



AC SERVO MOTOR

OPERATION MANUAL

MODEL : H V P – 90 SERIES



ENGLISH

MODEL : HVP - 90 SERIES

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Appendix A : Connector Panel	
1. HVP-90- 4 -7W	A
2. HVP-90- 4 -BR (T8)	A
3. HVP-90- 4-11 (Y6)	B
4. HVP-90- 4 -66 (07) 、(V7) 、(V8)	B
5. HVP-90- 4 -98	C
6. HVP-90- 4 -DW (46) (LT)	C

1. Safety Precaution

Please read this manual carefully , also with related manual for the machine head before use. For perfect operation and safety, installing and operating this product by trained personnel is required. Also the following precaution must be taken.

- Turn off the power, unplug the cord and wait 10 minutes before any installing, mounting, or opening the control box cover.
- This product is designed for use with specified sewing machines and must not be used for other purposes.
- Only use Power Voltage indicated on the name plate of the HVP-90 in $\pm 10\%$ ranges.
- To avoid the false operation, please keep the product away from the high electromagnetic machinery or electro pulse generator.
- Don't operate in direct sun light 、 outdoors area and the room temperature is 45°C above or 5°C under.
- Don't operate near the heater 、 dew area and the humidity is 30 % less or 95% more.
- Don't operate in dusty 、 evaporate 、 combustible gas area, and stay away from corrosive material.
- Avoid power cord being applied by heavy objects or excessive force, or over bend.
- Power cord must keep 3 cm or above distance to the V-belt and the pulley.
- To avoid the static interference and current leakage, all grounding must be done correctly.
- Use the correct connector and extension wire when connecting ground wire to Earth and secure it tightly.
- Turning on the machine in the first time, use low speed to operate and check the correct rotation direction.
- During machine operation, don't touch any moving parts.
- All moving parts must use the protective device to avoid the body contact and objects insertion.
- Maintenance and repairs must be done by the specially trained personnel.
- Don't cover up motor's ventilation, it can cause motor overheated.
- Don't use any objects or force to hit or ram the product.
- All spare parts for repair must be approved or supplied by the manufacturer.

Danger and caution signs :



Risks that may cause personal injury or risk to the machine are marked with this symbol in the instruction manual.



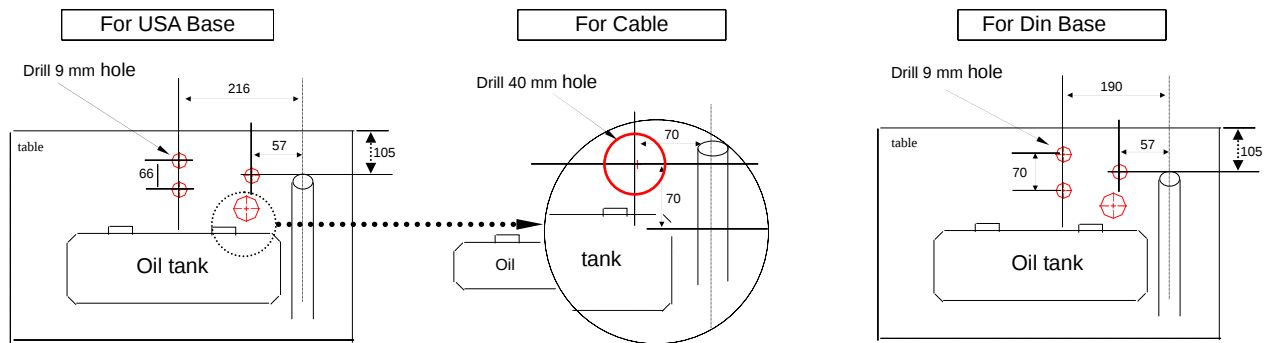
This symbol indicates electrical risks and warnings.

Warranty information :

Manufacturer provide a warranty in respect of the products covered for a period of 1 year use or 1 year and 6 months after the shipping date of the products for any defects arising in the normal course of use of the products by customers.

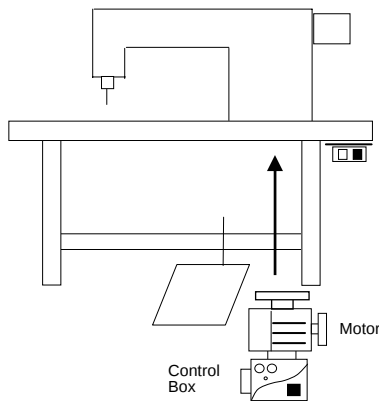
2. Installation and Adjustment:

2.1 Motor installation : (Recommend table drill holes)

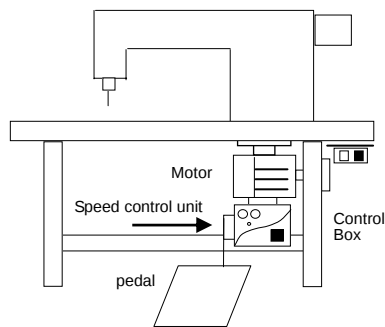


2.2 Installation diagram:

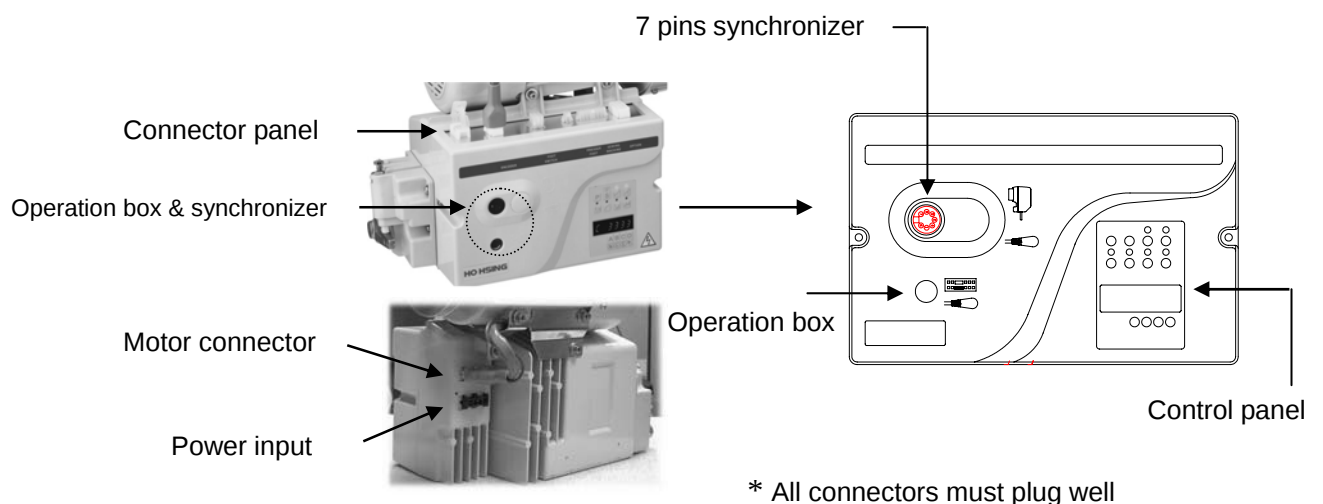
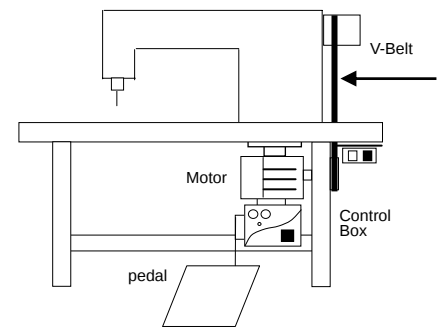
a). Install the motor and control box under the table



b). Install the pedal with speed control unit

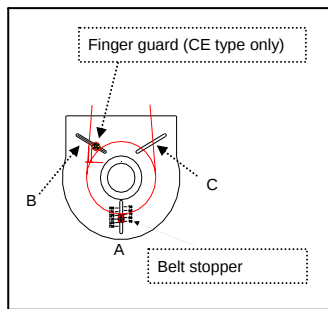


c). Install the V-Belt



- 1). Motor pulley and machine pulley must properly align.
- 2). Cable pass through or under the working table must be secured to avoid rubbing with the V-belt
- 3). Use the motor base to adjust belt's tension.

2.3 Adjustment on the belt cover:



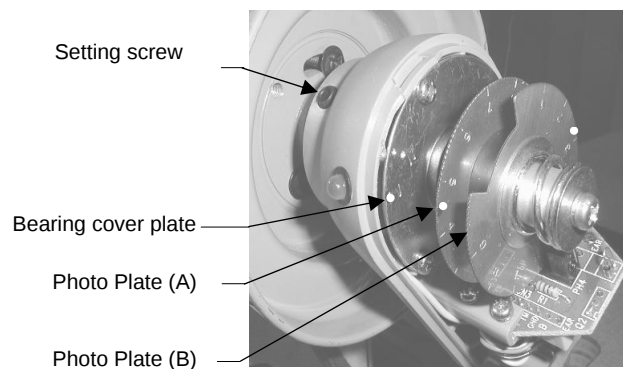
- Adjust the belt stopper (A) properly and leave about 5~10 mm space from V-belt.
- Factory default, finger guard is set at position (B). (for rotation of counterclockwise)
For rotation of clockwise, the finger guard must be moved to position (C) and avoiding contact to the V-belt or pulley.

2.4 Install and adjust the synchronizer (sensor):

- Synchronizer installation : Mounting the Synchronizer onto the flange of machine pulley and fasten the rotor by setting screws.
- Synchronizer adjustment :



Caution :
Turn OFF the power, before making the adjustment.



Needle up position : Rotate the machine pulley to reach mechanical needle up position and turn the photo plate (A) until its red mark is aligned with the red mark on the bearing cover plate.

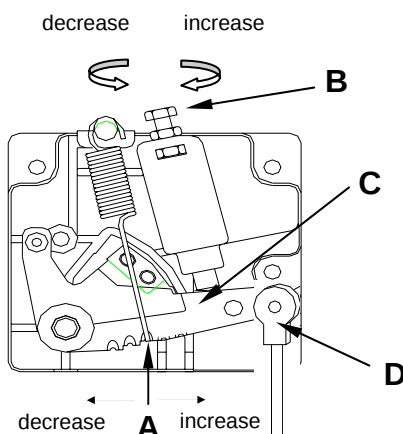
Needle down position : Rotate the machine pulley to reach mechanical needle down position and turn the photo plate (B) until its blue mark is aligned with the red mark on the bearing cover plate.

Note: instruction above is the standard adjustment. If you feel the position wasn't accurate, please do the fine tuning by yourself.

2.5 Speed control unit adjustment :

Components of speed control unit : see figure

- Spring for toeing forward force adjustment
- Bolt for heeling backward force adjustment
- Treadle / Pedal arm
- Pitman rod for Treadle / Pedal

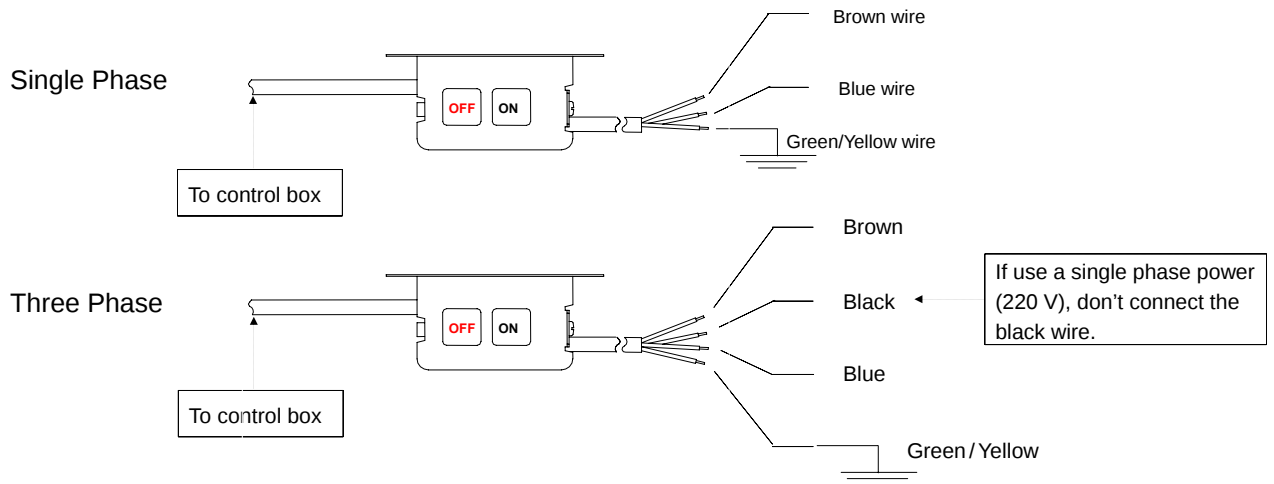


Term of adjustment		Adjustment result
1	Toeing forward force adjustment	Spring A move to right = force increased
		Spring A move to left = force decreased
2	Heeling backward force adjustment	Bolt B turn  = force decreased
		Bolt B turn  = force increased
3	Treadle stroke adjustment	Rod D secure at right = stroke is longer
		Rod D secure at left = stroke is shorter

3. Power Connection and Grounding:

3.1 Single phase and three phase connection:

Green/yellow wire is the ground wire.



1. When a three phase 220 V servo motor use a single phase 200 ~ 240 V power source, only connect brown and blue wires. Use insulating tape to wrap up the unused black wire, in order to prevent the current leakage.

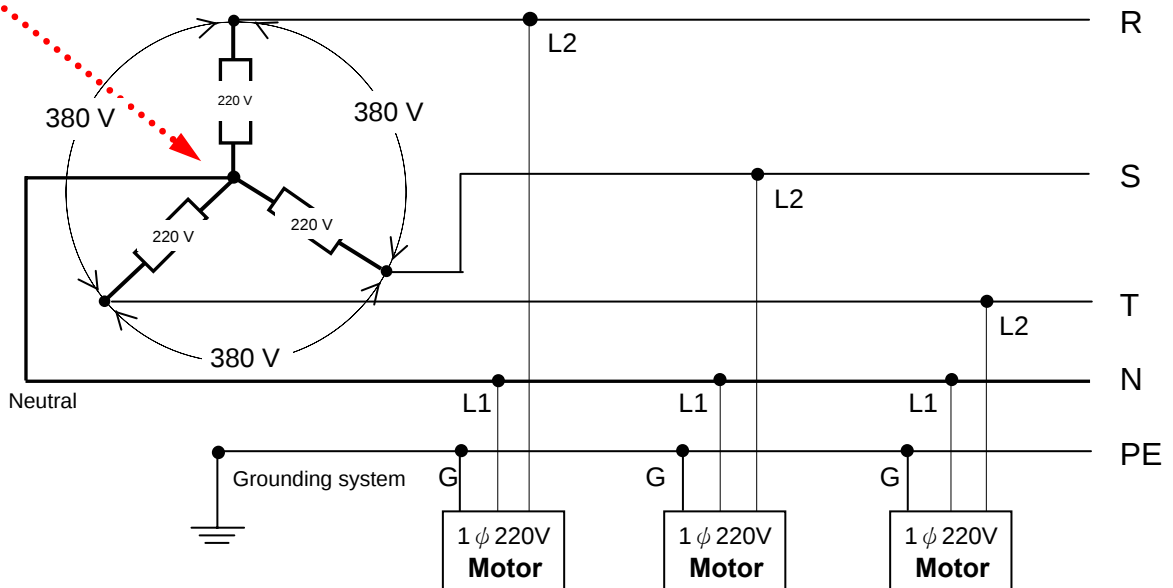
2. Green / Yellow wire must do the grounding.

3.2 How to connect a 1 Φ / 220 V power from a 3 Φ / 380 V power source



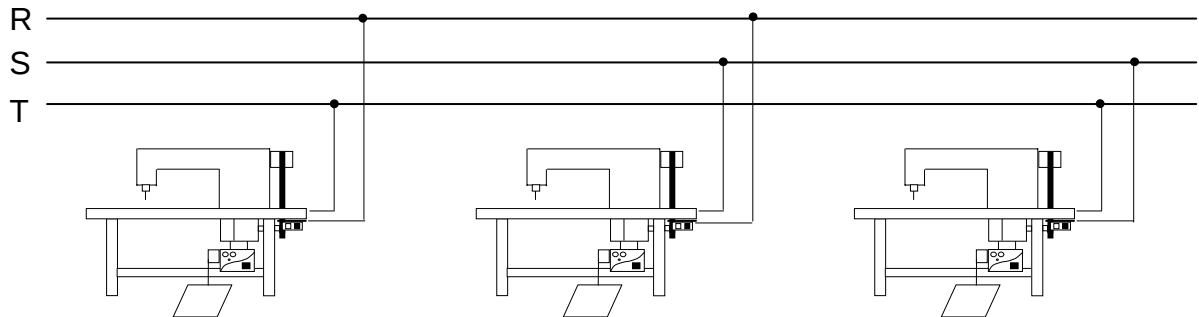
Caution : If the power source have no neutral point, then this servo motor is not suitable for this connection.

Caution: Must have a neutral point



3.3 The load balance for 1Φ / 220 V motors used on a 3 Φ / 220 V power source.

See the following figure for the load balance.



3.4 How to change solenoid supply voltage (DC: 24 V OR 30 V) :

The JP1 is for 30 V and JP2 is for 24 V.



Caution 1: Before making the switch, check the machine head's Solenoid specification.



Caution 2:

Turn off the power and wait for 10 min. before opening the cover.



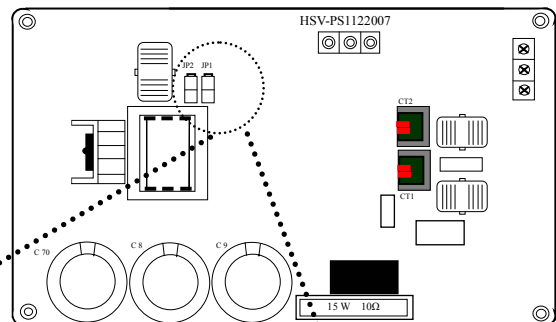
High Voltage inside

Step 1

The power board layout :



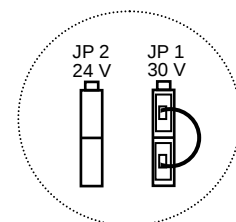
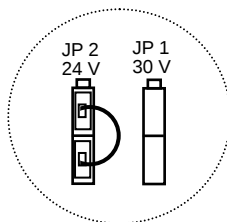
Remove 2 screws



Step 2

24 V jumper setting

30 V jumper setting

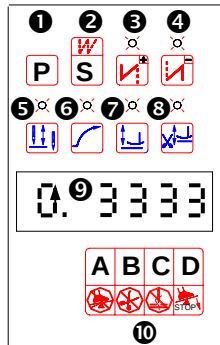


4. 7-Segment LED Display Mode and Function Keys :

4.1 Normal mode display :

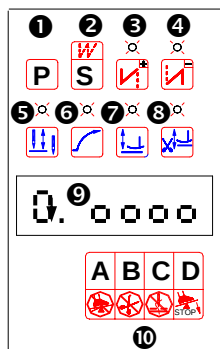
Power ON = Normal mode : See the diagram for lockstitch machine and interlock stitch machine display.

Lockstitch machine



- ① Enter parameter / Parameter increment
- ② Free sewing · Bar tacking · Constant stitch sewing / Enter parameter value / Saving
- ③ Start back tacking / Parameter increment
- ④ End back tacking / Parameter decrement
- ⑤ Needle up at machine stop.
- ⑥ Soft start
- ⑦ Presser foot up at machine stop
- ⑧ Presser foot up after trimming.
- ⑨ 7-segment LED.
- ⑩ Setting key for Number of stitches / Number of sections / Number of times

Interlock stitch machine



- ① Enter parameter / Parameter increment
- ② Enter parameter value / Saving
- ③ Parameter increment
- ④ Parameter decrement
- ⑤ Needle up at machine stop.
- ⑥ Soft start
- ⑦ Presser foot up at machine stop
- ⑧ Presser foot up after trimming.
- ⑨ 7-segment LED.
- ⑩ Special function keys

4.2 Panel function keys adjustment :

Lockstitch machine functions

- ② Select bar tacking function, LED show **0.6.44** . Press ⑩ **A B C D** key to adjust the stitches and times
- ② Select constant stitch sewing, LED show **0.8.15** . Press ⑩ **A B C D** key to adjust the stitches and sections.
- ③ ④ Select start / back tacking, LED show **0.3333** . Press ⑩ **A B C D** key to adjust the stitches.
- ⑤ ⑥ ⑦ ⑧ Function selection, LED above the key lighten means function enabled.

Interlock stitch machine functions

- ⑩ Special functions selection: A = half heeling · B = trimming · C = wiping · D = start constant stitch sewing.

Press any of A · B · C key, the icon  show up which mean the corresponding function been disable. Except the D key, the icon  show up which mean the start constant stitch sewing been enable.

5. General Parameter Adjustment :

5.1 How to enter each parameter mode :

Parameter mode		Operating method	First display	Keys	Range of parameter
Level 1	【Mode A】	At 【Normal mode】 Press P key	001. H	 	# 001 ~ 046
Level 2	【Mode B】	P + Turn-on power	047.0AC	 	# 001 ~ 122

5.2 How to enter parameter value area and make adjustment :

Step 1 : Enter the parameter level and find the parameter.

Step 2 : After find the parameter, press the **S** key to enter the parameter value area. Press any of

A **B** **C** **D** key to adjust the parameter value.

Terms for A 、B 、C 、D keys in the parameter value : :

TERMS \ KEY VALUE				
	A	B	C	D
IN TERMS OF SPEED	1000 spm	100 spm	10 spm	1 spm
IN TERMS OF ANGLE	-----	100 °	10 °	1 °
IN TERMS OF TIMING	1000 ms	100 ms	10 ms	10 ms
IN TERMS OF FUNCTION			FUNCTION SWAP	FUNCTION SWAP
∴ Other than the function selection, each press of the key will start change the value from 1 to 10				

Note : After value changed, press the **S** key to save the value, otherwise they will lost after turning power off.

5.3 Machine code adjustment :

☆Machine code **047. MAC**: Enter the parameter level 2, the first parameter is the machine code.

Then press the **S** key to enter the parameter value area. Press A 、B 、C 、D key to adjust the machine code.

After adjustment press the **S** key to save the setting.

Note :

1. The 【047.MAC】 machine code setting might be varies which depends on the machine head brand and model
2. Wrong machine code setting might cause machine head operation abnormal or damaged.
3. After save the machine code, the corresponding parameters will load the default value automatically.

5.4 General function parameter :

Follow the steps on section 5.1 、 5.2 to adjust the these parameters

Speed function	
【 001. H 】	Maximum sewing speed (spm)
【 004. N 】	Start back-tacking speed (spm)
【 005. V 】	End back-tacking speed (spm)
【 006. B 】	Bar-Tacking Speed (spm)
【 007. S 】	Soft start speed (spm)
【 009. A 】	Automatic constant-stitch sewing speed (spm)
【 122. H L 】	Upper limit of maximum speed (spm)

Bar tacking / Constant stitch	
【 032. B A R 】	Bar-tacking selection
【 033. B R C 】	Setting stitches of Bar-tacking
【 034. B R N 】	Setting turns of Bar-tacking
【 010. A C D 】	Automatic sewing End back-tacking
【 038. P M 】	Constant-stitch sewing selection
【 039. P S 】	Setting stitches for section of Constant-stitch sewing

Automatic presser foot	
【 064. FO 】	Full-On time setting for foot lifting solenoid
【 065. FC 】	Duty cycle time setting for foot lifting solenoid
【 066. FD 】	Running-Delay time setting
【 070.HHC 】	Cancel foot lifting at half-heeling pedal

Back tacking	
【 014. S B T 】	Start back-tacking function selection
【 015. S B A 】	Setting stitches A of Start back-tacking
【 016. S B B 】	Setting stitches B of Start back-tacking
【 017. S B N 】	Setting turns of Start Back-tacking
【 021. E B T 】	End back-tacking selection
【 022. E B C 】	Setting stitches C of End back-tacking
【 023. E B D 】	Setting stitches D of End back-tacking
【 024. E B N 】	Setting turns of End back-tacking

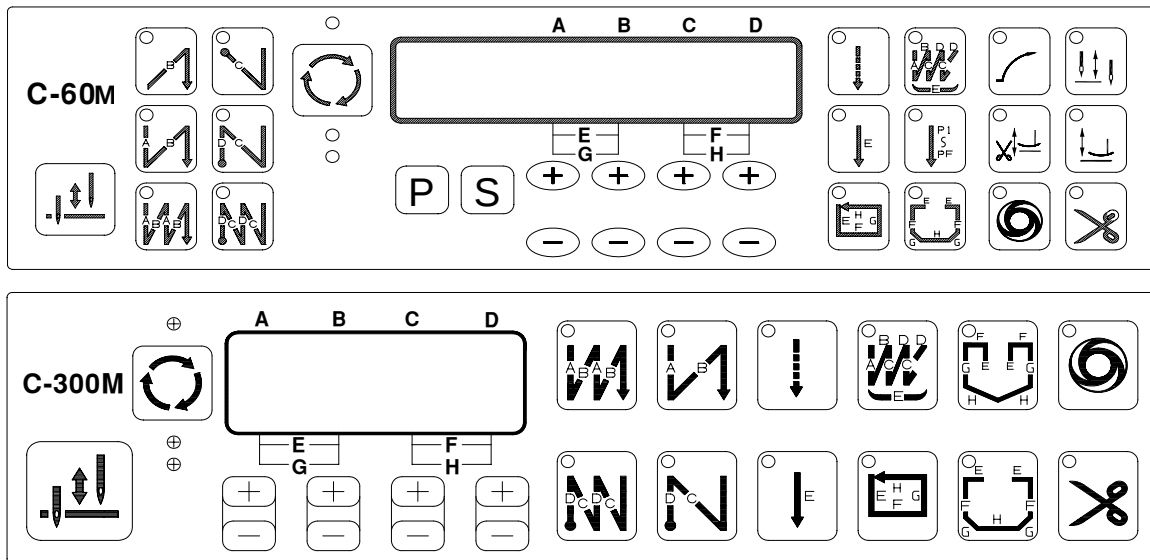
Wiper / Trimmer	
【 040. W O N 】	Wiper function selection
【 092. W 1 】	Delayed timing prior to wiper engaged
【 093. W 2 】	Setting timing of wiping
【 041. T M 】	Trimmer function selection
【 082. T 1 】	Delayed timing prior to trimmer engaged
【 083. T 2 】	Trimming time

NOTE:

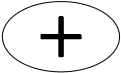
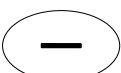
1. When motor running, the parameter area is locked and prohibited for access. The parameter only can be adjust when motor stop
2. When press the **[P]** key to access parameter area, the **[P]** key can also act as the parameter increment key.
3. When adjust the parameter, you must fully understand the function usage and the setting effects. If you have doubt or question, pleas ask the customer service or technical support to help you. Don't try to adjust blindly.
4. Caution! Wrong setting of the parameter might cause the abnormal operating and damage the sewing machine.

6.1 C-60M / C-300M Operation box keys definition : (C-300M don't have parameter setting function)

6. Operation Box :



Function	KEY	Operation of Sewing Machine
Start / End back tacking selection		Double start back tacking (A,B sections)
		Single start back tacking (A,B sections)
		Half start back tacking (B section) (C-60M)
		Double end back tacking (C,D sections)
		Single end back tacking (C,D sections)
		Half end back tacking (C section) (C-60M)
Constant stitch sewing		1). When the treadle is toeing down, constant-stitch sewing E 、 F 、 G or H performed section by section. 2). If the treadle returns to neutral intermediately in any one section, the machine will stop immediately. After the treadle toed down again, the balanced stitches of E 、 F 、 G or H goes on. 3).If the parameter 【010. ACD】 is set ON, the machine will not stop and automatically start trimming cycle and end back tacking at the end of the last section E or H. 4).When use P1~PF function, P1~P4 default setting is 15 stitches, other unused sections must set 0 stitch.

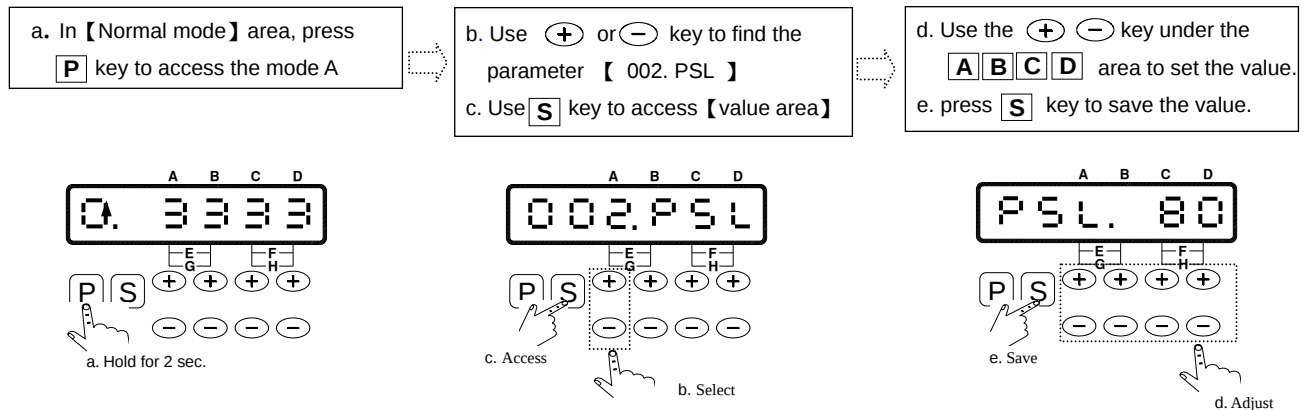
Soft start (C-60M)		1).When function turn on, soft start only activated at first run of motor start. After trimming cycle finish, it will be activated again on next motor start. 2). Speed of the soft start can be set by parameter [007. S]. 3). Number of stitches can be set by parameter [008.SLS].
Needle up / down when motor stop (C-60M)		Needle stop setting LED ON= Stop at up position LED OFF=Stop at down position
Presser foot up / down after trimming cycle (C-60M)		Presser foot action after trimming LED ON= Automatic lift the presser foot after trimming LED OFF=Presser foot not active after trimming..
Presser foot up / down when motor stop (C-60M)		Presser foot action when motor stop LED ON=Motor stop, presser foot goes up automatically. LED OFF=Presser Foot not active when motor stop.
Value increment key		A 、 B 、 C 、 D section value increment key, range in 0~ F.(Note) E 、 F 、 G 、 H section value increment key, range in 0~99.
Value decrement key		A 、 B 、 C 、 D section value decrement key, range in 0~ F.(Note) E 、 F 、 G 、 H section value decrement key, range in 0~99.
Enter parameter area / Parameter increment (C-60M)		Press and hold this key for 2 second to enter parameter area. Also act as parameter increment key
Enter parameter value / Saving (C-60M)		Press this key in parameter area to enter parameter value area. Also act as the parameter value saving key.

Note : Stitches setting of A、B、C、D sections correspond to the alphabet.

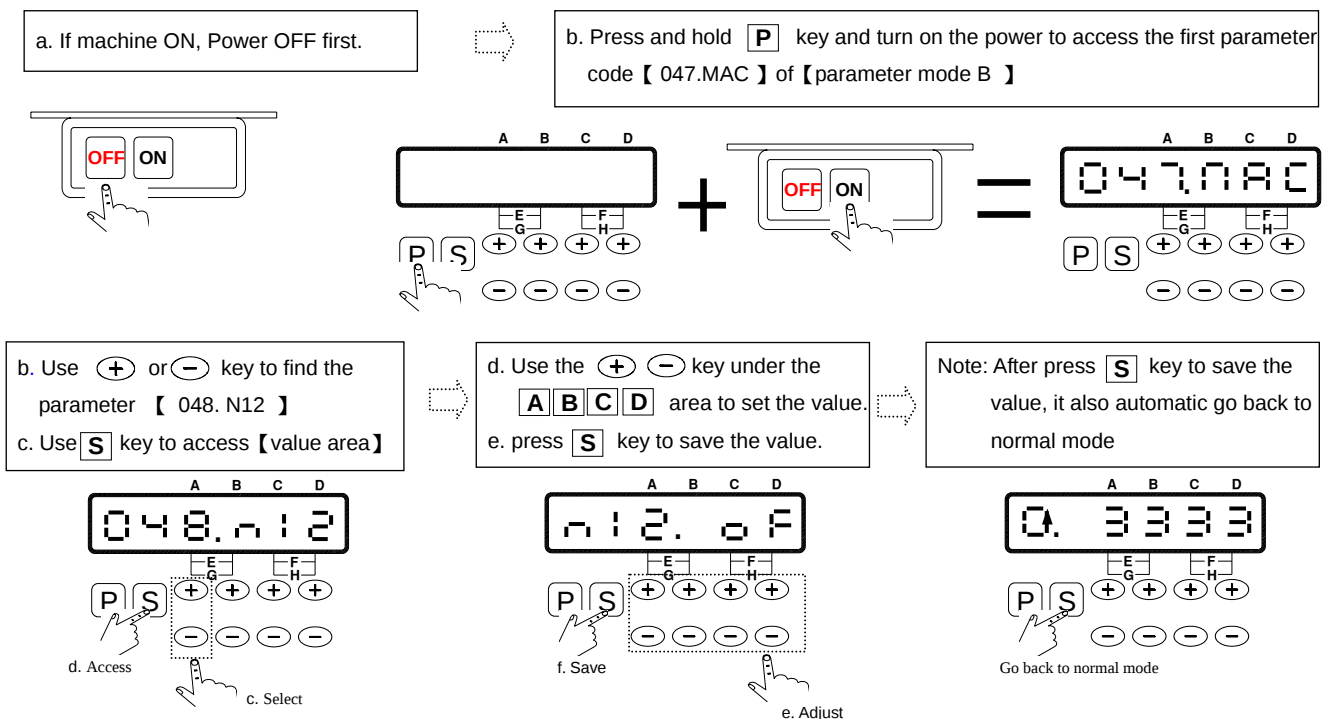
A=10 、 B=11 、 C=12 、 D=13 、 E=14 、 F=15 stitches

6.2 C – 60M parameter adjustment :

6.2.1 How to access 【Parameter Mode A】 parameters total from 001~046



6.2.2 How to access 【Parameter Mode B】 parameters total from 047~122



6.2.3 Terms for C-60M in parameter value:

Terms for A · B · C · D area which adjust by the **+** **-** key in the parameter value.

Key Value	A	B	C	D
IN TERM OF SPEED	1000 spm	100 spm	10 spm	1 spm
IN TERM OF ANGLE	-----	100 °	10 °	1 °
IN TERM OF TIMMING	1000 ms	100 ms	10 ms	10 ms
IN TERM OF FUNCTION				Mode selection

∴ Other than the mode selection, each press the **+** or **-** key will circling the value from 0 to 9, the total value can't be set lower or greater than the ranged value. When the value is the maximum ranged value, press any **+** key of the A · B · C · D area will change the value back to the minimum ranged value.

- Note :** 1. After value changed, press the **S** key to save the value, otherwise they will lost after turning power off.
2. Under the parameter mode, the function keys are invalid.

7. Error Code / Basic Trouble Shooting :

Error code and measurement :

Error Code	Cause of the Problem	Status and Measurement
ER0. 4	1. When power on, detected high voltage 2. Connect the wrong voltage, too high. 3. F2 fuse blown	Motor and machine will be shutting down. Please check the AC power. (Too high) Please check the main board. Please check the F2 fuse.
ER0. 5	1. When power on, detected low voltage 2. Connect the wrong voltage, too low..	Motor and machine will be shutting down.. Please check the AC power. (Too low) Please check the main board.
ER0. 7	1. Bad connection at the motor connector. 2. Synchronizer (sensor) signal error. 3. Machine locked or object stuck in the motor pulley. 4. Sewing material is too thick.	Motor and machine will be shutting down. Please check the motor or motor connectors and its connection. Please check the synchronizer (sensor) and its signal. Please check the machine head to see if objects stuck in the motor pulley, or rotate not smoothly.
ER0. 8	Operation box linked to CPU interface had communication error	Motor and machine will be shutting down. Please check the operation box.
ER0. 9	1. Machine solenoid shorted. 2. Main board's power transistor is faulty.	Motor still can run, but all output signals and operation box pattern sewing function will be invalid.. Please check the machine's solenoids or the resistance value is 2 Ω less. Please check all the power transistors which related to solenoid.
ER0. 11	1. If parameter 【121.ANU】 is set ON, but auto needle up is malfunction when the power turned on. 2. Machine locked or motor pulley have object stuck in it.	Motor still can run, but it automatic starts the clutch mode. All constant-stitch sewing pattern and trimmer wiper function will be invalid. Please check the synchronizer up position signal. Please check the main board's synchronizer circuitry. Please check the machine head to see if objects stuck in motor pulley or rotate not smoothly.
	Motor rotation icon in LED is halting and not moving. 1. Safety switch is either faulty or bad connection. (For interlock stitch or blind stitch machine). 2. Parameter 【075. SFM】 setting not match the machine head model.	Motor stops. Please check the safety switch. Please check parameter setting on 【075. SFM】 and make sure it accord with machine head safety switch mode

8. General Parameter List :

8.1 【Parameter Mode A】 list

Parameter Code	Parameter Function	Range / Selection	Description
【 001. H 】	Maximum sewing speed (spm)	50 ~ 9999	Maximum speed adjustments
【 002. P S L 】	Speed curve adjustments (%)	1 ~ 100 %	The speed up setting for the speed control unit. The larger the value the faster to up speed.
【 003. CNR 】	Counter ratio selection	1 ~ 100	Setting the multiple to the value of 【042. CUD】
【 004. N 】	Start back-tacking speed (spm)	50 ~ 8000	Start back-tacking speed adjustments
【 005. V 】	End back-tacking speed (spm)	50 ~ 8000	End back-tacking speed adjustments
【 006. B 】	Bar-Tacking Speed (spm)	50 ~ 8000	Repeat bar-tacking speed adjustments
【 007. S 】	Soft start speed (spm)	50 ~ 2000	Soft start speed adjustments
【 008. S L S 】	Stitch numbers for soft start (針)	0 ~ 99 stitches	Soft start stitches setting
【 009. A 】	Automatic constant-stitch sewing speed (spm)	50 ~ 8000	Valid only at the auto pattern sewing or one shot signal (SH) active
【 010. A C D 】	Automatic sewing End back-tacking	ON / OFF	Only at the last seam of pattern sewing ON : Valid. OFF : Invalid.
【 011. R V M 】	Back-tacking mode selection	J / B	J = JUKI mode , B = BROTHER mode. J : Active when motor stop or running B : Active only when motor running
【 012. S M S 】	Back-tacking mode selection	A / M / SU / SD	Start back-tacking mode selection : A : One shot sewing M : Pedal control and motor can stop at middle way. SU : One shot sewing but motor stops at needle up by [027.CT] timer at end of each seam. SD : One shot sewing but motor stops at needle down by [027.CT] timer at end of each seam.
【 013. T Y S 】	Mode selection at the end of Start back-tacking	CON / STP / TRM	CON : At the end of Start back-tacking ,it continues sewing if pedal pressed or START signal on (standing operation) STP : At the end of Start Back-Tacking, machine stops and must re-start by pedal command. TRM : Making the trimming cycle once the Start Back-Tacking finished. (Mini Bar tacking)
【 014. S B T 】	Start back-tacking function selection	ON / OFF	Valid only when the operation panel disconnected. ON : Perform OFF : Not perform
【 015. S B A 】	Setting stitches A of Start back-tacking	0 ~ 15 stitches	Start back-tacking stitches setting , 【014. SBT】 = ON valid
【 016. S B B 】	Setting stitches B of Start back-tacking	0 ~ 15 stitches	
【 017. S B N 】	Setting turns of Start Back-tacking	0 ~ 4 turns	Setting the seam times of Start back-tacking , 【014. SBT】 = ON valid
【 018. B T 1 】	Stitch balance for Start Back-tacking 1	0~F	BT1=0:Invalid,1-8:Increase stitches of reverse seam, 9-F:Increase stitches of forward seam
【 019. B T 2 】	Stitch balance for Start Back-tacking 2		BT2=0:Invalid,1-8:Increase stitches of forward seam, 9-F:Increase stitches of reverse seam
【 020. S M E 】	Mode selection for End back-tacking	A / SU / SD	End back-tacking mode selection. : A : One shot sewing. SU : One shot sewing but machine stops up position by 【027. CT】 timer at the end of each seam. SD : One shot sewing but machine stops down position by 【027. CT】 timer at the end of each seam.
【 021. E B T 】	End back-tacking selection	ON / OFF	Valid only when the operation panel disconnected. ON : Perform OFF : Not perform
【 022. E B C 】	Setting stitches C of End back-tacking	0 ~ 15 stitches	End back-tacking stitches setting , 【021. EBT】 = ON valid
【 023. E B D 】	Setting stitches D of End back-tacking	0 ~ 15 stitches	

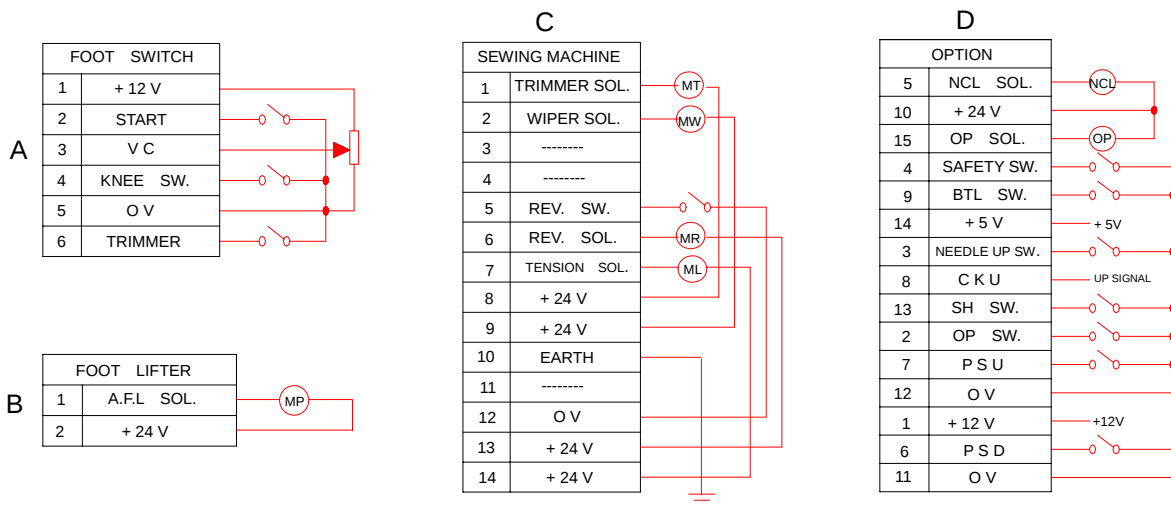
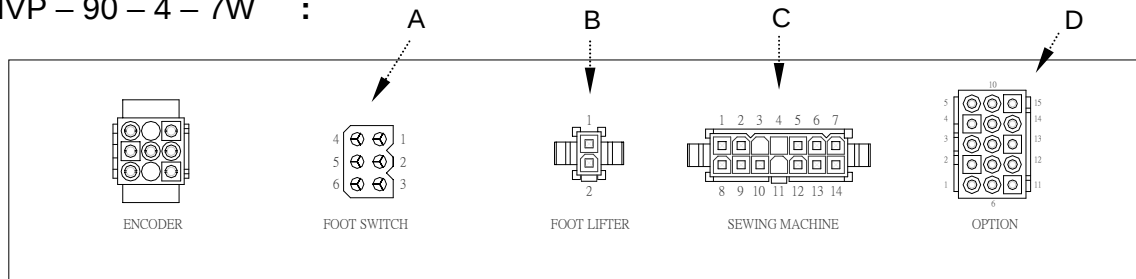
【 024. E B N 】	Setting turns of End back-tacking	0 ~ 4 turns	Setting the seam times of End back-tacking , 【 021 · EBT 】 = ON valid
【 025. B T 3 】	Stitch balance for End Back-tacking 3	0~F	BT3=0:Invalid,1-8:Increase stitches of reverse seam, 9-F:Increase stitches of forward seam
【 026. B T 4 】	Stitch balance for End Back-tacking 4		BT4=0:Invalid,1-8:Increase stitches of forward seam, 9-F:Increase stitches of reverse seam
【 027. C T 】	Setting time interruption at each section end of Back-Tacking. (ms)	0 ~ 990 ms	【012. SMS】【020. SME】【031. SMB】= SU,SD setting valid. Conner stop timer, valid only at 【012. SMS】,【020. SME】,【031. SMB】 setting SU/SD.
【 028. S B 5 】	15 stitches plus on Start/End back-tacking	ON / OFF	Additional 15 stitches are added to the Start and End back-tacking stitches function selection. ON : Valid. OFF : Invalid
【 029. S B 9 】	0-99 stitches plus on Start/End back-tacking	0 ~ 99 stitches	Additional setting stitches are added to the Start and End back-tacking stitches.
【 030. B C C 】	Added 1 stitch to the C segment of End back-tacking	ON / OFF	Added 1 stitch to the C segment of End back-tacking function selection. ON : Valid / OFF : Invalid
【 031. S M B 】	Mode selection for Bar-tacking	A / M / SU / SD	Bar-tacking mode selection. : A : One shot sewing. M : Pedal control and motor can stop at middle way. SU : One shot sewing but motor stops at needle up by 【027. CT】 timer at end of each seam. SD : One shot sewing but motor stops at needle down by 【027. CT】 timer at end of each seam.
【 032. B A R 】	Bar-tacking selection	ON / OFF	Valid only when the operation panel disconnected. ON : Perform / OFF : Not perform.
【 033. B R C 】	Setting stitches of Bar-tacking	0 ~ 99 stitches	One setting for all seams , 【032. BAR】 = ON valid.
【 034. B R N 】	Setting turns of Bar-tacking	0 ~ 15 turns	The seam times of Bar-tacking , 【032. BAR】 = ON valid.
【 035. B T 5 】	Stitch balance for Bar-tacking 5	0~F	BT5=0:Invalid,1-8:Increase stitches of reverse seam, 9-F:Increase stitches of forward seam
【 036. B T 6 】	Stitch balance for Bar-tacking 6		BT6=0:Invalid,1-8:Increase stitches of forward seam, 9-F:Increase stitches of reverse seam
【 037. S M P 】	Mode selection for Constant-stitch sewing	A / M	A : One shot sewing. M : Pedal control and motor can stop at middle way.
【 038. P M 】	Constant-stitch sewing selection	ON / OFF	Valid only when the operation panel disconnected. ON : Perform. / OFF : Not perform.
【 039. P S 】	Setting stitches for section 1~4 of Constant-stitch sewing	0 ~ 250 stitches	Stitches setting of seam P1-P4. 【038. PM】 =ON valid.
	Setting stitches for section 5~F of Constant-stitch sewing	0 ~ 250 stitches	Stitches setting of seam P5-PF. 【038. PM】 = ON valid.
【 040. W O N 】	Wiper function selection	ON / OFF	ON : Enable. OFF : Disable.
【 041. T M 】	Trimmer function selection	ON / OFF	ON : Enable. OFF : Disable.
【 042. C U D 】	Count mode selection (For Bobbin Thread or Sewing Piece)	NOP/U/D/US/DS/ UT/DT/UTS/DTS	NOP : The counter is invalid. U : Count up by stitches. When count over, counter will be auto-reset. D : Count down by stitches. When count over, counter will be auto-reset. US : Count up by stitches. When count over, motor stops and the counter must be reset by the external switch or the A key on the front panel.. DS : Count down by stitches. When count over, motor stops and the counter must be reset by the external switch or the A key on the front panel.. UT : Count up by trimming. When count over , counter will be auto-reset. DT : Count down by trimming. When count over , counter will be auto-reset UTS : Count up by trimming. When count over, motor stops and the counter must be reset by the external switch or the A key on the front panel.. DTS : Count down by trimming. When count over, motor stops and the counter must be reset by the external switch or the A key on the panel..
【 043. U D 】	Setting the count	1~9999	Count setting . (Note: The real number = the value of 【003.CNR】 X 【043.UD】 ,when 【042.CUD】 = U,D,US,DS valid only.)
【 044. P N 】	Display the current count	0 ~ 9999	Display the current count of 【043.UD】
【 045. S P 】	Sewing speed	-----	Showing the current sewing speed.
【 046. D I R 】	Direction of motor rotation	CW / CCW	CCW : Counterclockwise. CW : Clockwise.

8.2 【Parameter Mode B】 list

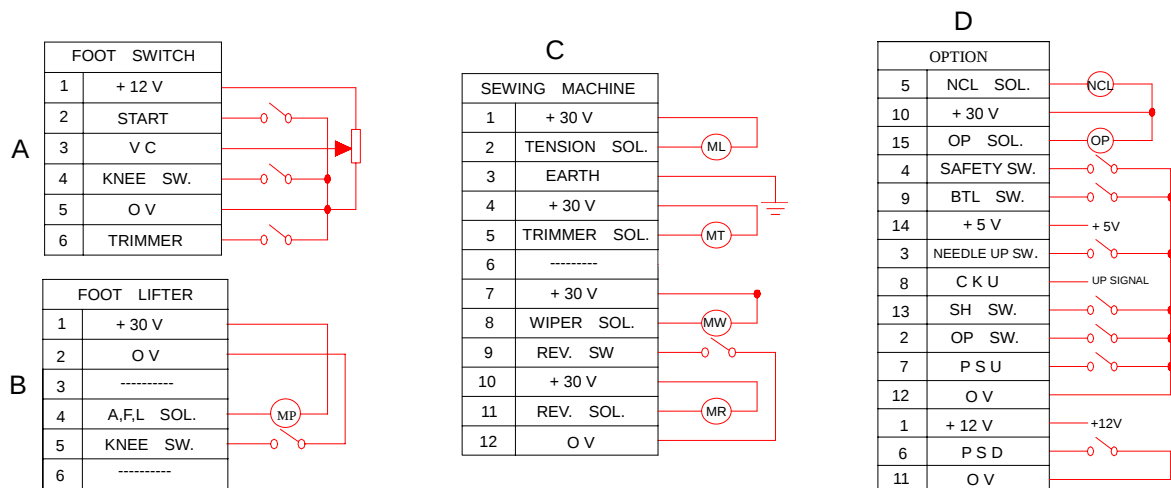
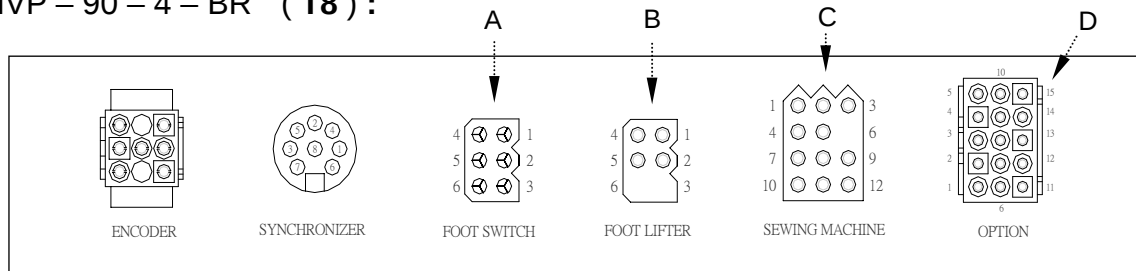
Parameter Code	Parameter Function	Range / Selection	Description
【 047. MAC 】	Machine Code	0 ~ 101	Machine code switchover
【 049. SPD 】	Machine's pulley dimension	1 ~ 250	Setting machine pulley size when 【051. PL】 = ON valid.
【 050. MPD 】	Motor's pulley dimension.	1 ~ 250	Setting motor pulley size when 【051. PL】 = ON valid.
【 054. BK 】	Motor braked at normal stop	ON / OFF	ON : Enable. OFF : Disable.
【 057. TRU 】	Motor stops with a reverse angle after trimming	ON / OFF	ON : Enable. OFF : Disable
【 058. TR8 】	Setting the angles of 【057. TRU】	1 ~ 360 °	Valid only when 【057. TRU】 = ON .
【 064. FO 】	Full-On time setting for foot lifting solenoid (ms)	0 ~ 990	For solenoid pulling torque adjustment.
【 065. FC 】	Duty cycle time setting for foot lifting solenoid (%)	10 ~ 90 %	For solenoid's switching power adjustment. Note : Wrongly adjustment will cause the solenoid unable to lift or over-heating
【 066. FD 】	Running-Delay time setting	0 ~ 990	If foot lifter is installed, set 100 ms min. to ensure the presser foot will come down first.
【 070. HHC 】	Cancel foot lifting at half-heeling pedal	ON / OFF	ON : No foot lifting at half-heeling. (but full-heeling can operate foot lifter) OFF : Operate foot lifting at half-heeling.
【 075. SFM 】	Safety switch protection mode	NC / NO	NO : Normal open. When signal at close, motor immediately stops and rotation symbol will stop. NC : Normal close. When signal at open, motor immediately stops and rotation symbol will stop
【 078. TRM 】	Motor running mode at trimming sequence	LK / RK / KA / KB/KC	LK : For general Lock-Stitch machines .Trimming from needle down to up. RK : For Chain-Stitch machine easy pull out cycle. Needle stops with a reverse angle set by 【116.DRU】 .) KA : For general Cover-Stitch machines with under trimmer only. KB : For special Cover-Stitch machines with upper trimmer. KC : Valid only when 【079. LTM】 =TK and 【081. TS】 >0, otherwise function same as LK mode.
【 082. T 1 】	Delayed timing prior to trimmer engaged (ms)	0 ~ 990 ms	Valid for 【079. LTM】 = T4/TK/TS/T7.
【 083. T 2 】	Trimming time (ms)	0 ~ 990 ms	Valid for 【079. LTM】 = T1/T3/T4/TK/TS/T7.
【 086. L 1 】	Delayed timing prior to tension release engaged (ms)	0 ~ 990 ms	Valid for 【080. LLM】 = L4/LK/LS/L7.
【 087. L 2 】	Timing of tension release (ms)	0 ~ 1500 ms	Valid for 【080. LLM】 = L1/L3/L4/LK/LS/L7.
【 092. W 1 】	Delayed timing prior to wiper engaged (ms)	0 ~ 980 ms	Time setting between needle up to wiper active.
【 093. W 2 】	Setting timing of wiping (ms)	0 ~ 9990 ms	Wiper ON timer setting.
【 094. W F 】	Delayed timing prior to foot lifter engaged (ms)	0 ~ 990 ms	Timer setting between wiper OFF to presser foot ON.
【 114. UEG 】	Needle UP position stop angle	5 ~ 180°	Adjust the needle up stop position.
【 116. DRU 】	Reverse angles through Needle down and up	1 ~ 360°	Valid only when 【078. TRM】 = 『RK』 mode Motor reverses from needle down, and stops at the needle upper dead point.
【 121. ANU 】	Needle goes up as power turned ON	ON / OFF	ON : Automatic needle UP at power on. OFF : Function invalid
【 122. H L 】	Upper limit of maximum speed (spm)	50 ~ 9999 spm	The motor's maximum speed setting

APPEDIX A : CONNECTOR DIAGRAM (HVP-90-3-XX model without option D)

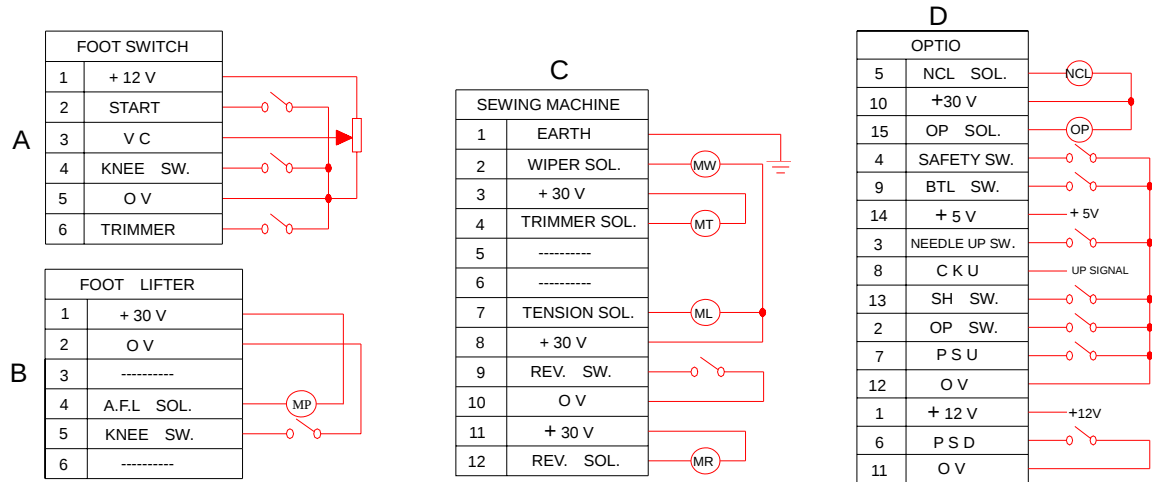
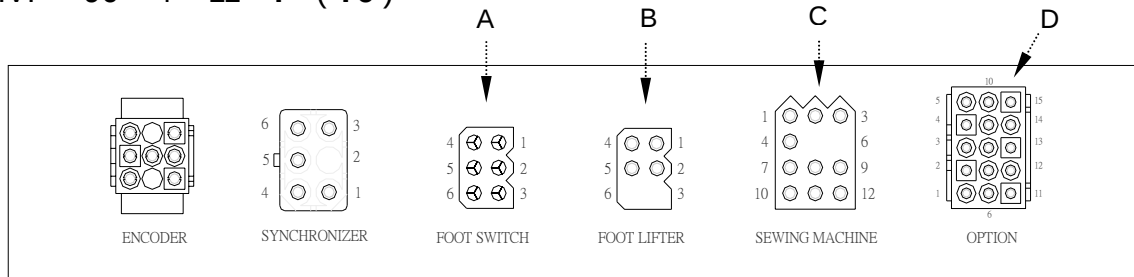
1. HVP – 90 – 4 – 7W :



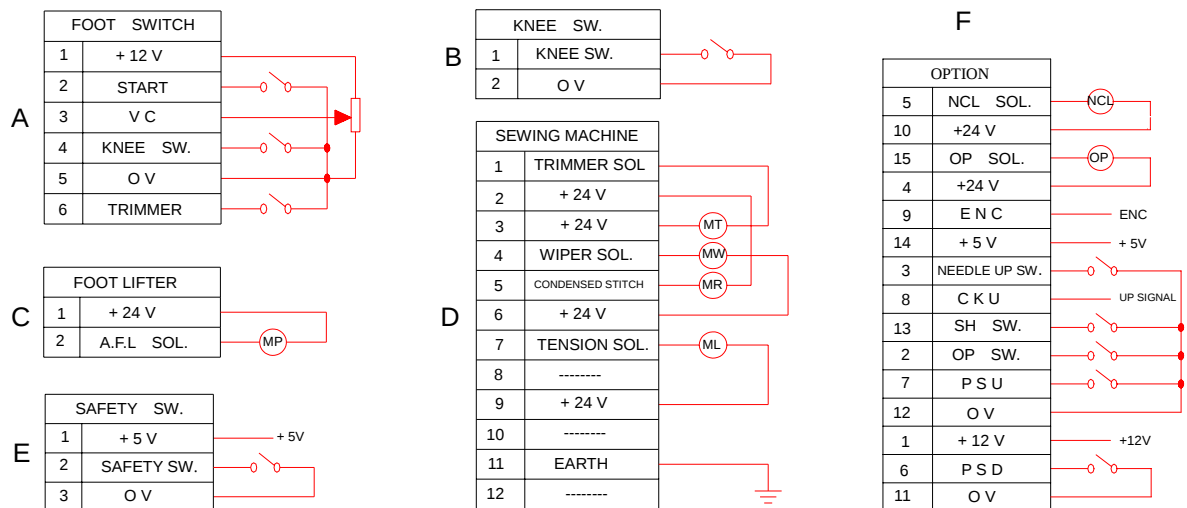
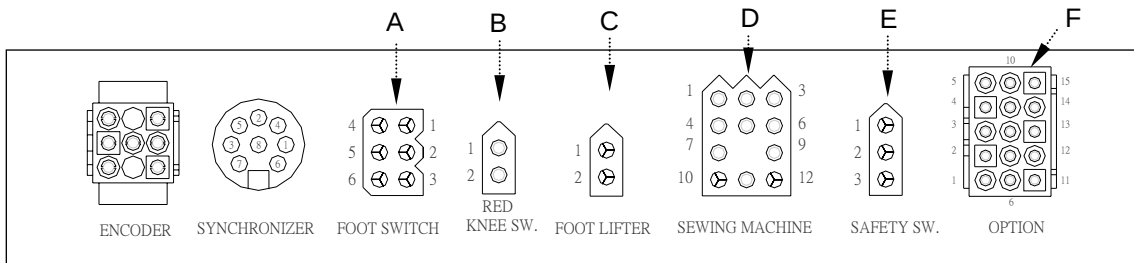
2. HVP – 90 – 4 – BR (T8) :



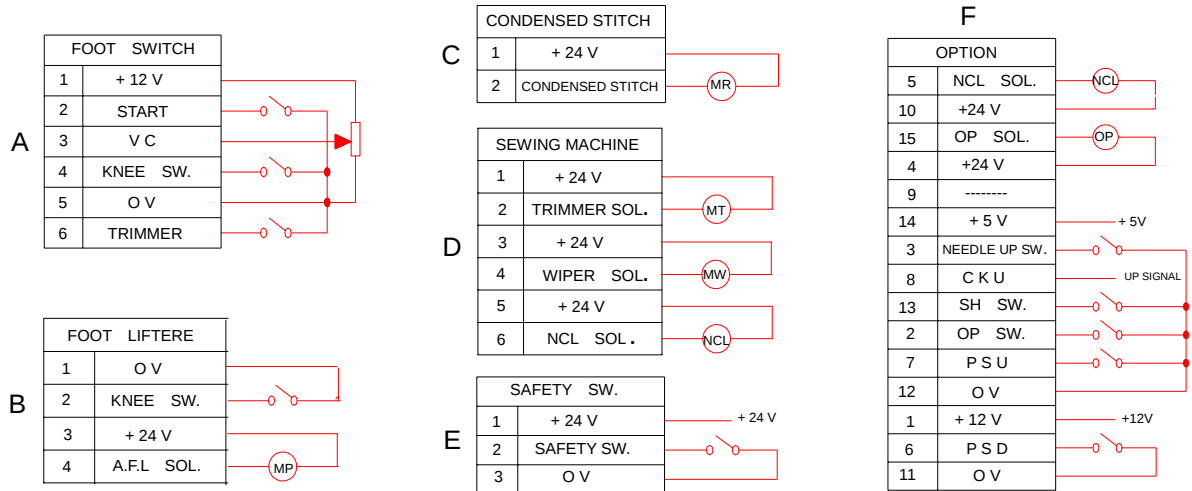
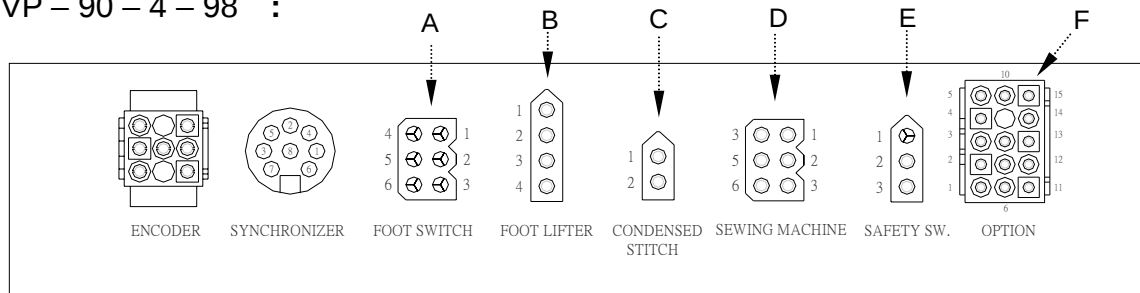
3. HVP – 90 – 4 – 11 : (Y6)



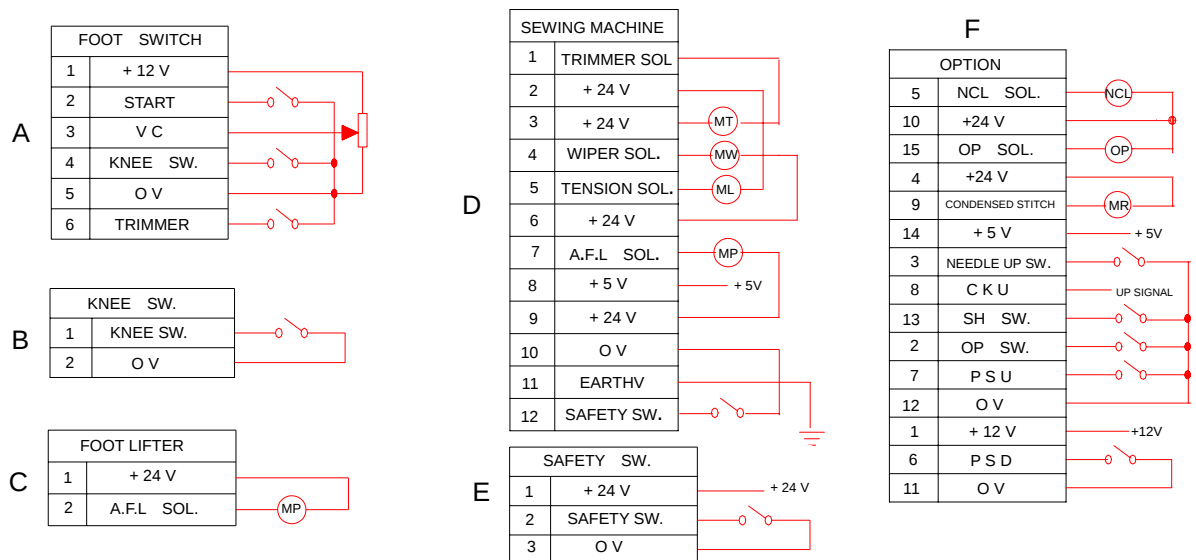
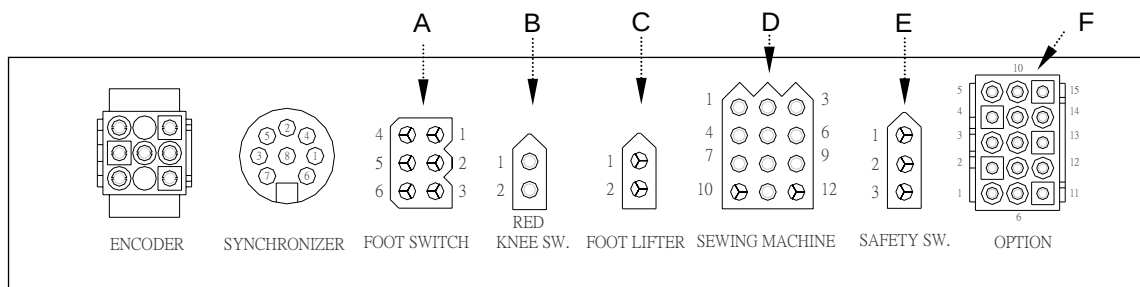
4. HVP – 90 – 4 – 66 (07) 、 (V8) 、 (V7) :



5. HVP – 90 – 4 – 98 :



6. HVP – 90 – 4 – DW (46) 、 (LT) :



7-Segment Display Characters Compare Table

Arabic Numerals

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

English Alphabet

Actual	A	B	C	D	E	F	G	H	I	J
Display	A	b	C	d	E	F	G	H	i	J
Actual	K	L	M	N	O	P	Q	R	S	T
Display	k	L	n	n	o	P	q	r	S	r
Actual	U	V	W	X	Y	Z				
Display	U	v	B	11	P	≡				