AC SERVO MOTOR
OPERATION MANUAL

MODEL : H V P – 70 SERIES

MINI-MOTOR TYPE

ENGLISH
Model: HVP - 70 Series

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Appendix : 7-Segment Display Characters Compare Chart
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.

When install and operate HVP-70 MINI Servo Motor, precaution must be taken as the following. This product is designed for specify sewing machines and must not be used for other purposes.

1.1 Work Environment:

(1). Power voltage:
Only use Power Voltage indicated on the name plate of the HVP-70 in ±10% ranges.

(2). Electromagnetic pulse interference:
To avoid the false operate, please keep the product away from the high electromagnetic machinery or electro pulse generator.

(3). Temperature:
   a. Please don’t operate in room temperature is above 45°C or under 5°C
   b. Avoid operating in direct sun light or outdoors area.
   c. Avoid operating near the heater.
   d. Avoid operating in the area which humidity is 30% or less and 95% or more, also keep away dew area.

(4). Atmosphere:
   a. Avoid operating in dusty area, and stay away from corrosive material.
   b. Avoid operating in evaporate or combustible gas area.

1.2 Safety In Installation:

(1). Motor and control box: Follow the instruction in this manual for correct installation.

(2). Accessories: Turn off the power and unplug the cord before mounting any accessories.

(3). Power cord:
   a. Avoid power cord being applied by heavy objects or excessive force, or over bend.
   b. Power cord must not set to be near the V-belt and the pulley, keep 3mm space or above.
   c. Check the outlet’s voltage before plugging the cord, make sure it match the voltage shown on the name plate of the HVP-70 in ±10% ranges.

(4). Grounding:
   a. To avoid the static interference and current leakage, all grounding must be done

   Ground Wire (Green/Yellow) must be grounding.
b. Use the correct connector and extension wire when connecting ground wire to Earth and secure it tightly.

1.3 Safety In Operating:
(1). When turn on the machine in the first time, use low speed to operate and check the correct rotation direction.
(2). During machine operation, don’t touch any moving parts.
(3). All moving parts must use the protective device to avoid the body contact and objects insertion.

1.4 Safety in Maintenance and Repairs:
Power must be turned off first, when:
(1). Uninstall the motor or the control box, or plug and unplug any connector.
(2). Turn off the power and wait 10 minutes before opening box cover.
(3). Raising the machine arms or changing needle, or threading needle. (show as above)
(4). Repairing or doing any mechanical adjustment.
(5). Machines rest.

1.5 Regulation in Maintenance and Repairs:
(1). Maintenance and Repairs must be done by specially trained personnel.
(2). Don’t cover up motor’s ventilation, it can cause motor over heated.
(3). Don’t use any objects or force to hit or ram the product.
(4). All spare parts for repair must be approved or supplied by the manufacturer.

1.6 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.

1.7 Warranty Information:
Manufacturer provide a warranty in respect of the products covered for a period of 18 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:

(1). Motor installation:

A). When motor and machine installed together, refer to the machine head's instruction.

B). When motor installed under the working table, drill holes in the table as the following diagram for the installation.

- Leave 100 mm space at right
- Mounting HVP-70 under the working table
- Use the motor base arm to adjust belt's tensions

![Diagram of Motor Installation](image)

1). Pulleys of motor and machine must properly align.
2). Cable pass through under the working table must be secured to avoid the V-belt to be rubbed.
3). Use the motor base arm to adjust belt's tensions.

(2). Control Box Installation:

a). Leave 100 mm space at right
b). Mounting HVP-70 under the working table
c). Installation layout

![Diagram of Control Box Installation](image)

(3). Speed Control Unit Installation:

a). Speed Control Unit
b). Keep rod in vertical, secure the unit under the table
c). Installation layout

Always use screwdriver to tightly secure screws

![Diagram of Speed Control Unit Installation](image)
(4). Components of Belt Cover Adjustment:

A. Finger Guard Adjustment: (For CE type only)
   1. Factory default, Finger guard is set at (B). (for lockstitch machine rotation direction)
   2. When use Interlock stitch machine, Finger guard is set at (C).

B. Belt Stopper Adjustment:
   a. Factory default Belt stopper is mount at pulley scale about 100 mm’s position (Fig. A), if pulley size change, follow the Fig. B.
   b. Adjustment tips: Move stopper pointer aligned with any position at pulley diameter scale that matches the pulley diameter size.

(5). Install the Belt Cover:
   a. Install the belt cover bracket at motor front cover.(screw hole face motor)
   b. Then secure base to the belt cover bracket, let the opening face machine pulley.
   c. After install base, mount with the motor pulley and secure it.
   d. Finally put the belt cover and secure screw A, B
(6). Install and Adjust the Synchronizer (sensor):
   a) Synchronizer installation: Mounting the Synchronizer onto the flange of machine pulley and fasten the rotor by setting screws.
   b) Synchronizer adjustment: Before adjustment, unscrew the synchronizer’s cover screw, and remove the cover.

   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.

(7). Adjust the Speed Control Unit

Components of the speed control unit: see figure
   A : Spring for toeing forward force adjustment
   B : Bolt for heeling backward force adjustment
   C : Treadle / Pedal arm
   D : Pitman Rod for Treadle / Pedal

<table>
<thead>
<tr>
<th>Term of adjustment</th>
<th>Adjustment result</th>
</tr>
</thead>
<tbody>
<tr>
<td>1  Toeing forward force adjustment</td>
<td>Spring A move to right = force increased</td>
</tr>
<tr>
<td></td>
<td>Spring A move to left = force decreased</td>
</tr>
<tr>
<td>2  Heeling backward force adjustment</td>
<td>Bolt B turn ⏬ = force decreased</td>
</tr>
<tr>
<td></td>
<td>Bolt B turn ⏩ = force increased</td>
</tr>
<tr>
<td>3  Treadle stroke adjustment</td>
<td>Rod D secure at right = stroke is longer</td>
</tr>
<tr>
<td></td>
<td>Rod D secure at left = stroke is shorter</td>
</tr>
</tbody>
</table>
3. Power Connection and Grounding:
(1). Single phase and three phase connection:
Green/yellow wire is the ground wire.

- Single Phase
  - PVC Cable
  - Brown wire
  - Blue wire
  - Green/Yellow wire

- Three Phase
  - Brown
  - Black
  - Blue
  - Green/Yellow

**Caution:**
1. When a three phase 220 V servo motor used on single phase 200 ~ 240 V power, only connect brown and blue wires. Use insulating tape to wrap up the black wire, in order to prevent the current leakage.
2. Green / Yellow wire must do the grounding.

(2). How to connect a 1Φ / 220 V power from a 3 Φ / 380 V power source

**Caution:** If the system have no Neutral point, then this servo motor is not suitable for this connection.

- Caution: Must have a Neutral point
(3). The load balance when use a 1Φ / 220 V motor used on a 3 Φ / 220 V power source. See the following figure for the load balance.

(4). How to change solenoid supply voltage (DC: 24 V OR 30 V):
The JP 4 is for 30 V and JP5 is for 24 V.

**Caution:** Before making the switch, check the machine head’s Solenoid specification.

**Caution:** Turn off the power wait for 10 min. before open the cover, then make the change.

---

**Step 1**

Remove 4 screws

**Step 2**

30 V jumper setting

24 V jumper setting

---
(5). How to supply a power source extend from the control box:

**Caution 1**: Turn off the power wait for 10 min. before open the cover, then make the change.

**Caution 2**: When turn off the control box’s power switch, it will not turn off the extended power, Please add switch for the extended power.

**Caution**: Unplugged the power cord before doing any the following jobs.

---

**Main board layout:**

- CN 5 Extended power connector
- Cable hole (A)
- Recommend use PVC cable
- Cyan/Green cable hole
- Brown, Blue, Green/Yellow (CN 5)
- Remove 4 screws
- When cable extended out from the box, cover the cable with the protective sleeve to avoid the wear and tear.

**Step 1**

- Use round head and secure tightly on CN 5, can avoid electric noise and spark which caused by the bad connection.
- After tighten the round head, let other side of the cable pass through the hole (A) and secure it.
4. Diagrams Of Control Box:

(1). Front side:

AC Power Switch

Needle UP/DOWN
Slow Start ON/OFF
Presser foot UP when machine stop
Presser foot UP after trimming

7-segment LCD

(2). Rear side: Connector Panel (Model sample : HVP-70-4-66)

DC12V 20 mA
Lamp connector

DC 12V lamp connect is available in P/N : 32ZLLT010

Motor Power

Motor Encoder

External Synchronizer

Speed Control Unit

Operation Box

Knee Switch

Automatic Foot Lifter

Sewing Machine
5. Programmable 7-segment Display:

(1). How to access the [Normal Mode] area:

Turn on the power and you can access the [Normal Mode] right away.
※ Under this mode, there are Lockstitch and Interlock stitch type displays different.

(2). Key functions in the [Normal Mode] on a lockstitch machine

- Normal sewing / Bar-tacking / Constant stitch sewing
- Parameter key
- Needle UP / Down at machine stop
- Soft Start ON / OFF
- Motor rotation direction icon
- Number of Stitches setting (All keys range in 15 stitch)
- Start Back-Tacking ON / OFF
- End Back-Tacking ON / OFF
- Presser Foot goes up after trimming
- Presser Foot goes up when machine stop
- Number of stitches display and other special function display
(3). Key functions in the【Normal Mode】 on a interlock stitch machine

- No Function
- Parameter key
- Soft Start
  - ON / OFF
- Needle UP / Down at machine stop
- Motor rotation
  - Direction icon
- Cancel Half Heeling
  - No Half Heeling Function
- Cancel Trimmer
  - No Trimmer Function
- Cancel Wiper
  - No Wiper Function
- Start Constant Stitch Sewing
  - ON (LED light)

(4). How to perform 「BAR Tacking」and「Constant Stitch Sewing」 in the【Normal Mode】

Under 【Normal Mode】 , press key  can active and switch back and forth in normal sewing, Bar-tacking, and constant stitch sewing functions.

* Unlisted keys are the same function as Lockstitch machine in normal mode.

- 【Bar-Tacking】 display
- 【Constant stitch】 display

- Number of stitches (0 ~ 99 stitches)
- Number of times (0 ~ 15 times )
- Section setting (1 ~ 15 section)
- Number of stitch (0~250 stitches)

LED for Star Constant stitch sewing (ON : LED light)
No Function
Presser Foot goes up when machine stop
Presser Foot goes up after trimming
Special Function Display
(5). How to access 【Parameter Mode A】: (Available parameter codes: 1 ~ 46)

a. Under 【Normal mode】 press key 【 】 will take you into the first parameter code 【001. H】 of 【Mode A】

b. Press 【】 or 【】 to get the parameter needed... e.g.: 【002.PSL】
c. Press 【S】 to enter 【parameter value】
d. In this area, press 【ABC】 key to make value adjustment.
e. Press 【S】 key to save the value.

(6). How to access 【Parameter Mode B】: (Available parameter codes: 1 ~ 122)

a. Turn off the power
b. Press hold 【P】 key and turn on the power to access the first parameter code 【047.MAC】 of 【parameter mode B】
c. Press 【】 or 【】 key to get the parameter code 【048. N12】
d. Use 【S】 key to enter 【parameter value】
e. In this area, press those key 【ABC】 to make value adjustment.
f. Press 【S】 key to save the value.

Note 1. After pressing 【S】 key, it will go back to 【Normal Mode】
Note 2. Example: on Lockstitch machine
(7). Key functions in the 【Parameter Mode A and B】: (example as the following)

Enter Value area
Parameter increment key
Parameter decrement key
No Function
No Function

7-segment Display
Same as parameter increment key

7-segment Display

In 【Mode A】. First parameter showing is 【001. H】. All available parameters start 1 ~ 46.

In 【Mode B】. First parameter showing is 【047. MAC】. All available parameters start 1 ~ 122.

(8). How to access the 【Parameter Value】 and adjust the setting
Step 1: Confirm the parameter code you want to make adjust. (see the parameter table for detail)
Step 2: Follow the instruction to access parameter area and call out the parameter code.
Step 3: Start making adjust parameter value. (Function selection use key C and D to make change.
Speed, timing and angle setting can be set as the following: 【001. H】 value setting for your reference)

A). How to increase the default value:
Example: Factory default setting 【H. 4500】 increase to 【H. 5000】.
See chapter 5, section (4) or (5) to learn how to access a · b · c value setting, then do the following step by step.

Example at left is showing for the "Lockstitch machine" icon showing is:

Example at right is showing for the "Interlock stitch machine" icon showing is:

STOP A

STOP A

STOP A

STOP A

STOP A

STOP A
B). How to decrease the default value:

Example: Factory default setting 【H. 4500】 decrease to 【H. 4000】:

See chapter 5, section (4) or (5) to learn how to access a,b,c value setting, then do the following step by step.

1. d. Into 【H.4500】 value area
2. e. Press A to make decrement
3. f. Stop when see minimum value

(9). Value setting for A, B, C, D keys in the 【Parameter Value】:

<table>
<thead>
<tr>
<th>TERMS</th>
<th>KEY VALUE</th>
<th>A</th>
<th>B</th>
<th>C</th>
<th>D</th>
</tr>
</thead>
<tbody>
<tr>
<td>IN TERMS OF SPEED</td>
<td>1000 spm</td>
<td>100 spm</td>
<td>10 spm</td>
<td>1 spm</td>
<td></td>
</tr>
<tr>
<td>IN TERMS OF ANGLE</td>
<td>--------</td>
<td>100 °</td>
<td>10 °</td>
<td>1 °</td>
<td></td>
</tr>
<tr>
<td>IN TERMS OF TIMING</td>
<td>1000 ms</td>
<td>100 ms</td>
<td>10 ms</td>
<td>10 ms</td>
<td></td>
</tr>
<tr>
<td>IN TERMS OF FUNCTION</td>
<td>FUNCTION SWAP</td>
<td>FUNCTION SWAP</td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

∴ Other than the function selection, each press of the key will start change the value from 1 to 10

Note: After value changed, press key S to save the value, otherwise they will lost after turning power off
### 6. General Parameter Table:

<table>
<thead>
<tr>
<th>Mode</th>
<th>Parameter Code</th>
<th>Parameter Function</th>
<th>Range / Selection</th>
<th>Description / Note</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>001. H</td>
<td>Maximum sewing speed (spm)</td>
<td>50 ~ 9999</td>
<td>Maximum speed adjustments.</td>
</tr>
<tr>
<td></td>
<td>004. N</td>
<td>Start Back-Tacking speed or Constant-Stitch speed for the Interlock Stitch machine (spm)</td>
<td>50 ~ 8000</td>
<td>Speed adjustment for Start Back-Tacking or Constant-Stitch sewing in the Interlock Stitch machine.</td>
</tr>
<tr>
<td></td>
<td>005. V</td>
<td>End Back-Tacking speed (spm)</td>
<td>50 ~ 8000</td>
<td>Speed adjustment for End Back-Tacking.</td>
</tr>
<tr>
<td></td>
<td>006. B</td>
<td>Bar-Tacking speed (spm)</td>
<td>50 ~ 8000</td>
<td>Speed adjustment for Bar-Tacking.</td>
</tr>
<tr>
<td></td>
<td>007. S</td>
<td>Slow Start speed (spm)</td>
<td>50 ~ 2000</td>
<td>Speed adjustment for Slow Start.</td>
</tr>
<tr>
<td></td>
<td>008. SLS</td>
<td>Number of Stitches for the Slow Start</td>
<td>0 ~ 99</td>
<td>Number of Stitches setting for Slow Start.</td>
</tr>
<tr>
<td></td>
<td>009. A</td>
<td>Automatic Constant-Stitch sewing speed or Auto-start testing speed (spm)</td>
<td>50 ~ 8000</td>
<td>Speed adjustment for Automatic Constant-Stitch sewing. Note: Valid only when the 【037. SMP】 set on 「A」.</td>
</tr>
<tr>
<td></td>
<td>010. ACD</td>
<td>Automatic End Back-Tacking sewing (Can invalidate the Stitch Correction function)</td>
<td>ON / OFF</td>
<td>strftime('%Y-%m-%d-%H-%M-%S')</td>
</tr>
<tr>
<td></td>
<td>011. RVM</td>
<td>Back-Tacking Mode selection</td>
<td>J / B</td>
<td>J : JUKI mode (Press TB switch will activate the reverse solenoid when either machine is stopped or running). B : BROTHER mode (Press TB switch will activate the reverse solenoid only when machine is running).</td>
</tr>
<tr>
<td></td>
<td>045. SP</td>
<td>Sewing speed</td>
<td>-----</td>
<td>Showing the current sewing speed.</td>
</tr>
<tr>
<td></td>
<td>060. L</td>
<td>Low speed (spm)</td>
<td>50 ~ 500</td>
<td>Speed adjustment for Low speed.</td>
</tr>
<tr>
<td></td>
<td>061. T</td>
<td>Trimmer speed (spm)</td>
<td>50 ~ 500</td>
<td>Speed adjustment for Trimmer.</td>
</tr>
<tr>
<td></td>
<td>064. FO</td>
<td>Full-On time setting for Automatic Foot Lifter (ms)</td>
<td>0 ~ 990</td>
<td>Timing adjustment for Full-On time of Automatic Foot Lifter active.</td>
</tr>
<tr>
<td></td>
<td>065. FC</td>
<td>Duty-Cycle setting for Automatic Foot Lifter (%)</td>
<td>0 ~ 90</td>
<td>Adjustment for Duty-Cycle of AFL. (Fine tuning can reduce the over heating)</td>
</tr>
<tr>
<td></td>
<td>066. FD</td>
<td>Running-Delay time setting (ms)</td>
<td>0 ~ 990</td>
<td>Running-Delay time adjustment for the Automatic Foot Lifter.</td>
</tr>
<tr>
<td></td>
<td>070. HHC</td>
<td>Cancel Automatic Foot Lifting when Half-Heeling the pedal</td>
<td>ON / OFF</td>
<td>O N : Pedal half heeling without foot lifting function. (Only full heeling can activate Foot Lifter.) OFF : Pedal half heeling with foot lifting function.</td>
</tr>
<tr>
<td></td>
<td>075. SFM</td>
<td>Safety switch mode</td>
<td>NC / NO</td>
<td>NO : Means Normal Opened. NC : Means Normal Closed.</td>
</tr>
<tr>
<td></td>
<td>083. T2</td>
<td>Trimming timing (ms)</td>
<td>0 ~ 990</td>
<td>Adjustment for trimming timing.</td>
</tr>
<tr>
<td></td>
<td>087. L2</td>
<td>Tension release timing (ms)</td>
<td>0 ~ 1500</td>
<td>Adjustment for tension release timing. (In Shing Ray brand's interlock stitch machine, it acts as wiper function.)</td>
</tr>
<tr>
<td></td>
<td>093. W2</td>
<td>Wiper timing (ms)</td>
<td>0 ~ 9990</td>
<td>Adjustment for wiper timing.</td>
</tr>
<tr>
<td></td>
<td>121. ANU</td>
<td>Needle goes up automatically as power turned on</td>
<td>ON / OFF</td>
<td>O N : Power turned on, needle goes up position automatically. OFF : No Use.</td>
</tr>
</tbody>
</table>
### 7. Basic Troubleshooting:

#### (1). Error Code and Measurement:

<table>
<thead>
<tr>
<th>Error Code</th>
<th>Cause of The Problem</th>
<th>Status and Measurement</th>
</tr>
</thead>
</table>
| ERO. 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 pc board.  
                                    Please check the F2 fuse. |
| ERO. 5     | 1. When power on, current sensor detect 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 pc board. |
| ERO. 7     | 1. Bad connection at the motor connector.  
             2. Synchronizer (sensor) signal error.  
             3. Synchronizer is a single position type, and parameter set wrong type.  
             4. Machine locked or object stuck in the motor pulley.  
             5. Sewing material is too thick. | Motor and machine will be shutting down.  
                                    Please check the motor or motor connectors’ connection.  
                                    Please check the Synchronizer (sensor) and its signal.  
                                    Please check machine head to see if objects stuck in the motor pulley, or rotate not smoothly. |
| ERO. 8     | Operation Box linked to CPU interface had communication error | Motor and machine will be shutting down.  
                                    Please check the Operation Box. |
| ERO. 9     | 1. Machine solenoid shorted.  
             2. Main board’s power transistor is faulty. | Motor still can run, but all output signals and Operation box’s pattern sewing function will be invalid.  
                                    Please check machine’s solenoids or the resistance value is 2 Ω less.  
                                    Please check all the power transistors which related to solenoid. |
| ERO. 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 Synchronizer’s up position’s signal.  
                                    Please check main board’s Synchronizer circuitry.  
                                    Please check machine head to see if objects stuck in motor pulley, or rotate not smoothly. |
| ERO. 12    | Motor rotation icon in LCD 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 table on 【075. SFM】 setting, make sure it match machine head safety switch |
(2). Instruction of Fuse Replacement

Fuse Type and Location: When fuse fused, find out the cause and fix it before replace the new one.

Caution: Turn off the power and wait 10 minutes before opening box cover.

F2 Fuse is 1.6 A / 250V (For Brake Protection)
F3 / F4 Fuse is 15 A / 250V (For AC Power Protection)
F1 Fuse is 2.5 A 250 V (For DC 12 V Protection)

(3). Others

1. If motor install with the machine head, then the CN2 must be shorted. The error code 12 will occur if CN2 not shorted.

Caution: Turn off the power and wait 10 minutes before opening box cover.

2. During the machine’s operation, if the synchronize (sensor) felt out or the belt snapped. The motor will rotate few stitches then stop, and ERO.7 will be shown in the display. Turn off the power and troubleshooting first then restart the power.

3. If other technical issues occur, beside the fuse replacement, don’t try to change any parts in the control box. Please ask supplier or trained technician for technical support.
### (4) HVP-70 Parts List:

#### Motor Set Assembly

<table>
<thead>
<tr>
<th>NO.</th>
<th>Order Code</th>
<th>Parts Name</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>2VP3411209AX1</td>
<td>Motor Set (CE)</td>
<td>Ke : 37 75EC006</td>
</tr>
<tr>
<td>2</td>
<td>2VP3411209AX2</td>
<td>Motor Set</td>
<td>Ke : 37 75EC006</td>
</tr>
<tr>
<td>3</td>
<td>2VP3411209AX3</td>
<td>Motor Set (CE)</td>
<td>Ke : 50 75CC006</td>
</tr>
<tr>
<td>4</td>
<td>2VP3411209AX4</td>
<td>Motor Set</td>
<td>Ke : 50 75CC006</td>
</tr>
<tr>
<td>5</td>
<td>2VP3432209AX3</td>
<td>Motor Set</td>
<td>Ke : 28 50AB007</td>
</tr>
<tr>
<td>6</td>
<td>2VP3432209AX4</td>
<td>Motor Set (CE)</td>
<td>Ke : 28 50AB007</td>
</tr>
<tr>
<td>1-1</td>
<td>2VPBT0V20</td>
<td>Motor Base</td>
<td>For HVP-70</td>
</tr>
<tr>
<td>1-2</td>
<td>315BGV080</td>
<td>Belt Cover Top</td>
<td>For V-Belt Type</td>
</tr>
<tr>
<td>1-3</td>
<td>2VP2PY4041D</td>
<td>Pulley (65 mm)</td>
<td>(14 ⌀ hole)</td>
</tr>
<tr>
<td>1-4</td>
<td>315BGV070</td>
<td>Belt Cover Base</td>
<td>For V-Belt Type</td>
</tr>
<tr>
<td>1-5</td>
<td>313BGEO30</td>
<td>Cover Bracket</td>
<td>For V-Belt Type</td>
</tr>
<tr>
<td>1-6</td>
<td>2VP3411209AX6</td>
<td>Motor Body (CE)</td>
<td>750 W Ke : 37</td>
</tr>
<tr>
<td>2</td>
<td>2VP3411209AX7</td>
<td>Motor Body</td>
<td>750 W Ke : 37</td>
</tr>
<tr>
<td>3</td>
<td>2VP3411209AX8</td>
<td>Motor Body (CE)</td>
<td>750 W Ke : 50</td>
</tr>
<tr>
<td>4</td>
<td>2VP3411209AX9</td>
<td>Motor Body</td>
<td>750 W Ke : 50</td>
</tr>
<tr>
<td>5</td>
<td>2VP3432209AX8</td>
<td>Motor Body</td>
<td>500 W Ke : 28</td>
</tr>
<tr>
<td>6</td>
<td>2VP3432209AX9</td>
<td>Motor Body (CE)</td>
<td>500 W Ke : 28</td>
</tr>
</tbody>
</table>

#### Control Box Assembly

<table>
<thead>
<tr>
<th>NO.</th>
<th>Order Code</th>
<th>Parts Name</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>315PB270</td>
<td>Left Cover</td>
<td>cover (no screw)</td>
</tr>
<tr>
<td>2</td>
<td>331SP1130</td>
<td>Left Cover Screws</td>
<td>M4 * 8</td>
</tr>
<tr>
<td>3</td>
<td>2VPMPB205</td>
<td>Aluminum Case</td>
<td>HVP-70 Series</td>
</tr>
<tr>
<td>4</td>
<td>2VP70304201</td>
<td>Cement Resistor</td>
<td>220  / / 30 W</td>
</tr>
<tr>
<td>5</td>
<td>2VP70302005</td>
<td>Main Board</td>
<td>1  / / 20 A</td>
</tr>
<tr>
<td>6</td>
<td>2VP70408BR001</td>
<td>Connector Panel</td>
<td>HVP-4-BR</td>
</tr>
<tr>
<td>7</td>
<td>2VP704087W001</td>
<td>Connector Panel</td>
<td>HVP-4-7W</td>
</tr>
<tr>
<td>8</td>
<td>2VP70308H1001</td>
<td>Connector Panel</td>
<td>HVP-3-H1</td>
</tr>
<tr>
<td>9</td>
<td>2VP7040866001</td>
<td>Connector Panel</td>
<td>HVP-4-66</td>
</tr>
<tr>
<td>10</td>
<td>2VP704086001</td>
<td>Connector Panel</td>
<td>HVP-4-46</td>
</tr>
<tr>
<td>11</td>
<td>2VP7040870001</td>
<td>Connector Panel</td>
<td>HVP-4-70</td>
</tr>
<tr>
<td>12</td>
<td>2VP7040898001</td>
<td>Connector Panel</td>
<td>HVP-4-98</td>
</tr>
<tr>
<td>13</td>
<td>2VP7040898001</td>
<td>Connector Panel</td>
<td>HVP-9-4</td>
</tr>
<tr>
<td>14</td>
<td>2VP70408GD001</td>
<td>Connector Panel</td>
<td>HVP-4-GD</td>
</tr>
</tbody>
</table>

#### Accessories

<table>
<thead>
<tr>
<th>NO.</th>
<th>Order Code</th>
<th>Parts Name</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>341BP1860</td>
<td>Curve Bracket</td>
<td>For C-300</td>
</tr>
<tr>
<td>2</td>
<td>341V50103</td>
<td>Membrane Sticker</td>
<td>For HVP-70</td>
</tr>
<tr>
<td>3</td>
<td>315MB280</td>
<td>Right Cover</td>
<td>Cover (no screw)</td>
</tr>
<tr>
<td>4</td>
<td>331SP1860</td>
<td>Right Cover Screws</td>
<td>M4 * 0.7 * 25</td>
</tr>
<tr>
<td>5</td>
<td>2VP70306001</td>
<td>Speed Control Unit</td>
<td>With bracket</td>
</tr>
<tr>
<td>6</td>
<td>2VP115002900</td>
<td>Synchronizer</td>
<td>500-29 (6P)</td>
</tr>
<tr>
<td>7</td>
<td>2VPOPBC300001</td>
<td>Operation Box</td>
<td>C-300 1.0 m.</td>
</tr>
<tr>
<td>8</td>
<td>2VPOPBC300002</td>
<td>Operation Box</td>
<td>C-300 1.5 m.</td>
</tr>
</tbody>
</table>

---

18
8. Operation Box:

(1). C – 300 Operation Box Diagram

(2). Key Functions of C – 300

<table>
<thead>
<tr>
<th>FUNCTION</th>
<th>KEY</th>
<th>OPERATION OF SEWING MACHINE</th>
</tr>
</thead>
<tbody>
<tr>
<td>Start Tacking Selection</td>
<td></td>
<td>Double start tacking</td>
</tr>
<tr>
<td></td>
<td></td>
<td>Single start tacking</td>
</tr>
<tr>
<td>End Back Tacking Selection</td>
<td></td>
<td>Double end back tacking</td>
</tr>
<tr>
<td></td>
<td></td>
<td>Single end back tacking</td>
</tr>
</tbody>
</table>
| Free Sewing                  |     | 1). As the treadle is toed down, machine will start sewing. Once the treadle returned to neutral, machine will stop immediately.  
|                              |     | 2). As the treadle heeled back, the trimming cycle will be finished automatically.          |
| Bar Tack Sewing              |     | Once the treadle is toed down, all the seams of Bar Tacking, A, B, C, D sections will be completed with E times, and the trimming cycle will be finished automatically.  
|                              |     | Note1 : When E is 4 times above, then the exceeded times will be started by the C, D section.  
|                              |     | Note2 : When the bar tack sewing start, it will not stop until the trimming cycle finished, except for the treadle heeled back to cancel the action. |
| Constant-Stitch Sewing       |     | 1). As the treadle is toed down, Constant-stitch Sewing E, F, G or H performed section by section.  
|                              |     | 2). Once the treadle returns to neutral intermediately in any one section, the machine will stop immediately. When 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. |
### Stitch Setting Selection

<table>
<thead>
<tr>
<th>Setting</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>A · B · C · D</td>
<td>Stitch setting range in 0 ~ F (Note)</td>
</tr>
<tr>
<td>E · F · G · H</td>
<td>Stitch setting range in 0 ~ 99</td>
</tr>
</tbody>
</table>

#### Note
- Press key to select:
  - Top: A · B · C · D
  - Middle: E · F
  - Bottom: G · H

### Needle Up / Forward Stitch Correction

1. In Free sewing:
   - One touch of this key acts as stitch correction. (half stitch forward)
2. In constant-stitch sewing:
   - If sewing stops at the end of section, one touch of this key will correct one stitch forward.
   - In Bar-tack sewing, it only acts as needle up.

### One-Shot-Sewing Selection

1. In Free sewing and Bar-tack sewing:
   - One touch of this key makes beep sound but has no function, also LED does not light up.
2. In Constant-stitch sewing:
   - One shot to the pedal, automatically performs number of stitches of E · F · G · H sections.
   - Toe down the pedal again and again to finish rest the sections until it finishes pattern.

### Trimming Cycle Selection

Enable or disable the trimming cycle.

#### 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
9. CONNECTOR DIAGRAM:

(1) HVP-70- 3/4-BR : (T1)

**NOTE**:
- For HVP-3-BR, there is no 【OPTION】.

<table>
<thead>
<tr>
<th>Item</th>
<th>Voltage supply</th>
<th>Factory setting</th>
<th>Location</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>Note 2</td>
<td>5 V / 12 V</td>
<td>5 V</td>
<td>JP 3</td>
<td>Must be set at 5 V.</td>
</tr>
<tr>
<td>Note 3</td>
<td>5 V / 12 V</td>
<td>5 V</td>
<td>JP 10</td>
<td></td>
</tr>
</tbody>
</table>

**Remark**
Switching voltage output is available for MR · MP only.
### Item Voltage supply Factory setting Location Description

| Note 2 | 5 V / 12 V | 5 V | JP 3 | Must be set at 5 V |
| Note 3 | 5 V / 12 V | 5 V | JP 10 | |

**Remark**
Switching voltage output is available for MR · MP only.
NOTE: For HVP-3-H1, There is no 【OPTION A & OPTION B】.

### Item | Voltage supply | Factory setting | Location | Description |
---|---|---|---|---|
Note 2 | 5 V / 12 V | 12 V | JP 3 | Must be set at 12 V. |
Note 3 | 5 V / 12 V | 5 V | JP 10 | |

**Remark**
Switching voltage output is available for MR · MP only.
### NOTE :

<table>
<thead>
<tr>
<th>Item</th>
<th>Voltage supply</th>
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</tr>
<tr>
<td>Note 3</td>
<td>5 V / 12 V</td>
<td>5 V</td>
<td>JP 10</td>
<td></td>
</tr>
</tbody>
</table>

### Remark

Switching voltage output is available for MR · MP only.

---

### Diagram Description

- **SEWING MACHINE**
  - 1: GND
  - 2: +24V
  - 3: +24V
  - 4: +24V
  - 5: +24V
  - 6: +24V
  - 7: +24V
  - 8: +24V
  - 9: +24V
  - 10: +24V
  - 11: EARTH
  - 12: EARTH

- **OPTION**
  - 1: 0V
  - 2: 0V
  - 3: 0V
  - 4: 0V
  - 5: 0V
  - 6: 0V
  - 7: 0V
  - 8: 0V
  - 9: 0V
  - 10: 0V
  - 11: 0V

- **PADEL**
  - 1: +12V
  - 2: +12V
  - 3: +12V
  - 4: +12V
  - 5: +12V

- **OPERATION BOX**
  - 1: +12V
  - 2: +12V
  - 3: +12V
  - 4: +12V
  - 5: +12V
  - 6: +12V

- **SYNCHRONIZER**
  - 1: +5V
  - 2: +5V
  - 3: +5V
  - 4: +5V
  - 5: +5V
  - 6: +5V
  - 7: +5V
  - 8: +5V

---

**Additional Notes**:

- Note 1: Specific voltage settings and switches.
- Note 2: Voltage supply settings and switches.
- Note 3: Voltage supply settings and switches.
NOTE:

<table>
<thead>
<tr>
<th>Item</th>
<th>Voltage supply</th>
<th>Factory setting</th>
<th>Location</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>Note 2</td>
<td>5 V / 12 V</td>
<td>5 V</td>
<td>JP 3</td>
<td>Must be set at 5 V.</td>
</tr>
<tr>
<td>Note 3</td>
<td>5 V / 12 V</td>
<td>5 V</td>
<td>JP 10</td>
<td></td>
</tr>
<tr>
<td>Note 4</td>
<td>5 V / 12 V</td>
<td>5 V</td>
<td>JP 11</td>
<td></td>
</tr>
</tbody>
</table>

Remark
Switching voltage output is available for MR · MP only.
### NOTE:

<table>
<thead>
<tr>
<th>Item</th>
<th>Voltage supply</th>
<th>Factory setting</th>
<th>Location</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>Note 2</td>
<td>5 V / 12 V</td>
<td>5 V</td>
<td>JP 3</td>
<td>Must be set at 5 V.</td>
</tr>
<tr>
<td>Note 3</td>
<td>5 V / 12 V</td>
<td>5 V</td>
<td>JP 10</td>
<td></td>
</tr>
</tbody>
</table>

**Remark**
Switching voltage output is available for MR · MP only.
NOTE:

<table>
<thead>
<tr>
<th>Item</th>
<th>Voltage supply</th>
<th>Factory setting</th>
<th>Location</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>Note 2</td>
<td>5 V / 12 V</td>
<td>5 V</td>
<td>JP 3</td>
<td>Must be set at 5 V.</td>
</tr>
<tr>
<td>Note 3</td>
<td>5 V / 12 V</td>
<td>5 V</td>
<td>JP 10</td>
<td></td>
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</tbody>
</table>

Remark

Switching voltage output is available for MR · MP only.
### Item

<table>
<thead>
<tr>
<th>Voltage supply</th>
<th>Factory setting</th>
<th>Location</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>Note 2</td>
<td>12 V / 5 V</td>
<td>5 V</td>
<td>JP 10</td>
</tr>
<tr>
<td>Note 3</td>
<td>12 V / 5 V</td>
<td>5 V</td>
<td>JP 11</td>
</tr>
</tbody>
</table>

### Remark

Switching voltage output is available for MR - MP only.

### MACHINE CODE DESCRIPTION

<table>
<thead>
<tr>
<th>GROUP</th>
<th>CODE</th>
<th>MACHINE</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>88</td>
<td>GARUDAN GF-115 (built-in synchronizer.)</td>
</tr>
<tr>
<td></td>
<td>89</td>
<td>GARUDAN GF-115 (external synchronizer.)</td>
</tr>
<tr>
<td></td>
<td>90</td>
<td>GARUDAN GF-115-447 (built-in synchronizer.)</td>
</tr>
<tr>
<td></td>
<td>91</td>
<td>GARUDAN GF-115-447 (external synchronizer.)</td>
</tr>
<tr>
<td></td>
<td>92</td>
<td>GARUDAN GF-130-446 H (built-in synchronizer.)</td>
</tr>
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<td>93</td>
<td>GARUDAN GF-130-446 H (external synchronizer.)</td>
</tr>
<tr>
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<td>94</td>
<td>GARUDAN GF-130-446 LM (external synchronizer.)</td>
</tr>
<tr>
<td></td>
<td>95</td>
<td>GARUDAN GF-207 Series</td>
</tr>
<tr>
<td></td>
<td>96</td>
<td>GARUDAN GF-233-448 / GF-133-448 Series</td>
</tr>
<tr>
<td></td>
<td>97</td>
<td>GARUDAN GP-510-146</td>
</tr>
<tr>
<td></td>
<td>98</td>
<td>GARUDAN GP-510-446</td>
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<tr>
<td></td>
<td>99</td>
<td>GARUDAN CT / FT Series</td>
</tr>
<tr>
<td></td>
<td>100</td>
<td>GARUDAN GF-138 /-238 Series</td>
</tr>
<tr>
<td></td>
<td>101</td>
<td>GARUDAN GZ-500 Series</td>
</tr>
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</table>
### 7-Segment Display Characters Compare Chart:

#### Arabic Numerals

<table>
<thead>
<tr>
<th>Actual Numbers</th>
<th>0</th>
<th>1</th>
<th>2</th>
<th>3</th>
<th>4</th>
<th>5</th>
<th>6</th>
<th>7</th>
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<th>9</th>
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<td>4</td>
<td>5</td>
<td>6</td>
<td>7</td>
<td>8</td>
<td>9</td>
</tr>
</tbody>
</table>

#### English Alphabet

<table>
<thead>
<tr>
<th>Actual Alphabet</th>
<th>A</th>
<th>B</th>
<th>C</th>
<th>D</th>
<th>E</th>
<th>F</th>
<th>G</th>
<th>H</th>
<th>I</th>
<th>J</th>
</tr>
</thead>
<tbody>
<tr>
<td>Display Alphabet</td>
<td>A</td>
<td>b</td>
<td>c</td>
<td>d</td>
<td>E</td>
<td>F</td>
<td>G</td>
<td>K</td>
<td>I</td>
<td>J</td>
</tr>
<tr>
<td>Actual Alphabet</td>
<td>K</td>
<td>L</td>
<td>M</td>
<td>N</td>
<td>O</td>
<td>P</td>
<td>Q</td>
<td>R</td>
<td>S</td>
<td>T</td>
</tr>
<tr>
<td>Display Alphabet</td>
<td>E</td>
<td>L</td>
<td>N</td>
<td>o</td>
<td>P</td>
<td>q</td>
<td>r</td>
<td>S</td>
<td>R</td>
<td></td>
</tr>
<tr>
<td>Actual Alphabet</td>
<td>U</td>
<td>V</td>
<td>W</td>
<td>X</td>
<td>Y</td>
<td>Z</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Display Alphabet</td>
<td>U</td>
<td>u</td>
<td>B</td>
<td>H</td>
<td>I</td>
<td>P</td>
<td>E</td>
<td></td>
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