⚠Safety Instruction

1. Users are required to read the operation manual completely and carefully before installation or operation.
2. The product should be installed and pre-operated by well-trained persons. All power supplies must be turned off during the installation work, remember not to operate with power on.
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 the power cord, it must be determined that the operating voltage conforms to the rated voltage value specified in the product identification.
6. Don′ t 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. Don′ t 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

* 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
Function parameter edit		If click, enter or exit the user parameter setting interface. If long-press, it will switch to the password input interface. Enter the correct password, press S key to confirm, you can enter the advanced parameter setting interface.
Setting parameter check and save		After powering on, you need to press the "S" button to confirm before you can use it normally. For the content of the selected parameters check and save: after select parameter press this key to check and modify operation, after modified parameter value press this key to exit and save the parameter.
Parameter increase		If click, increase the parameter. If long-press, continuously increase the parameter.
Parameter decrease		If click, decrease the parameter. If long-press, continuously decrease the parameter.
Reset		Long-press can restore factory setting.
Start back-tacking selection / Slow launch setting		If click, switch AB start back-tacking → ABAB start back-tacking → function off → B start back-tacking successively. If long-press, set used or cancelled slow launch function.
End back-tacking selection / Needle stop position selection		If click, switch CD end back-tacking → CDCD end back-tacking → function off → C end back-tacking successively. If long-press, the needle stop position after shift the sewing mode (up position / down position).
Free sewing / Constant stitch sewing		If click, set to free sewing mode. If long-press, set to constant stitch sewing mode.
Consecutive reverse sewing / Multi-segment sewing		If click, set to consecutive reverse sewing mode. If long-press, set to multi- segment sewing mode (switch to four-segment sewing, seven-segment sewing, eight-segment sewing, and fifteen-segment sewing in sequence).
Presser foot lifting setting / Auto function		If click, switch function off → automatic presser foot lifting after trimming → automatic presser foot lifting after pause → full function successively. If long-press, set used or cancelled auto function.
Trimming setting / Clamp function setting		If click, set used or cancelled trimming function. If long-press, set used or cancelled clamp function.
Differential motion mode		If click, switch to the differential motion mode editing screen.
Tight seam setting		Invalid.
Pattern backing-tacking setting		Invalid.
Pattern constant-stitch sewing setting		Invalid.
Stitch length setting		If click, increase or decrease stitch length. If long-press, continuously increase or decrease stitch length.

1.2 Auxiliary function

1.2.1 Debugging mode

On the main interface, long-press S key to enter to the debugging parameter interface. P92 correct the electrical angle of motor, P72 up needle position adjustment, P129 back-tacking stepping motor zero-point correction, P74 tacking stitch length compensation and P75 back-tacking stitch length compensation parameter setting, P144 tacking stitch length compensation in high speed, P145 back-tacking stitch length compensation in high speed, P11, P244, P207, P222, P130, P49, P177, P178, P179, P180, P181, P182, P183, P184, P185, P186, P187, and P188.

1.2.2 Differential motion mode editing

On the main interface, click the differential motion mode key to display "A-1.1 [4.0]". "1." represents the first differential motion mode. ".1" represents the first segment of the current differential motion mode. "[4.0]" represents the differential motion value.

2 User parameter

No.	Items	Range	Default	Description
P01	Free sewing maximum speed (rpm)	100-4000	4000	Maximum speed of machine sewing.
P02	Set accelerated curve (%)	10-100	80	Set the acceleration slope. The greater the slope value, the steeper the speed; the smaller the slope value, the slower the speed.
P03	Needle UP/ DOWN	UP/DN	DN	UP: Needle stops at up position DN: Needle stops at down position
P04	Start back-tacking speed (rpm)	200-3200	2000	
P05	End back-tacking speed (rpm)	200-3200	2000	
P06	Bar-tacking speed (rpm)	200-3200	2000	
P07	Soft start speed after second stitch (rpm)	200-1500	1500	
P08	Stitch numbers for soft start	1-15	2	
P09	Automatic constant-stitch sewing speed (rpm)	200-4000	3700	Speed adjustment for automatic constant-stitch sewing.
P10	Automatic end back-tacking sewing after constant-stitch sewing	ON/OFF	ON	ON: After executing the constant-stitch sewing, the back-tacking sewing will be executed automatically. In any sewing mode, mending stitch function cannot be used. OFF: After executing the last constant-stitch sewing, the back-tacking sewing function will not be automatically executed, and the front step or full back step must be performed again.
P11	Back-tacking stitch overall compensation	-20~20	0	
P12	Start back-tacking running mode selection	0-1	1	
P13	Ending mode of start back-tacking	CON/STP	CON	
P14	Slow start function selection	ON/OFF	OFF	

No.	Items	Range	Default	Description
P15	Manual switch A	0-6	5	0: OFF 1: Half stitch 2: One stitch 3: Continuous half stitch 4: Continuous one stitch 5: With back-tacking when machine sewing or pause 6: Tight seam function (press and hold the key to sew)
P16	Speed limit of manual back-tacking	0-3200	3000	The function is disabled when the value is less than 100.
P17-N04	Language setting	0-15	1	0: OFF 1: Chinese 2: English 3: Vietnamese 4: Portuguese 5: Turkish 6: Spanish 7: Russian 8: Arabic
P17-N06	Automatic piece counting function	0-50	1	0: OFF 1-50: Trimming counting times setting
P17-N08	Virtual and real speed function switch	0-1	0	For each increase of 100 above 4000 rpm, the actual increase is 100*[P17-N09].
P17-N09	Virtual and real speed ratio (%)	10-100	50	
P17-N12	Power-on display counter interface selection	0-1	0	0: OFF 1: ON
P17-N13	Thread trimming counter mode selection	0-1	0	0: Incremental piecework mode 1: Diminishing piecework mode
P18	Start back-tacking compensation 1	0-200	145	Stitch compensation for start back-tacking A section, 0~200 action gradually delay; The large value, the longer of the A section last stitch, and the shorter of the B section first stitch.
P19	Start back-tacking compensation 2	0-200	168	Stitch compensation for start back-tacking B section, 0~200 action gradually delay; The large value, the longer of the B section last stitch.
P21	The position of the pedal for accelerating	30-1000	520	
P22	The position of the pedal for the stop	30-1000	420	
P23	The position of the pedal for presser foot lifting	30-1000	270	
P24	The position of the pedal for thread trimming	30-500	130	
P25	End back-tacking compensation 3	0-200	145	Stitch compensation for end back-tacking C section, 0~200 action gradually delay; The large value, the shorter of the C section first stitch.
P26	End back-tacking compensation 4	0-200	168	Stitch compensation for end back-tacking D section,0~200 action gradually delay; the large value, the longer of the C section last stitch, and the shorter

No.	Items	Range	Default	Description
				of the D section first stitch.
P28	Bar-tacking running mode selection	0-1	1	
P29	The strength of thread trimming stop	1-45	25	
P32	Bar-tacking compensation 5	0-200	145	Stitch compensation for bar-tacking A (C) section, 0~200 action gradually delay; the large value, the longer of the A (C) section last stitch; the shorter of the B (D) section first stitch.
P33	Bar-tacking compensation 6	0-200	168	Stitch compensation for bar-tacking B (D) section, 0~200 action gradually delay; the large value, the longer of the B (D) section last stitch; the shorter of the C section first stitch.
P34	Constant-stitch sewing running mode selection	A/M	A	A: Touch the foot pedal to automatically execute constant-stitch sewing action M: Controlled by foot pedal, can be stopped and started at will
P35	Thread tension releasing function setting when presser foot lifting action	0-2	0	0: OFF 1: Thread tension releasing output function ON when presser foot lifting, thread tension releasing output function OFF when pause 2: Full function
P36	Thread tension releasing function selection	0-1	1	0: OFF 1: ON
P37	Thread wiping function / Thread clamping function selection	0-11	6	0 : OFF 1: Thread wiping function 2-11: Thread clamping function, the greater the value, the greater the action strength.
P38	Automatic thread trimming function selection	ON/OFF	ON	
P39	Automatic presser foot lifting when pause function selection	UP/DN	DN	
P40	Automatic presser foot lifting after trimming function selection	UP/DN	DN	
P41	Thread trimming counter display	0-9999	0	Display the quantity of finished sewing piece. Long-press “-” key to clear the count.
P42-N01	The control system version number			
P42-N02	The panel version number			
P42-N03	Speed			
P42-N04	The pedal AD			
P42-N05	The mechanical angle (up position)			
P42-N06	The mechanical angle (down position)			
P42-N07	Bus bar voltage AD			
P42-N11	Status information			
P42-N14	The control system version number 2			

No.	Items	Range	Default	Description
P42-N16	Stitch counter display (every 10 stitches, the value changes by 1)			
P42-N17	Number of needles for maintenance operation (10,000 needles) *10			
P43	Motor rotation direction setting	CCW/CW	CCW	CW: Clockwise CCW: Counter clock wise
P44	Brake strength during pause	1-45	16	
P45	Periodic signal of back-tacking output (%)	1-50	30	Back-tacking action with periodic power saving output to avoid the solenoid from getting hot.
P46	Reverse angle function selection after trimming	ON/OFF	OFF	
P47	Adjustment of reverse angle after trimming	10-300	40	Start from the upper needle position and adjust the angle of the needle lift in reverse operation after trimming.
P48	The minimum speed (positioning speed) (rpm)	100-500	210	Adjust the minimum speed
P49	Thread trimming speed (rpm)	100-500	300	Adjust thread trimming speed
P50	The working time of presser foot full output (ms)	10-990	200	
P51	Periodic signal of presser foot output (%)	1-50	38	
P52	Delay the start of the motor to protect the lowering time of presser foot (ms)	10-990	120	Delay the start time, with automatic presser foot down.
P53	Presser foot lifting function when half pedaling to cancel	0-2	1	0: OFF 1: Back pedaling and half back pedaling with lifting presser foot 2: Half back pedaling without lifting presser foot, back pedaling with lifting presser foot
P54	Thread trimming action time (ms)	10-990	200	
P55	Thread wiping action time (ms)	10-990	30	
P56	Power on and positioning	0-1	0	0: Always not to find the up needle position 1: Always to find the up needle position
P57	Presser foot lifting protection time (s)	1-60	5	After the holding time is over, it is forced to be lowered to prevent the stepping motor from being raised for a long time and becoming hot.
P58	Up needle position adjustment	0-359		Up position adjustment, the needle will advance stop when the value decreased, the needle will delay stop when the value increased.
P59	Down needle position adjustment	0-359		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)	100-3700	3500	Setting testing speed.
P61	Testing A	ON/OFF	OFF	Continuous running testing.
P62	Testing B	ON/OFF	OFF	Start and stop testing with all functions.

No.	Items	Range	Default	Description
P63	Testing C	ON/OFF	OFF	Start and stop testing without all function.
P64	Test run time	1-250	30	
P65	Test stop time	1-250	10	
P66	Machine protection switch selection	0-1	1	0: Disable 1: Testing zero signal
P70	Model selection		20	
P72	Up needle position adjustment	0-359		Adjust up needle position, the displayed value will change with the position of the handwheel, press "S" key to save the current position (value) as up needle position.
P73	Down needle position adjustment	0-359		Adjust down needle position, the displayed value will change with the position of the handwheel, press "S" key to save the current position (value) as down needle position.
P74	Tacking stitch length compensation	-100~100	0	
P75	Back-tacking stitch length compensation	-100~100	0	
P76	Back-tacking full out time(ms)	10-990	200	
P77	Opportunity point of back-tacking for end back-tacking in high speed in free sewing mode	0-350	235	
P78	The start angle of thread clamping	5-359	100	
P79	The stop angle of thread clamping	5-359	270	
P80	Trimming engage angle	0-359	5	
P82	Trimming retract angle	0-359	175	
P83	Stopping strength after trimming	10-100	20	
P84	Trimming full output time (ms)	10-990	60	
P85	Periodic signal of trimming output (*10%)	1-10	7	
P86	Up and down needle position distance	15-345	170	Up and down positioning distance angle (1 degree for every 4 values).
P87	Wiping thread return delay time	10-990	50	Make sure the wiper returns to its original position
P88	The stopping distance during machine pause	10-100	30	
P89	AC overvoltage setting	500-1023	880	
P90	Soft start first stitch speed	200-1500	400	

No.	Items	Range	Default	Description
P91	Soft start second stitch speed	200-1500	1000	
P92	Correct the electrical angle of motor		160	Reading the initial Angle of encoder, the factory default was set, please do not change the values (parameter value cannot be changed manually, random change it will result the control box and motor abnormal or damaged).
P93	Semi-reverse pedal function onset time (ms)	10-900	100	
P101	The start angle of thread tension releasing	1-359	30	Thread tension releasing start angle (defined as 0°under calculation).
P102	The stop angle of thread tension releasing	1-359	180	Thread tension releasing end angle (defined as 0°under calculation, must be greater than P101 parameter value).
P103	Periodic signal of thread tension releasing output (%)	1-8	5	
P104	Pause time when constant-stitch sewing switch to end back-tacking sewing	0-990	100	
P109	The delay time before thread wiping	5-990	220	Interval time before entering thread wiping action after finding the upper positioning.
P110	Trimming back time (ms)	60-990	65	Make sure the thread trimming device returns to its original position.
P119	Solenoid overcurrent protection detection switch	0-1	0	
P130	Zero point compensation for close puller stepping motor	-100~100	0	
P138	Presser foot release buffer duty ratio (%)	0-100	2	
P139	Presser foot release buffer delay time (ms)	0-200	8	
P144	Tacking stitch length compensation in high speed	-100~100	0	
P145	Back-tacking stitch length compensation in high speed	-100~100	0	
P165	Stitch counter mode selection	0-4	0	0: Do not count 1. Increase cycle count 2. Decrease cycle count 3. Increase count, alarm after the count is full, need to press the clear key to start recounting 4. Decrease count, alarm after the count is full, need to press the clear key to start recounting
P166	Upper limit of stitch counter (stitch) *10	0-9999	500	

No.	Items	Range	Default	Description
P167	Upper limit of maintenance stitch number (10000 stitches) *10	0-9999	9000	
P174	Manual Switch B	0-6	3	0: OFF 1: Half stitch 2: One stitch 3: Continuous half stitch 4: Continuous one stitch 5: With back-tacking when machine sewing or pause 6: Tight seam function
P175	Manual Switch C	0-6	0	0: OFF 1: Half stitch 2: One stitch 3: Continuous half stitch 4: Continuous one stitch 5: With back-tacking when machine sewing or pause 6: Tight seam function
P176	Manual Switch D	0-6	0	0: OFF 1: Half stitch 2: One stitch 3: Continuous half stitch 4: Continuous one stitch 5: With back-tacking when machine sewing or pause 6: Tight seam function
P177	Differential motion mode 1 forward compensation	0-1000	500	
P178	Differential motion mode 1 backward compensation	0-1000	500	
P179	Differential motion mode 2 forward compensation	0-1000	500	
P180	Differential motion mode 2 backward compensation	0-1000	500	
P181	Differential motion mode 3 forward compensation	0-1000	500	
P182	Differential motion mode 3 backward compensation	0-1000	500	
P183	Differential motion mode 4 forward compensation	0-1000	500	
P184	Differential motion mode 4 backward compensation	0-1000	500	
P185	Differential motion mode 5 forward compensation	0-1000	500	
P186	Differential motion mode 5	0-1000	500	

No.	Items	Range	Default	Description
	backward compensation			
P187	Differential motion mode 6 forward compensation	0-1000	500	
P188	Differential motion mode 6 backward compensation	0-1000	500	
P189	Differential motion mode 7 forward compensation	0-2000	620	
P190	Differential motion mode 7 backward compensation	0-2000	625	
P191	Differential motion mode 8 forward compensation	0-2000	0	
P192	Differential motion mode 8 backward compensation	0-2000	0	
P193	Differential motion mode 9 forward compensation	0-2000	0	
P194	Differential motion mode 9 backward compensation	0-2000	0	
P201	Presser foot lifting switch when start sewing	0-1	1	0: OFF 1: ON
P202	Presser foot lifting start angle when start sewing	0-359	1	
P203	Presser foot lifting stop angle when start sewing	0-359	200	
P204	Presser foot lifting strength when start sewing	0-100	40	
P251	Differential motion mode number	1-9	1	

Note: the initial value of parameters is for reference only, and the actual value of parameters is subject to the real object.

3 Error code list

Error Code	Problem description	Solutions
E01	High voltage	1. Whether the grid voltage is higher than AC260V. 2. If it is self-generated power supply, please reduce the generator power. 3. If it still does not work normally, please replace the control box and notify the after-sales service.
E02	Low voltage	1. Whether to connect to low voltage. 2. Reset. 3. If it still does not work normally, please replace the control box and notify the after-sales service.
E03	CPU communication abnormal	1. Turn off the system power and check whether the connection of the display screen is loose or disconnected, restart the system after returning it to normal. 2. Turn off the system power, remove the control box and only plug in the

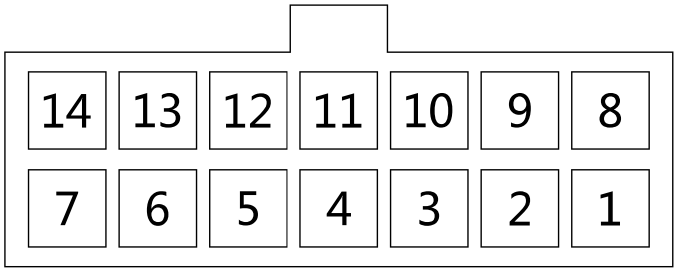
		power cord to power on, whether alarm E05, if it still alarms E03, replace the control box and notify the after-sales service.
E05	Pedal signal abnormal	1. Check whether the pedal connector is loose or fall off, and restart the system after returning it to normal. 2. If it still does not work normally, please replace the control box or speed controller and notify the after-sales service.
E07	Main shaft motor locked-rotor	1. Turn off the power and check whether the handwheel can be turned smoothly (turn the handwheel by hand), if it cannot be turned, please check the machine; 2. Turn off the power, check whether the motor power connector is loose, plug it in and restart it; 3. Check whether the upper needle stop position is correct, if not, please adjust the upper positioning position; 4. If it still does not work normally, please replace the control box or spindle motor and notify the after-sales service.
E10	Electromagnet overcurrent	1. Unplug the solenoid connector, if alarm E10, replace the control box and notify the after-sales service. 2. If there is no alarm after removing the solenoid connector, please plug it back in 1) Step on the front pedal to let the sewing machine perform thread clamping and back-tacking. If alarms, please turn off start back-tacking and end back-tacking, restart the control box, and then step forward. If alarms, please turn off the thread clamping function and restart the electronic control, and step forward again. If there is no alarm, replace the clamper. 2) Step on the front pedal to let the sewing machine perform thread clamping, back-tacking and half anti-side trample foot lifting. If there is no alarm, please back pedaling thread trimming, if it alarms, please replace thread tension releasing solenoid.
E09 E11	The positioning signal of main shaft motor encoder is abnormal	1. Turn off the system power, check whether main shaft motor encoder connector is loose or fall off, restore it to normal and restart the system. 2. Check whether the motor zero point correction setting is correct; Reset the motor zero point correction; Whether there is oil on the encoder code plate, please clean it if there is any; 3. If it still does not work normally, please replace the control box or main shaft motor and notify the after-sales service.
E14	Main shaft motor encoder signal is abnormal	1. Turn off the system power, check whether the main shaft motor encoder connector is loose or fall off, restore it to normal and restart the system. 2. Check whether the grating is installed correctly (whether the grating screws are tightened and whether the grating is in the center of the encoder). 3. Check whether there is oil on the encoder code plate, if there is, please clean it up, and restart the system after recovery. 4. If it still does not work normally, please replace the control box or main shaft motor and notify the after-sales service.

E15	Main shaft motor drive overcurrent	1. Please check whether the motor power cord has bad contact. 2. Please check whether the motor power cord is crushed. 3. Please replace the control box or main shaft motor and notify the after-sales service.
E17	Machine overturned	1. Turn off the system power and check if the machine is overturned. 2. Check whether the machine protection switch detection setting is correct. 3. If it still does not work normally, please replace the control box or panel and notify the after-sales service.
E20	Main shaft motor failed to start	1. Turn off the system power, check whether main shaft motor power cord connector and encoder connector are loose or fall off, restore them to normal and restart the system. 2. Check whether the motor zero point correction setting is correct, reset the motor zero point correction 3. If it still does not work normally, please replace the control box or main shaft motor and notify the after-sales service.
E80	Abnormal communication between main chip and drive chip	Please replace the control box and notify the after-sales service.
E82	Stepping motor overcurrent	1. Turn off the system power and observe whether stepping motor is stuck. If it is stuck, remove the mechanical failure of the machine first. If it is normal, check whether connector of stepping motor is loose or fall off, restore it to normal and restart the system. 2. If it still does not work normally, please replace the control box or stepping motor and notify the after-sales service.
E84	The positioning signal of stepping motor encoder is abnormal	1. Turn off the system power and observe whether stepping motor is stuck. If it is stuck, remove the mechanical failure of the machine first. If it is normal, check whether the encoder connector of stepping motor is loose or fall off, and restart the system after returning it to normal. 2. Check whether the grating is installed correctly (whether the grating screws are fastened and whether the grating is in the center of the encoder); 3. Check if there is oil on the grating code plate, if so, please clean it up, and restart the system after restoration; 4. If it still does not work normally, please replace the control box or stepping motor and notify the after-sales service.
E85	Stepping motor encoder signal is abnormal	1. Turn off the power of the system, check whether the encoder connector of stepping motor is loose or fall off, restore it to normal and restart the system. 2. Check whether the grating is installed correctly (whether the grating screws are fastened and whether the grating is in the center of the encoder); 3. Check if there is oil on the grating code plate, if so, please clean it up, and restart the system after restoration; 4. If it still does not work normally, please replace the control box or stepping motor and notify the after-sales service.

E86	Stepping motor failed to start	1. Turn off the power of the system, check whether the power cord connector of stepping motor and the encoder connector are loose or fall off, restore them to normal and restart the system. 2. Check whether the grating is installed correctly (whether the grating screws are fastened and whether the grating is in the center of the encoder); 3. Check if there is oil on the grating code plate, if so, please clean it up, and restart the system after restoration; 4. If it still does not work normally, please replace the control box or stepping motor and notify the after-sales service.
E87	Stepping motor locked-rotor	1. Turn off the system power and observe whether stepping motor is stuck. If it is stuck, remove the mechanical failure of the machine first. If it is normal, check whether the power cord connector of motor and the encoder connector are loose or fall off, restore them to normal and restart the system. 2. If it still does not work normally, please replace the control box or stepping motor and notify the after-sales service.

4 Port diagram

4.1 14P function port description



1. Thread trimming electromagnet: 1, 8 (+32V)
2. Thread clamping electromagnet: 2, 9 (+32V)
3. Back-tacking electromagnet: 3, 10 (+32V)
4. LED Light: 4 (DGND), 11 (+5V)
5. Back-tacking key: 5 (signal)
6. Presser foot electromagnet: 6, 13 (+32V)
7. Manual darning stitch signal: 7 (signal)
8. 1/2 manual darning stitch signal: 14 (signal)
9. 1/4 manual darning stitch signal: 12 (signal)

4.2 4P (black) function port description (operation panel interface)

4.3 6P function port description (reserved)

4.4 4P (orange) function port description (reserved)