ※Attention: If the Control Box is AC 220V system, please don't connect the Control Box to AC 380V power outlet. Otherwise, the error will occur and motor will not work. If that happens, please turn off the power immediately and check the power voltage.
- Don't operate in direct sun light, outdoors area and where the room temperature is over 45°C or below 5°C.
- Please avoid operating near the heater at dew area or at the humidity below 30% or above 95%.
- Don't operate in area with heavy dust, corrosive substance or volatile gas.
- Avoid power cord being applied by heavy objects or excessive force, or over bend.
- 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.
- All the moving portions must be prevented to be exposed by the parts provided.
- Turing on the machine in the first time, operate the sewing machine at low speed and check the correct rotation direction.
- Turn off the power before the following operation:
 - Connecting or disconnecting any connectors on the control box or motor.
 - Threading needle.
 - Raising the machine head.
 - Repairing or doing any mechanical adjustment.
 - Machines idling.
- Repairs and high level maintenance work should only be carried out by electronic technicians with appropriate training.
- All the spare parts for repair must be provided or approved by the manufacturer.
- 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:

- 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.
- Damage by fire, Earth quake, lightning, wind, flood, salt corrosive, moisture, abnormal power voltage and any other damage cause by the natural disaster or by the inappropriate environments.
- 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 Button Displays and operating instructions

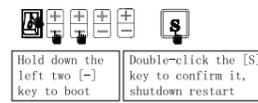
1.1 Key Description

Name	key	Indicate	Icons
Start /End Back-Tacking Selection		Execution starting back seam B segment or execution starting back seam (A, B segment) 1 Execution starting back seam (A, B segment) 2 times	
Freedom sewing shortcuts		Execution terminates back seam C segment or execution terminates back seam (C, D segment) 1 Execution terminates back seam (C, D segment) 2 times	
Continuous back seam shortcuts		As the treadle is toed down, all the seams of Bar-Tacking will be completed with D times, and then the thread will automatically be trimmed. Note: When the Bar-Tacking Sewing starts, will not stop until the trimming cycle finished, except for the treadle heeled back to cancel the action.	
Some fixed stitch shortcuts		As the treadle is toed down, Constant-Stitch Sewing E, F, G or H performs section by section. Once the treadle returns to neutral intermediately in any section, machine will stop immediately. When the treadle is toed down again, the balance stitches of E, F, G or H goes on. The key adjustable four, seven-segment, eight, and other multi-sew sewing patterns. When the display P1 ~ PF press [S] key to confirm the changes multi-sewing patterns P1 ~ PF is appropriate to modify the number of segment, the latter two is to modify the segment pin number.	
Multi-set stitch shortcuts		Enter parameter values such items and their contents change after adjustment, need to press the [S] key to save the confirmation. Note: The parameters are saved directly by the [S] key.	
Enter and determine \ save button		Continuous back seam except, any kind of sewing stop, click for lifting the needle or forward fill half needle. Any kind of sewn termination is not tangent, click for lifting the needle or forward fill half needle.	
Mention needles / fill needle key		1. In Free sewing: One touch of this key makes beep sound without any function also LED does not light up. 2. In Constant-Stitch Sewing: One shot to the pedal, stitches number of E, F, G or H will be automatically performed. Toe down the pedal again and again to finish the rest sections until it finish pattern.	
Automatically trigger button		1. Set or cancel the use of the tangent function. 2. The corresponding icon is not lit, turn off the corresponding functions.	
Tangent line function keys		Under normal mode, press the [P] key to enter the user parameter mode Press and hold the [P] key to boot into parameter mode Technician	
Function key enter parameter area		1. A, B, C, D, E, F, G, H section, increase the number of setting stitch . 2. Increase the parameter in Parameter selection. 3. Increase the setting value in Parameter value.	
Set value increment / parameter increment key		1. A, B, C, D, E, F, G, H decrease the number of setting stitch 2. Decrease the parameter in Parameter selection. 3. Decrease the setting value in Parameter value.	
Set value decrement / decrement key parameters		1. LED ON indicate stopping machine at the upper stop needle position. 2. LED ON indicate stopping machine at the lower stop needle position.	
Needle stop up and down keys		1. LED ON=Presser Foot automatically goes up after trimming. 2. LED ON=Presser Foot automatically goes up after motor stops. 3. Two icons are both LED ON= Presser Foot automatically goes up after trimming and motor stops. 4. Two icons are both LED OFF=Presser Foot is inactive.	
Presser foot shortcuts		1. The corresponding icon lights, slow starting sewing open. 2. The corresponding icon is not lit, no slow-starting sewing function.	
Slow play seam shortcuts		1. The corresponding icon lights, thread nipper function is turned on. 2. The corresponding icon is not lit, no thread nipper function.	
Clamp function keys		Speed up key: the speed should not lower than the value set by technician Slow down key: the minimum speed is 200r/m	
Maximum speed setting key			

1.2 Manually adjust the positioning

- In the shutdown state, hold on the S key to turn on machine and enter P-72,press the S key into the parameter;
- Turn the hand wheel till the needle's point touches the board,and the value will change at the same time;
- press the S key,and then end the operation.

1.3 Restore factory settings



2 User Parameter & Technician Parameter

Parameter	Parameter Function	Range	Default	Key	Description
Under the normal mode press [P] key					
P01	Maximum Sewing Speed (rpm)	100-3000	3000	[F]	Maximum speed of machine sewing
P02	Speed Curve Adjustment (%)	1-100	80	[F]	The Lager the value, the faster to increase speed
P03	Needle UP/ DOWN	UP/DN	DN	[F]	UP: Needle Stops at Up Position DN: Needle Stops at Down Position
P04	Start Back-Tacking Speed (rpm)	200-2000	700	[F]	Start Back-Tacking Speed Adjustment
P05	End Back-Tacking Speed (rpm)	200-2000	700	[F]	End Back-Tacking Speed Adjustment
P06	Bar-Tacking Speed (rpm)	200-2000	700	[F]	Bar-Tacking Speed Adjustment
P07	Soft Start Speed (rpm)	200-1500	400	[F]	Soft Start Speed Adjustment
P08	Stitch Numbers for Soft Start	0-99	2	[F]	Soft Start Stitches Setting
P09	Automatic Constant-Stitch Sewing Speed (rpm)	200-3500	2000	[F]	Constant-Stitch sewing speed adjustment when one shot signal us active.
P10	Automatic End Back-Tacking Sewing(Can invalidate the stitch correction function)	ON/OFF	ON	[F]	ON: After finished the last seam of Stitch-Correction, it can automatic execute end back-tacking action. Under the any of sewing mode, the end back-tacking can't as the stitches correction function. OFF: After finished the last seam of Stitch-Correction, it can't automatic execute end back-tacking function, it must step or full heeling action again then can execute end back-tacking or stitch-correction function.
P11	Back-Tacking Mode Selection	J/B	J	[F]	Press Back-Tacking switch by hand: J: JUKI Mode (it will activate when machine is stopped or running) B: BROTHOR mode (It will active the reverse solenoid when machine is running, and it will active stitch-correction action when machine is stopped)
P12	Start Back-Tacking Mode Selection	0-3	2	[F]	0: Manual, Pedal- control can stop and start. 1: Automatic, One shot to pedal, it can automatic execute back-tacking action.
P13	Mode Selection at the end of Start Back-Tacking	CON/STP	CON	[F]	CON: At the end of Start Back-Tacking, machine continues sewing if pedal pressed or START signal on (standing operation) STP: At the end of Start Back-Tacking, machine stops
P14	Soft Start	ON/OFF	OFF	[F]	ON: Soft start function is turn on. OFF: Soft start function is turn off.

P15	Stitch Correction Mode	0-4	2	[F]	0: Half stitch 1: One stitch 2: Continuous correct half stitch 3: Continuous correct stitch and quickly stop machine.
P17	Automatic count mode selection	0-1	0	[F]	0: P41 parameter value increase auto-count 1: P41 parameter disable auto-count.
P18	Stitch Balance for Start Back-Tacking 1	0-200	170	[F]	Stitch Balance for start back-tacking A section, 0-200 action gradually delay; the large value, the longer of A section last seam, and the short of B section first seam.
P19	Stitch Balance for Start Back-Tacking 2	0-200	170	[F]	Stitch Balance for start back-tacking B section, 0-200 action gradually delay; the large value, the longer of B section last seam.
P20	Mode Selection for End Back-Tacking	1-3	2	[F]	1: Automatic, one shot to pedal, it can automatic execute back-tacking action. 2: Pause
P24	The voltage of foot heeling pedal point	30-500	110	[F]	the foot heeling pedal point position adjustment
P25	Stitch Balance for End Back-Tacking 3	0-200	170	[F]	Stitch Balance for end back-tacking C section, 0-200 action gradually delay; the large value, the short of C section first seam.
P26	Stitch Balance for End Back-Tacking 4	0-200	170	[F]	Stitch Balance for end back-tacking D section, 0-200 action gradually delay; the large value, the longer of C section last seam, and the short of D section first seam
P28	Mode Selection for Bar-Tacking	0-3	2	[F]	0: Manual, Pedal- control can stop and start. 1: Automatic, One shot to pedal, it can automatic execute bar-tacking action. 2: Pause
P29	After trimming braking output	1-45	23	[F]	The large value the more strength, if adjust more value maybe will caused motor abnormal
P30	Thick material force	0-50	0	[F]	The large value the more strength, if adjust more value maybe will caused motor abnormal
P31	Trimming force	0-50	0	[F]	The large value the more strength, if adjust more value maybe will caused motor abnormal
P32	Stitch Balance for Bar-Tacking 5	0-200	170	[F]	Stitch Balance for bar-tacking A (C) section, 0-200 action gradually delay; the large value, the longer of A (C) section last seam, and the short of B (D) section first seam
P33	Stitch Balance for Bar-Tacking 6	0-200	170	[F]	Stitch Balance for bar-tacking B (D) section, 0-200 action gradually delay; the large value, the longer of B (D) section last seam, and the short of C section first seam
P34	Mode Selection for Constant-Stitch Sewing	A/M	A	[F]	A: One shot to pedal, it will automatic execute Constant-Stitch M: Pedal-controlled and motor can stop and start arbitrarily
P36	Thread tension release output function setting (tension release device pressure setting)	0-11	8	[F]	0: No tension release action 1-11: tension release strength gradually large
P37	Wiper, Clamp function Selection (Pressure setting of the Thread Clamp Device)	0-11	0	[F]	0: No Action 1: Wiper Action 2-11: The Clamp action and the pressure gradually increased
P38	Trimmer Function Selection	ON/OFF	ON	[F]	ON: Trimmer Valid OFF: Trimmer Invalid
P39	Presser Foot UP / Down at intermediate stop	UP/DN	DN	[F]	UP: Presser foot goes up automatically DN: Presser foot keeps down (Controlled by heeling pedal)
P40	Presser Foot UP / Down after Trimming	UP/DN	DN	[F]	UP: Presser foot goes up automatically DN: Presser foot keeps down (Controlled by heeling pedal)
P41	Display the sewing finished quantity		0	[F]	Valid for enter sewing pieces display interface, automatic save; long press minus key to reset the counter.

P42	Information Display		N-01		Press S key to enter, press P key to exit NO1 Control box version serial number NO2 Operation panel version number. NO3 Sewing Speed NO4 Pedal AD value NO5 Up positioning angle NO6 Down positioning angle NO7 Busbar voltage AD value NO8 Solenoid testing mode
P43	Setting Direction of Motor Rotation (CCW/CW)	CCW/CW	CCW	[F]	CW: Clockwise CCW: Counter Clockwise
Press [P] key to turn on the machine					
P44	The force of intermediate stop	1-45	18	[F]	The strength selection at the sewing intermediate stop
P45	Duty-Cycle setting of Back tacking output duty-cycle (%)	1-50	30	[F]	Adjustment for duty-cycle of back tacking. Fine tuning can reduce the over-heating. ON: It will automatic as reverse function after trimming (angle adjustment according to the parameter 【P47,TR8】 OFF: No Function
P46	Motor stops with a reverse angle after trimming	ON/OFF	OFF	[F]	
P47	Adjustment of reverse angles after trimming	50-200	160	[F]	Adjusting at reverse direction after trimming
P48	Low (Positioning) Speed (spm)	100-500	200	[F]	Setting Positioning Speed
P49	Trimming Speed (spm)	100-500	200	[F]	Adjusting trimming duty-cycle motor speed.
P50	The time of Foot lifting (ms)	10-990	150	[F]	Foot lifting sequence time
P51	Duty-Cycle Setting for Foot Lifter (%)	1-50	25	[F]	Adjustment for Duty-Cycle of Foot Lifter (Fine tuning can reduce the over-heating)
P52	Foot lift lay down time (ms)	10-990	200	[F]	Foot lift lay down sequence time
P53	Cancel Foot Lifting when Half-Heeling the Pedal	ON/OFF	OFF	[F]	ON: Pedal half heeling without foot lifting function. OFF: Pedal half heeling with foot lifting function
P54	Trimming Time (ms)	10-990	200	[F]	Trimming sequence time setting
P55	Thread wiping/Thread sweeping time	10-990	270	[F]	Thread wiping/Thread sweeping sequence time 0: No Function. 1: Power turned on, needle goes up position automatically 2: If needle at the up position, no function! the motor at the up position, so no longer to find up position.
P57	The presser foot protection time (s)	1-60	10	[F]	The presser foot lift exceeds the set value automatically disconnect protection time
P58	Up Position Adjustment	0-1439	40	[F]	Up Position Adjustment The needle will advance stop when the value decreased. The needle will delay stop when the value increased.
P59	Down Position Adjustment	0-1439	750	[F]	Down Position Adjustment The needle will advance stop when the value decreased. The needle will delay stop when the value increased.
P60	Testing Speed (rpm)	100-3500	2000	[F]	Setting testing speed
P61	Testing A		OFF	[F]	Option of Testing A, after setting press 【P60】 to set the speed execute the cycle of Start - Sewing - Stop - Trimming
P62	Testing B		OFF	[F]	Option of Testing B, after setting press 【P60】 to set the speed execute the cycle of Start - Sewing - Stop - Trimming
P63	Testing C		OFF	[F]	Option of Testing C, after setting press 【P60】 to set the speed execute the cycle of Start - Sewing - Stop without positioning function
P64	Running Time of Testing B and C	1-250	20	[F]	Setting running time of testing B and C
P65	Stop Time of Testing B and C	1-250	20	[F]	Setting stop time of testing B and C
P66	Machine Protection Switch Testing	0-2	1	[F]	0: Disable, 1: Testing zero signal, 2: Testing positive signal
P67	Trimming Protection Switch Testing	ON/OFF	OFF	[F]	OFF: Disable ON: Enable

Press [P], [S] key at the same time to turn on the machine					
P69	Back tacking release buffering(%)	0-50	0	[F]	Adjustment output when back tacking release
P70	Factory type selection		10	[F]	
P71	Foot lift release buffering(%)	0-50	1	[F]	Adjustment output when foot lift lay down
P72	Upper needle stop position correction			[F]	1. In the shutdown state, hold on the S key to turn on machine and enter P-72,press the S key into the parameter; 2. Turn the hand wheel till the needle's point touches the board,and the value will change at the same time; 3. press the S key,and then end the operation.
P73	Down needle stop Position Adjustment			[F]	Adjustment down needle stop position, the value will change according to the hand-wheel position, press S key to save current position(value) as down needle stop position.
P76	Back tacking fully output time (ms)	10-990	200	[F]	Back tacking start action, fully output action time.
P77	Freedom sew back seam even terminate pause time (ms)	20-200	100	[F]	
P78	Clamp start action angle	5-359	100	[F]	
P79	Clamp end angle	5-359	270	[F]	
P80	The angle of trimming infeced	0-359	0	[F]	The angle of trimming infeced setting (Down needle stop position as 0°)
P81	Trimming start angle	5-359	200	[F]	Trimming start angle setting (Down needle stop position as 0°)
P82	Trimming end angle	5-359	280	[F]	Trimming end angle setting (Down needle stop position as 0°)
Press and hold needle up/ forward stitch correction key to turn on the machine.					
P83	Brake force after trimming	10-120	30	[F]	Adjustment of brake force after trimming
P84	Torque increase initial angle of over thick material	0-359	5	[F]	
P85	Torque increase finish angle of over thick material	0-359	50	[F]	
P86	The distance of up and down position	100-1400	240	[F]	The angle of the distance of up and down position.(each 4 value as 1 degree)
P87	The thread wiping/ sweep back delay times	10-990	50	[F]	Ensure Thread wiping/Thread sweeping in situ
P89	Alternating current(ac) overvoltage value set	500-1023	880	[F]	
P93	Half step delay times(ms)	10-990	300	[F]	The valid time of half step relative function
P98	Back tacking release time (ms)	1-800	200	[F]	Back tacking release sequence actioning time.
P101	Thread tension release start angel	1-359	240	[F]	Start angle of thread tension release (Down needle stop position as 0°)
P102	Thread tension release end angel	1-359	280	[F]	End angle of thread tension release (Down needle stop position as 0° , the value should bigger than P101)
P109	The delay time before thread wiping/ sweep (ms)	5-990	5	[F]	The interval time of thread wiping/ sweep action after finding up needle stop position
P110	Trimming back delay time (ms)	60-990	60	[F]	Ensure trimming in situ
P111	Motor type selection	0-1	0	[F]	0: without magnetic ring; 1: with magnetic ring
P112	Trimming fully output time (ms)	10-990	200	[F]	trimming start action, fully output action time.

P113	Duty-cycle setting for trimming action (%)	0-100	80	[F]	Adjustment for duty-cycle of trimming. (Fine tuning can reduce the over heating)
P114	Trimming release buffering (%)	0-100	0	[F]	Adjustment output of trimming release.
P115	Trimming release buffering time (ms)	0-990	0	[F]	Adjustment time of trimming relase buffering function.
P116	Trimming release buffering delay time (ms)	0-990	0	[F]	Adjustment delay time of trimming release buffering
P117	Presser foot lift release buffering delay time (ms)	0-990	0	[F]	Adjustment delay time of presser foot lift release buffering
P118	Under pause mode pause position adjustment	0-1000	150	[F]	(Down needle stop position as 0°)
P119	Solenoid over-current protection function switch	0-1	1	[F]	0: OFF; 1: ON

3 Error Code List

Error Code	Problem	STATUS / MEASUREMENT
E01	1) When power on, detected main voltage too high. 2) When the supply voltage is too high	Turn off the system power supply, and detect whether the supply voltage is correct. (Or exceed the rated voltage.) If correct, please replace the control box and inform the factory
E02	1) When power ON, detected main voltage too low. 2) When the supply voltage is too low.	Turn off the system power supply, and detect whether the supply voltage is correct. (Or exceed therated voltage) If correct, please replace the control box and inform the factory
E03	Operation panel linked to CPU interface had communication error.	Turn off the system power supply, please check the operation panel plug if loose. If connecting well, please replace the operation panel. If not the operation panel, it is control box caused, please replace the control box.
E05	Speed control unit connection is abnormal	Turn off the system power supply, please check the speed control unit connector if loose or fall off. Will resume normal after the restart system If you still can not work normally, please replace the speed control unit and notify the manufacturer.
E07	a)Bad connection at the motor connector. b)Machine locked or object stuck in the motor pulley c)Sewing material is too thick. d)Module output is abnormal.	Turn off the system power supply, please check the encoder connector and motor power cord connector if loose. If loose please tight connection. If connection well, please check supply voltage whether abnormal or setting speed too high. If have please modify. If normal, please replace the control box and notify the manufacturer.
E08	Manual Back-Tacking lasts for 15 sec.	Back-tacking solenoid running time too long, please restart the machine. If restart the machine it still error E-08, please check the manual back-tacking switch is damage or not.
E10	Solenoid over-current protection	Turn off the system power supply, please check the solenoid (solenoid valve) connector or solenoid (solenoid valve) is broken or not.

E09 E11	Synchronizer signal error.	Turn off the system power supply, please check motor encoder connector if loose or fall off, renew to normal then restart system. If still not work, please replace the motor and notify the manufacturer.
E14	Encoder signal error.	Turn off the system power supply, please check motor encoder connector if loose or fall off, renew to normal then restart system. If still not work, please replace the motor and notify the manufacturer.
E15	Power module abnormal over current protection	Module driver output and head output will close all. Waiting for the power to open / reset. (please carefully check power supply board each function)
E17	The sewing table safety switch is not in the correct position	Please check sewing table is open or not, the sewing table safety switch is damage or not, the socket is abnormal or not.
E20	Power On motor drive fail	Turn off the system power supply, please check motor encoder connector and motor power interface if loose or fall off, renew to normal then restart system. If still not work, please replace the motor and notify the manufacturer.

4 Part Outline Diagram

4.1 The Name of each port

