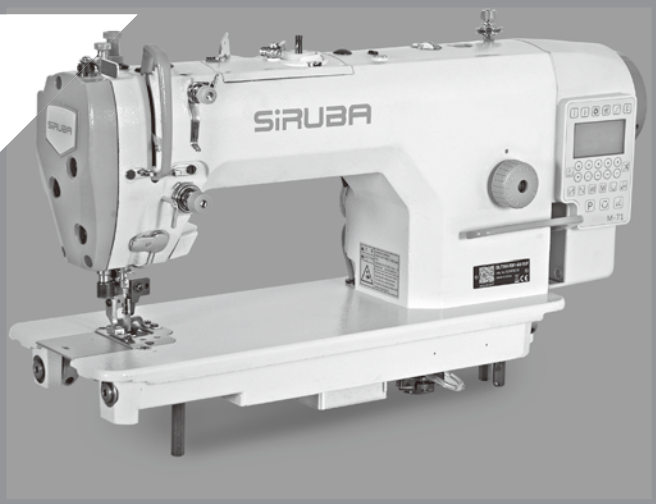
SiRUBA

電控參數說明書

ELECTRONIC CONTROL PARAMETER MANUAL

DL7300



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前言

注意：

使用前請仔細閱讀本用戶手冊及所搭配的縫製機械說明書，並且必須由接受過正確培訓的專業人員來安裝調試或操作.一旦投入使用，我們認為您已經認真閱讀本手冊並充分瞭解產品性能及使用範圍。

本產品僅適用於指定範圍的縫製機械，請勿移做他用。

本公司擁有此用戶手冊的最終解釋權。

使用中若有任何疑問或對我們的產品及服務有任何意見或建議，請隨時與經銷商或直接與我們聯繫。

安全說明

1. 所有標有符號的地方或指示，均為安全警示，必須特別注意並嚴格遵守，否則會造成人身傷害或機器損壞.
2. 所有標有符號的地方或指示，均為高電壓或電氣方面的安全警示，必須特別注意並嚴格遵守，否則會造成人身傷害或機器損壞。
3. 本產品必須由受過培訓的專業人員進行安裝和調試。
4. 配接電源時必須符合產品銘牌上標示的電壓範圍及技術要求，並確保本產品可靠接地。
5. 接通電源時，請勿踏腳踏板。
6. 本產品為精密電子產品，內含電腦控制晶片，使用地區雷擊、電壓變化太大或接觸不良時，可能造成機器損壞，請勿使用。
7. 進行以下操作時，必須切斷系統電源：

■安裝機器時；
■打開控制箱或在控制箱上拔出或插接任何連接插頭時；
■翻抬機頭、換機針或穿針線時；
■雷擊、機器休息或長時間不用、修理或調整時。

8. 重新啟動機器時，應相隔 30S 以上。
9. 系統參數設置或保養應由受過專門相關訓練專業人員完成。
10. 所有維修用零件須由本公司提供或認可，方可使用。

1．產品說明

1.1　概述

工業縫紉機數控交流伺服系統,採用多項高科技數位控制和交流伺服技術,多項技術及性能指標達到或超過國際先進水準.是一款適配工業高速自動平縫機的高端產品,與普通離合式電機相比,節電 40%以上,極大的提高了工業縫紉機的工作效率,降低了工業縫紉機的使用成本,提高了服裝廠的競爭力。

該系統由交流伺服電機及控制器組成。

交流伺服電機採用稀土元素永磁無刷伺服電機。具有體積小、重量輕、壽命長、且功率大、噪音低、振動小、效率高、力距大、運轉更平穩等特點，安裝簡易方便。

電控箱體採用鋁合金外殼，箱體強度高、散熱性更好、抗干擾能力更強，控制電路採用先進的光電分離和向量控制技術，高速的控制晶片的採用使電機轉速控制精度高，停針速度快，位置精確，操作簡便。

線路板採用先進的高速貼片技術,整機供電系統採用開關電源供電，適應更寬的電壓範圍。具有過壓、欠壓、過流、各類回路短路保護等先進的故障自診斷和人機對話功能，有效防止在各種異常狀態下機器故障的發生，確保控制系統正常工作。

1.2　產品使用環境

1.2.1 本產品使用請遠離高頻電磁波和電波發射器以免受其影響，而發生誤動作。

1.2.2 產品在用環境溫度要求:

a、請在室溫 5℃以上或 45℃以下場所使用。

b、請不要在陽光直射的場所或室外運作。

c、請不要在暖氣(電熱器)旁邊運作。

d、請保持工作在 30%~95%相對濕度

e、請不要在可燃氣體或爆炸物附近工作

1.2.3 額定工作電壓 220V±10％ 50(60)HZ

1.2.4 系統接地電阻<4Ω

1.3 產品規格

電機輸出功率（Power)：400W、500W 或者 550W，可選

電機轉輪直徑（Motor Pulley Size)：80mm

可配置縫紉機機頭轉輪直徑：65～130mm，缺省設置 75mm

縫製速度（Sewing Speed)：180r/min～4500r/min 可設

調速方法：無級變速，也可自動定速運行

輸入信號數量（Input Signal Port)：2 路，包括手工回縫開關、安全開關

電磁鐵輸出信號（Solenoid Signal Output Port)：5 路，包括切線、掃線、夾線、回縫、抬壓腳電磁鐵驅動

故障保護：過流、超溫、短路、堵轉等

堵轉保護判斷時間：1.5 秒

1.4 基本組成及結構

1.4.1 控制箱見圖 1

a 70T **b 70E2**

圖 1

1.4.2 外置雙屏操作面板如下圖 2

a 70T **b 70E2**

圖 2

2、安裝與調整

2.1.1 操作面板安裝

操作面板固定在支架上，在借用機頭後窗板的兩個安裝螺絲位置將支架固定住。安裝後如下圖所示：

2.1.2 控制箱安裝

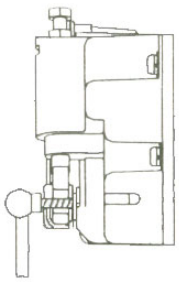
將電控箱用自功螺絲緊固。安裝後如下圖所示：

.

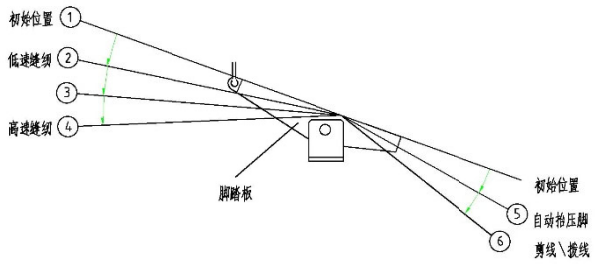
2.1.3 腳踏板安裝調整:

將腳踏板連杆穿入腳踏板搖臂孔內並鎖緊螺母，根據實際需要調節連杆長短獲得最佳踏板角度，以腳踏舒適方便最佳。

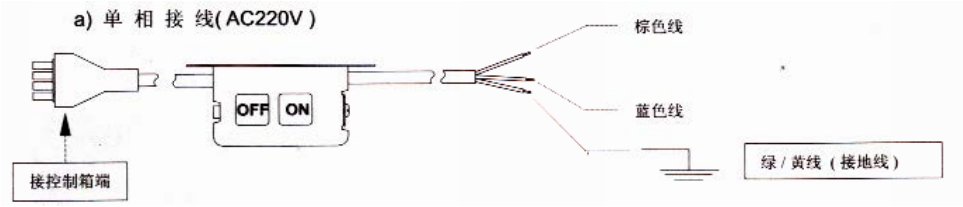
腳踏板由初始位置，至最高速位置的夾角與縫紉速度及各動作之關係見下圖

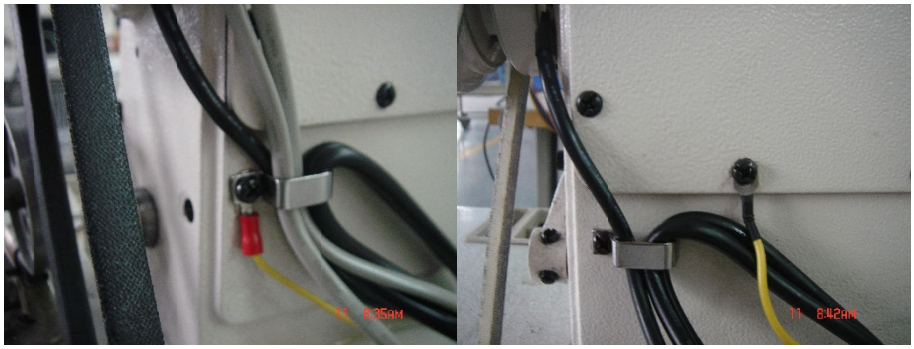


腳踏板從初始位置①向下踩到位置②時縫紉機開始低速縫紉，繼續踩到位置④時為高速縫紉，中間為無級調速
腳踏板由初始位置①向後踏到位置⑤時系統開始拔線剪線，到位置⑥時壓腳自動抬升(當安裝了自動抬壓腳電磁鐵時)
針杆停至上針位
腳踏板力的調整:見圖



2.1.4 接線與接地
按下圖連接電源線及按鈕開關

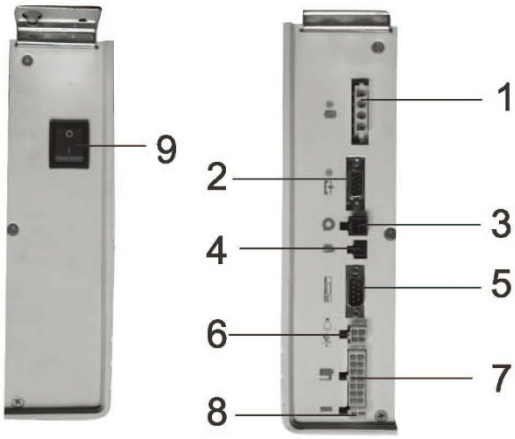




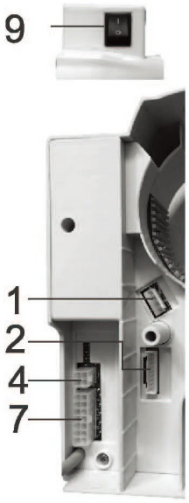
注意:

■綠黃線為接地線，一定要可靠接地,接地電阻＜4Ω
■所有電源線\信號線\接地線在接線時不要被其它物體壓到或過度扭曲，不能有表皮損傷，固定時不可靠近皮帶及皮帶輪，並最少相距 3 釐米以確保安全
■電源插頭必須採用兩相三線插座，同時使用者應確保其接地線可靠接地
■70E（M-70）控制器所用電源線為專用電源線，嚴禁使用其他型號控制器電源線或用於其他產品上，否則會有觸電危險。

2.1.5 接外掛程式插口說明：



a 70T



b 70E2

①電機插口②電機編碼器插口
③機頭定位器插口④腳踏開關插口
⑤操控盒插口　　⑥5V 燈和安全開關插口
⑦電磁鐵插口(黃綠線為接機頭接地線)
⑧夾線電磁鐵插口⑨220V 電源開關
按端子座面板的指示插接各連接線，DB 插頭要插牢後鎖緊，其餘的插頭插緊後確定其鎖扣已扣牢。

3 功能介紹

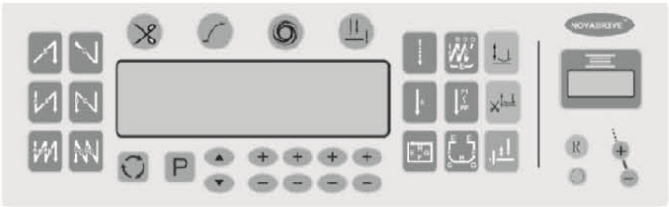
3.1 產品功能

		示意圖	描述及備註
自動縫紉功能	自動剪線		當縫紉機配上切線抬壓腳電磁鐵後，根據使用者設置自動完成相應的動作
	自動掃線	O/I	
	自動抬壓腳		
	前加固縫		當縫紉機配上回縫電磁鐵後根據使用者的設置自動完成一次、二次、多次、回縫加固起始和終止針跡
	連續回縫		
	自動定寸縫		
	自由縫		
	後加固縫		
其他功能	定寸停針上下停針位選擇		縫紉中可選上或下定針位
	慢速啟動		電機啟動時會先執行慢速啟動的針數後繼續正常車縫
	過流.過壓，堵轉，斷電檢測等保護	具體見其故障代碼	當發生過流過壓，堵轉斷電時進行自動保護

4 基本操作

4.1 顯示板的使用與操作

操作面板如下圖



a 70T

b 70E2

按鍵及功能

功能	按鍵	車縫動作說明
前加固縫選擇		執行前加固縫（A，B 段）2 次
		執行前加固縫（A，B 段段）1 次
後加固縫選擇		執行後加固縫（C，D 段）2 次
		執行後加固縫（C，D 段）1 次
定針縫（定寸縫）		1）.當踏板往前踩下時，就執行 E，F 段或 G 段定針縫的針數。 2）.在任何一段車縫途中，一旦踏板回到中間時，則立即停止車縫，此時當踏板再次往前踏下，則開始執行 E，F 或 G，H 段末完成的針數。 3）.當在執行完最後一段 E，F 或 G，H 段針數後則自動連貫執行終止回縫或切線，掃線等動作。 4）.當使用 P1——PF 功能時，P1——P4 段的出廠設定針數為 15，如末用之段，其針數必須設為 0。
自由縫		1）.一旦踏板往前踩下就正常車縫，當踏板回到中間時，立即停止車縫。 2）.當踏板往後踏時，就自動完成切線，掃線等動作。
連續回縫		一旦踏板前踩下，就自動執行來回的連續回縫動作，來回次數由 E 段設定。 前踏之後即自動執行此功能到完成切線為止，中途是不會停止車縫，除非將踏板作往後踏解除動作。
針數設定選擇		A，B，C，D 等四區，其針數設定可選擇從 0 到 9。 E，F，G，H 等四區，其針數設定可選擇從 0 到 99。 4 4 4 4 (A B C D) 代表 A=B=C=D=4 針 1E0 1F0 代表 E=F=10 針 1G5 1H5 代表 G=H=15 針

		按此鍵可選擇切換上段 A，B，C，D 中段 E，F 下段 G，H 的針數設定與視窗顯示 在進入參數修改模式時，按鍵確認保存
提針/補針		1）.在自由縫的式樣中： 按一下則可做提針功能或半針往前補針動作。 （可依實際需要作連續補針動作） 2）.在定針縫的式樣中：(除連續回縫功能外) a.當車縫在每段之中途停止時，按一下則只作提針。 b.當車縫在每段之終點停止時，按一下則可往前補一針。 （可依實際需要作連續補針動作）
觸發自動（AUTO）		1）.在自由縫與連續縫的樣式中： 按下此鍵蜂鳴器會聲響，但無功能 LED 亦不亮 2）.在定針縫的樣式能夠按下此鍵： a. 當踏板一經往前踩下觸發，即自動執行 E，F 段或 G，H 段中選所設定的針數，直到段內針數完成後始自動自動停止。 b. 再逐一觸發踏板，即自動執行下一段所設定的針數直到自動完成切線，掃線動作為止。
切線開關		設定使用或取消切線功能。 液晶操控盒有顯示,執行切線動作 液晶操控盒無顯示,不執行切線動作
慢速啟動		1）.當此功能開啟時，電機啟動時會先執行慢速啟動的針數後繼續正常車縫。中間停止後再前踏時只會正常車縫，除非有往後踏動作後再次前踏，則電機於啟動前會再先執行慢速啟動。 2）.慢速啟動之速度設定可由參數[6]調整。 3）.慢速啟動之針數設定可由參數[7]調整。
電機停止時針停設定針上/針下		電機停止時，針停的位置 液晶操控盒有顯示時，電機停止時針停上定位 液晶操控盒無顯示時，電機停止時針停下定位
切完線後自動抬壓腳上/下		切完線後，壓腳是否動作 液晶操控盒有顯示時，切完線後壓腳自動抬起 液晶操控盒無顯示時，切完線後壓腳不動作
車縫中停止時自動抬壓腳上/下		車縫停止時，抬腳是否動作 液晶操控盒有顯示時，車縫中電機停止時壓腳自動抬起 液晶操控盒無顯示時，車縫中電機停止時壓腳不動作
設定數值遞增		A，B，C，D 區的設定針數增加，其設定值可選擇從 0 到 9。 E，F，G，H 區的設定針數增加，其設定值可選擇從 0 到 99。 參數選擇區內當參數遞增鍵。 參數內容區內當設定數值遞增鍵。
設定數值遞減		A，B，C，D 區的設定針數減少，其設定值可選擇從 0 到 9。 E，F，G，H 區的設定針數減少，其設定值可選擇從 0 到 99。 參數選擇區內當參數遞減鍵。 參數內容區內當設定數值遞減鍵。
進入參數選擇區/參數遞增		按著此鍵兩秒便可進入參數區。 參數區內此鍵可當參數遞增鍵
底線數量恢復/底線設定鍵		短按一次，將當前底線數數量恢復到設定值。長按 3 秒，進入底線總數設定狀態。

顯示切換鍵	◎	可以切換待調底線數的數位位元。
遞增鍵	⊕	按下遞增鍵時，正在設定的資料在設定範圍內遞增。
遞減鍵	⊖	按下遞減鍵時，正在設定的資料在設定範圍內遞減。

5.功能參數表

5.1 A 功能參數表(用戶使用)

開機後或剪線後，按 P 鍵 2 秒後進入用戶參數設置，每修改一項參數後需按 △ 鍵才能對修改的參數保存。

參數代碼	參數內容	範 圍	初始值	設 置 內 容 數 值 說 明
001.H	最高轉速 r/min	150～5000	3500	車縫時的最高轉速設定,與機型相關
002.PSL	加速曲線調整%	1～100%	80%	控制器的加速爬升斜率設定
003.NUD	針停定位選擇	UP/DN	DN	UP(上停針)/DN（下停針）
004.N	起始回縫速度 r/min	150～2800	1800	起始回縫的速度設定
005.V	終止回縫速度 r/min	150～2800	1800	終止回縫的速度設定
006.B	連續回縫速度 r/min	150～2800	1800	連續回縫的速度設定
007.S	慢速起縫速度 r/min	150～2800	400	慢速起縫的速度設定
008.SLS	慢速起縫針數（針）	0～99 針	2	慢速起縫的針數設定
009.A	自動定寸縫速 r/min	300～5000	3000	操作面板盒 AUT0 鍵有按下時的速度設定
010.ACD	定寸縫後自動執行終止回縫功能（不補針功能設定）	OFF/ON	ON	ON：在執行完最後一段定針縫後，將自動執行終止回縫動作。即在任何縫製模式下，終止回縫前不能作補針功能。 OFF：在執行完最後一段定針縫後，將無法自動執行終止回縫功能，必須重新再作前或全後踏動作始可。終止回縫前能作補針功能。
011.RVM	手動動倒縫時功能 模式選擇	JUK/BRO	JUK	手按車頭回縫開關動作時機：JUK：JUKI 方式（即在車縫中或者停止時均有動作） BRO：BROTHER 方式（即在車縫中才有動作）
012.SMS	起始回縫運動模式選擇	A/M	A	A：輕觸踏板，即自動執行定寸縫動作 M：受踏板控制，可任意停止與起動
013.TYS	起始回縫結束後 操作模式選擇	CON/STP	CON	CON：起始回縫完成後，自動連續下一段功能； STP：起始回縫段針數完成後自動停止
017. SBN	起始回縫回數設定	1～4 回	2	設定起始回縫的來回次數
018.BT1	起始回縫補償 1	提前動作: 1～16 延遲動作: 17～31	7	BT1,BT2 = 0　無效 BT1,BT2 = 1~16　提早動作時機(1/8 針為單位) BT1,BT2 = 17~31　延遲動作時機(1/8 針為單位)
019.BT2	起始回縫補償 2		6	

020.SME	終止回縫運動模式擇	A/M	A	A：輕觸踏板，即自動執行定寸縫動作 M：受踏板控制，可任意停止與起動
024. EBN	終止回縫回數設定	1～4 回	2	設定終止回縫之來回次數
025.BT3	終止回縫補償 3	提前動作: 1～8 延遲動作: 9～15	6	BT3,BT4 = 0　無效 BT3,BT4 = 1~16　提早動作時機 BT3,BT4 = 17~31 延遲動作時機
026.BT4	終止回縫補償 4		7	
030.BCC	終止回縫時 C 段 再加 1 針	OFF/ON	OFF	終止回縫時 C 段自動再加 1 針 ON：有效　　OFF：無效
031.SMB	連續回縫運動模式選擇	A/M	A	A：輕觸踏板，即自動執行定寸縫動作 M：受踏板控制，可任意停止與起動
032.BAR	連續回縫參數設置方式	0 / 1 / 2	0	0：連續回縫 A.B-D 次（最大 9 針） 鍵盤最後一種操作模式鍵：配置 I 型操作，定義為 E.F.G.H.H.G.F.E 操作,沒有 P1～-PF 操作模式 1：連續回縫 AB.CD-F 次（最大 99 針） 需要配置 II 型操作面板，同時具有 P1～-PF 操作模式 2：連續回縫 A.B-F 次+C.D（最大 9 針） 需要配置 II 型操作面板，同時具有 P1～-PF 操作模式 該參數修改後，斷電 10 秒後重啟才生效
035.BT5	連續回縫補償 5	提前動作: 1～16 延遲動作: 17～31	7	BT5,BT6 = 0　無效 BT5,BT6 = 1~16　提早動作時機 BT5,BT6 = 17~31 延遲動作時機
036.BT6	連續回縫補償 6		6	
037. SMP	定寸縫運動模式選擇	A/M	M	A：輕觸踏板，即自動執行定寸縫動作 M：受踏板控制，可任意停止與起動
038.PM	保留			
039.PS	回縫按鈕補針功能	0 / 1	0	011.RVM 在 BRO 模式下有效： OFF：回縫按鈕不作為補針功能 ON：　回縫按鈕作為補針功能；
040.WON	掃線/抓線出力功能設定	0 / 1 / 2 / 3	3	0：無掃線動作、無抓線動 1：有掃線動作、無抓線動作 2：無掃線動作、有抓線功能動作（啟動時機，角度受 071.W1、072.W2 控制） 3：有掃線動作，有抓線動作
041.TM	件數統計/底線計數 設置	0/1/10/100	0	0－件數統計模式，按住加工件數遞增 非 0－底線計數模式，按針數遞減 1－基數為 1 遞減 10－基數為 10 遞減 100－基數為 100 遞減
042.FSM	車縫途中停止時，押腳出力選擇	OFF/ON	ON	OFF 表示取消抬押腳功能

043.FTM	切完線停止時，押腳 出力選擇	OFF/ON	ON	OFF 表示取消抬押腳功能
044.PN	車縫完成件數顯示	0～9999	0	根據 041.PBS 參數設置，顯示自動累計完成件數或者底線量
045.SS	慢速起縫功能選擇	OFF/ON	OFF	OFF 表示取消慢速起縫功能

5.2 B 功能參數表(技術人員使用)

按 P 鍵同時打開電源，2 秒後進入技術員模式，每修改一項參數後需按 ⏎ 鍵才能對修改的參數保存。

參數代碼	參數內容	範 圍	初始值	設 置 內 容 數 值 說 明
046.DIR	馬達轉動方向設定 （正反轉）	CW/CCW	CCW	CCW：逆時針方向 CW：順時針方向
047.MAC	縫紉機機型號	0～256	6	縫紉機機型碼設定，小於 80 是平縫型號 其中 9：特殊平縫型號，具有啟動默認一針慢啟動。在慢啟動關閉情況下自由縫第一針總是慢的。
048.SYM	同步器型號設定	0～3	a:2 b:3	0：H 型同步器，相容 HOHSING 1：B 型同步器，改進型同步。上針位元、下針位元、自檢信號線 2：D 型同步器，配置直接驅動型 DB9,沒有同步器安裝電氣自檢信號線。上針位元、下針位元、編碼器信號共線。 3：S 型同步器，只有零點信號，下針位元、上針位元需要 076.DRU、078.URU 設定針位角度（以零點為基準）
049.SPD	車頭皮帶輪的尺寸	30～200	75	隨車頭機型碼設定，已預置車頭皮帶輪尺寸
050.MPD	馬達皮帶輪的尺寸	50～150	75	隨車頭機型碼設定，已預置車頭皮帶輪尺寸
051.CHK	上電自檢功能是否開啟 （腳踏信號、斷電檢測）	0～10	1	1：上電自檢功能開啟 0：上電自檢功能關閉 擴展功能設置：堵轉判斷時間 0，即 10 秒 1，即 2 秒 2，即 3 秒 9，即 10 秒
052.PA	腳踏前踏縫製速度回應靈敏度設置	50－400%	200%	5%速度隨踏板回應最慢， 400%速度隨踏板回應最塊， 可根據操作人員熟練程度設置

053.FT	縫製過程中半後踏（輕後踏）抬壓腳確認時間	50～2000ms	300	若有安裝壓腳提升器，請根據縫紉機的機械踏板的靈活性設定參數
054.BK	馬達停止時，煞車鎖住功能	OFF/ON	OFF	ON：馬達停止時，煞車鎖住車頭 OFF：無作用
055.TOT	UTD=ON 時， 馬達運轉總限時間	1～800Hrs	2	最長可達 33 天（800 小時）
056.TM1	UTD=ON 時，馬達運轉時間	1～60s	3	在自動運轉測試時，自由縫的工作時間
057.TM2	UTD=ON 時，馬達停止時間	1～60s	3	在自動運轉測試時，每次的間隔時間
058.UTD	自動運轉測試功能	OFF/ON	OFF	該參數設置為 ON，自動運轉測試開始，按選針盒的設置的縫製模式運行
059.T	切線、停車的速度設定 r/min	120～400	350	切線停車的速度調整，速度過低可能導致無法正常切線，速度過高可能導致定位控制不平穩
060.L	低速速度 r/min	120～400	250	運行低速速度調整
061.FO	押腳、回縫全額初始出力的動作時間 ms	0～990	250	押腳、回縫開始動作時，全額出力的動作時間
062.FC	押腳、回縫動作的週期 信號%	10～90	28	押腳、回縫動作時，以週期性省電輸出， 避免押腳發燙
063.FD	延遲馬達啟動，保護押腳下放時間	0～990	50	踩下時延遲啟動時間，以配合押腳放下的確認
064.HHC	半後踏取消抬押腳能	OFF/ON	ON	ON：半後踏時，無抬押腳出力，並直接剪線動作 OFF：半後踏時，有抬押腳出力，不剪線（全後踏才剪線）
065.SFM	安全開關信號形式	0/1	0	NO：安全開關入力信號，必須保持常開狀態； NC：安全開關入力信號，必須保持常閉狀態
066.LTM	切線時序模式	0/1/2/3	2	0: 保留 1: 保留 2: 下定位切到上定位切線模式（平車切線模式） 3: 繃縫車切線模式（上停切）
067.T1	切線動作前延遲時間 ms	0～180	150	繃縫模式，找到上定位後進至切線時序前所需的間距時間
068.T2	切線動作時間 ms	0～360	150	繃縫模式，切線時序所需的動作時間
069.M	中途停車速度設定	150～800	350	中途不剪線停車速度設定
070.NC	剪線停車後反向提針角度設置	0～280	0	0：不需要反向提針 1－280 反向提針角度，4 表示 1 度
071.W1	掃線動作前的延遲時 ms	0～980	10	找到上定位後進至撥/掃線時序的間距時間
072.W2	掃線動作時間 ms	0～9990	70	撥/掃時序的動作時間
073.WF	押腳動作前的延遲時間 ms	0～990	50	撥/掃動作完後進至抬押腳時序前的間距時間

074.FHT	車縫停止時自動押腳上升維持時間 s	1～200	30	自動抬押腳上升的維持時間
075.UEG	上停針停止時的位置調整	5～250	40	微調修正上定位停止時的角度位置（中心數值為 40）：數值減少時會提前停針，數值增加時會延遲停針
076.DRU	由下針位算起的反向轉動達到上針位的角度	1～360	165	【048.SYM】設定 3 時，由針下算起達到上針位的反向角度以設定虛擬下針位
077.ANU	開電後自動找上定位	OFF/ON	ON	ON：開啟電源後，自動找到上定位信號後停止 OFF：無作用
078. URU	由上針位算起的反向轉動達到零點的角度	1～360	a:0 b:235	【048.SYM】設定 3 時，由零點算起達到上針位的反向角度以設定虛擬下針位
079.ER	上次故障的錯誤代碼	0～999	0	0－無故障發生

5.3　恢復出廠設置：

同時按住鍵和 P 鍵情況下上電，參數會恢復到出廠備用資料（存放在主機板內的備用資料-預設值）

1、操作方法：同時按住鍵和 P 鍵情況下，然後上電，顯示“3-xxxx”，5 秒內主機板內的參數恢復到出廠的設置預設數值配置.

6 錯誤資訊碼及處理對策：

錯誤代碼		代碼含義	可能存在的問題	解決措施
嚴重錯誤	**ERR－00**	輸入信號自檢錯誤	1．腳踏板電路存在問題或者上電自檢發現腳踏板一直處於前踏、後踏狀態無法回復到中立位置； 2．直流母線電壓偏低； 3．驅動模組故障信號不正常。	1．鬆開腳踏板，回復到中立位 2．檢查腳踏板的信號線是否連接好
	ERR－01	車頭信號回饋不正常	1．同步器不正常，無法檢測上針位； 2．感測器的磁鐵脫落； 3．皮帶脫落或者過於寬鬆。	
	PWROFF	斷電	1．30V 保險絲故障； 2．系統斷電。	斷電，檢查各個保險絲，重新上電
	ERR－03	車頭運行不正常	1．同步器不正常，無法檢測下針位； 2．感測器的磁鐵脫落； 3．皮帶過松或者脫落。	
	ERR－04	過流、過壓、欠壓	1．電機功率驅動模組故障；2．瞬間干擾。	
	ERR－05	直流母線電壓超壓	1．制動電阻壞或者制動保險絲燒斷； 2．瞬間干擾。	關閉系統電源檢查
	ERR－06	電磁鐵供電電源過流	1．電磁鐵負載過大或者短路； 2．驅動電路故障； 3．瞬間干擾。	關閉系統電源檢查
	ERR－07	堵轉	1．機械卡住； 2．剪線機構有問題； 3．編碼器信號不正常；	關閉系統電源檢查，檢測縫紉機機械特性是否正常
一般警告	**A**	定位停車錯誤	1．MPD、SPD 參數設置不對； 2．負載過大； 3．編碼器信號不正常； 4．同步器信號不穩定； 5、電機故障，驅動力不足。	斷電，檢查車頭和電機是否正常
	B	超過規定最大速度	1．超過同方向最大速度； 2．超過反方向 300r/min； 3．編碼器信號不正常； 4．電機故障（如退磁）。	1．控制箱與電機之間驅動線 U/V/W 連接是否良好 2．系統是否已經可靠接地
	C	同步器自檢錯誤	同步器沒有插上。	1．斷電，插上同步器，再上電 2．更換同步器
	D	EEPROM 錯誤	存放參數的 EEPROM 有問題	更換 EEPROM
	E	EEPROM 內設置參數錯誤	EEPROM 內設置參數不正確。	上電重新啟動
	F	電機編碼器輸出信號錯誤	如果“F”持續報警，說明電機內置編碼器存在問題。	檢查電機輸出信號線是否斷線或者接觸不良

發生故障後，首先關閉系統電源，檢查控制系統接地是否良好。30 秒後重新開機電源觀察系統是否能正常工作。若故障沒有清除，請多試幾次，仍然沒有清除時，請聯繫供應商。

7.操控盒顯示字元與實際數值對照表：

數位字體部分：

實際數值	0	1	2	3	4	5	6	7	8	9
顯示字體	0	1	2	3	4	5	6	7	8	9

英文字體部分：

實際字母	A	B	C	D	E	F	G	H	I	J
顯示字體	A	b	C	d	E	F	G	H	I	J
實際字母	K	L	M	N	O	P	Q	R	S	T
顯示字體	K	L	M	n	o	P	q	r	S	T
實際字母	U	V	W	X	Y	Z				
顯示字體	U	u	W	H	Y	Z				

使用說明書

User Guide

感謝您購買本公司的產品。
為了您的使用安全，請您在使用之前一定閱讀本使用說明書。
請您保管本使用說明書，以便隨時查閱。

●前言

感謝你選購本產品，為了你更好的使用，在安裝與調試前，請仔細閱讀本操作說明及所搭配的縫紉機設備使用說明書，正確的使用。並由專業人員來安裝，調試。

注意：

本產品僅適用於指定範圍的縫紉設備，請勿作其他用途

本公司擁有對此手冊的最終解釋權

使用中若出現任何疑問或對我們的產品及服務有任何的意見或建議，請隨時與我們聯繫！

由於產品升級需要，功能、規格若有更改，恕不另行通知。

本操作指南的用途：

本操作指南基於使用者的要求提供相關指導資訊。

這些資訊涉及設備及其他使用場合、運輸、安裝、使用和維護。

本操作指南主要面向使用者和技術人員。

●安全說明

(1) 請確保在插上插頭通電以前，控制器開關按鈕為關閉。

(2) 請確保在開關按鈕打開前已將各電機接頭線插好，否則會提示出錯。

(3) 連接插頭是一一對應的，接線時請確認接線端子相互匹配。插入時請不要過分用力，以免造成系統損壞。

(4) 不要將電機線被外物壓住或過度扭曲。以免接頭信號線損壞。

(5) 無專業人員在場，請勿拆開控制器，以免造成意外。

警告：控制器內部及介面線頭均帶強電，切勿觸碰，以免觸電！

●電控技術指標

控制器型號	分體 M-6SD2	7300DP
工作電壓	AC 220V±20% 50/60HZ	AC 220V±20% 50/60HZ
額定功率	550W	550W
電機扭矩	≤ 3 N·M	≤ 3 N·M
電機轉速	200rpm ~ 6000rpm	200rpm ~ 4500rpm
上下停針	有（需配停針器）	有
過流、超載保護	有	有

●埠定義

① 電機電源插座

② 電機編碼插座

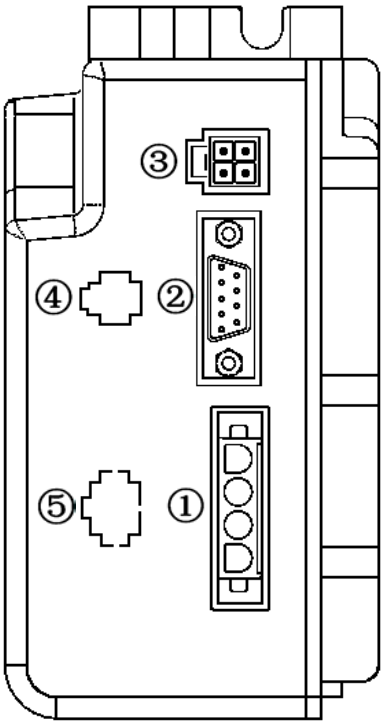
③ 腳踏開關插座

④ LED 燈插座

⑤ 外置停針器插座

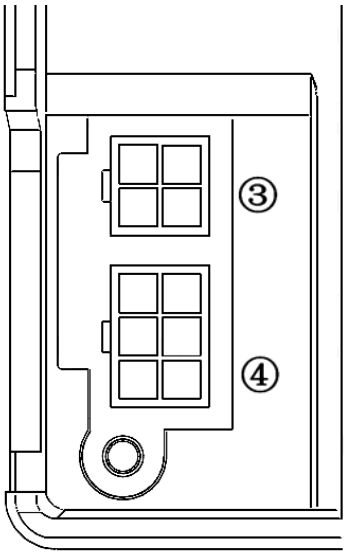
※ 請遵照介面定義及端子顏色相連接。

下挂式电控



一体式电控

※ ①②⑤已內置不需要外接

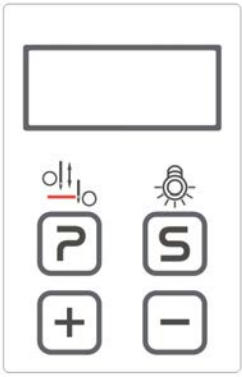


●操作面板說明

① P：工作模式下，切換上下停針位；參數模式下，作參數設置。

② S：工作模式下，開關 LED 燈；參數模式下，作參數保存。

③ + −：工作模式下，調節電機轉速，參數模式下，作參數的選擇及調整。



●參數調整及示例

1.1 控制器操作面板顯示方式為四位元數碼管。

待機介面下，按[+]鍵，[−]鍵，可以調節即時轉速。

1.2 待機介面下，按[P]鍵，上針位指示燈亮時，為上停針，下停針指示燈亮時，為下停針，指示燈不亮，關閉停針功能。

1.3 待機介面下，按[S]鍵，可以打開和關閉機頭燈。

1.4 進入及修改系統參數：

①上電後，先按住[P]鍵不放，再按[+]鍵，即進入參數模式，此時數碼管顯示“**P-00**”，

②按[+]，[−]鍵可切換參數，

③選擇好參數後，按[P]鍵進入參數，使用[+]，[−]鍵修改參數，

④修改完畢後，按[S]鍵保存退出。

1.4 電機正反轉設置：

①上電後，先按住[P]鍵不放，再按[+]鍵，即進入參數模式，此時數碼管顯示“**P-00**”，

②按[+]鍵切換參數至“**P-0 2**”，

③選擇好參數後，按[P]鍵進入參數，使用[+]，[−]鍵修改數值，

0 代表反轉，**1** 代表正轉，初始值為正轉。

④修改完畢後，按[S]鍵保存退出。

●錯誤代碼及參數表

附表 1：錯誤代碼顯示

錯誤代碼	代表含義	可能出現的問題
Er01	停針錯誤	①電機霍爾壞 ②手輪磁鐵脫落 ③9 針信號線接觸不良 ④下掛式電控未接外置停針器（⑤插座）開了停針功能
Er02	檢測不到腳踏信號	①腳踏接觸不良或損壞
Er03	電機霍爾或相位錯誤	①9 針電機信號線接觸不良或損壞 ②電機霍爾壞
Er04	堵轉保護	①電機超載 ②電機電源線接觸不良
Er05	硬體過流	①電機超載 ②電機信號線接觸不良
Er07	串口通訊錯誤	①操控盒線接觸不良或損壞 ②傾倒開關損壞

附表 2：使用者參數內容詳解

序號	名稱	參數範圍	出廠值	功能
P-01	最高轉速鎖定	200~6500	4500	
P-02	電機正反轉設置	0~1	1	0 代表反轉，1 代表正轉，初始值為正轉。
P-03	下停角度	6~18	12	12 度
P-04	起縫速度	200~800	250	250 轉
P-05	加速快慢	2000~4000	3500	3500 轉
P-06	定針縫	0~999	0	
P-07				該參數保留，不更改
P-08				該參數保留，不更改
P-09				該參數保留，不更改

P-10	自動跑合測試	0~1	0	該參數改為 1 時自動跑合，關閉電源跑合停止
P-11			0	該參數保留，不更改
P-12			0	該參數保留，不更改
P-13	電機選擇	0~1	0	1 為老電機，0 位普通電機
P-14	最大電流	50~1000	280	
P-15	檢測上下針位	0~1	1	1 為檢測針位，0 為不檢測

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Foreword

Attention!

Please make sure that you have read the user manual and the enclosed sewing machine instruction before operating the machine and it must be debugged or operated by the professional person, who has been trained. Once operating the machine, you were supposed that have already read the manual and know the function and the using range for the product.

The product is only applicable for the sewing machine which is in the specified range.

The final explanation belongs to our company.

Please contact our distributor or our company directly when you have any questions to our products or any advises to our service.

Safety instruction

1. The sign ⚠ means safety warn, user must take care and obey it strictly. Otherwise it will cause personal injury or machine damage.
2. The sign ⚠ means the safety warn about the high-voltage and the electronic. User must take care and obey it strictly. Otherwise it will cause personal injury or machine damage.
3. The product must be debugged and operated by the professional perso who has been trained.
4. ⚠When connecting the power, make sure that it is conformed to the voltage and the technical requirements marked on the label, and the product connect the ground.
5. ⚠ Don't step the pedals when the power is being connected.
6. ⚠ It's a precision electronic product. Please don't use when thundering or the voltage is not steady or the poor contact. It may cause the machine damage.
7. ⚠ The power must be cut off when doing the following operations:
   - ■When installing the machine
   - ■When opening the control box and pulling out and inserting any plug from the control box.
   - ■When opening the head of the machine, changing the needle and threading a needle.
   - ■When thundering, the machine stops working or haven't been used for a long time, being mended or being adjusted.
8. When restarting the machine, the interval must be longer than 30 seconds.
9. It must be set and mended by the professional person who has been trained.
10. All the spare parts for mending must be supplied by our company or confirmed by our company before using

1.Product instruction

1.1 summary

The industrial sewing machine digital AC servo system adopts many high technical digital control and AC servo technology. The technology and function achieve or exceed the international advanced level. It is a high-end product which adapts to industrial super high-speed lockstitch sewing machine. Compared with the normal clutch motor, it can save more than 40% power. The efficiency of the industrial sewing machine has been improved greatly, and the cost is lower. Increase the competitiveness of the garment factory.

The system is composed of AC servo motor and controller.

The AC servo motor adopts the rare earth permanent magnetic brushless servo motor. It has the advantage of small, light, long life-time, big power, low voice, low vibration, high efficiency, big torque, running steady and easy to install.

The control box adopts the aluminum alloy shell. The box has high intensity, the heat dissipating is much better; the anti-jamming capability is stronger. The control circuit adopts the advanced photoelectric separation technology and the vector control technology. The high-speed control chip can control the motor speed in high accuracy, can stop the needle quickly, the position is precise and easy to operate.

The circuit board adopts the advanced high speed paster technology. The machine' s power supply system adopts switching power supply. It' s suitable for larger voltage range. It has the function of over-voltage protection, under-voltage protection, over-current protection, short-circuit protection advanced fault self-diagnosis and man-machine dialogue. It can prevent the machine breakdown in abnormal state, make sure the control system working regularly.

1.2The product operating environment

1.2.1 Please keep far away from the place where has high frequency electromagnetic wave and Radio transmitter when operating the machine, otherwise it will cause false action.

1.2.2 The product operating temperature requirement:

a. Please operate the machine in the temperature between 5℃ and 45 ℃.

b. Please don' t operate the machine in the direct sunlight or outdoor.

c. Don' t operate the machine beside the heater(electric heater).

d. Keep the working place' s relative humidity in 30%~95%.

e. Please don' t operate the machine beside the combustible gas or the explosive.

1.2.3 Rated working voltage: 220V+10% 50(60) HZ

1.2.4 Electric resistance of system connecting ground: <4Ω

1.3 Product specifications

Motor output power: 400W,500W and 550W ,optional

Motor Pulley Diameter: 80mm

The diameter of the sewing machine head reel: 65～130mm,the setting of default is 75mm

Sewing Speed:150r/min～5000r/min

The way to adjust speed: CVT, it can also run automatically at constant speed.

Input Signal Port: 2 ways, including the switch of manual reverse sewing switch and safety switch.

Solenoid Signal Output Port: 5 ways, including tangent, sweep line, clamp line, reverse sewing and the foot presser solenoid drive.

Fault protection: over-current, over-temperature, short circuit, stall etc.

The judgment time of stall protection:1.5 seconds

1.4 Component and construction

1.4.1 The control box as below the picture 1

a 70T b 70E2

Picture 1

1.4.2 The outside double control panel as below picture 2

a 70T b 70E2

Picture 2

2、Installation and adjustment

2.1.1 The installation of the operate panel

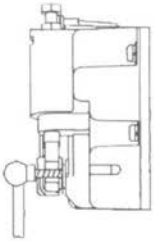
The operate panel is fixed on the support. The support is fastened by two screws on the rear window back of the head. As below picture:

2.1.2 The installation of the control box

Control box is fixed by automatic screw, and the effect as below picture:

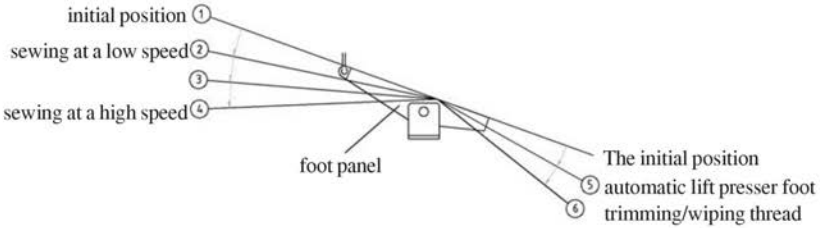
2.1.3 The installation and adjustment of the pedal

Penetrate the pedal connecting bar into the hole of the pedal rocker and fasten the screw nut, and adjust the connecting bar' s length according to the actual needs to get the best pedals angle, so that the pedal is comfortable and convenient. The pedal' s angle from the start position to the highest speed position and the sewing speed and each movement' s connecting as below pictures:



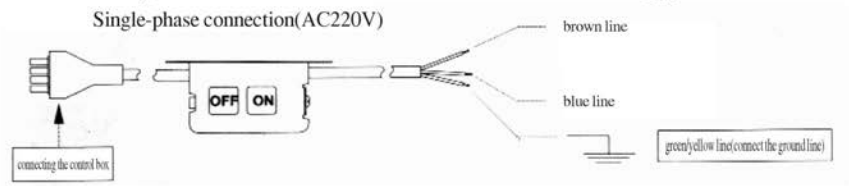
The pedal step forward from the start position ①to the position ②, the sewing machine start to work at a low speed. And continue to step to the position ④, the machine work in a high speed. Between them is infinitely adjustable-speed. The pedal step backward from start position ①to the position ⑤,the machine start to trim line, and continue to move to position ⑥, the foot presser will lift automatic(only in the case that the machine installed the auto presser foot electromagnet),and the needle bar stop to the up needle position.

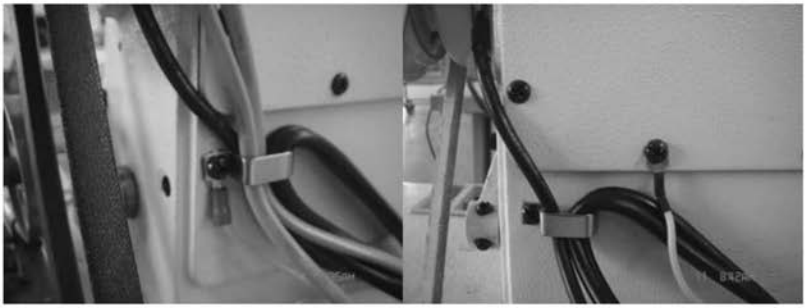
The adjustment of the foot lifter as below picture:



2.1.4Cord connection and ground connection

Connect the power cord and button switch as the following picture

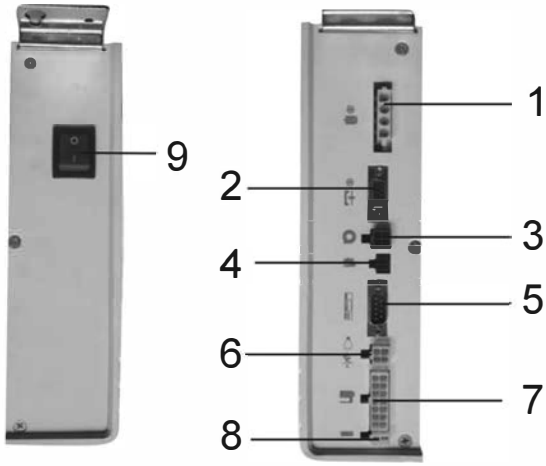




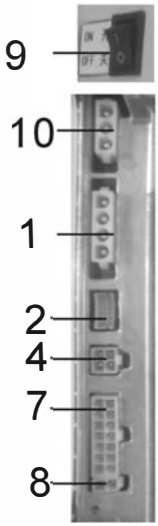
Attention:

- The green yellow line is the ground line. It must be connected to the ground safely. The resistance should be below 4 Ω (<4 Ω).
- When all power cord/signal cord/ground cord connect, please make sure that they are not pressed by other things or they are not bent overly, and surface should not be damaged. Can’ t be close to the belt and the pulley, at least keep 3CM away from them to make sure to be safe when fasten them.
- The power plug must adopt two phase three wire socket, at the meantime user should make sure that the ground cord connected to the ground safely.
- The power cord of 70E(M-70) controller is special power cord, and don’ t use other type controller power cord, otherwise it has the danger of electric shock.

2.1.5 The specification of connector socket:



a 70T



b 70E2

①Servo-motor socket ②Motor encoder socket

③Head locator socket ④Foot pedal switch socket

⑤Control box socket ⑥5V light and safety switch socket

⑦Electromagnet socket (the yellow-green line is the machine head ground line)

⑧Clamp solenoid socket ⑨220v power switch

⑩Power club socket

Please insert each connecting line according to the instruction of the terminal block panel. After DB plug lock insert firmly, and determine that lock catch has been anchored after the rest of the plug insert.

3. Function introduction

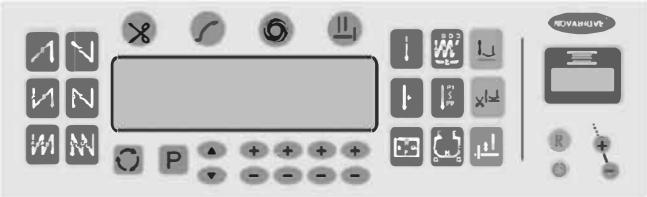
3.1 product function

	Function	Diagram	Description
Auto function	Auto thread trimming		The machine will finish the motions automatically according to the user' s setting after the sewing machine is installed the foot lifter electromagnet
	Auto thread sweeping	O/I	
	Auto foot lifter		
	Front straight line bar-tacking		After the sewing machine is installed the reverse sewing electromagnet, it finished once, twice and many times reverse sewing automatically to reinforce the start and end stitch according to the user' s setting.
	Continuously reverse sewing		
	Auto stitch quantity sewing		
	Free sewing		
	Back straight line bar-tacking		
Other functions	The selection of up/down stop needle position		Up/down needle position are optional during the sewing.
	Slow start		When motor begins running, it will execute the slow-start needles first before regular sewing.
	Over-current, overvoltage, Locked rotor, power off	Reference for the error code	It will be self-protection automatically when overvoltage, over-current and power-off happened.

4 Basic operation

4.1 The operation of display panel

Control panel as below picture:

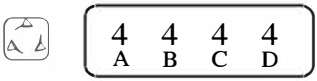
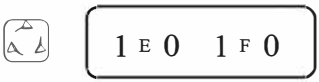
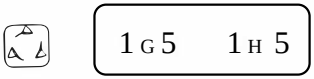


a 70T

b 70E2

The key and function:

Function	Key	The instructions of lockstitch Sewing motions
The selection of front straight line bar-tacking		Execute front straight line bar-tacking (A,B sections)twice
		Execute front straight line bar-tacking (A,B sections) once
The selection of back straight line bar-tacking		Execute back straight line bar-tacking (C,D sections) twice
		Execute back straight line bar-tacking(C,D sections) once

Stitch quantity sewing		1)When the pedal is stepped forward, the machine executes the E, F or G section's position needles. 2)Once the pedal is back to the middle position during any section's lockstitch sewing, the machine stops sewing immediately. Now step the pedal forward again, the machine begins to execute the E, F, or G, H section's left needles. 3)When the machine finishes the last section's needles of the E, F, G, H, it will stop reverse sewing, thread trimming, or thread sweeping etc motions automatically. 4)The P1-P4's factory setting number is 15 when the P1-PF's function is used. If not, the number is 0
Free sewing		1)The machine sew regularly when the pedal is stepped forward, it stops sewing when the pedal is back to middle position. 2)The machine finishes thread trimming and thread sweeping automatically when the pedal is stepped towards back.
Continuously reverse sewing		1)The machine executes the continuously reverse sewing motion automatically when the pedal is stepped forward. The time is up to the D section setting. 2)After stepping the pedal forward, the machine executes the function to finish the thread trimming automatically, it won't stop sewing in the midway unless pressing the pedal towards the back to cancel the motion.
Number of needles setting selection		For A,B,C,D four sections, the No. of needles can be set from 0 -9 For E, F,G,H four sections, the No. of needles can be set from 0-99  Means A=B=C=D=4 needles  Means E=F=10 needles  Means G=H=15 needles Pressing the key can choose to switch the up sections A,B,C,D, middle sections E,F, below sections G,H's No. of needles setting and windows show. After changing the parameter, please press the key to reserve.

Lift/compen-sate Needles		1)In the free sewing Pressing the key can do the function of lift needle or half-needle compensation forth motions(it can do the continuous compensation sewing motions according to the actual needs) 2)In the stitch quantity sewing:(except continuously reverse function) a. When the lockstitch sewing stop in the midway of every section, the machine will only do the lift needle when pressing the key. b. When the lockstitch sewing stop in the end of every section, press the key that it will compensate one needle forward. (It can do the continuously compensate needles according to the actual needs).
AUTO		1） In the free sewing and continuously sewing model: Press the key, the buzzer will sound, but have no the LED function and no bright. 2) In the stitch quantity sewing press the key: a.When the pedal is stepped forward, it will execute the setting needles in the E,F or G,H sections, the AUTO will stop automatically when all the needles in the sections are finished. b. Then touch the pedal one by one ,the machine will execute the next section’ s needles until to finish the thread trimming and thread sweeping.
Thread trimming switch		Set use or cancel the thread trimming function. It will execute the thread trimming function when the diagram shows in the LCD control box. It won’ t execute the thread trimming function when the diagram doesn’ t show in the LCD control box.
Slow start		1)When the function turned on, when the motor start the machine will execute the slow start needles before regularly sew. It will only sew regularly when it’ s pressed forward again after stopping in the middle, unless the pedal is stepped towards back and then stepped forward ,the motor will execute slow start before running. 2) The speed of the slow start setting can adjust by parameter[6] 3) The No. of needles of the slow start can adjust by parameter[7]
The position of needle stop(up/down) setting when motor stop		The position of needle stop setting when motor stop When the diagram show in the LCD control box, the needle stop in the up position when motor stop. When the diagram doesn’ t show in the LCD control box ,the needle stop in the down position when motor stop
The auto foot lifter up/down after thread trimming		The presser foot move or not after thread trimming When the diagram shows in the LCD control box, the presser foot will lift up automatically after thread trimming. when the diagram doesn’ t show in the LCD control box, the presser foot won’ t move after sewing stop

The auto foot lifter up/do within when stop in the sewing		The foot lifter move or not when sewing stop. When the diagram shows in the LCD control box, the presser foot will lift up automatically when sewing stopped. When the diagram doesn't show in the LCD control box, the presser foot won't move when sewing stop.
Parameter increment setting	▲	Setting the No. of needles in A, B, C, D areas increment. The number can be set from 0 to 9. Setting the No. of needles in E, F, G, H areas increment. The number can be set from 0 to 99. The number increment key should be set in the parameter area.
Number decreasing setting	●	Setting the No. of needles in A, B, C, D areas decreasing, the number can be set from 0 to 9. Setting the No. of needles in E, F, G, H areas decreasing. The number can be set from 0 to 99. The number decreasing key should be set in the parameter area.
Enter into the parameterarea/ Parame-ter increment	P	Press the key for two seconds can enter into parameter area. The key can be considered as the button of parameter increment
The number of bottom line recovery/ The setting button of bottom line	R	Press once shortly and recover the current number of bottom line to the setting number. Then press for 3 seconds and enter to the setting number of the bottom line.
Show the toggle key		The bottom line can be switched to be transferred digit number.
Increasing button	+	When pressing the increasing button, the setting data will increase in the setting range
Decreasing button	−	When pressing decreasing button, the setting data decrease in the setting range.

5. Function parameter list

5.1 A function parameter list (for user)

Press the [P] key for 2 seconds to enter into the user operating model afte turning on or thread trimming, and each need to press the button [icon] to reserve after modify parameter.

Parameter code	Corresponding content	Range	Factory setting	Content instruction and memo
001. H	the highest rotational speed r/min	150～5000	3500	The setting of the lockstitch sewing highest speed is related to the machine
002. PSL	the adjustment of acceleration curve%	1～100%	80%	The setting of the controller climbing slope.
003. NUD	The options of stop needle position	UP/DN	DN	UP(Up stop-needle)/DN(down stop-needle)
004. N	Starting reverse sewing speed r/min	150～2800	1800	The setting of starting reverse sewing speed
005. V	Stopping reverse sewing speed r/min	150～2800	1800	The setting of stopping reverse sewing speed
006. B	Continuously reverse sewing speed r/min	150～2800	1800	The setting of continuously reverse sewing speed
007. S	Slow starting sewing speed r/min	150～2800	400	The setting of slow starting sewing speed
008. SLS	Slow starting sewing needle number(needle)	0～99 needles	2	The needle setting of slow starting sewing
009. A	Auto stitch quantity sewing speed r/min	300～5000	3000	The operation panel box AUTO key has the speed setting under pressing.
010. ACD	Automatic execute the function of stopping reverse sewing after stitch quantity sewing (Setting the function of un-compensate needle)	OFF/ON	ON	ON: After executing the last setting needle sewing, it will stop the reverse sewing automatically. Even in any sewing modes, it can not compensate needle before stopping reverse sewing. OFF: After executing the last setting needle sewing, it will not stop the reverse sewing automatically. It must restart, and it can compensate before stopping reverse sewing.
011. RVM	Manual reverse sewing function	JUK/BRO	JUK	The time that pressing the switch of the head reverse sewing: JUK:

				JUKI way（Even in the lockstitch sewing and stop, there are also actions) BRO：BROTHER way（Only in the lockstitch are there actions.）
012. SMS	The sport mode selection of starting reverse sewing	A/M	A	A：Step the pedal lightly and it will execute the stitch quantity sewing automatically. M：It can stop and start by controlling the foot pedal.
013. TYS	The operation mode selection after starting reverse sewing	CON/STP	CON	CON：After finishing the starting reverse sewing, it can continue sewing next function. STP：After finishing the starting reverse sewing, it will stop automatically.
017. SBN	Starting reverse sewing setting	1～4	2	Set the back and forth times of starting reverse sewing
018.BT1	Starting reverse sewing compensation 1	Advanced actions: 1～16 Delay actions: 17～31	7	BT1,BT2 = 0 Invalid; BT1,BT2 = 1～16 ahead action (1/8,the unit is needle); BT1,BT2 = 17～31 delay action (1/8,the unit is needle);
019.BT2	Starting reverse sewing compensation 2		6	
020. SME	The sport mode selection of the stopping reverse sewing	A/M	A	A：Step the pedal lightly and it will operate the setting sewing automatically. M：It can stop and start by controlling the foot pedal.
024. EBN	Stopping reverse sewing setting	1～4	2	Set the back and forth times of the stopping reverse sewing
025.BT3	Stopping reverse sewing compensation 3	Advanced actions: 1～8 Delay actions: 9～15	6	BT3,BT4 = 0 Invalid; BT3,BT4 = 1～16 ahead action; BT3,BT4 = 17～31 delay action;
026.BT4	Stopping reverse sewing compensation 4		7	
030. BCC	When stopping reverse sewing, C add to 1 needle.	OFF/ON	OFF	When stopping reverse sewing, C add to 1 needle automatically. ON: valid OFF: invalid
031. SMB	Continuously reverse sewing sport mode	A/M	A	A：Step the pedal lightly and it will execute the setting sewing automatically. M：It can stop and start by controlling the foot pedal.

032. BAR	Continuous reverse sewing parameter setting	0/1/2	0	0: Continuously reverse sewing A,B,D (The maximum is 9 needles) The last operation mode of the keyboard: The operation of I style is defined as E,F,G, H,H,G,F,E,and don' t have the P1~-PF operation mode. 1:Continuously reverse sewing AB.CD-F (The maximum is 99 needles) It needs to deploy II operation pedal and has the P1~-PF operation mode. 2:Continuously reverse sewing A.B-F+C.D (The maximum is 9 needles) It needs to deploy II operation pedal and has the P1~-PF operation mode. After this parameter changes, it will work after power-off 10 seconds to re-start.
035. BT5	Continuously reverse sewing compensation 5	Advanced actions: 1~16 Delay actions: 17~31	7	BT5,BT6 = 0 invalid; BT5,BT6 = 1~16 ahead action time; BT5,BT6 = 17~31 delay action time;
036. BT6	Continuously reverse sewing compensation 6		6	
037. SMP	The sport mode selection of the setting sewing	A/M	M	A: Step the pedal lightly and it will execute the setting sewing automatically. M: It can stop and start by controlling the foot pedal.
038. PM	Retain			
039. PS	The compensation needle function of the reverse sewing button	0/1	0	011.RVM is valid at the mode of BRO; OFF: The reverse sewing button can' t be regarded as the function of the compensation needle; ON: The reverse sewing button can be regarded as the function of the compensation needle;

040. WON	Sweep line/grasp line output function setting	0/1/2/3	3	0: Don' t have the action of sweeping line and grasping line 1: Have the action of sweeping line and don' t have the action of grasping line 2: Don' t have the action of sweeping line and have the action of grasping line(When the machine start, the angle is in the control of 071.W1、072.W2) 3: Have the action of sweeping line and grasping line.
041. PBS	Unit statistics/The setting of bottom line count	0/1/10/100	0	0—The mode of the number statistics, it increases according to the quantity of processing; Not 0—The mode of the number statistics, it decreases according to the quantity of processing 1—The cardinal number 1 decrease 10—The cardinal number 1 0 decrease 100—The cardinal number 1 00 decrease
042. PSM	When it stops during the lockstitch sewing, and select the presser foot output.	OFF/ON	OFF	OFF: It means to cancel the function of the foot lift.
043. FTM	When trimming stops , and select the presser foot output.	OFF/ON	OFF	OFF: It means to cancel the function of the foot lift.
044. PN	The finished number of lockstitch sewing	0～9999	0	Setting according to 041.PBS parameter, it will show the finished number or the number of bottom line
045. SSS	The selection of slow starting sewing	OFF/ON	OFF	OFF: It means to eliminate the function of slow start sewing.

5.2 B Function parameter list (for technician)

Turn on the power while pressing the key P , enter into the technician model after 2 seconds. After changing the parameter, it needs to press the key to reserve.

Parameter Code	Parameter content	Range	Factory setting	Content instruction
046. DIR	The motor running direction setting	CW/CCW	CCW	CCW: counter-clockwise CW: clockwise

047. MAC	The style of sewing machine	0～256	6	The style set of the sewing machine. Less than 80,it is the lockstitch sewing. 9：Special lockstitch sewing has a slow start needle. At the situation of slow start, the first needle of free sewing is always slow.
048. SYM	The style setting of synchronous machine	0～3	a:2 b:3	0:H is synchronous machine, and it is compatible to HOHSING 1: B is modified synchronous machine. Up needle position, down needle position, self-check signal line 2: D is synchronous machine with direct drive Db9 installed electric self-check signal line without synchronous machine. Up needle position, down needle position, and encode signal。 3：S is synchronous machine, it only has zero signal, up needle position and down needle position that need 076.DRU and 078.URU to set the angle of needle position.
049. SPD	The size of the head pulley	30～200	75	The front pulley size is set along with the head model code.
050. MPD	The size of the motor belt	50～150	75	The front pulley size is set along with the head model code.
051. CHK	Whether power-on self-test function turn on or not. （the foot pedal signal, power-off detection）	0～10	1	1:Power-on self-test function turn on 0:Power-on self-test function turn off The setting of extended feature: Judging the time by locked machine. 0 means 10 seconds. 1 means 2 seconds. 2 means 3 seconds. ..... 9 means 10 seconds.
052. PA	Front foot pedal sewing speed react the sensitivity settings.	50－400%	200%	5% of the pedal speed react the slowest speed，400%of the pedal speed react the pedal the quickest speed, according to the operator proficiency to set.

053. FT	Half step backward presser foot in the process of sewing (step lightly backward presser foot) to confirm the time.	50～ 2000ms	300	If installing the foot lift, please according to the sewing machine pedal flexibility to set the parameters.
054. BK	When the motor stop, the brake can lock automatically.	OFF/ON	OFF	ON: When the motor stop, the brake can lock the head. OFF: No effect.
055. TOT	When UTD is ON, it means the limit time of motor running.	1～800Hrs	2	The longest time is 33 days(800 hours)
056. TM1	When UTD is ON , it means the motor running time.	1～60s	3	When operating test automatically, it means the working hours of free sewing.
057. TM2	When UTD is ON, it means the motor stopping time	1～60s	3	When operating test automatically, each interval time.
058. UTD	The function of automatic operation test	OFF/ON	OFF	When the parameter is ON, the automatic operation test start and run according to the elected needle sewing pattern box to set.
059. T	The speed setting of trimming and stopping r/min	120～400	350	The speed adjustment of trimming parking, the speed is too low that may lead to abnormal trimming. The speed is too high that may lead to an unstable position control.
060. L	Low speed r/min	120～400	250	The speed adjustment of operating slowly
061. FO	The full initial output time of presser foot, reverse sewing /ms	0～990	250	When presser foot and reverse sewing start, the time of the full output.
062. FC	The cycle signal of presser foot and reverse sewing %	10～90	28	When presser foot and reverse sewing operate, the power output periodically to avoid the presser foot hot
063. FD	Delay the motor start to protect the time of the presser foot put down.	0～990	50	When stepping, delay the machine start to match the confirmation of presser foot.
064. HHC	Half-step pedal to cancel the presser foot function	OFF/ON	ON	ON: When half-step pedal, it doesn' t have the output of lifting pedal and direct trimming. OFF: When half-step step, it has the output of lifting pedal and don' t trim (Trimming only full-step pedal)
065. SFM	Safety switch signal form	0/1	0	0: When the safety switch input signal , it must remain open state; 1: When the safety switch input signal, it must remain normally close.

066. LTM	Trimming time-series mode	0/1/2/3	2	0: retain 1: retain 2:Bottom positioning cut to up positioning trimming mode (lockstitch sewing trimming mode) 3:Interlock sewing trimming mode (the stop cut)
067.T1	The mechanical angle of grasping line start/ms	0～180	150	Absorb the grasp electromagnet from any mechanical angles of the up needle. If setting 10,it is the 10 degree of the up needle that absorb.
068.T2	The continuous angle of absorbing the grasp electromagnet	0～360	150	The angle of absorbing the grasp electromagnet (mechanical angle), from T1 to (T1+T2), the total of (067, T1+068, T2) must be larger than 076.DRU.
069. M	The speed setting of midway parking	150～800	350	The speed setting of midway no-parking trimming.
070. NC	After trimming parking, the angle setting of reverse lifting needle	0～280	0	0: Do not need to lift the needle back. 1-280 the angle of reverse lifting needle, 4 represents one degree.
071. W1	Delay time before sweeping /ms	0～980	10	The interval time of sweeping after finding up-position.
072. W2	Sweeping time /ms	0～9990	70	Sweeping time
073. WF	Delay time before the presser foot /ms	0～990	50	The interval time of entering into the foot lift after sweeping
074. FHT	when sewing stops, automatic presser foot rise maintenance time/s	1～200	30	Automatic presser foot rise maintenance time
075. UEG	The adjustment of the up-needle stop position	5～250	40	Modify lightly the angle position of the up-needle stop (the center number is 40): It will lift the needle stop in advance when the number decreases. It will delay the needle stop when the number increasing.
076. DRU	From the down-needle position reverse rotation reaches the angle of the up-needle position	1～360	165	[048.SYM] set 3:00,from the down-needle reaches the up-needle reverse angle to set the virtual down -needle position.

077. ANU	After power-on, automatically find the position	OFF/ON	ON	ON: After the power turn on, automatically find the positioning signal to stop OFF: No effect
078. URU	From the up-needle position, reverse rotation reaches zero angle	1～360	a:0 b:235	[048.SYM] set 3:00,from zero reaches to the reverse angle of up-needle positions set a virtual down-needle position
079. ERR	The error code of the last trouble	0～999	0	0－No trouble

5.3 Recover the factory setting:

Press the buttons and P simultaneously, then power-on. The parameters will recover to the factory setting.（The data that store in the mainboard is the default number.)

1. The way to operate: Press the buttons and P simultaneously, then power-on, it shows "3-xxxx" ,the parameters inside the mainboard will recover to the factory setting 5 seconds later. Renew power-on after power-off.

6 Error code and the way to solve

Error code		Code Content	The possible problem	The way to solve
Fatal error	ERR－00	The self-test of input signals is wrong	1. The circuit of the pedal has a problem, or the pedal has been in forward riding, backward riding and can't return to the neutral position. 2. DC voltage is low. 3. The fault signal of the drive module is abnormal.	1. Loose the pedal and return to the neutral position. 2. Checking whether the signal line of the pedal insert or not.
	ERR－01	The head signal feedback is abnormal.	1. The synchronous machine is abnormal, and can not find the up-needle position. 2. The sensor magnet is off. 3. The belt is off or over-loose.	

	PWROFF	Power-off	1. The 30v fuse is wrong. 2. The system is power-off.	Power-off and check each fuse and power on again.
	ERR－03	The operation of the head is abnormal.	1. The synchronous machine is abnormal and can't find the down-needle position. 2. The sensor magnet is off. 3. The belt is off or over-loose.	
	ERR－04	Over-current, over-voltage, under-voltage	1.The motor power module is wrong. 2.Immediately interrupt.	
	ERR－05	DC voltage exceeds the voltage.	1.The braking resistor is wrong or the braking fuse is broken. 2.Immediately interrupt.	Close the system power-supply and check
	ERR－06	The solenoid power is over-current	1. The electromagnet is over-loaded or short circuit. 2. The driving circuit is wrong. 3. Immediately interrupt.	Close the system power-supply and check
	ERR－07	Block	1. The machine is blocked. 2. The cutting-line system is wrong. 3. The encoder signal is abnormal.	Close the system power-supply and check whether the sewing machine's mechanical features is normal or not.
General warn	A	The error of the positioning parking	1. The setting of the MPD, SPD parameter is wrong. 2. Over-load. 3. The encode signal is abnormal. 4. The synchronous signal is not stable. 5. The motor is wrong or the driving power is not enough.	Power-off and check whether the head and motor is normal or not.
	B	Exceed the maximum speed	1. Exceed the same direction maximum speed. 2. Exceed the inverse direction speed 300r/min. 3. The encode signal is not normal. 4. The motor is wrong.(Such as demagnetization)	1. Whether the driving line U/V/W between control box and motor connects or not. 2. Whether the system connects ground reliably or not.
	C	The self-test of the synchronous machine is wrong	The synchronous machine doesn't insert.	1. Power-off and insert the synchronous machine and then power-on. 2. Change the synchronous machine.

	D	The error of EEPROM	The EEPROM that store parameters has a problem.	Change EEPROM
	E	The inside parameter of EEPROM is wrong.	The inside parameters of EEPROM is wrong.	Power-on and renew to start.
	F	The output signal of motor code is wrong.	If F continues calling, it states that the inside encode of the motor has a problem.	Checking whether the output signal line disconnect or not.

After having a problem, firstly, shutting down the system supply, and then checking whether the control system connect ground or not. After 30 seconds, renew to start the power supply and checking whether the power supply work or not. If it still don' t work, please try again. If the problem still eliminate, please contact the supplier.

7 Comparison table for script display on control box with the actual digital

The number style part:

Actual number	0	1	2	3	4	5	6	7	8	9
Display style	0	1	2	3	4	5	6	7	8	9

The English style part:

actual grapheme	A	B	C	D	E	F	G	H	I	J
display grapheme	A	b	C	d	E	F	G	H	I	J
actual grapheme	K	L	M	N	O	P	Q	R	S	T
display grapheme	K	L	M	n	o	P	q	r	S	T
actual grapheme	U	V	W	X	Y	Z				
display grapheme	U	u	W	X	Y	Z				

使用说明书

User Guide

Thank you for purchasing our products.

For your use safety, please must read the instruction manual before use.

●Preface

Thank you for purchasing this product, In order to make use of product better, Before installing and testing, please read the operating instructions and the sewing equipment specification carefully, to use correctly, and be installed and tested by professionals.

Note:

This product is only applicable to the specified range of sewing equipments, please do not use for other purposes.

Our company has the right of final interpretation of this manual.

If there is any doubt when using product or any comments or suggestions of our products and services, please feel free to contact us!

Due to upgrade products, features and specifications are subject to change without notice.

The usage of the operating instructions:

The operating instructions provide guidance information based on user's requirements.

The information involves equipments and other usage occasions, transportation, installation, use and maintenance.

The operating instructions are intended for users and technical staff.

●Safety Instructions

(1) Make sure that the controller switch button is off before plugging in power.

(2) Make sure that all the motor connector cord is plugged in before the switch button turn on, otherwise it will be an error.

(3) Connecting plug is one to one, be sure to match each other when make connection. Do not be excessive force when inserting to avoid damage to the system.

(4) The motor lines do not be pressed or excessive distortion, to avoid damage to the signal line connectors.

(5) Do not disassemble the controller without professionals, to avoid accidents.

Caution: Inside of the controller and interface wire are with strong power, please do not touch, in order to avoid an electric shock!

●Control box technical index

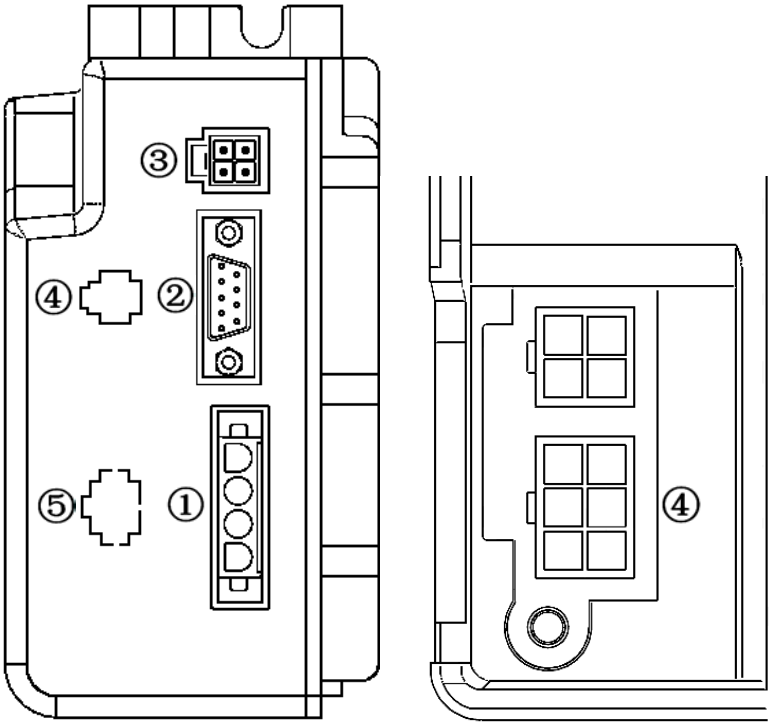
Controller type	Split M-6SD2	7300DP
Working voltage	AC 220V ± 20% 50/60HZ	AC 220V ± 20% 50/60HZ
Rated power	550W	550W
Motor torque	≤ 3 N·M	≤ 3 N·M
Motor speed	200rpm ~ 6000rpm	200rpm ~ 4500rpm

Up-down needle position	Yes（need needle position device）	Yes
Over current, overload protection	Yes	Yes

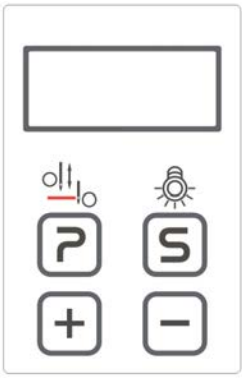
●Port definition

① **Electric outlet**
② **Encoding outlet**
③ **Pedal switch Socket**
④ **LED light outlet**
⑤ **External needle**

※ Please follow the interface Color phase connection.



●Operation panel description



① P：Under the working model, switch the UP-down needle position；under the parameter model, setting the parameter.

② S：Under the working model, open and close the LED ligth；under the parameter model, save the parameter。

③ + −：Under the working model，adjust the motor speed, under the parameter model, choice and adjust parameter.

●Parameter adjusting and example

1.1 The panel is four ditigal nixietube display

Adjust the speed by press the + and − key when in standby interface

1.2 In standby interface ,press the P key ,when the up needle position indicator light is on ,it is on up needle stop , when the down needle position indicator light is on , it is on down position stop, when the indicator light is off ,the needle position function turn off.

1.3 In standby interface , press the S key , can turn on/off the machine head light.

1.4 Enter in and change the system parameter：

①When the power is on ,press the P key for some seconds ,then press the + key , it enters into the parameter mode. The nixietube shows "**P-00**"

②Press the + or − key ,can change the parameter

③After choose the parameter , press the P key ,enter into the parameter ,then can change the value of the parameter by + or − key.

④Press the S key save the value

1.4 The motor clockwise rotation and counter-clockwise rotation setting：

①When the power is on , press the "p" key for some seconds, then press the "+" key ,enter into the parameter mode, the nixietube shows "**P-00**"

②Press the + key ,change the parameter to "**P-02**"

③Press the P key enter into the parameter, use the + and − to change the value. **0** means counter-clockwise rotation setting, **1** means clockwise rotation setting

④Press the S key save the value .

●Error code and parameter

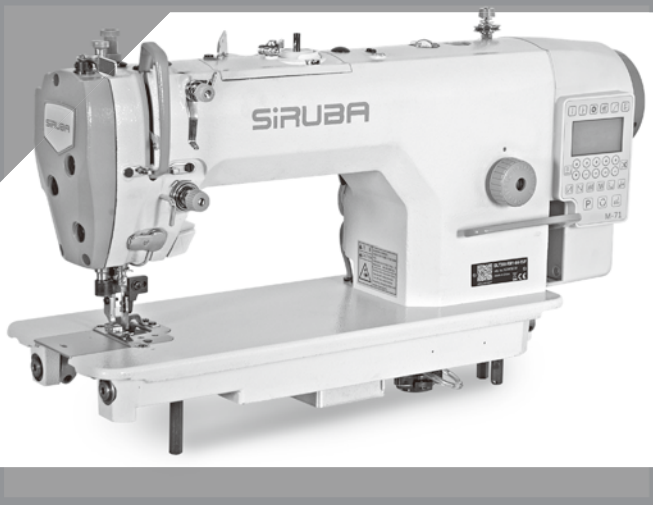
List 1: Error code

Error code	Meaning	Possible problem
Er01	The error of needle position	①The motor hall is broken ②The hand-wheel magnet fall off ③The connecting of 9 needle signal line is not good
Er02	Can't test the motor signal	①The connecting of 9 needle signal line is not good ②The connecting of motor switch is not good.
Er03	The hall or phase of motor is wrong.	①The connecting of 9 needle signal line is not good ②The motor hall is broken.
Er04	The protection of locked-rotor	①The motor is overloading. ②The connecting of motor power line is not good.
Er05	The hardware is over-current.	①The motor is overloading. ②The connecting of motor signal line is not good.
Er07	The serial communication is wrong.	①The line connecting of control box is no good.

List 2: Parameter

No.	Name	Parameter range	Leave-factory number	Function
P-01	The locked highest speed	200~6500	4500	
P-02	The setting of motor positive and negative rotate	0~1	1	0 means negative rotate, 1 means positive rotate, the original is positive notate.
P-03	The angle of down stop	6~18	12	12 degree
P-04	The starting speed	200~800	250	250rpm
P-05	Accelerate the speed	2000~4000	3500	3500rpm

P-06	Set the needle sewing	0~999	0	
P-07				Retention parameter
P-08				Retention parameter
P-09				Retention parameter
P-10	Automatic Mode switch	0~1	0	0：normal 1: Automatic
P-11			0	Retention parameter
P-12			0	Retention parameter
P-13	Selection of motor	0~1	0	1: Old motor，0: normal motor
P-14	Maximum current	50~1000	280	
P-15	Needle position setting	0~1	1	1 means detecting needle position, 0 means no detect



高林股份有限公司
KAULIN MFG. CO., LTD.

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The specification and/or the equipment described in the instruction book and parts list are subject to change because of modification with out previous notice

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