MITSUBISHI

Industrial Sewing Machine
INSTRUCTION MANUAL <Control Unit>

Electronic Pattern Sewing Machine
PLK-A Series

A180E207P05

Introduction

Thank you for purchasing the Mitsubishi Industrial Sewing Machine PLK-A Series. Please read this manual thoroughly before use, to ensure long and safe operations.
(Refer to the separate instruction manual for the PLK-A05BT.)
Refer to the "Mitsubishi Industrial Electronic Sewing Machine Instruction Manual <Machine Head> section for the entire structure and sewing machine head.

Structure of This Manual

This manual describes the handling methods of the Mitsubishi Industrial Electronic Sewing Machine control unit. The following are described:

1. **Specifications**
   Describes feature, basic specification and so on.

2. **Precautions for Operation**
   Read this section carefully together with the specifications before starting operation.

3. **Operation**
   Describes the instructions for preparation before turning on the power, basic operation, and advanced operation.

4. **Teaching**
   Method to complete the pattern data is described based on concrete examples covering from the basis operating method to complicated applied operations.
   It is also explained here the methods to correct and delete the pattern data and the method to write the completed data on the floppy disk or P-ROM.

5. **Message Table**
   Errors, etc. which are raised during operation of sewing machine, are displayed on the operation panel. They are designed to indicate the cause of trouble and method of remedies.

6. **Maintenance**
   Describes a simple troubleshooting and repair work.
   It is also explained here methods to confirm the speed of and to adjust the electronic sewing machine.

7. **Control Unit**
   Describes the overall electric wiring diagram and connector connection diagram.

Contents

1. Specifications

1.1 Features

The PLK-A series machine which is a successor of the Mitsubishi Industrial Electronic Sewing Machine which won popularity provides much more features than that.

(1) Pattern storage media

As pattern storage media, both a floppy disk and P-ROM can be used.
P-ROM data which was prepared by the conventional model can be used without correction.
(P-ROM is an optional specifications.)

(2) Storage capacity

Each floppy disk can store 150 patterns and 360000 stitches of sewing data in total.
The P-ROM can store 16 patterns and 8000 stitches of sewing data in total. The maximum number of stitches per pattern is up to 8000.

(3) Stitch length and resolution

The stitch length can be input with a resolution from 0.1 to 12.7 mm in the unit of 0.1 mm.

(4) Machine drive motor control

The machine drive motor is controlled with PWM (pulse width modulation) system, thereby obtaining stable rotations of the machine.

(5) Teaching

The machine control box provides a teaching function which allows simple patterns to be easily input. In addition, patterns according to the work holder can be easily input.
The data being input can be stored on the floppy disk or P-ROM.

(6) Modification

The pattern data can be modified. After the pattern data is modified, it can be stored on the floppy disk or P-ROM.

(7) Correction of home position

By the home position correcting operation on the operation panel, the home position can be mechanically moved in the range from 0.1 to 12.7 mm in the unit of 0.1 mm.

(8) LCD (Liquid Crystal) display

LCD display is provided on the operation panel for convenience of operation control. The display is designed to indicate various setting values, operation procedures, error messages, etc.

1.2 Specifications

(1) Standard specifications of control unit

Item	General specification			
Sewing area	Refer to the Mitsubishi Industrial Electric Sewing Machine Instruction Manual <Machine Head> section.			
Pattern storage media	3.5" floppy disk and P-ROM (option)			
Number of storable patterns	3.5" floppy disk, 150 patterns, P-ROM (option), 16 patterns			
Number of storable stitches	3.5" floppy disk, 360000 stitches in total, P-ROM (option), 8000 stitches in total			
Number of stitches/pattern	8000 stitches			
Length of stitch	0.1 to 12.7 mm (Resolution: 0.1 mm)			
Speed setting	200 to 2000 s/min., 10 levels selectable			
Enlargement/reduction	10 to 200% , 0.1% step			
Electrical home position correction	0.1 ~ 12.7mm 0.1mm steps			
Test function	Jog +, – key			
Troubleshooting function	Check of input switch signals, Check of output signals, Confirmation and adjustment of sewing speed			
Power	**Phases**	**Frequency (Hz)**	**Voltage (V)**	**Input (kVA)**
	Single-phase	50, 60	100 110 120 200 220 230 240	1
	Three-phase	50, 60	200 220 380 415	1
Ambient temperature humidity	5 to 40°C, 30 to 80% (No condensation)			

Item	Teaching specification
Input method	Point input, P-P input, circular input, arc input, curve input and broken line input by teaching
Enlargement/reduction	Only 100%
Number of input stitches	8000 stitches
Input data	Stitch data, feed data, thread trimming data, end data, second home position data, halt data, reverse rotation shaft output data, baste stitch data, etc.
Stitch speed command	4 steps setting of high speed (HIGH), medium-high speed (MD1), medium – low speed (MD2), low speed (LOW).
Correction: Correction and reduction 1 stitch addition Speed change Function change	Block correction, feed correction, deletion of stitch from middle stitch, deletion of data from a specified position to the last stitch 1 stitch added at specified position, 1 stitch added at same point as specified position Change of N stitches speed at specified position, change of all stitches speed following specified position Addition or deletion of function code
Data write	Written to floppy disk and P-ROM.
Erase	A specific pattern is erased (only from floppy disk).

2. Precautions for Operation

(1) Safety

1) Since the sewing machine which is in operation is very dangerous, do not touch the moving portion of the sewing machine.
In addition, before repairing or inspecting the sewing machine, make sure to turn off the power.

2) Make sure to ground the sewing machine to prevent noises and electric shocks.

(2) Operation environment

1) Do not operate the sewing machine at a high temperature (higher than 40°C) or low temperature (lower than 5°C) place. Otherwise, malfunction or a trouble occurs in the sewing machine.
2) Do not install the sewing machine at a place where it is exposed to direct such light or at a place close to a heat source such as a heater.
3) Take care not to enter water, liquid matter, and electric conductor such as metal rubbish in the machine head and control unit.
4) Do not use the sewing machine at a place where it is exposed to excessive shocks and vibrations.
5) The sewing machine pattern may dislocate or malfunctions may occur if a surge voltage (noise) is applied on the power line. When using equipment (such as high frequency welder) near the sewing machine, keep it as far apart from the sewing machine as possible and use a separate power system.
6) If a radio or TV set is used near the sewing machine, noise may enter the radio or TV set. To prevent noise, use a different power supply or place the radio or TV set at a place away from the sewing machine.

(3) Operation

1) When turning on or off the power switch, release your foot from the start switch (foot switch).
2) When sewing a new pattern or enlarging/reducing a pattern, make sure to perform the test operation and check the relationship between the work holder and the pattern.
3) When inserting or removing the P-ROM cassette, make sure to turn off the power.
4) When manually turning the machine pulley, the presser foot should be in the lower position. While the power is being turned off, since the presser foot is in the lower position, it can be turned.
5) Dip switch setting
   Various functions can be selected by changing the setting of dip switches. Be sure to turn off the power for safety before changing the setting of dip switch.
6) Check of result of teaching
   Result of teaching can be checked by the jog under the teaching mode or under the sewing mode.

(4) Power voltage

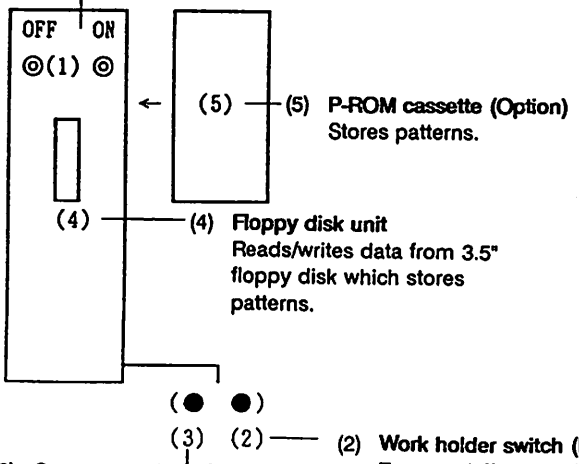
1) The power voltage should be in the range of rating voltage ±10%.
2) If an instantaneous power failure occurs, the sewing machine is reset or an error state takes place.
   To recover the sewing machine from such a state, turn on the power switch of the sewing machine.

3. Operation

3.1 Basic Function of Structural Machine

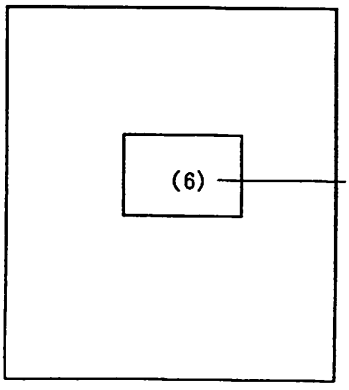
(1) Sewing machine control unit

(1) **Power switch**
Turns on/off the main power of the electronic sewing machine.



(5) **P-ROM cassette (Option)**
Stores patterns.

(4) **Floppy disk unit**
Reads/writes data from 3.5" floppy disk which stores patterns.

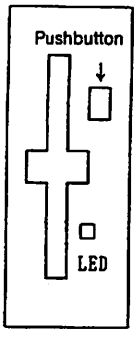


(6) **Side position setting switch**
Selects and sets various functions.
For details, see 3.3 Advanced Operation.

(2) **Work holder switch (Black foot switch)**
Turns on/off the work holder of the machine head.

(3) **Start switch (Red foot switch)**
Starts the machine operation or resume the machine operation from the halt state.

(2) Floppy disk unit



1) The floppy disk unit reads/writes data from/to the 3.5" floppy disk which stores patterns. The pattern data should be input from the Mitsubishi input unit PTN-A40, PTN-A10 or through the teaching operation of this sewing machine.
2) A 3.5" 2HD type floppy disk can be used.
Hold a floppy disk with its surface at left and insert in the arrow direction properly while the door shutter is pressed.
Be sure not to insert the floppy disk in wrong direction, otherwise, the floppy disk itself or the floppy disk drive unit may be destroyed.
3) The floppy disk which has not been used should be formatted (initialized) using the input unit PTN-A40, PTN-A10 or this sewing machine.
Regarding the format method, refer to 4.6 (1) Floppy disk format.

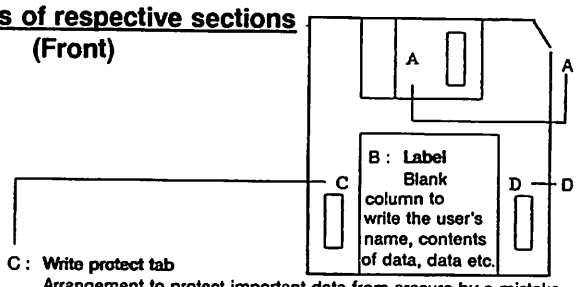
4) While the disk unit is reading/writing data, the LED lamp lights. While the LED is lighting, do not turn off the power or remove the floppy disk from the disk unit. Otherwise, the data stored on the floppy disk may be destroyed.
Refer to 6.2 Floppy Disk Unit for the cautions on the handling of the floppy disk drive unit and the floppy disk. Read this section carefully before operating the sewing machine.

5) Pressing the pushbutton on the disk unit allows the floppy disk to be removed.

(3) Applicable floppy disk

High density 3.5" micro floppy disk (memory capacity 1.4 MB) (here after, 2HD type) is used with the machine.

Names of respective sections
(Front)



A : **Sliding cover**
Protects magnetic face. Type of floppy disk, name of manufacturer (MITSUBISHI, MF2-HD, for example), etc. are described on the front face.

D : **Tab to identify the type of floppy disk**
2HD type has a square window.
2DD type (has no square window) cannot be used with this sewing machine.

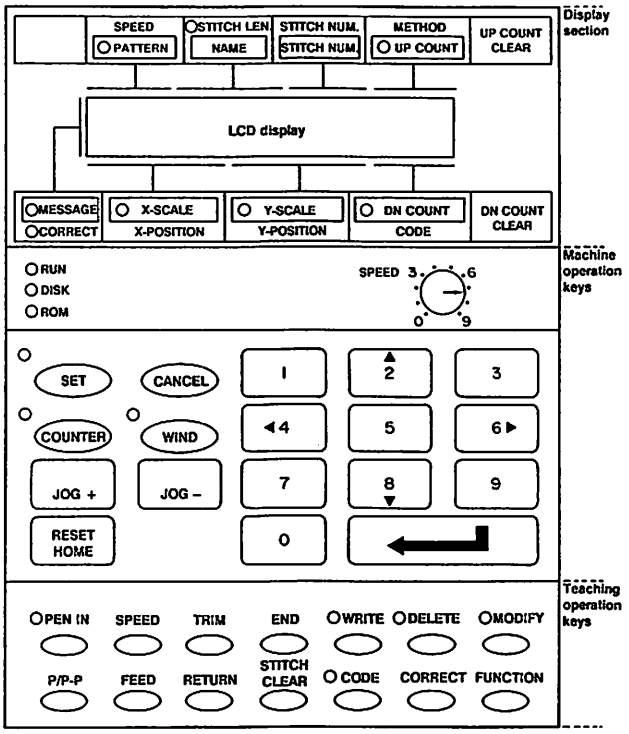
C : **Write protect tab**
Arrangement to protect important data from erasure by a mistake.
Writing is prohibited when a small, square window is open, while the protection is released when the window is closed.
Use the slide lever, provided on the rear face, to open or close.
Have any disk protected when it contains any important data.

(4) P-ROM cassette (Option)

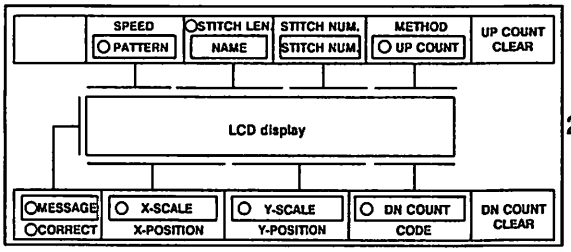
Refer to the P-ROM option instruction manual.

(5) Functions and operating method of operation panel

Operation panel



Display section



1) [MESSAGE]
The LED lamp lights and the LCD display displays operation procedures and error messages.

2) [CORRECT]
When electrically correcting the home position, the LED lamp lights and displays the amount of correction of axis X and axis Y in the unit of 0.1 mm.
While the sewing machine is in operation, the amount of correction can be switched between the enable state and disable state. (While the LED is putting off, the amount of correction is set to the disable state.)

3) [PATTERN]
Displays a pattern number.

0 to 15	:	P-ROM patterns
100 to 249	:	Floppy disk patterns
300 to 339	:	Floppy disk registered patterns
500 to 549	:	Floppy disk compounded patterns

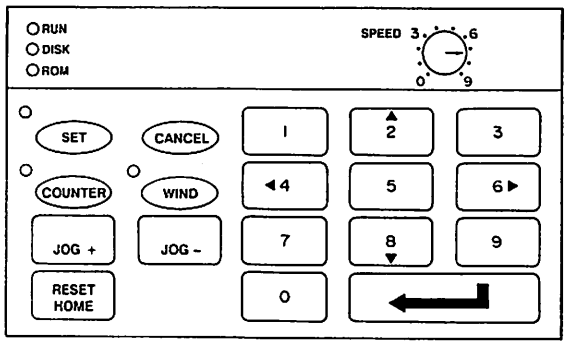
4) [NAME]
Displays a pattern name using up to six alphanumeric characters if the pattern is stored on the floppy disk with its name. If the pattern does not have a name, the pattern name column becomes NEW. The pattern name is input using the input unit PTN-A40, PTN-A10. It cannot be input from the operation panel.

5) [STITCH NUM.]
Displays the number of stitches being stored.

6) [UP COUNT], [DN COUNT]
Displays the number counted by the internal counter. Whenever the sewing operation is completed, the counter is incremented or decremented. Up counter (+1 count at each stitching of 1 pattern) can be used to count the number of sewn products while the DOWN counter (–1 count at each stitching of 1 pattern) can be used to monitor the consumption of bobbin thread.

7) [X-SCALE], [Y-SCALE]
Displays the ratio of enlargement/reduction of a pattern in the range from 10 to 200% in the unit of 0.1%. The enlargement/reduction can be performed independently on axis X or axis Y.
8) [UP COUNT CLEAR], [DN COUNT CLEAR] keys
Resets the counting of the up/down counter to the initial setting value (the initial setting value of the up counter is "0000").

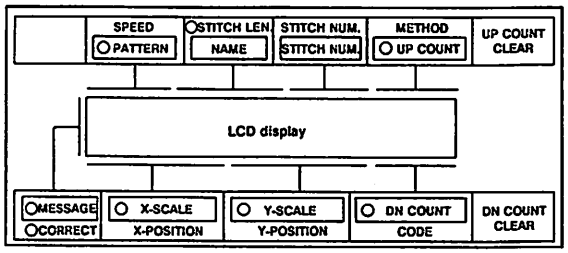
Machine operation keys



1) [NUMERIC] keys (1, 2, -----, 9, 0)
Set a pattern number or scale value.
The [NUMERIC] keys 2, 4, 6, and 8 are named [ARROW] keys which are used to move the XY table.
2) [⟵] key (Enter key)
Stores or executes a numeric value being set by the [NUMERIC] keys.
3) [CANCEL] key
Cancels a numeric value or setting condition being set by the [NUMERIC] keys.
This is also used to cancel the movement of work holder when, under the teaching mode, the work holder has been moved by the arrow mark key but [⟵] key (Enter key) is not yet pressed.
4) [SET] key
Changes a setting value of the sewing condition.
5) [WIND] key (Used to lift the presser foot.)
If the work holder is brought down at the home position and the [WIND] key is turned on (LED lighted), the presser foot comes down and it enters into the bobbin winding mode. If the start switch (foot switch) is turned on under this mode, the machine start to operate with the speed of about 600 s/min. but the XY table does not yet move.
This key is also used to elevate the presser foot at any other position than the home position.
6) [RESET HOME] key
When the [RESET HOME] key is turned on, the work holder is automatically returned back to the home position. If the needle is not placed in the UP position, the needle is automatically stopped at the UP position and then returned back to the home position.
7) [COUNTER] key
By turning on/off the [COUNTER] key, the up counter or down counter is switched between the enable state and the disable state. While the key is in the ON position (the LED lights), the counter is in the enable state.
8) SPEED dial
Specifies the maximum speed of the sewing machine.
It allows to specify 10 steps of 0 to 9.
9) [JOG +] key, [JOG –] key
Registered pattern data can be checked for the path (test operation) while the work holder is brought down.
While the [JOG +] key is being pressed, the XY table moves in accordance with the pattern data. When the [JOG –] key is being pressed, the XY table reversely moves in accordance with the pattern data.
10) LED lamps
RUN: While the setting condition is correct or the sewing machine can be operated or while the sewing machine is in operation, the RUN led lights. It flickers during pattern input mode.
DISK: While data is read/written from/to the floppy disk or the sewing machine is being operated by data of the floppy disk, the DISK LED lights.
ROM: While the sewing machine is being operated by the data of the P-ROM, the ROM LED lights.

(6) Teaching section operation panel

Display section

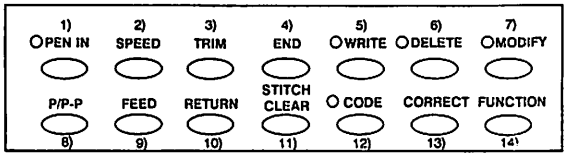


1) [MESSAGE]
The LED lamp lights and the LCD display displays an operation procedure and error message.
2) [SPEED]
Displays the sewing speed of stitches being input.
On of four levels of HIGH, MD1, MD2, and LOW can be specified by the teaching operation key.
3) [STITCH LEN.]
Displays the length of stitches which has been specified when the input method is the linear input (P-P).
In addition it displays the length of stitches "000" when the input method is the point input (POIN).
4) [STITCH NUM.]
Displays the total number of stitches which is being input.
Since function code data and END data are counted as stitches, it displays a larger number than actual number of stitches.
5) [METHOD]
The following will display according to the current input method

Linear input : P-P	Curve input: S001
Arc input : AP1, AP2	Broken line: B001
Circular input: CP1 CP2	Point input : POIN

If the input code display is FEED, the last selected input method will display. The input method can be changed after pressing the [⟵] key.
6) [X-POSITION], [Y-POSITION]
Displays the amount of movement of each of X and Y in the unit of 0.1 mm when the XY table is moved using the [ARROW] keys.
7) [CODE]
Displays a function code name when function code data is input. However, part of function code is represented by numeric values.

Teaching operation keys



1) [PEN IN] key
When the [PEN IN] key is turned on (the LED lights), the sewing machine enters the pattern input mode. when the [PEN IN] key is turned off, the sewing machine exits from the pattern input mode.
2) [SPEED] key
This key is used to specify the sewing speed and stitch length of input data. Whenever this key is pressed, the speed rolls over in the order of HIGH, MD1, MD2, and LOW.
3) [TRIM] key
This key is used to trim the thread.
4) [END] key
This key is used to generate end data. After data input is complete, make sure to press the [END] key.
5) [WRITE] key
When the [WRITE] key is turned on (the LED lights), the sewing machine enters the write mode. When the [WRITE] key is turned off, the sewing machine exits from the write mode.
6) [DELETE] key
When the [DELETE] key is turned on (the LED lights), the sewing machine enters the delete mode. When the [DELETE] key is turned off, the sewing machine exits from the delete mode.
7) [MODIFY] key
When the [MODIFY] key is turned on (the LED lights), the sewing machine enters the modification mode. When the [MODIFY] key is turned off, the sewing machine exits from the modification mode.

8) [P/P-P] key
The linear input (P-P), point input (POIN), circular input (C P1), arc input (A P1), curve input (SOO1), and break line input (BOO1) can be selected with the [PEN IN] key.

9) [FEED] key
This key is used to input feed data.

10) [RETURN] key
When this key is pressed, feed data from the point which is last input to the home position (which is the input start point) is automatically generated. If there is second home position data in data being input, feed data until the second home position is automatically generated.

11) [STITCH CLEAR] key
This key is used to clear the number of stitches in the pattern input mode or the modification mode.

12) [CODE] key
By turning on the [CODE] key (the LED lights) and operating the [NUMERIC] keys, second home position data, halt data, or reverse rotation shaft data, etc. can be input. This key also allows data to be sent/received to/from the input unit.

13) [CORRECT] key
When the [CORRECT] key is turned on (the LED lights), the amount of correction of the home position can be set. After the correction, while the [CORRECT] key is being turned on (the LED lights), the amount of correction of the home position is enabled; while the [CORRECT] key is being turned off (the LED puts off), the amount of correction is disabled.

14) [FUNCTION] key
① If the [FUNCTION] key is turned on while the working holder stays at the mechanical home position, various functions such as the format of floppy disk, etc. can be operated.
② During teaching, this is used to select the special input function or conversion input function.

Note

With the keys which can be turned on or off ([PEN IN] key, for example), LED is lighted when the key is turned on while LED goes off if the key is turned off.

3.2 Basic Operation Method

(1) Before starting the operation

The control flow after the power switch is turned ON is as shown in the appendix chart.
The various operation modes can be selected with the control unit when the sewing machine is stopped at the needle UP position.
The basic flow of control after the power switch is turned ON is shown below.

Note

◎ : Indicates the steps controlled by the operator.
♦ : Indicates the steps, which are automatically judged and executed, or the steps of which the No., etc. is checked by the operator by means of LCD display.

◎ Set the floppy disk or P-ROM cassette.
◎ Turn on the power switch.
♦ The copyright notice appears.
♦ The automatic home position return operation takes place.
♦ The back up memory is checked. . . . . (If the memory is faulty.) . . . . . The results are displayed on the LCD display.
(If the memory is not faulty.)
♦ The setting conditions are checked . . (To change the setting conditions) . . . . . Change the setting conditions.
(To operate the sewing machine without changing the setting conditions)
♦ The sewing machine is ready to operate.
◎ Turn on the [RESET HOME] key (home position return).
◎ Turn on the work holder switch.
◎ Check the operation of the sewing machine using the [JOG +] key and [JOG −] key.
◎ Turn on the [RESET HOME] key.
◎ Turn on the work holder switch.
◎ Turn on the start switch.
♦ The sewing machine automatically works.
♦ Is the machine operating with normal revolution? . . . . (No) Message is displayed and the machine stops.
(Yes)
♦ Is it normal the detector of sewing machine? . . . . . (No) Message is displayed and the machine stops.
(Yes)
♦ Halt switch . . . . . (ON) Halt
(located on the machine head)
(OFF)
♦ Automatic sewing completes.
♦ Automatic home position return
– End

(2) Power ON, home position return, and memory check

1) Turn on the power
Check that the medium (floppy disk or P-ROM cassette) which stores the desired sewing pattern has been set and then turn on the power switch.
If both the media have been set, the data of the P-ROM cassette has a higher precedence than that of the floppy disk.

2) Copyright notice appears
After the power is turned on, the following message appears on the LCD display. It represents that the software of the sewing machine is a property of Mitsubishi Electric Corporation.

♦ The following message appears.
(case of PLK-A1710)

COPYRIGHT (C) 1993
PLK-A1710 VER.*.*

MITSUBISHI ELECTRIC
CORPORATION

Each display is incremented with an interval of about 1 second.
– End

Note: No. of software version is indicated at the position marked with *.

3) Home positioning
Using the dip switch SW 3-4, the following operation is performed. This switch has been placed in the OFF position at factory.

OFF position: While the needle is in the UP position, the sewing machine automatically performs the home position return operation. While the needle is not in the UP position, the sewing machine stops the needle in the UP position and then perform the home position return operation.

ON position : Prohibits the automatic home position return operation.
In accordance with the message which appears on the LCD display, manually operate the sewing machine using the switches to perform the home position return operation.

♦ The following message appears.

ｵｻｴﾃ ｵﾛｼﾃｸﾀﾞｻｲ
PRESS FOOT SW

◎ Turn on the work holder switch.

♦ The following message appears.

ｹﾞﾝﾃﾝ ﾌｯｷ ｼﾃｸﾀﾞｻｲ
PUSH RESET SW

◎ Turn on the [RESET HOME] key (return to home position).

– End

4) Check the memory
The control unit stores each setting condition of the operation which was conducted last time (for about one week). The control unit automatically checks the memory after it performs the home position return operation.
When the pattern data are not saved in memory, operate as instructed below.

♦ The memory is checked.
(No pattern data in memory)

♦ The following message appears.

ｻｲｾｯﾃｲ ﾏﾀﾊ ﾆｭｳﾘｮｸ
RESETTING / TEACHING

◎ Turn on the [SET] key.

Pattern number / Pattern name / Stitch number / Up counter

*** ****** 0000 0000
X100.0% Y100.0% 9999

X-scale / Y-scale / Down counter

Set the sewing conditions in accordance with 3.2 (3) Setting operation panel.

– End

If the pattern data are saved in memory, respective setting conditions of the preceding operation are displayed on the LCD display. Check the contents of the display.
When changing the contents of the setting conditions, turn on the [SET] key.

(3) Setting operation panel

After the home positioning operation is conducted the sewing conditions can be set or changed in the following manner.

- ◎ Turn on the [SET] key (the LED lamp lights).
- ♦ The pattern number LED lamp blinks.
- ◎ Set a pattern number using the [NUMERIC] keys.
  - 0 to 15 P-ROM patterns
  - 100 to 249 Floppy disk patterns
  - 300 to 339 Floppy disk registered patterns
  - 500 to 549 Floppy disk compounded patterns
- ◎ Turn on the [←┘] key. (Refer to <Additional description> a.)
- ♦ The X-SCALE LED lamp blinks.
- ◎ X-scale setting
  - Set in the range from 10 to 200%
- ◎ Turn on the [←┘] key.
- ♦ The Y-SCALE LED lamp blinks.
- ◎ Y-scale setting
  - Set in the range from 10 to 200%
- ◎ Turn on the [←┘] key.
- ♦ The DN COUNT LED lamp blinks.
- ◎ Down counter setting
  - Set in the range from 0 to 9999.
- ◎ Turn on the [←┘] key.
  - Turn UP COUNT LED lamp blinks.
- ◎ Up counter setting
  - Set in the range from 0 to 9999.
- ◎ Turn on the [←┘] key, or turn off the [SET] key. (The LED lamp puts off.)
  (Refer to <Additional description> b.)
- ♦ Read ROM or floppy disk of pattern from P-ROM or floppy disk. (LED lights.)
- ♦ The RUN LED lamp lights.
  - The sewing conditions have been set.
- ◎ Speed dial setting
  - Set in the range from 0 to 9.
- End

<Additional description>

a. Not to change the setting value, press the [←┘] key only.
   After that, the next setting item appears.

b. OFF of the [SET] key is always operative and the sewing pattern is read under the state displayed by LCD.

<Setting example>

Pattern number / Pattern name / Stitch number / Up counter

123 PATTER 0345 0000
X110.6% Y121.5% 9999

X-scale / Y-scale / Down counter

When a pattern with a name is read, the pattern name is displayed. Although the PTN-A40 or PTN-A10 input unit can input up to eight alphanumeric characters, this control unit only displays the first six characters.
The patterns stored in the P-ROM do not have their names. They are displayed in blank. Remember the pattern name cannot be input from the operation panel.
The stitch number represents the total number of stitches of the pattern being read.

(4) Operation check

After the home position return operation is executed, while the work holder is in the lower position, check the operation using the [JOG +] key and [JOG –] key.

1) While the [JOG +] key is being turned on, the XY table (work holder) moves at a constant speed in accordance with the pattern. When the [JOG +] key is turned off, the table stops in the position.
   While the [JOG –] key is turned ON, the XY table will move in the direction that the pattern returns. When turned OFF, the XY table will stop in that position.
2) When the XY table comes to the end of the pattern by continuously pressing the [JOG +] key, the work holder rises and the home position return operation takes place.
   When it comes to the start of pattern after the [JOG –] key was operated repeatedly, the work holder stops at the descended position. Return it to home position so far as there is no error in the input pattern.
   In this state, by pressing the start switch, the sewing operation can be started or by pressing the [JOG +] key, the operation can be checked.
3) While checking the operation, at the sewing portions of the pattern, the presser foot is in the lower position; at the feed portions, the presser foot is in the upper position.

(5) Raising/lowering presser foot

By turning on/off the [WIND] key (the LED lights/puts off), the presser foot can be raised/lowered. It is convenient to lower the presser foot for passing the thread. After the thread is passed, turn off the [WIND] key (the LED puts off).

> **Note**
>
> Note that if the start switch (red foot switch) is turned on while the presser foot is in the lower position, the sewing machine rotates.
> It is a good idea to move away the start switch to prevent the operation of the switch by mistake.

(6) Sewing operation

1) Before starting the sewing operation, it is necessary to check for the settings on the operation panel, particularly, for the speed dial setting.
2) Sewing speed
   The sewing speed depends on the speed dial setting and the stitch length of the pattern to be sewed. While the speed dial value determines the maximum sewing speed, the stitch length automatically limits the sewing speed.
   (Do not turn the speed dial during operation.)
3) Set the item to be sewed and turn on the work holder switch. After that, by turning on the start switch, the sewing machine rotates and starts the sewing operation.
   Once the sewing operation starts, even if the operator releases his/her foot from the start switch, the sewing machine continues the sewing operation. After the sewing machine has sewed the pattern, it stops and the work holder automatically rises.

Dial value and maximum sewing speed

Dial value	Maximum sewing speed (s/min)
9	2000
8	1820
7	1670
6	1430
5	1250
4	1000
3	800
2	600
1	400
0	200

(7) Halt

Press the halt switch (located on the machine head to stop the sewing operation midway. The sewing machine needle will stop at the needle DOWN position. By pressing the halt switch again, the thread will be trimmed and the needle will stop at the UP position. The following operation is possible when the needle is at the UP position after stopping operation midway.
The following operations are available in the halt state.

1) Resume the sewing operation using the start switch.
2) Move the XY table to the sewing start position using the [JOG +] key and [JOG –] key.
3) Raise the work holder using the work holder switch.
4) Change the sewing speed using the speed dial.
5) Raise/lower the presser foot using the [WIND] key.

(8) Resewing method

Using the halt function, the item can be resewed.
If the sewing machine is stopped during the sewing operation because the thread is cut, move the XY table to the position where the thread was cut using the [JOG –] key and restart the sewing operation using the start switch.

(9) Erroneous motion during sewing

1) Reverse turn of sewing machine

It judges automatically the direction of turns when the machine started and stops the operation with following message.
Any switches will be disabled in such occasion.

ﾐｼﾝ ｷﾞｬｸﾃﾝ
REVERSE ROTATION

Turn the power off and, after the turns of motor stopped completely (it takes about 2 minutes), change the direction of reversing plug, which is provided on the motor end cover, and back on again the power switch.

2) Error with the detector of sewing machine

When there is any error on PG signal of detector, the machine operates with high speed for a short period and the stops showing following message.
Any switches will be disabled in such occasion.

PG ﾀﾞﾝｾﾝ
SYNCHRONIZER DEFECT

Turn off the power, repair the detector and back on the power again.
Above message may appear when the machine got caught (stops at the locked state) as explained below.

3) Lock of machine

When the machine got caught by some reason, following message appears.
Any switches will be disabled at such occasion.

ﾐｼﾝ ｺｳｿｸﾁｭｳ
MACHINE WAS LOCKED

Turn off the power, remove the cause of catching and back on the power. When the machine was caught completely, the above detector error is raised.

4) Momentary power failure

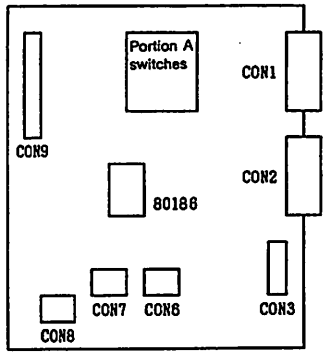
When the power supply was interrupted for a moment, following message appears and the operation stops, then any switches become inoperative.
Turn to off the power switch and back on again.

ｼｭﾝﾃｲ ﾊﾟﾜｰ ｵﾌｼﾃｸﾀﾞｻｲ
POWER OFF THEN ON

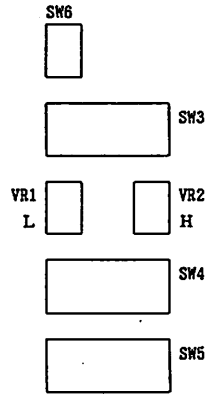
3.3 Advanced Operation

Using the dip switches on the CPU board in the control unit, the following various functions can be executed.

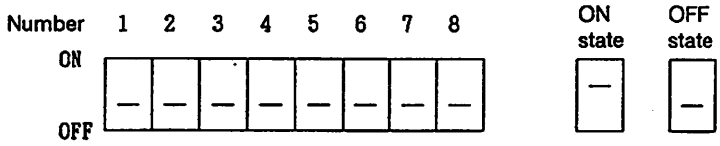
Switch positions on CPU board



Enlarged diagram of portion A



Positions of SW3, SW4 and SW5



- The switch number and ON/OFF positions are marked on the switch.
- In the following descriptions, switch numbers and positions are abbreviated as SW4-5.
- All switches have been placed in the OFF position at factory.

(1) Electric correction of home position

The home position can be mechanically moved in the unit of 0.1 mm by the home position correcting operation on the operation panel.
While the [CORRECT] key is being turned on (the LED lights), the amount of correction of the home position can be set.
After the home position is corrected, while the [CORRECT] key is being turned on (the LED lights) and the work holder being lowered, the amount of correction can be enabled. While the [CORRECT] key is being turned off (the LED puts off), the amount of correction can be disabled.
After executing the home position return operation, execute the following operation.

◎ Turn on the work holder switch.
(Following operation is prohibited when the work holder is not lowered.)
◎ Turn on the [CORRECT] key (the CORRECT LED on the display section blinks).
◆ The following message appears.

ｹﾞﾝﾃﾝﾎｾｲ(CORRECTION)
X:+ 0.0mm Y:+ 0.0mm

◎ Operate the [ARROW] keys.
Set the amount of correction using the [ARROW] keys ([NUMERIC] keys, [2], [4], [6], and [8]). The amount of correction can be varied in the unit of 0.1 mm. At the time, the XY table also moves. The maximum amount of correction for each of X and Y is 12.7 mm.

◎ Turn on the [CORRECT] key (The CORRECT LED on the display section lights).
The correction of the home position is enabled.
◆ Do you enable CORRECT? ..... (NO) ..... ◎ Turn off the [CORRECT] key (the LED puts off).
(YES)
◎ Turn on the [RESET HOME] key.
The data of amount of correction is stored (about 1 week after the power OFF) even if CORRECT was disabled.
– End

(2) Up counter, down counter

Displays a numeric value that the internal counter holds. Whenever the sewing operation is completed, the counter is incremented or decremented. The up counter and the down counter are used to count the number of items being sewed and the amount of bobbin thread, respectively.

1) For setting a numeric value of the counter, see 3.2 (3).
2) By turning on/off the [COUNTER] key, the up counter and the down counter can be switched between the enable state and the disable state. While the [COUNTER] key is being turned on (the LED lights), the counter is in the enable state.
3) The dip switch SW4-1 operates as follows. At factory, the switch has been set in the OFF position.
   ON position : The buzzer sounds and the next sewing machine operation is prohibited. By using the [COUNTER] key that follows, the sewing machine operation is resumed.
   OFF position: Counting is performed by the buzzer warning and the prohibition of next sewing machine operation are not performed.

4) [UP COUNT CLEAR] key, [DN COUNT CLEAR] key
Reset a display value of the up counter or down counter to the initial setting value. (The initial setting value of the up counter is "0000".)

(3) Repeat sewing

By turning on the dip switch SW3-1, the repeat sewing operation is executed. This switch has been placed in the OFF position at factory.
While this switch is being turned on, when the sewing operation is completed, the work holder is still in the lower position. At the time by turning on the start switch, the sewing operation can be immediately started. This function is very convenient to sew items without frequently raising and lowering the work holder such as an ornament sewing of parts.

(4) Releasing sewing area limit

By turning on the dip switch SW3-2, the sewing area limit can be released. This switch has been placed in the OFF position at factory.
When the machine home position is moved, the sewing area is proportionally narrowed. To use the entire area, turn on this switch. This function is operative only when the power switch was turned on. On or off operation of this switch must be conducted while the power switch is turned off.

(5) Using two step work holder

By turning on the dip switch SW3-3, the two step work holder can be used. The switch has been placed in the OFF position at factory. When using the two step work holder, connect the two step work holder switch. After both the work holder and the two step work holder are lowered, the sewing machine can be started. (Any of them can be lowered first.)

(6) Prohibiting automatic home position return operation

By turning on the dip switch SW3-4, the automatic home position return operation can be prohibited. This switch has been placed in the OFF position at factory. While a complicated holder is being used, employing this function prevents the holder from damaging.
For the procedure, see 3.2 (2).

(7) Prohibiting thread trimming in halt state (switch)

By turning on the dip switch SW3-5, when the sewing operation is stopped by the halt switch, the thread trimming operation can be prohibited. This switch has been placed in the OFF position at factory.
The work holder is still in the lower position.

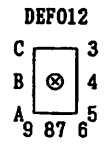
(8) Prohibiting work holder up operation in halt state (Input code) (Refer to 4.2 (2) 8))

By turning on the dip switch SW3-6, when the sewing operation is halted by halt code, the work holder up operation can be prohibited. This switch has been placed in the OFF position.
In this state, the thread trimming operation is not conducted.

(9) Adjusting fabric feed timing

By using the digital switch SW6, the fabric feed timing can be changed. This switch has been placed in the position C at factory.
The fabric feed timing can be adjusted in accordance with the position where the needle DOWN position signal of the needle position detector goes down.

SW6



If a smaller value (going closer to 0) is set, the fabric feed timing is quickened in comparison with the motion of sewing needle.

(10) Sewing machine operation using free home position

By turning the dip switch SW3-7, the sewing machine can be operated at any home position. This switch has been placed in the OFF position (mechanical home position) at factory.

The sewing operation using the free home position can be used only when the start position of the pattern is the same as that of the end position.

Contrary to the standard motion, it does not return to the mechanical home position even if the [RESET HOME] key is turned on.

When the free home position is used, it becomes automatically at the state where the sewing area limit is reset even if the sewing area limit dip switch SW3-2 is not turned on.

◎ Turn on the dip switch SW3-7.
◎ Turn on the power switch.
◎ Turn on the work holder switch.
◎ Operate the [ARROW] keys.
  Set the start position of the pattern using the [ARROW] keys ([NUMERIC] keys [2], [4], [6], and [8].)
  (At the time, the XY table also moves.)
◎ Turn on the start switch.
◆ Automatic sewing operation starts.
– End

(11) Adjusting sewing machine speed

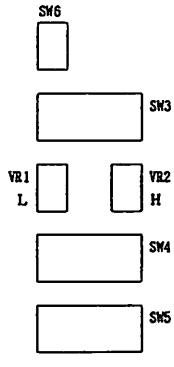
The control unit provides two independent speed control circuits. One circuit is that when the speed dial is set to "9", the maximum speed is obtained. The other circuit is that when the speed dial is set to "0", the minimum speed is obtained.

Speed corresponding the 1 to 8 of the speed dial is calculated and determined from the max. speed. By the way, the thread trimming speed is same as the lowest speed.

There are other speed adjust methods. Refer to 6.3.3 Confirmation and adjustment of sewing speed.

1) Adjusting maximum speed
   The max. speed of machine is obtained by setting the speed dial at 9 and it was operated with the stitch length data of less than the speed limit.
   In the above conditions, while operating the sewing machine, set the sewing speed to 2000 (s/min) using VR2 as shown in the following figure. To increase the speed, turn the VR2 clockwise. To decrease the speed, turn the VR2 counterclockwise.

Enlarged diagram of portion A



2) Adjusting minimum speed
   To obtain the minimum speed of the sewing machine, set the speed dial to 0 and while operating the sewing machine, set the speed to 200 (s/min) using the VR1 described above.
   To increase the speed, turn VR1 clockwise.
   To decrease the speed, turn VR1 counterclockwise.

(12) Changing the type of floppy disks

This control unit provides the read/write function with 2HD type floppy disk formatted for 1.4 MB. The same can be achieved with 2HD type floppy disk formatted for 1.0 MB if the dip switch SW3-8 is turned on.

Contact your dealer for further detail.

(13) Prohibition of thread trimming motion

If the dip switch SW4-3 is turned on, the thread trimming and wiper motion are prohibited. This switch is turned to OFF (not prohibited) at the shipment from factory.
Turn to ON also SW3-5 in order to prohibit the tread trimming and wiper motion with the halt switch.

(14) Selection of presser weight

When the special clamp, etc. are attached to the standard presser, turn on the dip switch SW4-2 in accordance with the weight of clamp. It is set to OFF at the shipment from factory. Guidelines of clamp weight are as listed below.

Clamp weight setting

Model	PLK-A05PF PLK-A0804 PLK-A1006		PLK-A1710 PLK-A1710R		PLK-A2516R PLK-A2016F PLK-A2016FL		PLK-A6030, PLK-A6019 PLK-A4516L, PLK-A4516 PLK-A3530L, PLK-A3530	
* Clamp weight (kg)	0 ~ 0.2	0.2 ~ 0.5	0 ~ 0.4	0.4 ~ 1.0	0 ~ 0.6	0.6 ~ 1.6	0 ~ 1.0	1.0 ~ 2.0
Dip switch SW4-2	OFF	ON	OFF	ON	OFF	ON	OFF	ON

* Indicates the weight in addition to the standard state at the shipment.

Note

1. Values of weight quoted in the clamp weight setting table give the guidelines. Since the actual case may contradict the table of "Clamp weight setting" depending on the holding state of sewing cloth, stitching conditions of stitching pattern, etc., it is necessary to adjust the setting based on the result of actual stitching.
2. If any item, which is more heavy than the value quoted in the table of clamp weight setting, is attached to the standard presser foot, the stitching pattern could be deformed or the presser foot and the presser could collide each other.

(15) 1 pedal specifications

If the dip switch SW4-5 is turned on, the work holder goes down and the stitching can be started once the start switch (foot switch, red) is turned on.

(16) Selection of thickness of sewing cloth

Optimum fabric feed timing for sewing cloth can be obtained by the selection of dip switch SW4-6 and SW4-7. Refer to the following table to set.

Selection of thickness of sewing cloth

	Standard	Thick 1	Thick 2	Not used
Cloth thickness	0 ~ 3 mm	3 ~ 6 mm	6 ~ 8 mm	Not used
SW4-6	OFF	ON	OFF	ON
SW4-7	OFF	OFF	ON	ON

Note

1. It is not used such setting where SW4-6 and SW4-7 are turned on simultaneously. Be sure not to select such setting.
2. Quoted cloth thickness represents the guidelines. There will be cases that the actual result may contradict the table of "Selection of thickness sewing cloth" depending on the stitching conditions such as the materials of cloth, cloth holding state, stitching pattern, etc. It is recommended to adjust the setting based on the result of actual stitching.
3. If the select switch of sewing cloth thickness and the fabric feed timing switch (digital switch SW6) are used in combination, the optimum sewing condition for sewing cloth will be obtained.

(17) Pneumatic pressure 2 stage work holder

If the pneumatic 2 stage work holder (option) is installed on the sewing machine and the dip switch SW5-2 is turned on, the pneumatic 2 stage work holder can be operated.
For further detail, refer to the instruction manual of the pneumatic 2 stage work holder.

(18) Selection of pneumatic pressure switch

Turn on dip switch SW5-3 when the pneumatic pressure switch (accessory of pneumatic 2 step switching device, air supply unit – both optional devices) is installed on the main unit.

(19) Label holder

When the label holder (option) is installed, turn on dip switch SW5-4.
For further detail, refer to the instruction manual of label holder.

3.4 Dip Switch Function Table

SW3	Name	Function when turning on SW
1	Repeat sewing	When the sewing operation is completed, the work holder is still in the lower position. To restart the sewing operation, press the start switch.
2	Sewing area limit	Releases the area limit.
3	2 step work holder	2 step work holder operation
4	Automatic home position return prohibition	Prohibits automatic home position return operation when power is turned on.
5	Thread trimming prohibition	Prohibits thread trimming operation when switch is pressed.
6	Work holder up prohibition	Prohibits work holder up operation when stop code is input.
7	Free home position	Free home position operation
8	Floppy disk selection	1.0 MB floppy disk read/write

SW4	Name	Function when turning on SW			
1	Counter mode	Prohibits sewing operation in count up state.			
2	Presser weight selection	When a heavy item is attached to the presser.			
3	Thread trimming prohibition	Thread trimming, wiper operation are fully prohibited.			
4	I/O	For general-purpose I/O use (optional)			
5	1 pedal specifications	As the start switch is turned on, the work holder goes down and the stitching starts.			
6	Selection of sewing cloth thickness	Standard	Thick 1	Thick 2	Not used
7		OFF	ON	OFF	ON
		OFF	OFF	ON	ON
8	Reserved	Do not turn on.			

SW5	Name	Function when turning on SW
1	Troubleshooting	Troubleshooting is conducted.
2	Pneumatic pressure 2 stage work holder	Controls the work holder with 2 stages by pneumatic pressure. (Option)
3	Selection of pneumatic pressure switch	Makes valid the pneumatic pressure switch signal. (Option)
4	Label holder	Label holding motion (Option)
5	Thread trimmer sensor selection	Turn ON to use the thread trimmer sensor.
6	Reserved	Do not turn on.
7	Solenoid reverse work holder	Turn ON with SW5-4 when using the solenoid reverse clamp
8	Tension upper thread catcher	Turn ON when using the tension upper thread catcher

Switches have been placed in the OFF position at the factory.

4. Teaching

4.1 Basic Function

(1) Pattern input mode

Point input	: Inputs an individual stitch which does not exceed 12.7 mm.
Linear input	: Creates data for stitch length specified by two points being input.
Circular input	: As the points on a circle are input, the data of circle, which has the stitching length specified with the linear input, is created.
Arc input	: As the start point, an optional point and the end point on an arc are input, the data of arc, which has the stitching length specified with the linear input, is created.
Curve input	: As the points of an optional curve are input, the data of smooth curve, which has the stitching length specified with the point input.
Break line input	: By inputting the point where the linear line breaks, the data is created with the stitch length designated with the linear line data.
Speed input	: Inputs one of four speed levels of HIGH, MD1, MD2, and LOW for each stitch.
Function code input	: Inputs a function code such as feed data and thread trimming data.
One stitch delete	: Deletes data which has been just input.

(2) Modification mode

Deletes, modifies, and adds stitch data for a pattern which is currently created or which has been created.

(3) Write mode

The pattern program that is created can be written into floppy disk or P-ROM.

(4) Delete mode

Deletes a pattern by specifying a pattern number of the floppy disk.

(5) Function mode

The floppy disk format, thread trimming prohibit, and alternate stitching can be set.

(6) Communication mode

Receives pattern data from the input unit PTN-A40 or PTN-A10 which is connected with the sewing machine.

Note

When the free home position is used, there are various limitations with the input and correction of patterns. Please consult for detail.

4.2 Pattern Input Mode

(1) How to enter the pattern input mode

1) Work holder is lowered after home position return
or
2)

ｾｲｾｯﾃｲ ﾏﾀﾊ ﾆｭｳﾘｮｸ
RESETTING/TEACHING

LCD display

The pattern input mode is entered when [PEN IN] key (LED lights) in the left state.

Caution
Remove the pressor foot for safer and more accurate pattern input.

- Note that the work holder will automatically lower when the pattern input mode is entered from state 2).
- To leave the pattern input mode, turn the [PEN IN] key off, and turn the [RESET HOME] key on.

Note that the needle will return to the UP position when the [PEN IN] key is turned off and the [RESET HOME] key on.

- [CANCEL] key : The last state will be returned to. If moving the work holder with the [ARROW] key, the work holder will move in the direction that the X,Y position becomes 000.0.

The flow chart to enter the pattern input mode is shown below.

100 ****** 0123:0000
X100.0% Y100.0%:9999

◎ Turn the [RESET HOME] key on.
◆ Home position return
Note: If the free home position has been set with the dip switch, the mechanical home position return is not performed. The pattern input mode cannot be entered unless the [RESET HOME] key is turned on.
◎ Turn the black foot switch on.
◆ Work holder lowers.

ﾒﾓﾘ ﾜ ｸﾘｱ ｼﾏｽｶ ▒▒
DO U CLEAR RAM 2.N▒E

◎ Turn on the [PEN IN] key.
◆ Display changes (PEN IN LED lights)
◎ Input the NUMERIC [1] or [2] keys and then turn on [⟵] key.
1: To newly input 2: To input additional pattern

Note
1. The ▒ mark in the display refers to the display corresponding to the explanation.
2. The input number is displayed in the * mark in the display.
3. The E on the right of the display refers that the [⟵] is turned on.

ｿｸﾄﾞ SPEED	LOW
ﾋﾟｯﾁ ST.LEN.	3.0E

◆ Display changes
◎ Stitching speed: The speed display will change in the following manner when the [SPEED] key is turned on. Display the required speed.

LOW → HIGH → MD1 → MD2 → LOW → HIGH ·····
(LOW) (HIGH) (MEDIUM HIGH) (MEDIUM LOW) (LOW) (HIGH)

Stitch length: Input a [NUMERIC] key and then press [⟵].

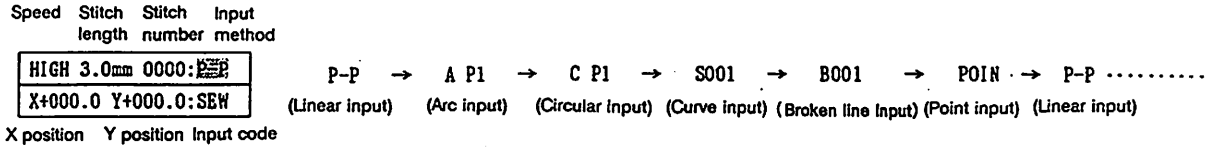
Note
The stitching speed and stitch length can be set when the X position and Y position both display 000.0 and the [SPEED] key is pressed.

HIGH 3.0mm 0000:P-P
X+000.0 Y+000.0:SEW

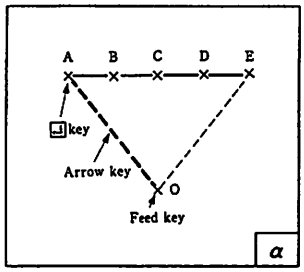
◆ Display changes

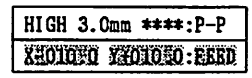
(2) Normal input method

1) Setting of input method
Input of speed, stitch length, and number of stitches
The input method display will change as shown below when the [P/P-P] key is pressed. The names of each are shown in the parentheses.



2) Point input (To input pattern by stitch)
The pattern shown on the left will be input in this example. The dotted lines in the diagram indicate the feed data.
Execute the following operation after performing "4.2 (1) How to enter the pattern input mode".



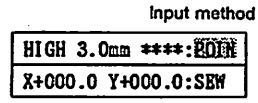


↓ This refers to the number in the diagram.

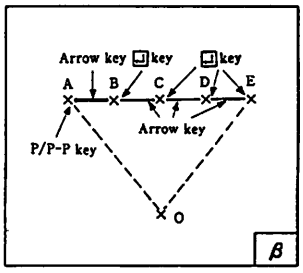
α ◎ Turn the [FEED] key on.
◆ Display changes

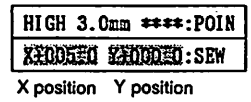
α ◎ Move the work holder to the stitching start position (A point) with the [ARROW] keys.
The amount that the work holder was moved will show in the X and Y positions.

α ◎ Press the [⟵] key.
◆ Display changes
If the input method display is not POIN, press the [P/P-P] key several times, and display POIN.

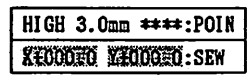


β ◎ Move the work holder to the B point with the [ARROW] keys.
The amount that the work holder was moved will show in the X and Y positions.



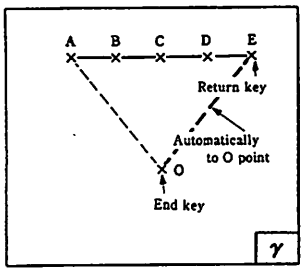


β ◎ Press the [⟵] key.
000.0 will display in the X and Y positions, and the B point will be input.
If the X or Y position is more than 12.7mm an error will display. Press the [⟵] key and then turn on the [CANCEL] key. Then input again.
Input to the E point with the [ARROW] key and the key with the same method.



γ ◎ Turn on the [RETURN] key at the E point after the E point is input.

Note
The work holder will automatically return when the [RETURN] key is turned on.
Take care if the needle is lowered.



γ ◎ Turn on the [END] key.
◆ Display changes
◎ Turn on the [RESET HOME] key.

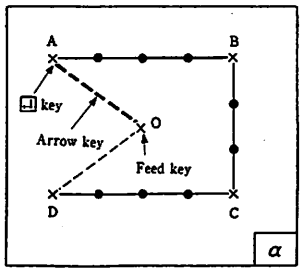
Note : The needle will rise.

- The pattern input mode is exited. (PEN IN LED goes out.)
- Turn the [JOG +] and [JOG −] keys on, and confirm the created pattern.
- Turn on the [WRITE] key, and save the data in a floppy disk.

3) Linear input (for inputting a pattern with many linear lines)

The pattern shown on the left will be input in this example.

Execute the following operation after performing "4.2 (1) How to enter the pattern input mode".



HIGH 3.0mm ****:P-P
X+010.0 Y+010.0:FEED

X position Y position Input code

α ◎ Turn the [FEED] key on.

◆ Display changes

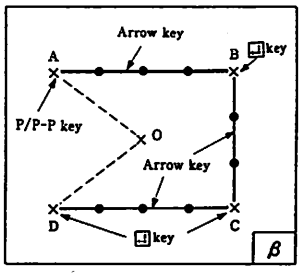
α ◎ Move the work holder to the stitching start position (A point) with the [ARROW] keys.
The amount that the work holder was moved will show in the X and Y positions.

α ◎ Press the [⟵] key.

◆ Display changes
If the input method display is not P-P, press the [P/P-P] key several times, and display P-P.

Input method

HIGH 3.0mm ****:P-P
X+000.0 Y+000.0:SEW



HIGH 3.0mm ****:P-P
X+020.0 Y+000.0:SEW

X position Y position

β ◎ Move the work holder to the B point with the [ARROW] keys.
The amount that the work holder was moved will show in the X and Y positions.

HIGH 3.0mm ****:P-P
X+020.0 Y+000.0:SEW

X position Y position

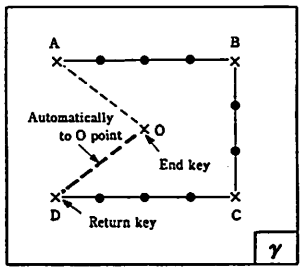
β ◎ Press the [⟵] key.
000.0 will display in the X and Y positions, and the B point will be input.

Input to the D point with the [ARROW] key and the [⟵] key with the same method.

γ ◎ Turn on the [RETURN] key at the D point after the D point is input.

Note

The work holder will automatically return when the [RETURN] key is turned on.
Take care if the needle is lowered.



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PUSH RESET SW

γ ◎ Turn on the [END] key.

◆ Display changes

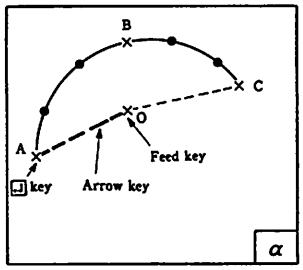
◎ Turn on the [RESET HOME] key.

Note : The needle will rise.

- The pattern input mode is exited. (PEN IN LED goes out.)
- Turn the [JOG +] and [JOG −] keys on, and confirm the created pattern.
- Turn on the [WRITE] key, and save the data in a floppy disk.

4) Arc input (to input an arc)

The pattern shown on the left will be input in this example.
Execute the following operation after performing "4.2 (1) How to enter the pattern input mode".



HIGH 3.0mm ****:P-P
X010.0 Y005.0:ERRO

X position Y position Input code

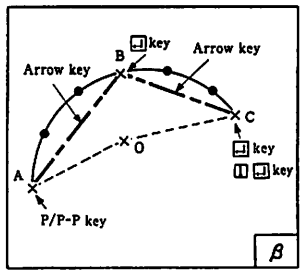
Input method

HIGH 3.0mm ****:A P1
X+000.0 Y+000.0:SEW

α ◎ Turn the [FEED] key on.
◆ Display changes

α ◎ Move the work holder to the stitching start position (A point) with the [ARROW] keys.
The amount that the work holder was moved will show in the X and Y positions.

α ◎ Press the [⟵] key.
◆ Display changes
If the input method display is not A P1, press the [P/P-P] key several times, and display A P1.



HIGH 3.0mm ****:A P1
X+013.2 Y+015.1:SEW

X position Y position

HIGH 3.0mm ****:A P2
X+000.0 Y+000.0:SEW.

X position Y position

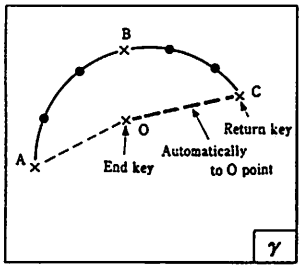
β ◎ Move the work holder to the B point with the [ARROW] keys.
The amount that the work holder was moved will show in the X and Y positions.

β ◎ Press the [⟵] key.
000.0 will display in the X and Y positions, and the B point will be input. The input method display will change to A P2.

β ◎ Move the work holder to the C point with the [ARROW] keys.
The amount that the work holder was moved will show in the X and Y positions.

β ◎ Press the [⟵] key.
000.0 will display in the X and Y positions, and the C point will be input.
◆ Display changes

β ◎ Input the NUMERIC [1] key and then press the [⟵] key.
The pattern will be calculated on the C point.
◆ Display changes



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MAKE DATA 2.NIE

HIGH 3.0mm ****:A P1
X+000.0 Y+000.0:SEW

γ ◎ Turn on the [RETURN] key at the C point after the C point is input.

Note

The work holder will automatically return when the [RETURN] key is turned on.
Take care if the needle is lowered.

ｹﾞﾝﾃﾝ ﾌｯｷ ｼﾃｸﾀﾞｻｲ
PUSH RESET SW

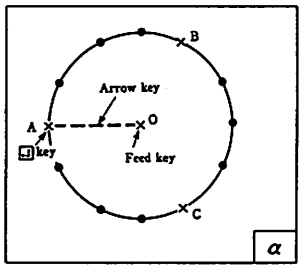
γ ◎ Turn on the [END] key.
◆ Display changes
◎ Turn on the [RESET HOME] key.

Note : The needle will rise.

- The pattern input mode is exited. (PEN IN LED goes out.)
- Turn the [JOG +] and [JOG −] keys on, and confirm the created pattern.
- Turn on the [WRITE] key, and save the data in a floppy disk.

5) Circular input (to input a circle)

The pattern shown on the left will be input in this example.
Execute the following operation after performing "4.2 (1) How to enter the pattern input mode".

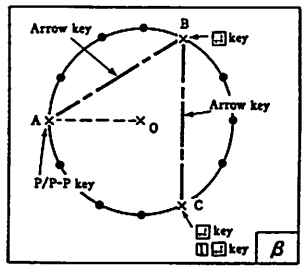


HIGH 3.0mm ****:P-P
X=0122 Y=0000:FEED

X position Y position Input code

Input method

HIGH 3.0mm ****:C P1
X+000.0 Y+000.0:SEW



HIGH 3.0mm ****:C P1
X0122 Y0000:SEW

X position Y position

Input method

HIGH 3.0mm ****:C P2
X+000.0 Y+000.0:SEW

X position Y position

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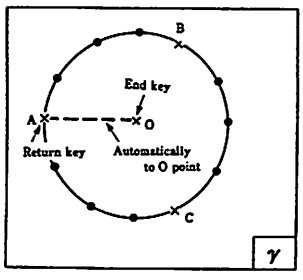
MAKE DATA 2.NEW



HIGH 3.0mm ****:END
X+000.0 Y+000.0:SEW

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PUSH RESET SW

α ◎ Turn the [FEED] key on.
◆ Display changes

α ◎ Move the work holder to the stitching start position (A point) with the [ARROW] keys.
The amount that the work holder was moved will show in the X and Y positions.

α ◎ Press the [⟵] key.
◆ Display changes
If the input method display is not C P1, press the [P/P-P] key several times, and display C P1.

β ◎ Move the work holder to the B point with the [ARROW] keys.
The amount that the work holder was moved will show in the X and Y positions.

β ◎ Press the [⟵] key.
000.0 will display in the X and Y positions, and the B point will be input. The input method display will change to C P2.

β ◎ Move the work holder to the C point with the [ARROW] keys.
The amount that the work holder was moved will show in the X and Y positions.

β ◎ Press the [⟵] key.
◆ Display changes

Note

If the NUMERIC [1] key and the [⟵] key is pressed according to the display, the work holder will automatically move from C point to B point and return to A point. Take care if the needle is lowered. The HALT switch will not function in this case.

β ◎ Input the NUMERIC [1] key and then press the [⟵] key.
◆ Display changes

γ ◎ Turn on the [RETURN] key at the A point.

Note

The work holder will automatically return when the [RETURN] key is turned on.
Take care if the needle is lowered.

γ ◎ Turn on the [END] key.
◆ Display changes
◎ Turn on the [RESET HOME] key.

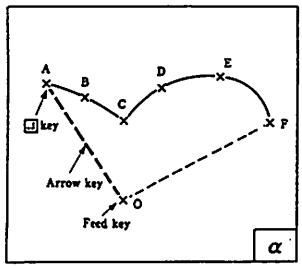
Note : The needle will rise.

- The pattern input mode is exited. (PEN IN LED goes out.)
- Turn the [JOG +] and [JOG −] keys on, and confirm the created pattern.
- Turn on the [WRITE] key, and save the data in a floppy disk.

6) Curve input (to input a free curve)

The arc shown on the left will be input in this example.

Note: The stitch length must be 0 to 10.0mm.



Execute the following operation after performing "4.2 (1) How to enter the pattern input mode".

```
HIGH 3.0mm ****:P-P
X=005.2 Y=022.5:FEED
```
X position Y position Input code

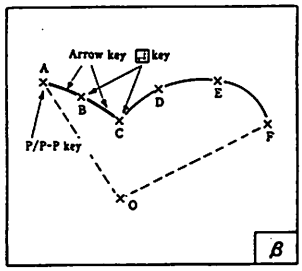
α ◎ Turn the [FEED] key on.
♦ Display changes

α ◎ Move the work holder to the stitching start position (A point) with the [ARROW] keys.
The amount that the work holder was moved will show in the X and Y positions.

α ◎ Press the [⟵] key.
♦ Display changes
If the input method display is not S001, press the [P/P-P] key several times, and display S001.

Input method

```
HIGH 3.0mm ****:S001
X+000.0 Y+000.0:SEW
```




```
HIGH 3.0mm ****:S001
X+002.2 Y-001.1:SEW
```
X position Y position

```
HIGH 3.0mm ****:S002
X+000.0 Y+000.0:SEW
```

β ◎ Move the work holder to the B point with the [ARROW] keys.
The amount that the work holder was moved will show in the X and Y positions.

β ◎ Press the [⟵] key.
000.0 will display in the X and Y positions, and the B point will be input. The input method display will change to S002.

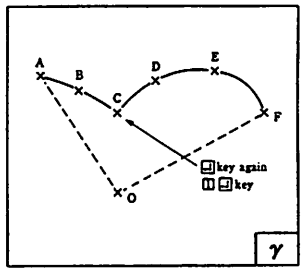
β ◎ Move the work holder to the C point with the [ARROW] keys.
The amount that the work holder was moved will show in the X and Y positions.

X position Y position

```
HIGH 3.0mm ****:S002
X+000.0 Y+000.0:SEW
```

β ◎ Press the [⟵] key.
000.0 will display in the X and Y positions, and the C point will be input. The input method display will change to S003.

γ ◎ Press the [⟵] key again at the point where the C point was input.
♦ Display changes



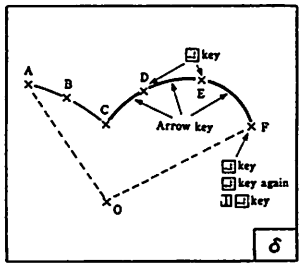

```
ﾃﾞｰﾀ ｻｸｾｲ ｼﾏｽｶ ***
MAKE DATA      2.NIE
```

γ ◎ Input the NUMERIC [1] key and then press the [⟵] key.
Input [1] and then press the [⟵] key:
Pattern is created from A point to C point.
Input [2], and then press the [⟵] key:
Display returns to previous display, and enters state after C point input.

```
ﾃﾞｰﾀ ｻｸｾｲ ﾁｭｰﾃﾞｽ
NOW DATA MAKING
```
♦ Display changes
It will take several seconds to minutes for the data to be created.

```
HIGH 3.0mm ****:S001
X+000.0 Y+000.0:SEW
```
① ♦ Display changes.
The input method display will return to the S001 display.

δ ◎ Move the work holder to the D point with the [ARROW] keys.
The amount that the work holder was moved will show in the X and Y positions.

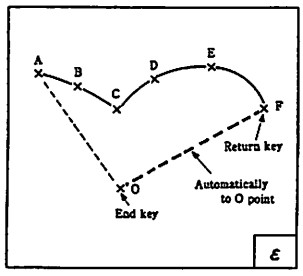



```
HIGH 3.0mm ****:S002
X+000.0 Y+000.0:SEW
```

δ ◎ Press the [⟵] key.
000.0 will display in the X and Y positions, and the D point will be input. Input points E and F in the same manner. (A max. of 63 points can be input.)

δ ◎ Press the [⟵] key again at the point where the F point was input.
♦ Display changes

```
ﾃﾞｰﾀ ｻｸｾｲ ｼﾏｽｶ ***
MAKE DATA      2.NIE
```



デ゛ータ サクセイ チュウデ゛ス
NOW DATA MAKING

HIGH 3.0mm ****:S001
X+000.0 Y+000.0:SEW

δ ◎ Input the NUMERIC [1] key, and then press the [⟵] key.
Input [1], and then press the [⟵] key:
Pattern is created from C point to F point.
Input [2], and then press the [⟵] key:
Display returns to previous display, enters state after F point input.

♦ Display changes
It will take several seconds to minutes for the data to be created.

♦ Display changes.
The input method display will return to the S001 display.

ε ◎ Turn on the [RETURN] key.

Note
The work holder will automatically return when the [RETURN] key is turned on.
Take care if the needle is lowered.

ゲ゛ンテン フッキ シテクダ゛サイ
PUSH RESET SW

ε ◎ Turn on the [END] key.

♦ Display changes

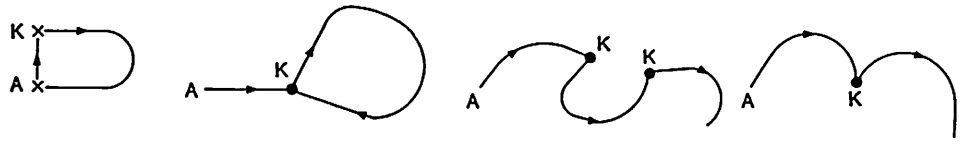
◎ Turn on the [RESET HOME] key.

Note : The needle will rise.

- The pattern input mode is exited. (PEN IN LED goes out.)
- Turn the [JOG +] and [JOG −] keys on, and confirm the created pattern.
- Turn on the [WRITE] key, and save the data in a floppy disk.

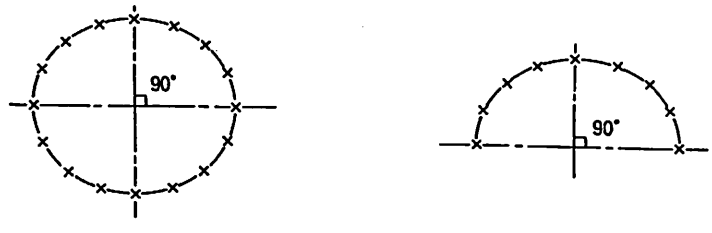
Precautions when inputting curve

① When creating data for a shape as shown below, end the curve input once at the corner (K point), and then continue with the curve input.



② When creating curve input data, a highly accurate data can be created by inputting many points on the curve.
Thus, as many points as possible should be input even if bothersome.

Example 1: To input data close to a circle or arc, input 5 points within 90°.

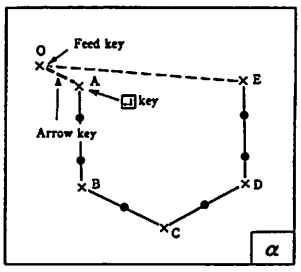


Example 2: To create a curve as shown below, input as many points as possible where the curve changes from a soft to sudden curve.

7) Broken line input (to input a pattern with many lines)

A linear pattern as shown on the left will be input in this example. Basically, the same pattern as the linear input (P-P) can be input. This input method is used with the special input function.

Execute the following operation after performing "4.2 (1) How to enter the pattern input mode".



HIGH 3.0mm ****:P-P
X+010.0 Y-002.0:FEED
X position Y position Input code

Input method

HIGH 3.0mm ****:B001
X+000.0 Y+000.0:SEW

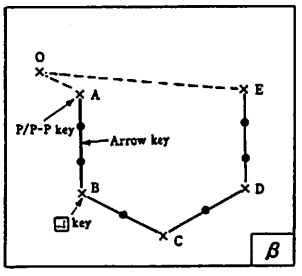
α ◎ Turn the [FEED] key on.

◆ Display changes

α ◎ Move the work holder to the stitching start position (A point) with the [ARROW] keys.
The amount that the work holder was moved will show in the X and Y positions.

α ◎ Press the [⟵] key.

◆ Display changes
If the input method display is not B001, press the [P/P-P] key several times, and display B001.



HIGH 3.0mm ****:B001
X+000.0 Y-010.0:SEW
X position Y position

HIGH 3.0mm ****:B002
X+000.0 Y+000.0:SEW
X position Y position

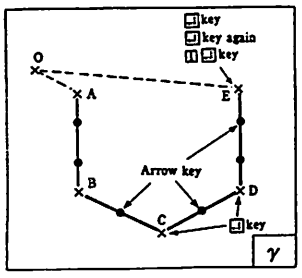
β ◎ Move the work holder to the B point with the [ARROW] keys.
The amount that the work holder was moved will show in the X and Y positions.

β ◎ Press the [⟵] key.
000.0 will display in the X and Y positions, and the B point will be input. The input method display will change to B002.

γ Input points C, D and E in the same manner.

γ ◎ Press the [⟵] key after inputting the E point.

◆ Display changes

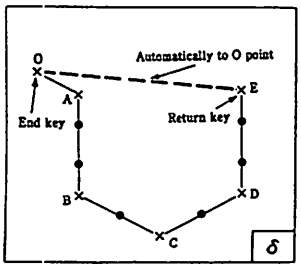


ﾃﾞｰﾀ ｻｸｾｲ ｼﾏｽｶ ?KEY
MAKE DATA 2.NIE

γ ◎ Input the NUMERIC [1] key, and then press the [⟵] key.
Input [1], and then press the [⟵] key:
Pattern is created from A point to E point.
Input [2], and then press the [⟵] key:
Display returns to previous display and enters state after E point input.

ﾃﾞｰﾀ ｻｸｾｲ ﾁｭｰﾃﾞｽ
NOW DATA MAKING

◆ Display changes
It will take several seconds to minutes to create the data.



HIGH 3.0mm ****:B001
X+000.0 Y+000.0:SEW

♦ Display changes
The input method display will change to B001.

δ ◎ Turn on the [RETURN] key.

Note
The work holder will automatically return when the [RETURN] key is turned on.
Take care if the needle is lowered.

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PUSH RESET SW

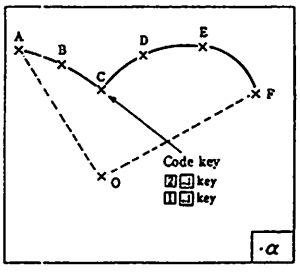
δ ◎ Turn on the [END] key.
♦ Display changes
◎ Turn on the [RESET HOME] key.

Note : The needle will rise.

- The pattern input mode is exited. (PEN IN LED goes out.)
- Turn the [JOG +] and [JOG –] keys on, and confirm the created pattern.
- Turn on the [WRITE] key, and save the data in a floppy disk.

8) Code data input method (to input code data)

A halt data will be input on the C point of the curve pattern as shown on the left. Execute the following operation at the ① position (C point input complete) in "4.2 (2) 6) Curve input".



1.TRIM 2.STOP 3.FUN1
4.2HP 5.NEXT 02E

When 5 is input and then the [⟵] key turned ON

6.BAT 7.LNK 8.END
9.FUN2 10.NEXT 00E

When 10 is input and then the [⟵] key turned ON

11.FUN3 12.FUN4
13.CODE NO. E

When 13 is input and then the [⟵] key turned ON

ｺｰﾄﾞ ﾊﾞﾝｺﾞｳ ｾｯﾃｲ
SET CODE NO. **E

α ◎ Turn on the [CODE] key.
♦ Display changes (LED flickers)

α ◎ Input the NUMERIC [2] key, and then press the [⟵] key.
2. STOP indicates halt. Refer to the following table for the other codes.

NEXT refers to moving to the next code.

Code	Function	Code	Function
TRIM	Trimming code	LNK **Note)**	Link code
STOP	Halt code	END	End code
FUN1	Function code 1	FUN2	Function code 2
2HP	No. 2 home position code	FUN3	Function code 3
NEXT	To next display	FUN4	Function code 4
BAT	Baste code	CODE NO **Note)**	Code number specification

Function code 1 is used for the reverse shaft rotation.

Note) Input with the specified LINK code and CODE NO. cannot be performed currently.
The sewing machine may operate abnormally when inputs are made with code numbers. Never input with this method.

Perform steps following ① in 4.2 (2) 6) Curve input after this.

Caution

1. Input of the code data may not be possible according to the type and place. The following message will display in this case. Turn the [⟵] key on, and input the correct value.

ｺｰﾄﾞ ﾊﾞﾝｺﾞｳ ｶﾞﾁｶﾞｲﾏｽ
ILLEGAL CODE NUMBER

2. Function codes 1 to 4 are used in the following manner.

Code	Function	Usage method
FUN1	Function code 1	Reverse shaft rotation for reverse work holder
FUN2	Function code 2	Output between No. 3 (+) and No. 4 (–) pins in the E connector.
FUN3	Function code 3	Output between the No. 9 (+) and No. 10 (–) pins in the E connector.
FUN4	Function code 4	Output between the No. 11 (+) and No. 12 (–) pins in the E connector.

Do not input codes 2, 3, and 4 will not function when the pneumatic pressure 2-step selection work holder, 2-step work holder, or solenoid reverse work holder is selected with the dip switches.
The four function code data will turn on with the odd time and off with the even time.

3. The No. 2 home position data can be input in only one place of the pattern data.

(3) 1 stitch deletion function

The last input data can be deleted during linear input or point input by pressing the [DELETE] key. By pressing the [DELETE] key several times, the pattern data will be deleted in order from the back. The XY table will also be deleted at this time, so move to the position before the data. If the last input data was linear, circular, arc, curve or broken line input, the data created last will all be deleted. However the data input with linear, circular, arc, curve or broken line input before the last input data will be deleted by stitch.

(4) Save and recall function

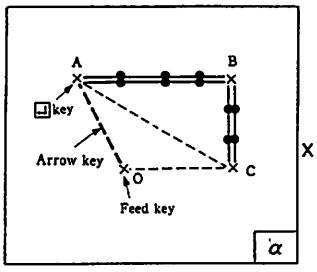
1) Save function
When writing the pattern that does not have an end data, the pattern number can be written into the save pattern 300 to 339.

2) Recall function
New pattern data can be created by calling out a pattern saved in a floppy disk during pattern input and combining it with the pattern being input. However, the feed data before stitching and the end data after stitching will be removed from the pattern called out.
The recall function is executed with the following operation:
[SET] key on → input of pattern number with [NUMERIC] keys → [SET] key on → [↵]key on.

(5) Special input function

Special pattern data such as two parallel stitching lines can be created.
The pattern input with the special input function cannot be used in point input (POIN).

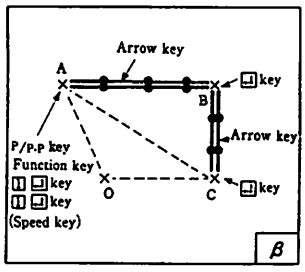
1) Overlap stitching (the same stitch is sewed twice to reinforce the stitch) Display is 1.REP.
The overlap stitching will be input using broken line input as shown on the left.
(═══ is the repeated section)
Execute the following operation after performing "4.2 (1) How to enter the pattern input mode".



HIGH 3.0mm ****:P-P
X+007.1 Y+013.2:FEED
X position Y position Input code

Input method
HIGH 3.0mm ****:B001
X+000.0 Y+000.0:SEW

α ◎ Turn the [FEED] key on.
◆ Display changes
α ◎ Move the work holder to the stitching start position (A point) with the [ARROW] keys.
The amount that the work holder was moved will show in the X and Y positions.
α ◎ Press the [↵]key.
◆ Display changes



ﾌｧﾝｸｼｮﾝ FUNCTION
2.ﾍﾝｶﾝ CONVERSION IE

β ◎ Press the [P/P-P] key several times, and display B001. (Select the actual input method: linear input: P-P, circular input: C P1, arc input: A P1, curve input: S001, broken line input: B001.)

β ◎ Turn on the [FUNCTION] key.

◆ Display changes

β ◎ Input the NUMERIC [1] key, and then the [⟵] key. [1] indicates the special input function.

Note

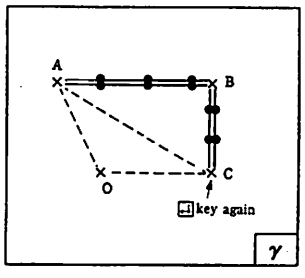
The E on the lower right of the display indicates to turn the [⟵] key on.

1.REP 2.INV 3.PARA
4.OFS 5.ZIG 6.B.T.1E

◆ Display changes

The displays have the following meanings:

1. REP : Overlap stitching
2. INV : Inverted overlap stitching
3. PARA: Parallel stitching 4. OFS: Offset stitching
5. ZIG : Zigzag stitching 6. B.T. : Back tacking



Input method

HIGH 3.0mm ****:B001
X+000.0 Y+000.0:REP

Input code

ｿｸﾄﾞ SPEED	HIGH
ﾋﾟｯﾁ ST.LEN.	3.0E

β ◎ Input the NUMERIC [1] key, and then the [⟵] key.

1. REP : overlap stitching is selected.

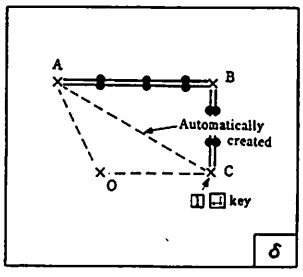
◆ Display changes

REP indicating overlap stitching is displayed on the input method section.

◎ Check that the input method section indicates B001 for broken line input.

β ◎ To change the stitching speed or stitch length, turn the [SPEED] key ON, and set each. Refer to section 4.2 (1).

β ◎ Input from A point to C point with the [ARROW] keys and the [⟵] key.
(The input method is the same as normal input. Refer to section 4.2 (2) 7).)



γ ◎ Press the [⟵] key again at the C point.

◆ Display changes

ﾃﾞｰﾀ ｻｸｾｲ ｼﾏｽｶ ENT
MAKE DATA 2.NIE

δ ◎ Input the NUMERIC [1] key, and then press the [⟵] key.
The pattern from A point to C point, feed from C point to A point, and pattern from A point to C point is created.

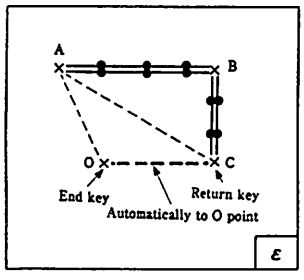
◆ Display changes

ﾃﾞｰﾀ ｻｸｾｲ ﾁｭｰﾃﾞｽ
NOW DATA MAKING

◆ Display changes

The input method display will change to B001.

HIGH 3.0mm ****:B001
X+000.0 Y+000.0:SEW



ε ◎ Turn on the [RETURN] key.

Note

The work holder will automatically return when the [RETURN] key is turned on.
Take care if the needle is lowered.

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PUSH RESET SW

ε ◎ Turn on the [END] key.

◆ Display changes

◎ Turn on the [RESET HOME] key.

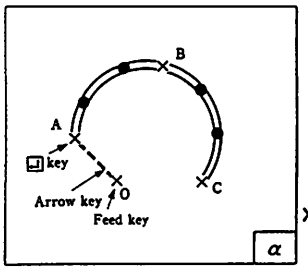
Note : The needle will rise.

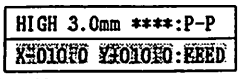
- The pattern input mode is exited. (PEN IN LED goes out.)
- Turn the [JOG +] and [JOG –] keys on, and confirm the created pattern.
- Turn on the [WRITE] key, and save the data in a floppy disk.

2) Inverted repeat stitching (the same stitch is sewed twice from the reverse direction to reinforce the stitch) Display is 2.INV.

The repeat stitching will be input using circular input as shown on the left. (═══ is the overlap section)

Execute the following operation after performing "4.2 (1) How to enter the pattern input mode".





X position Y position Input code

α ◎ Turn the [FEED] key on.

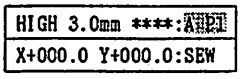
♦ Display changes

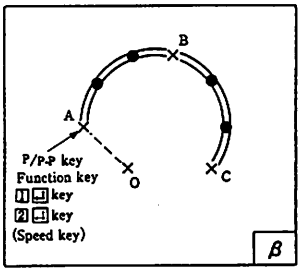
α ◎ Move the work holder to the stitching start position (A point) with the [ARROW] keys.
The amount that the work holder was moved will show in the X and Y positions.

α ◎ Press the [⏎]key.

♦ Display changes

Input method





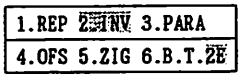
β ◎ Press the [P/P-P] key several times, and display A P1. (Select the actual input method: linear input: P-P, circular input: C P1, arc input: A P1, curve input: S001, broken line input: B001.)

β ◎ Turn on the [FUNCTION] key.

♦ Display changes

β ◎ Input the NUMERIC [1] key, and then the [⏎]key.
[1] indicates the special input function.

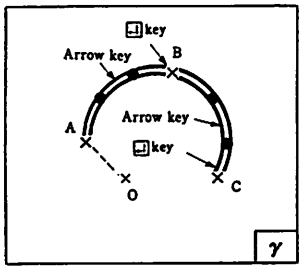
♦ Display changes



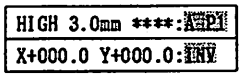
The displays have the following meanings:
1. REP : Overlap stitching
2. INV : Inverted overlap stitching
3. PARA: Parallel stitching 4. OFS: Offset stitching
5. ZIG : Zigzag stitching 6. B.T. : Back tacking

β ◎ Input the NUMERIC [2] key, and then the [⏎]key.
2. INV : inverted overlap stitching is selected.

♦ Display changes
INV indicating overlap stitching is displayed on the input method section.



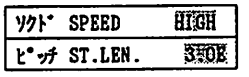
Input method



◎ Check that the input method section indicates A P1 for circular input.

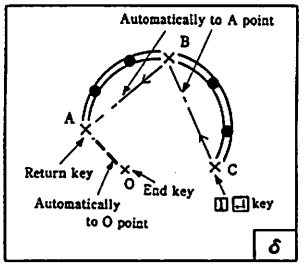
◎ To change the stitching speed or stitch length, turn the [SPEED] key ON, and set each.
Refer to section 4.2 (1).

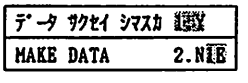
Input code



γ ◎ Input from B point to C point with the [ARROW] key and the [⏎]key.
(The input method is the same as normal input. Refer to section 4.2 (2) 4).)

♦ Display changes





γ ◎ Input the NUMERIC [1] key, and then press the [⏎]key.
Input [1], and then press the [⏎]key:
Pattern is created in order of A point, C point, A point.

Note
The work holder will automatically move from C point to A point.

Input [2], and then press the [⏎]key:
The display will return to the previous display and will wait for C point input.

ﾃﾞｰﾀ ｻｸｾｲ ﾁｭｰﾃﾞｽ
NOW DATA MAKING

♦ Display changes
It will take several seconds to minutes to create the data.

HIGH 3.0mm ****:P-P
X+000.0 Y+000.0:SEW

♦ Display changes

δ ◎ Turn on the [RETURN] key.

Note
The work holder will automatically return when the [RETURN] key is turned on.
Take care if the needle is lowered.

δ ◎ Turn on the [END] key.

ｹﾞﾝﾃﾝ ﾌｯｷ ｼﾃｸﾀﾞｻｲ
PUSH RESET SW

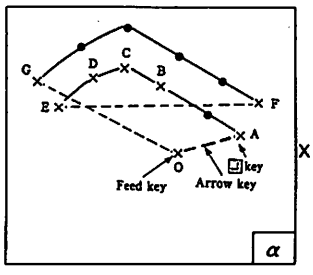
♦ Display changes

◎ Turn on the [RESET HOME] key.

Note : The needle will rise.

- The pattern input mode is exited. (PEN IN LED goes out.)
- Turn the [JOG +] and [JOG –] keys on, and confirm the created pattern.
- Turn on the [WRITE] key, and save the data in a floppy disk.

3) Parallel stitching (to stitch in parallel) Display is 3. PARA.
The parallel stitching shown on the left will be input.
Execute the following operation after performing "4.2 (1) How to enter the pattern input mode".



HIGH 3.0mm ****:P-P
X+013.2 Y+004.6:FEED

X position Y position Input code

α ◎ Turn the [FEED] key on.

♦ Display changes

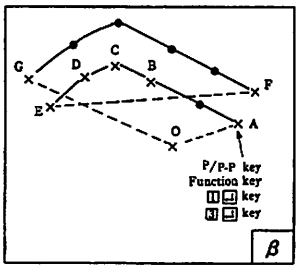
α ◎ Move the work holder to the stitching start position (A point) with the [ARROW] keys.
The amount that the work holder was moved will show in the X and Y positions.

Input method

α ◎ Press the [⟵] key.

HIGH 3.0mm ****:S001
X+000.0 Y+000.0:SEW

♦ Display changes



β ◎ Press the [P/P-P] key several times, and display S001. (Select the actual input method: linear input: P-P, circular input: C P1, arc input: A P1, curve input: S001, broken line input: B001.)

β ◎ Turn on the [FUNCTION] key.

1.ﾘﾋﾟｰﾄ FUNCTION
2.ﾍﾝｶﾝ CONVERSION

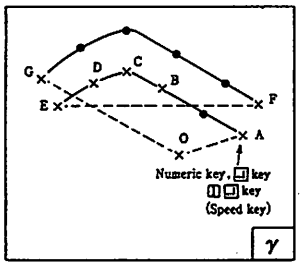
♦ Display changes

β ◎ Input the NUMERIC [1] key, and then the [⟵] key.
[1] indicates the special input function.

1.REP 2.INV 3.PARA
4.OFS 5.ZIG 6.B.T.

♦ Display changes
The displays have the following meanings:
1. REP : Overlap stitching
2. INV : Inverted overlap stitching
3. PARA: Parallel stitching 4. OFS: Offset stitching
5. ZIG : Zigzag stitching 6. B.T. : Back tacking

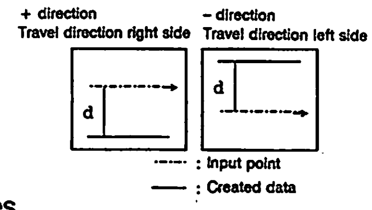
β ◎ Input the NUMERIC [3] key, and then the [⟵] key.
3. PARA: parallel stitching is selected.

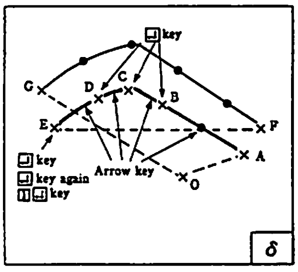


ｷｮﾘ
DISTANCE 30.0mm

♦ Display changes

γ ◎ Input a [NUMERIC] key, and then press [⟵] key.
Set the width (d) of the parallel lines shown in the next page.
The maximum width of the parallel lines is 10.0mm.






```
ホウコウ
DIRECTION      2.-
```
Input method

```
HIGH 3.0mm ****:S001
X+000.0 Y+000.0:PARA
```
Input code

```
ソクド SPEED      HIGH
ピッチ ST.LEN.
```

- ♦ Display changes

γ ◎ Input the NUMERIC [1] key, and then the [←┘] key.
Set the right side for the travel direction.

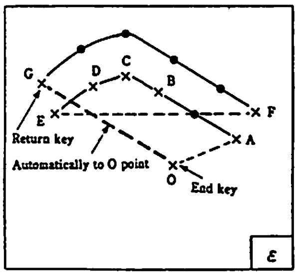
- ♦ Display changes
PARA indicating parallel stitching will display on the input code display section.

◎ Check that the input method section indicates S001 for curve input.

◎ To change the stitching speed or stitch length, turn the [SPEED] key ON, and set each.
Refer to section 4.2 (1).

δ ◎ Input from A point to E point with the [ARROW] keys and the [←┘] key.
(The input method is the same as normal input.
Refer to section 4.2 (2) 6).)

δ ◎ Press the [←┘] key again at the E point.




```
データ サクセイ シマスカ
MAKE DATA      2.NIE
```

- ♦ Display changes

δ ◎ Input the NUMERIC [1] key, and then press the [←┘] key.
Input [1], and then press the [←┘] key:
The pattern from A point to E point, feed from E point to F point, and pattern from F point to G point is created.

> **Note**
> The work holder will move automatically from E point to G point.

Input [2], and then press the [←┘] key:
The display changes to the previous display and waits for E point input.

```
データ サクセイ チューデス
NOW DATA MAKING
```

- ♦ Display changes
It will take several seconds to minutes for the data to be created.

Input method

```
HIGH 3.0mm ****:S001
X+000.0 Y+000.0:SEW
```

- ♦ Display changes
The input method display will change to S001.

ε ◎ Turn on the [RETURN] key.

> **Note**
> The work holder will automatically return when the [RETURN] key is turned on.
> Take care if the needle is lowered.

```
ゲンテン フッキ シテクダサイ
PUSH RESET SW
```

ε ◎ Turn on the [END] key.

- ♦ Display changes

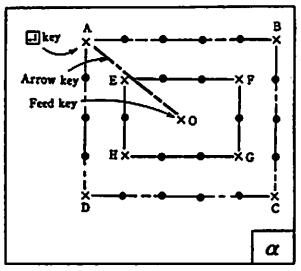
◎ Turn on the [RESET HOME] key.

> **Note :** The needle will rise.

- The pattern input mode is exited. (PEN IN LED goes out.)
- Turn the [JOG +] and [JOG −] keys on, and confirm the created pattern.
- Turn on the [WRITE] key, and save the data in a floppy disk.

4) Offset stitching (to stitch inside of label, etc.) Display is 4. OFS.

The offset stitching shown on the left will be input in the broken line input.
The input point is chain line and the created data is the full line.
Execute the following operation after performing "4.2 (1) How to enter the pattern input mode".



HIGH 3.0mm ****:P-P
X=032.6 Y=025.4:ERRD

X position Y position Input code

α ◎ Turn the [FEED] key on.
◆ Display changes

α ◎ Move the work holder to the stitching start position (A point) with the [ARROW] keys.
The amount that the work holder was moved will show in the X and Y positions.

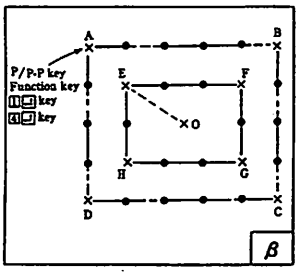
α ◎ Press the [⟵] key.

Input method

HIGH 3.0mm ****:B001
X+000.0 Y+000.0:SEW

◆ Display changes

β ◎ Press the [P/P-P] key several times, and display B001. (Select the actual input method: linear input: P-P, circular input: C P1, arc input: A P1, curve input: S001, broken line input: B001.)



β ◎ Turn on the [FUNCTION] key.

ﾌﾝｶｸ FUNCTION
2.ﾍﾝｶﾝ CONVERSION IE

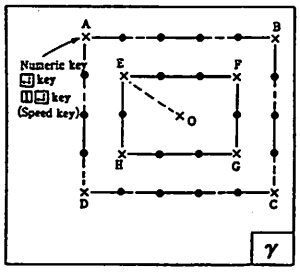
◆ Display changes

β ◎ Input the NUMERIC [1] key, and then the [⟵] key.
[1] indicates the special input function.

1.REP 2.INV 3.PARA
4.OFS 5.ZIG 6.B.T.SE

◆ Display changes
The displays have the following meanings:
1. REP : Overlap stitching
2. INV : Inverted overlap stitching
3. PARA: Parallel stitching 4. OFS: Offset stitching
5. ZIG : Zigzag stitching 6. B.T. : Back tacking

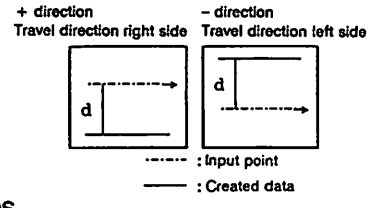
β ◎ Input the NUMERIC [4] key, and then the [⟵] key.
4. OFS : offset stitching is selected.



ｷｮﾘ
DISTANCE 5.0mmE

◆ Display changes

γ ◎ Input a [NUMERIC] key, and then press the [⟵] key.
Set the width (d) of the offset shown in the below.
The maximum width of the offset is 10.0mm.

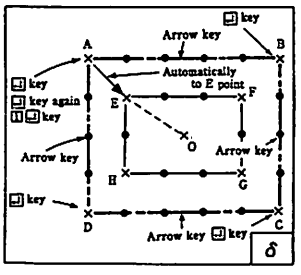


ﾎｳｺｳ
DIRECTION 2.- IE

Input method

◆ Display changes

γ ◎ Input the NUMERIC [1] key, and then the [⟵] key.
Set the right side for the travel direction.



Input method

HIGH 3.0mm ****:B001
X+000.0 Y+000.0:OFS

Input code

◆ Display changes
OFS indicating offset stitching will display on the input code display section.

◎ Check that the input method section indicates B001 for broken line input.

◎ To change the stitching speed or stitch length, turn the [SPEED] key ON, and set each. Refer to section 4.2 (1).

ｿｸﾄﾞ SPEED HIGH
ﾋﾟｯﾁ ST.LEN. 5.0E

δ ◎ Input from A point to B, C, and D points, and then A point with the [ARROW] keys and the [⟵] key.
(The input method is the same as normal input.
Refer to section 4.2 (2) 7).)

δ ◎ Press the [⟵] key again at the A point.

ﾃﾞｰﾀ ｻｸｾｲ ｼﾏｽｶ 1.Y
MAKE DATA 2.N

♦ Display changes

δ ◎ Input the NUMERIC [1] key, and then press the [↵] key.

Input [1], and then press the [↵] key:

The feed from O point to E point, pattern from E point to F, G, H points to E point is created.

> **Note**
> The work holder will move automatically from A point to E point.

Input [2], and then press the [↵] key:

The display changes to the previous display enters state after A point input.

ﾃﾞｰﾀ ｻｸｾｲ ﾁｭｰﾃﾞｽ
NOW DATA MAKING

♦ Display changes

It will take several seconds to minutes for the data to be created.

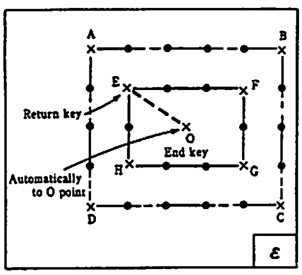
HIGH 3.0mm ****:B001
X+000.0 Y+000.0:SEW

♦ Display changes

The input method display will change to B001.

ε ◎ Turn on the [RETURN] key.

> **Note**
> The work holder will automatically return when the [RETURN] key is turned on.
> Take care if the needle is lowered.



ε ◎ Turn on the [END] key.

ｹﾞﾝﾃﾝ ﾌｯｷ ｼﾃｸﾀﾞｻｲ
PUSH RESET SW

♦ Display changes

◎ Turn on the [RESET HOME] key.

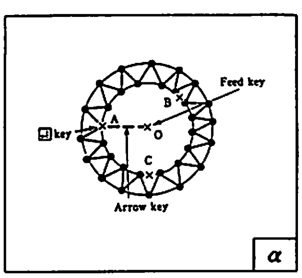
> **Note :** The needle will rise.

- The pattern input mode is exited. (PEN IN LED goes out.)
- Turn the [JOG +] and [JOG −] keys on, and confirm the created pattern.
- Turn on the [WRITE] key, and save the data in a floppy disk.

> **Note**
> When using the broken line input with offset stitching, if the distance from the input start point to input end point is 0.4mm or less after feed, the input start point and input end point will forcibly be matched. If over 0.5mm, the pattern in the above figure will not be obtained.

5) Zigzag stitching (to stitch a zigzag pattern) Display is 5. ZIG.

The zigzag stitching shown on the left will be input with circular input.
Execute the following operation after performing "4.2 (1) How to enter the pattern input mode".



HIGH 3.0mm ****:P-P
X[illegible] Y[illegible]:FEED

X position Y position Input code

α ◎ Turn the [FEED] key on.

♦ Display changes

α ◎ Move the work holder to the stitching start position (A point) with the [ARROW] keys.

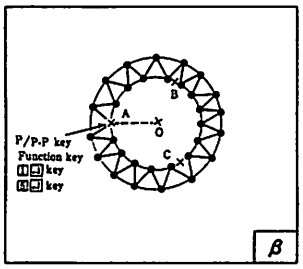
The amount that the work holder was moved will show in the X and Y positions.

Input method

HIGH 3.0mm ****:CIR1
X+000.0 Y+000.0:SEW

α ◎ Press the [↵] key.

♦ Display changes



1.FUNCTION
2.ﾍﾝｶﾝ CONVERSION

1.REP	2.INV
3.PARA	
4.OFS	5.ZIG
6.B.T.	

β ◎ Press the [P/P-P] key several times, and display C P1. (Select the actual input method: linear input: P-P, circular input: C P1, arc input: A P1, curve input: S001, broken line input: B001.)

β ◎ Turn on the [FUNCTION] key.

◆ Display changes

β ◎ Input the NUMERIC [1] key, and then the [⟵] key. [1] indicates the special input function.

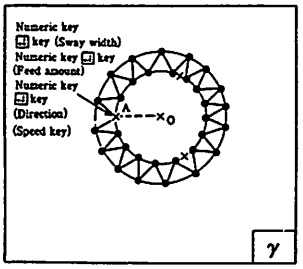
◆ Display changes

The displays have the following meanings:

1. REP : Overlap stitching
2. INV : Inverted overlap stitching
3. PARA: Parallel stitching 4. OFS: Offset stitching
5. ZIG : Zigzag stitching 6. B.T. : Back tacking

β ◎ Input the NUMERIC [5] key, and then the [⟵] key.
5. ZIG : Zigzag stitching is selected.

◆ Display changes



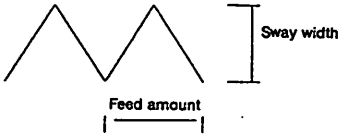
ﾌﾘﾊﾊﾞ	
WIDTH	5.0

γ ◎ Input the NUMERIC [0], [5], [0] keys, and then press the [⟵] key.
Set the width (d) of the sway.
The maximum width of the sway is 10.0mm.

◆ Display changes

ｵｸﾘ ﾘｮｳ	
PITCH	3.0

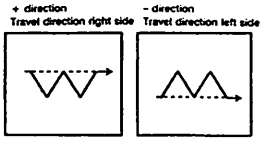
γ ◎ Input the NUMERIC [0], [3], [0] keys, and then press the [⟵] key.
Set the feed amount (0.5mm to 10.0mm)



◆ Display changes.

ﾎｳｺｳ	1.+
DIRECTION	2.-

γ ◎ Input the NUMERIC [2] key, and then the [⟵] key.
Set the direction of the zigzag.
NUMERIC [1] key, and then press the [⟵] key:
+ direction
NUMERIC [2] key, and then press the [⟵] key:
– direction



Input method

HIGH 3.0mm ****:C P1
X+000.0 Y+000.0:ZIG

◆ Display changes
ZIG indicating zigzag stitching will display on the input code display section.

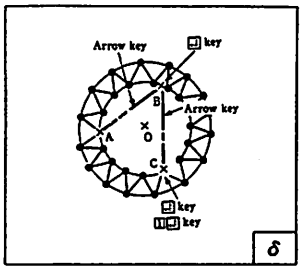
◎ Check that the input method section indicates C P1 for circular input.

◎ To change the stitching speed or stitch length, turn the [SPEED] key ON, and set each.
Refer to section 4.2 (1).

Input code

ｿｸﾄﾞ SPEED	HIGH
ﾋﾟｯﾁ ST.LEN.	3.0

δ ◎ Input B point and C point with the [ARROW] keys and the [⟵] key.
(The input method is the same as normal input.
Refer to section 4.2 (2) 5).)



ﾃﾞｰﾀ ｻｸｾｲ ｼﾏｽｶ [illegible]
MAKE DATA 2.N[illegible]

◆ Display changes

δ ◎ Input the NUMERIC [1] key, and then press the [⟵]key.
Input [1], and then press the [⟵]key:
The zigzag is created from A point to A point.
Input [2], and then press the [⟵]key:
The display changes to the previous display and waits for C point input.

ﾃﾞｰﾀ ｻｸｾｲ ﾁｭｰﾃﾞｽ
NOW DATA MAKING

◆ Display changes
It will take several seconds to minutes for the data to be created.

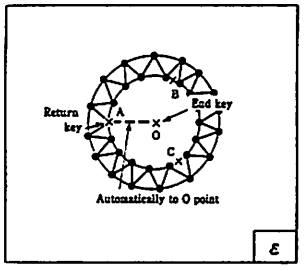
Input method

HIGH 3.0mm ****:[illegible]
X+000.0 Y+000.0:SEW

◆ Display changes
The input method display will change to C P1.

ε ◎ Turn on the [RETURN] key.

Note
The work holder will automatically return when the [RETURN] key is turned on.
Take care if the needle is lowered.



ｹﾞﾝﾃﾝ ﾌｯｷ ｼﾃｸﾀﾞｻｲ
PUSH RESET SW

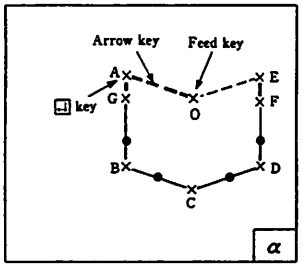
ε ◎ Turn on the [END] key.
◆ Display changes
◎ Turn on the [RESET HOME] key.

Note : The needle will rise.

- The pattern input mode is exited. (PEN IN LED goes out.)
- Turn the [JOG +] and [JOG –] keys on, and confirm the created pattern.
- Turn on the [WRITE] key, and save the data in a floppy disk.

6) Back tacking 1 (To eliminate thread from coming undone at start and end of stitching)
Display is 6. BT

The five back tack stitches shown on the left will be input in broken line input.
————: Bold line is the five V back tack stitches.
Execute the following operation after performing "4.2 (1) How to enter the pattern input mode".
- - - - -: This section is the part where the work holder is moved with the arrow keys. It is not input in the stitching pattern.



HIGH 3.0mm ****:P-P
X=015[illegible] Y=003[illegible]:[illegible]

X position Y position Input code

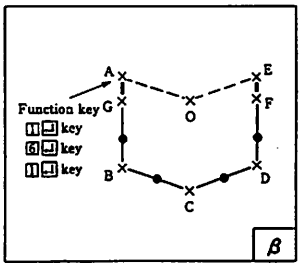
α ◎ Turn the [FEED] key on.
◆ Display changes
α ◎ Move the work holder to the A point with the [ARROW] keys.
The amount that the work holder was moved will show in the X and Y positions.

Input method

α ◎ Press the [⟵]key.
◆ Display changes

HIGH 3.0mm ****:B001
X+000.0 Y+000.0:SEW

β ◎ Press the [P/P-P] key several times, and display B001. (Select the actual input method: linear input: P-P, circular input: C P1, arc input: A P1, curve input: S001, broken line input: B001.)

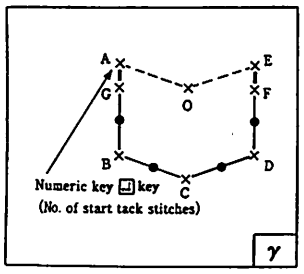


β ◎ Turn on the [FUNCTION] key.

[illegible]FUNCTION
2.ﾍﾝｶﾝ CONVERSION [illegible]

◆ Display changes

β ◎ Input the NUMERIC [1] key, and then the [⟵]key.
[1] indicates the special input function.



1.REP 2.INV 3.PARA
4.OFS 5.ZIG 6EB:B.T.

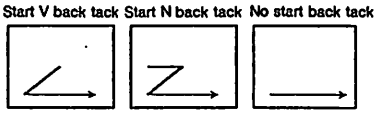
◆ Display changes
The displays have the following meanings:
1. REP : Overlap stitching
2. INV : Inverted overlap stitching
3. PARA: Parallel stitching 4. OFS: Offset stitching
5. ZIG : Zigzag stitching 6. B.T. : Back tacking

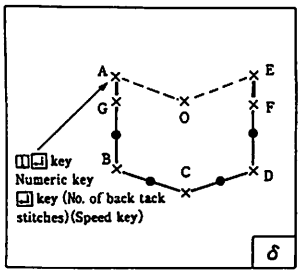
β ◎ Input the NUMERIC [6] key, and then the [⏎] key.
6. B.T. : Back tack stitching is selected.

ﾏｴﾄﾞﾒ 1.V 2.N 3.NO
START B.T. 1E

◆ Display changes

β ◎ Input the NUMERIC [1] key, and then press the [⏎] key.
1: Specifies start V back tack
2: Specifies start N back tack
3: Specifies no front back tack





ﾏｴﾄﾞﾒ ﾊﾘｶｽﾞ
STITCH NO 5E

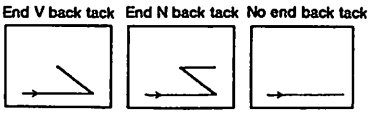
◆ Display changes

γ ◎ Input the NUMERIC [5] key, and then the [⏎] key.
Set the number of start tacking stitches.
(Specify from 1 to 9.)

ｳｼﾛﾄﾞﾒ 1.V 2.N 3.NO
END B.T. 1E

◆ Display changes

δ ◎ Input the NUMERIC [1] key, and then press the [⏎] key.
1: Specifies end V back tack
2: Specifies end N back tack
3: Specifies no end back tack



ｳｼﾛﾄﾞﾒ ﾊﾘｶｽﾞ
STITCH NO 5E

◆ Display changes

δ ◎ Input the NUMERIC [5] key, and then the [⏎] key.
Set the number of end tacking stitches.
(Specify from 1 to 9.)

Input method

HIGH 3.0mm ****:B001
X+000.0 Y+000.0:BTE

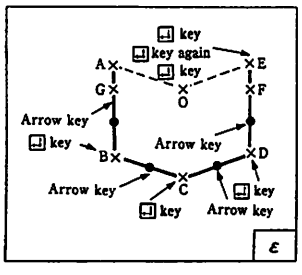
Input code

ｿｸﾄﾞ SPEED HIGH
ﾋﾟｯﾁ ST.LEN. 5.0E

◆ Display changes
BT indicating back tacking will display on the input code display section.

◎ Check that the input method section indicates B001 for broken line input.

◎ To change the stitching speed or stitch length, turn the [SPEED] key ON, and set each. Refer to section 4.1.



ε ◎ Input from A point to E point with the [ARROW] keys and the [⏎] key. (Points G and F do not need to be input.)

ε ◎ Press the [⏎] key again at the E point.

ﾃﾞｰﾀ ｻｸｾｲ ｼﾏｽｶ1:Y
MAKE DATA 2.N 1E

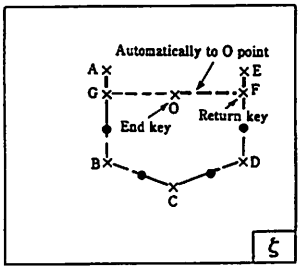
◆ Display changes

ε ◎ Input the NUMERIC [1] key, and then press the [⏎] key.
Input [1], and then press the [⏎] key:
The feed from O point to G point, back tacking at G, A, G points, stitching to G, B, C, D, F points, and back tacking at F, E, F points is created.

Note

When the [⟵] key is pressed, only the work holder will move to the end point (F point) of the stitching data for end V tacking. Take care if the needle is lowered.

ﾃﾞｰﾀ ｻｸｾｲ ﾁｭｰﾃﾞｽ
NOW DATA MAKING



Input [2], and then press the [⟵] key:
The display changes to the previous display, and will wait for E point input.

◆ Display changes
It will take several seconds to minutes for the data to be created.

HIGH 3.0mm ****:B001
X+000.0 Y+000.0:SEW

◆ Display changes
The input method display will change to B001.

ζ ◎ Turn on the [RETURN] key.

Note

The work holder will automatically return when the [RETURN] key is turned on.
Take care if the needle is lowered.

ζ ◎ Turn on the [END] key.

ｹﾞﾝﾃﾝ ﾌｯｷ ｼﾃｸﾀﾞｻｲ
PUSH RESET SW

◆ Display changes

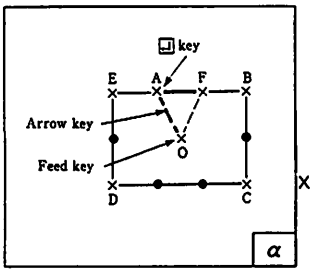
◎ Turn on the [RESET HOME] key.

Note : The needle will rise.

- The pattern input mode is exited. (PEN IN LED goes out.)
- Turn the [JOG +] and [JOG −] keys on, and confirm the created pattern.
- Turn on the [WRITE] key, and save the data in a floppy disk.

7) Back tacking 2 (To eliminate thread from coming undone at start and end of stitching with overlap stitching) Display is 6. BT

The overlap back tack stitches shown on the left will be input in break line input.
——: Bold line is the overlap back tack stitches.
Execute the following operation after performing "4.2 (1) How to enter the pattern input mode".



HIGH 3.0mm ****:P-P
X+000.0 Y+000.0:FEED

X position Y position Input code

α ◎ Turn the [FEED] key on.

◆ Display changes

α ◎ Move the work holder to the stitching start position (A point) with the [ARROW] keys.
The amount that the work holder was moved will show in the X and Y positions.

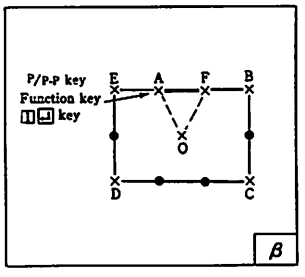
Input method

α ◎ Press the [⟵] key.

HIGH 3.0mm ****:B001
X+000.0 Y+000.0:SEW

◆ Display changes

β ◎ Press the [P/P-P] key several times, and display B001. (Select the actual input method: linear input: P-P, circular input: C P1, curve input: S001, broken line input: B001.)



β ◎ Turn on the [FUNCTION] key.

ｾｯﾃｲ=FUNCTION
2.ﾍﾝｶﾝ CONVERSION

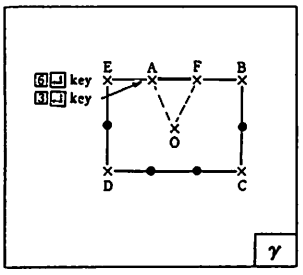
◆ Display changes

β ◎ Input the NUMERIC [1] key, and then the [⟵] key.
[1] indicates the special input function.

1.REP 2.INV 3.PARA
4.OFS 5.ZIG 6.B.T.

◆ Display changes
The displays have the following meanings:
1. REP : Overlap stitching
2. INV : Inverted overlap stitching
3. PARA: Parallel stitching 4. OFS: Offset stitching
5. ZIG : Zigzag stitching 6. B.T.: Back tacking

γ ◎ Input the NUMERIC [6] key, and then the [⟵] key.
6. B.T. : Back tack stitching is selected.



ﾏｴﾄﾞﾒ 1.V 2.N 3.NO
START B.T. 3

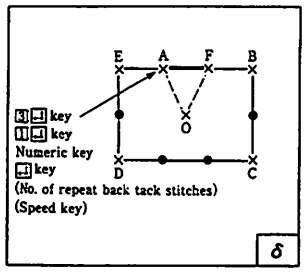
◆ Display changes

γ ◎ Input the NUMERIC [3] key, and then press the [⟵] key.
1: Specifies start V back tack
2: Specifies start N back tack
3: Specifies no front back tack

ｳｼﾛﾄﾞﾒ 1.V 2.N 3.NO
END B.T. 3

◆ Display changes

δ ◎ Input the NUMERIC [3] key, and then press the [⟵] key.
1: Specifies end V back tack
2: Specifies end N back tack
3: Specifies no end back tack

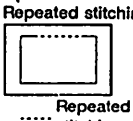


ｶｻﾈﾄﾞﾒ 1.V
REPEAT B.T. 2.N 1

◆ Display changes

δ ◎ Input the NUMERIC [1] key, and then press the [⟵] key.
1: Specifies repeated back tacking.
2: Specifies no repeated back tacking.

Repeated stitching



..... Repeated stitching part

ｶｻﾈﾄﾞﾒ ﾊﾘｶｽﾞ
REP STITCH NO 4

◆ Display changes

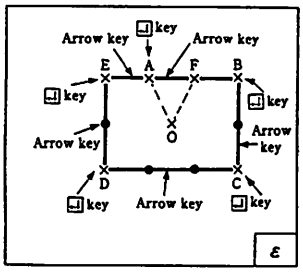
δ ◎ Input the NUMERIC [4] key, and then the [⟵] key.
Set the number of repeated back tacking stitches.
(Specify from 1 to 9.)

Input method
HIGH 3.0mm ****:B001
X+000.0 Y+000.0:BT

◆ Display changes
BT indicating back tacking will display on the input code display section.

◎ Check that the input method section indicates B001 for broken line input.

◎ To change the stitching speed or stitch length, turn the [SPEED] key ON, and set each. Refer to section 4.1.



Input code
ｿｸﾄﾞ SPEED HIGH
ﾋﾟｯﾁ ST.LEN. 3.0

ε ◎ Input from A point to B, C, D, E and A point with the [ARROW] keys and [⟵] key.

Note

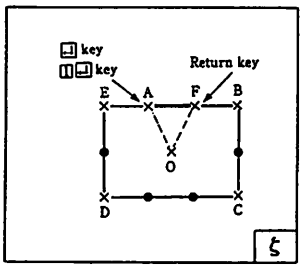
If the A point specified first and the return A point are within ±0.4mm, the two points will be judged as the same.
An error will occur if more than ±0.5mm apart.

ζ ◎ Press the [⟵] key again at the A point.

◆ Display changes

ｻｸｾｲ ｼﾏｽｶ 1.Y
MAKE DATA 2.N 1

ζ ◎ Input the NUMERIC [1] key, and then press the [⟵] key.
Input [1], and then press the [⟵] key:
The pattern from A point to F point will be created. The needle will drop at the same point during the repeated back tack from A point to F point. The work holder will move automatically from A point to F point.
Input [2], and then press the [⟵] key:
The display changes to the previous display and waits for A point input.



ﾃﾞｰﾀ ｻｸｾｲ ﾁｭｰﾃﾞｽ
NOW DATA MAKING

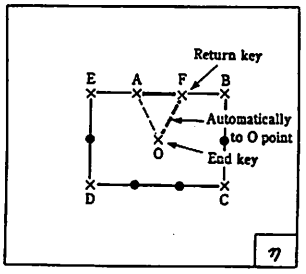
◆ Display changes
It will take several seconds to minutes for the data to be created.

HIGH 3.0mm 0000:B001
X+000.0 Y+000.0:SEW

◆ Display changes
The input method display will change to B001.

η ◎ Turn on the [RETURN] key.

Note
The work holder will automatically return when the [RETURN] key is turned on.
Take care if the needle is lowered.



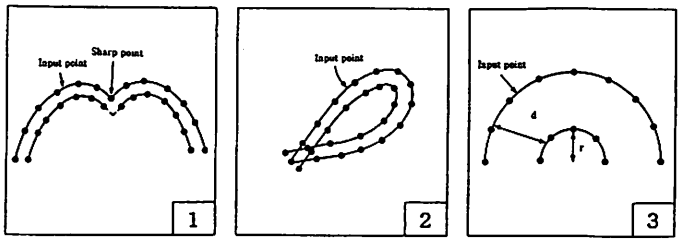
ｹﾞﾝﾃﾝ ﾌｯｷ ｼﾃｸﾀﾞｻｲ
PUSH RESET SW

η ◎ Turn on the [END] key.
◆ Display changes
◎ Turn on the [RESET HOME] key.

Note : The needle will rise.

- The pattern input mode is exited. (PEN IN LED goes out.)
- Turn the [JOG +] and [JOG –] keys on, and confirm the created pattern.
- Turn on the [WRITE] key, and save the data in a floppy disk.

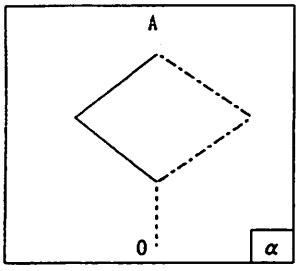
8) Precautions for special input function
Precautions for offset stitching and parallel line sewing with curve input.



The following patterns may not be able to be input. (No.1 and 2 cannot be input.)
1. When there is a non-continuous point
2. Closed pattern
3. When radius (r) is smaller than movement amount (d)
(Data may be created for method 3 by inputting the inner side.)

(6) Conversion input function

1) Mirror



A mirror form as shown on the left is input.
Input the left or right side with the linear input, and perform the following operations from A point.

1.ｷﾉｳ FUNCTION
2.ﾍﾝｹｲ CONVERSION

α ◎ Turn the [FUNCTION] key on.
◆ Display changes
α ◎ Input the NUMERIC [2] key, and then press the [←┘]key.
Select the conversion input function.

1.X 2.Y 3.XY 4.ROTA

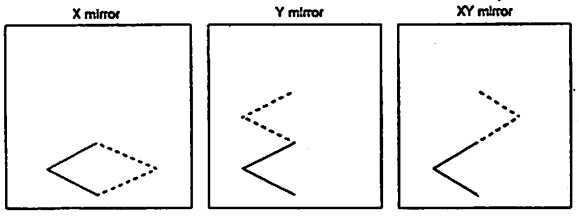
◆ Display changes
α ◎ Input the NUMERIC [1] key, and then press the [←┘]key.
1: Select X mirror
2: Select Y mirror
3: Select XY mirror

X ﾀｲｼｮｳ	1.X
X MIRROR	2.N

◆ Display changes
Confirm that the conversion function to be executed is set.
α ◎ Input the NUMERIC [1] key, and then press the [←┘]key:
X mirror is executed.

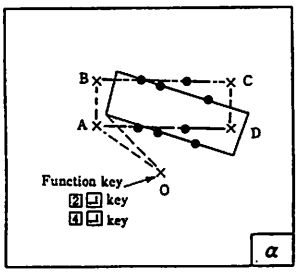
Input the NUMERIC [2] key, and then press the [⟵]key:
The display returns to the previous display.

- ◆ Display changes
- ◎ Turn on the [RESET HOME] key.
- ◎ Turn on the [JOG+] key, and confirm the created pattern.
- ◆ After execution, the display will return to the state before the [FUNCTION] key was turned on.



The X mirror, Y mirror, and XY mirror will create the stitching patterns shown with the dotted lines in the figures.

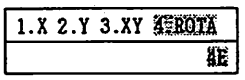
2) Rotation (To rotate to match the pattern to the work holder)
The dotted line pattern shown in the left is converted into the full line.



α ◎ Turn the [FUNCTION] key on.

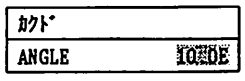
- ◆ Display changes

α ◎ Input the NUMERIC [2] key, and then press the [⟵]key.
Select the conversion input function.



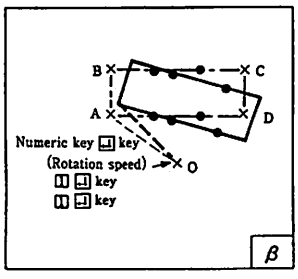
- ◆ Display changes

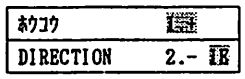
α ◎ Input the NUMERIC [4] key, and then press the [⟵]key.
4: Select rotation.



- ◆ Display changes

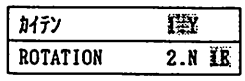
β ◎ Press [1], [0], [0], and then turn on the [⟵]key.
The rotation angle is set. (Set between 0 to 90.)





- ◆ Display changes

β ◎ Input the NUMERIC [1] key, and then press the [⟵]key: Set + direction rotation (right turn)
Input the NUMERIC [2] key, and then press the [⟵]key: Set – direction rotation (left turn)



- ◆ Display changes

β ◎ Input the NUMERIC [1] key, and then press the [⟵]key: Rotation is executed.
Input the NUMERIC [2] key, and then press the [⟵]key: Display returns to previous display.

- ◆ Display changes
- ◎ Turn on the [RESET HOME] key.
- ◎ Turn on the [JOG+] key, and confirm the created pattern.
- ◆ After execution, the display will return to the state before the [FUNCTION] key was turned on.

4.3 Modification Mode

(1) Main functions of modification mode

- Modification of pattern (Display: 1. STITCH)
  - Block modification (Display: 1. BLOK) : Indicate the two points to be modified and modify with broken line, circular, arc or linear input.
  - Feed modification (Display: 2. FEED) : Indicate stitching start point and move to stitching start point.
  - 1 stitch delete (Display: 3. DEL1) : The specified stitch is deleted.
  - Delete all stitches after specified stitch (Display: 4. DEL2) : All data after specified stitch is deleted.
  - 1 stitch addition (Display: 5. AD1) : 1 stitch is added to specified stitch.
  - Same 1 stitch addition (Display: 6 AD2): One stitch is added to same stitch as specified.

- Stitching speed modification (Display: 2. SPEED)
  - Modification of speed for all stitches (Display: 1: ALL) : Speed is changed for all stitches after specified stitch.
  - Modification of speed for N stitches (Display: 2. N STITCH): Speed is changed for N stitches after specified stitch.

- Code data modification (Display: 3. CODE)
  - Code data deletion (Display: 1. CODE DEL) : Code data for specified stitch is deleted.
  - Code data addition (Display: 1. CODE ADD) : Code data is added to specified stitch.

(2) How to enter modification mode

- The modification mode is entered by pressing the [MODIFY] key (LED lights) when the work holder is lowered after home return.
- The modification mode can be entered by pressing the [MODIFY] key (LED lights) when the X position and Y position are 000.0 in the pattern input mode.
- Turn the [MODIFY] key off to leave the modify mode.

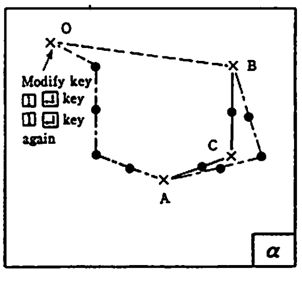
Note that the needle will return to the up position when the [RESET HOME] key is pressed after turning the [MODIFY] key off.

- [CANCEL] key: The last state will be returned to. If moving the work holder with the [ARROW] key, the work holder will move in the direction that the X,Y position becomes 000.0.

(3) Block modification 1 (To modify a set range of the input pattern with broken line.)

The display is 1. STITCH → 1. BLOCK

The chain line pattern will be modified to a continuous line as shown on the left. Execute the following procedure when the work holder is lowered after home return or when the following is indicated for during pattern input.




```
*  **.*mm ****:****
X000.0 Y000.0:****
```

* is an arbitrary value.

α ◎ Turn the [MODIFY] key on.

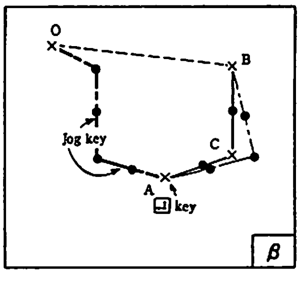
◆ Display changes (MODIFY LED lights)

```
1.STITCH 2.SPEED
3.CODE
```

α ◎ Input the NUMERIC [1] key, and then press the [↵] key.

1. Modification of pattern
2. Modification of stitching speed
3. Modification of code data

◆ Display changes




```
1.BLOCK 2.FEED 3.DEL1
4.DEL2 5.AD1 6.AD2
```

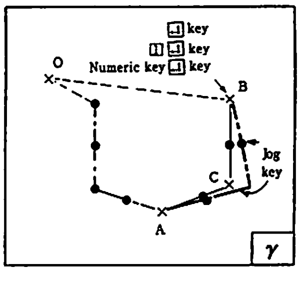
α ◎ Input the NUMERIC [1] key, and then press the [↵] key.

1. BLOCK: Block modification
2: FEED: Feed modification
3. DEL1 : Delete 1 stitch
4. DEL2 : Delete all stitches following specified stitch
5. AD1 : Add 1 stitch   6. AD2: Add same stitch

```
ｶｲｼﾃﾝ        X000.0
START POINT  Y000.0
```

◆ Display changes

β ◎ Move the work holder to A point with [JOG +] and [JOG −], and then press the [↵] key.
Specify the modification start point.




```
ｼｭｳﾘｮｳﾃﾝ      X000.0
END POINT    Y000.0
```

◆ Display changes

γ ◎ Move the work holder to B point with [JOG +] and [JOG −], and then press the [↵] key.
Specify the modification end point.

```
1.LINE 2.ARC 3.CURVE
4.P-P
```

◆ Display changes

γ ◎ Input the NUMERIC [1] key, and then press the [↵] key.

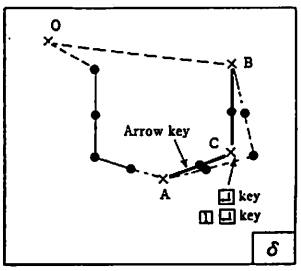
1. LINE : Broken line modification
2. ARC : Arc modification

3. CURVE: Curve modification
4. P-P : Linear modification

Note

The work holder will automatically move to A point when the [←┘] key is turned on.
Take care when the needle is lowered.

ﾋﾟｯﾁ
STITCH LEN 3.0
- ♦ Display changes
- γ ◎ Input the NUMERIC [3], [0] keys, and then press the [←┘] key. Set the stitch length.



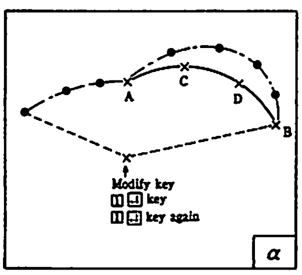
3.0mm :B001
X+010 0Y+001
- ♦ Display changes
- δ ◎ Move the work holder to C point with the [ARROW] keys.
- δ ◎ Press the [←┘] key.

ﾃﾞｰﾀ ｻｸｾｲ ｼﾏｽｶ
MAKE DATA 2.N 1E
- ♦ Display changes
- δ ◎ Input the NUMERIC [1] key, and then press the [←┘] key.
  Input the [1] key, and then press the [←┘] key:
    Pattern is created to B point while passing A point to C point.
  Input the [2] key, and then press the [←┘] key:
    Display returns to previous display, and waits for C point input.

ﾃﾞｰﾀ ｻｸｾｲ ﾁｭｰﾃﾞｽ
NOW DATA MAKING
- ♦ Display changes
  It will take several seconds to minutes to create the data.

1.STITCH 2.SPEED
3.CODE 1E
- ♦ Display changes
  After calculating the curve modification, the left display will appear and corrections can be continued.

(4) Block modification 2 (To modify a set range of the input pattern with curve.)
The display is 1. STITCH → 1. BLOK

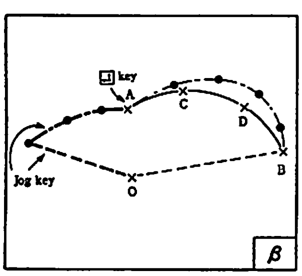


The chain line pattern will be modified to a continuous line (A, C, D, B points) as shown on the left.
Execute the following procedure when the work holder is lowered after home return or when the following is indicated for during pattern input.

* **.*mm ****:****
X±000±0 Y±000±0:****
* is an arbitrary value.
- α ◎ Turn the [MODIFY] key on.

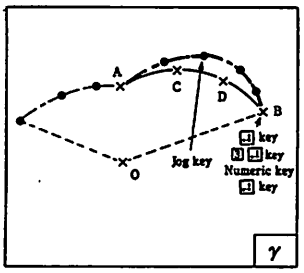
1.STITCH 2.SPEED
3.CODE 1E
- ♦ Display changes (MODIFY LED lights)
- α ◎ Input the NUMERIC [1] key, and then press the [←┘] key.
    1. Modification of pattern
    2. Modification of stitching speed
    3. Modification of code data

1.BLOK 2.FEED 3.DEL1
4.DEL2 5.AD1 6.AD2 1E
- ♦ Display changes
- α ◎ Input the NUMERIC [1] key, and then press the [←┘] key.
  1. BLOK: Block modification
  2: FEED: Feed modification
  3. DEL1 : Delete 1 stitch
  4. DEL2 : Delete all stitches following specified stitch
  5. AD1 : Add 1 stitch 6. AD2: Add same stitch



ｶｲｼﾃﾝ
START POINT
- ♦ Display changes
- β ◎ Move the work holder to A point with [JOG +] and [JOG –], and then press the [←┘] key.
  Specify the modification start point.

ｼｭｳﾘｮｳﾃﾝ
END POINT
- ♦ Display changes
- γ ◎ Move the work holder to B point with [JOG +] and [JOG –], and then press the [←┘] key.
  Specify the modification end point.



γ

1.LINE 2.ARC 3.CURVE
4.P-P 0E

♦ Display changes

γ ◎ Input the NUMERIC [3] key, and then press the [⟵] key.

1. LINE : Break line modification
2. ARC : Arc modification
3. CURVE: Curve modification
4. P-P : Linear modification

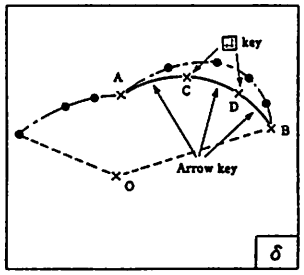
Note

The work holder will automatically move to A point when the [⟵] key is turned on.
Take care when the needle is lowered.

ﾋﾟｯﾁ
STITCH LEN. 3.0E

♦ Display changes

γ ◎ Input the NUMERIC [3], [0] keys, and then press the [⟵] key.
Set the stitch length.



δ

3.0mm :S001
X+010.5Y+001.3

♦ Display changes

δ ◎ Move the work holder to C point with the [ARROW] keys, and then press the [⟵] key.

δ ◎ Press the [⟵] key.

X position Y position

3.0mm :S002
X+000.0Y+000.0

♦ Display changes
(X, Y positions will display 000.0mm)

δ ◎ Move the work holder to D point with the [ARROW] keys.

δ ◎ Press the [⟵] key.

ε ◎ Press the [⟵] key again.

X position Y position

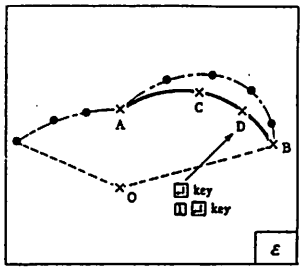
ﾃﾞｰﾀ ｻｸｾｲ ｼﾏｽｶﾗ Y
MAKE DATA 2.N 1E

♦ Display changes

ε ◎ Input the NUMERIC [1] key, and then press the [⟵] key.

Input [1], and then press the [⟵] key:
Pattern is automatically created from A point to C, D, B points, and work holder returns to A point.

Input [2], and then press the [⟵] key:
Display returns to previous display, enters state after D point input.



ε

ﾃﾞｰﾀ ｻｸｾｲ ﾁｭｰﾃﾞｽ
NOW DATA MAKING

♦ Display changes
It will take several seconds to minutes to create the data.

1.STITCH 2.SPEED
3.CODE 1E

♦ Display changes
After calculating the curve modification, the left display will appear and corrections can be continued.

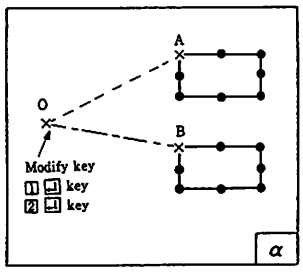
Note

1. When arc modification (2. ARC) is selected in the block modification, the arc will be modified by specifying only one point.
2. When linear modification (4. P-P) is selected in the block modification, a modification to link the modification start point to end point with a linear line can be performed.
3. Note that if code data is included in the block to be modified, the code data will be deleted.
4. Block modification of the feed is not possible.
5. The code data place for the start point or the code data (excluding thread trimming code) for the end point of block modification cannot be specified. An error will display in this case. Press the [⟵] key, and input the correct points.

(5) Feed modification (To change the start point of the input pattern data)
The display is 1. STITCH → 2. FEED

The dashed line feed data on the left figure is modified to chain line feed data. (The stitches will not change)

Execute the following procedure when the work holder is lowered after home return or when the following is indicated for during pattern input.



* **.*mm ****:****	
X±000.0 Y±000.0:****	

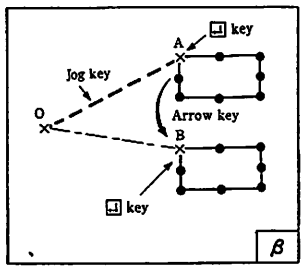
* is an arbitrary value.

1.STITCH 2.SPEED	
3.CODE	1E

α ◎ Turn the [MODIFY] key on.

◆ Display changes (MODIFY LED lights)

α ◎ Input the NUMERIC [1] key, and then press the [⟵]key.
1. Modification of pattern
2. Modification of stitching speed
3. Modification of code data



1.BLOK 2.FEED 3.DEL1	
4.DEL2 5.AD1 6.AD2	2E

◆ Display changes

α ◎ Input the NUMERIC [2] key, and then press the [⟵]key.
1. BLOK: Block modification
2: FEED: Feed modification
3. DEL1 : Delete 1 stitch
4. DEL2 : Delete all stitches following specified stitch
5. AD1 : Add 1 stitch 6. AD2: Add same stitch

Stitch number

ﾇｲﾊｼﾞﾒ ﾃﾝ	****
JOG+	SEW E

◆ Display changes

β ◎ Move the work holder to the start point of the feed to be modified (A point) with [JOG +] and [JOG −], and then press the [⟵]key.

Note

When changing the stitching start point, turn the [⟵]key on when the first "SEW" is displayed when the display changes from "FEED" to "SEW".

ﾇｲﾊｼﾞﾒ ﾃﾝ X ***.*	
START POIN Y ***.*	E

◆ Display changes

β ◎ Move the work holder to the end point of the feed to be modified (B point) with the [ARROW] keys, and then press the [⟵]key.

1.STITCH 2.SPEED	
3.CODE	1E

◆ Display changes
After correcting the feed the left display will appear and corrections can be continued.

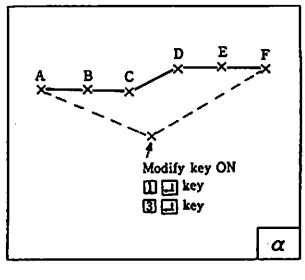
Note

If the end data is at the O point, the feed data will be recreated between B point and O point. Note that if there is code data in the feed data before modification, the feed following the code data will be modified.

(6) Delete one stitch (Delete one stitch from input pattern) The display is 1. STITCH → 3. DEL1

The pattern between the C point and D point is deleted as shown on the left.

Execute the following procedure when the work holder is lowered after home return or when the following is indicated for during pattern input.



* **.*mm ****:****	
X±000.0 Y±000.0:****	

* is an arbitrary value.

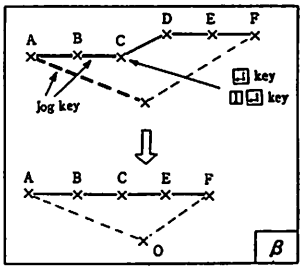
1.STITCH 2.SPEED	
3.CODE	1E

α ◎ Turn the [MODIFY] key on.

◆ Display changes (MODIFY LED lights)

α ◎ Input the NUMERIC [1] key, and then press the [⟵]key.
1. Modification of pattern
2. Modification of stitching speed
3. Modification of code data

◆ Display changes



1.BLOK 2.FEED 3.DEL1
4.DEL2 5.AD1 6.AD23E

α ◎ Input the NUMERIC [3] key, and then press the [⟵]key.
1. BLOK: Block modification
2: FEED: Feed modification
3. DEL1 : Delete 1 stitch
4. DEL2 : Delete all stitches following specified stitch
5. AD1 : Add 1 stitch 6. AD2: Add same stitch

1 シン サクジョ 2.FEED
DEL 1 STITCH JOG+ E

◆ Display changes

β ◎ Move the work holder to C point to be modified with [JOG +] and [JOG −], and then press the[⟵]key.

1 シン サクジョ 3.DEL1
DEL 1 STITCH 2.N E

◆ Display changes

β ◎ Input the NUMERIC [1] key, and then press the [⟵]key: One stitch is deleted.
Input the NUMERIC [2] key, and then press the [⟵]key: Returns to previous display.

1.STITCH 2.SPEED
3.CODE 1E

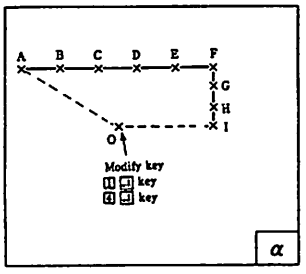
◆ Display changes
After deleting the specified stitch, the left display appears, and corrections can be continued.

Note

If there is end data at the O point, the number of stitches deleted may not be one stitch to allow the feed data between F point to O point to be recreated.

(7) Delete all stitches (Delete all stitches after specified stitch from input pattern)
The display is 1. STITCH → 3. DEL2

The continuous line pattern after F point is deleted as shown on the left.
Execute the following procedure when the work holder is lowered after home return or when the following is indicated for during pattern input.



* **.*mm ****:****
X±0000 Y±0000:****

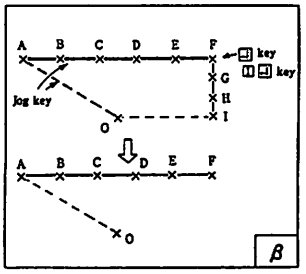
* is an arbitrary value.

1.STITCH 2.SPEED
3.CODE 1E

α ◎ Turn the [MODIFY] key on.

◆ Display changes (MODIFY LED lights)

α ◎ Input the NUMERIC [1] key, and then press the [⟵]key.
1. Modification of pattern
2. Modification of stitching speed
3. Modification of code data



1.BLOK 2.FEED 3.DEL1
4.DEL2 5.AD1 6.AD24E

◆ Display changes

α ◎ Input the NUMERIC [4] key, and then press the [⟵]key.
1. BLOK: Block modification
2: FEED: Feed modification
3. DEL1 : Delete 1 stitch
4. DEL2 : Delete all stitches following specified stitch
5. AD1 : Add 1 stitch 6. AD2: Add same stitch

シテイシン サクジョ 2.FEED
DEL ALL STI JOG+ E

◆ Display changes

β ◎ Move the work holder to F point to be modified with [JOG +] and [JOG −], and then press the[⟵]key.

シテイシン イコウサクジョ 3.DEL1
DEL ALL STI 2.N E

◆ Display changes

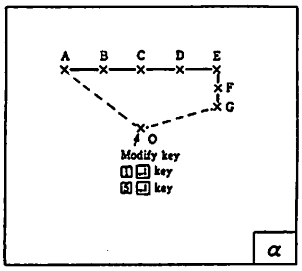
β ◎ Input the NUMERIC [1] key, and then press the [⟵]key:
All stitches after specified stitch are removed.
Input the NUMERIC [2] key, and then press the [⟵]key: Returns to previous display.

1.STITCH 2.SPEED
3.CODE 1E

◆ Display changes
After deleting all stitches, the left display appears, and corrections can be continued.

(8) One stitch addition (Add one stitch of desired stitch length to input pattern)
The display is 1. STITCH → 5. AD1

A stitch of the desired stitch length is added to the pattern as shown on the left.
The maximum length is 12.7mm.
Execute the following procedure when the work holder is lowered after home return or when the following is indicated for during pattern input.



* **.*mm ****:****
X±000±0 Y±000±0:****

* is an arbitrary value.

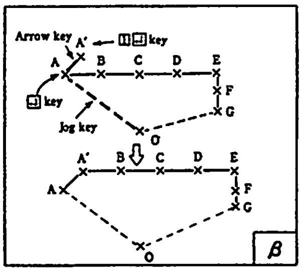
◎ Turn the [MODIFY] key on.

◆ Display changes (MODIFY LED lights)

1.STITCH 2.SPEED
3.CODE 1E

◎ Input the NUMERIC [1] key, and then press the [↵] key.

1. Modification of pattern
2. Modification of stitching speed
3. Modification of code data



1.BLOK 2.FEED 3.DEL1
4.DEL2 5.AD1 6.AD25E

◆ Display changes

◎ Input the NUMERIC [5] key, and then press the [↵] key.

1. BLOK: Block modification
2: FEED: Feed modification
3. DEL1 : Delete 1 stitch
4. DEL2 : Delete all stitches following specified stitch
5. AD1 : Add 1 stitch 6. AD2: Add same stitch

1ｼﾝ ﾂｲｶ ｽﾝﾄﾞｳ±
ADD 1STITCH JOG± E

◆ Display changes

◎ Move the work holder to A point to be modified with [JOG +] and [JOG −], and then press the [↵] key.

1ｼﾝ ﾂｲｶ X **.*
ADD 1STITCH Y **.* E

◆ Display changes

◎ Move work holder to A' point with the [ARROW] keys, input the NUMERIC [1] key, and then press the [↵] key.

Input [1], and then press the [↵] key:
One stitch is added and work holder returns to A point.

Input [2], and then press the [↵] key:
Returns to previous display.

1.STITCH 2.SPEED
3.CODE 1E

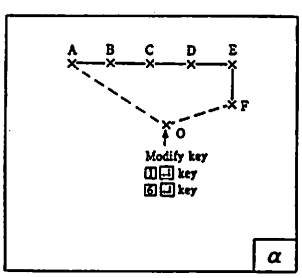
◆ Display changes
After adding the stitch, the left display appears, and corrections can be continued.

Note

If there is end data at the O point, the number of stitches added may not be one stitch to allow the feed data between B point to O point to be recreated.

(9) Same stitch addition (Add same stitch to input pattern) The display is 1. STITCH → 6. AD2

The A' point that is the same stitch length as A point is added to the A point in the pattern as shown on the left.
Execute the following procedure when the work holder is lowered after home return or when the following is indicated for during pattern input.



* **.*mm ****:****
X±000±0 Y±000±0:****

* is an arbitrary value.

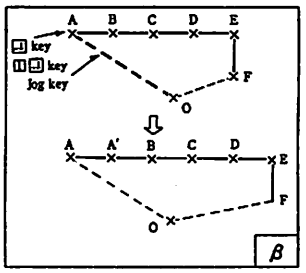
◎ Turn the [MODIFY] key on.

◆ Display changes (MODIFY LED lights)

1.STITCH 2.SPEED
3.CODE 1E

◎ Input the NUMERIC [1] key, and then press the [↵] key.

1. Modification of pattern
2. Modification of stitching speed
3. Modification of code data



1.BLOK 2.FEED 3.DEL1
4.DEL2 5.AD1 6=AD2

♦ Display changes

α ◎ Input the NUMERIC [6] key, and then press the [⟵]key.
1. BLOK: Block modification
2: FEED: Feed modification
3. DEL1 : Delete 1 stitch
4. DEL2 : Delete all stitches following specified stitch
5. AD1 : Add 1 stitch 6. AD2: Add same stitch

ﾄﾞｳｲｳｼﾝ ﾂｲｶ
ADD SAME STI

♦ Display changes

β ◎ Move the work holder to A point to be modified with [JOG +] and [JOG -], and then press the[⟵]key.

ﾄﾞｳｲｳｼﾝ ﾂｲｶ
ADD SAME STI 2:N

♦ Display changes

β ◎ Input the NUMERIC [1] key, and then press the [⟵]key: The same stitch is added.
Input the NUMERIC [2] key, and then press the [⟵]key: Returns to previous display.

1.STITCH 2.SPEED
3.CODE

♦ Display changes
After adding the same stitch, the left display appears, and corrections can be continued.

Note

If there is end data at the O point, the number of stitches added may not be one stitch to allow the feed data between B point to O point to be recreated.

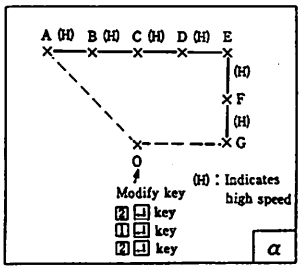
(10) Stitching speed modification 1

(To change the stitching speed for all stitches after specified stitch in pattern)

The display is 2. SPEED - 1. ALL

The stitching speed for all stitches following the stitch (A point) specified in the stitching pattern as shown on the left will change from high to medium high speed.

Execute the following procedure when the work holder is lowered after home return or when the following is indicated for during pattern input.



* **.*mm ****:****
X±000.0 Y±000.0:****

* is an arbitrary value.

α ◎ Turn the [MODIFY] key on.

1.STITCH 2=SPEED
3.CODE 2E

♦ Display changes (MODIFY LED lights)

α ◎ Input the NUMERIC [2] key, and then press the [⟵]key.
1. Modification of pattern
2. Modification of stitching speed
3. Modification of code data

Sewing machine speed theory

High	Dial speed	2000 s/min
Medium high	2/3 of dial speed	1300 s/min
Medium low	1/3 of dial speed	660 s/min
Low	Dial 0 speed	200 s/min

↑
Example of dial 9
(When not limited by stitch length)

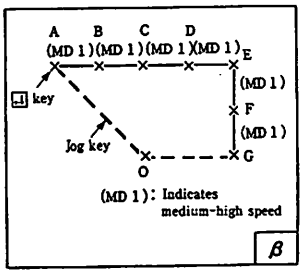
ﾄﾞｳｲｳｼﾝ ALL
2.N ｼﾝ N STITCH 1E

♦ Display changes

α ◎ Input the NUMERIC [1] key, and then press the [⟵]key.
1. ALL : Modify speed for all stitches after specified stitch
2. N STITCH: Modify speed for N stitches after specified stitch

1.H 2=MD1 3.MD2 4.L
2E

♦ Display changes



ｽﾍﾟﾃ:MD1
ALL:MD1

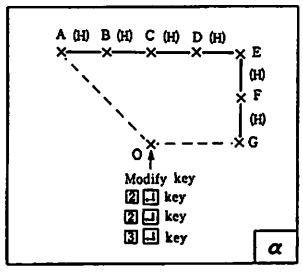
1.STITCH 2.SPEED	
3.CODE	1E

α ◎ Input the NUMERIC [2] key, and then press the [⟵]key.
1. H :High 2. MD1:Medium high
3. MD2:Medium low 4: L :Low
◆ Display changes
β ◎ Move the work holder to A point to be modified with [JOG +] and [JOG -], and then press the[⟵] key.
◆ Display changes
After correcting the speed, the left display appears, and corrections can be continued.

(11) Stitching speed modification 2 (To change the stitching speed for N stitches after specified stitch in pattern) The display is 2. SPEED → 2. N STITCH

The stitching speed for 4 stitches following the stitch (A point) specified in the stitching pattern as shown on the left will change from high to medium high speed.

Execute the following procedure when the work holder is lowered after home return or when the following is indicated for during pattern input.



* **.*mm	****:****
X±0000.0	Y±0000.0:****

* is an arbitrary value.

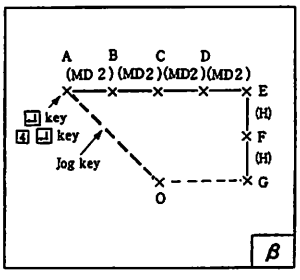
1.STITCH 2.SPEED	
3.CODE	2E

α ◎ Turn the [MODIFY] key on.
◆ Display changes (MODIFY LED lights)
α ◎ Input the NUMERIC [2] key, and then press the [⟵]key.
1. Modification of pattern
2. Modification of stitching speed
3. Modification of code data

Sewing machine speed theory

High	Dial speed	2000 s/min
Medium high	2/3 of dial speed	1300 s/min
Medium low	1/3 of dial speed	660 s/min
Low	Dial 0 speed	200 s/min

↑
Example of dial 9
(When not limited by stitch length)



1.ｼﾃｲ ｲｺｳ ｽﾍﾟﾃ ALL	
2:N STITCH	2E

◆ Display changes
α ◎ Input the NUMERIC [2] key, and then press the [⟵]key.
1. ALL : Modify speed for all stitches after specified stitch
2. N STITCH: Modify speed for N stitches after specified stitch
◆ Display changes

.1.H 2:MD1 3:MD2 4.L	
	5E

α ◎ Input the NUMERIC [3] key, and then press the [⟵]key.
1. H :High 2. MD1:Medium high
3. MD2:Medium low 4: L :Low
◆ Display changes

Nｼﾝ:MD2
N STI:MD2

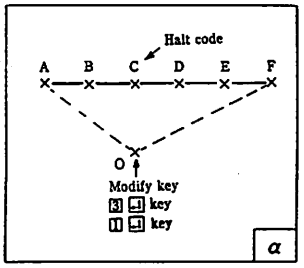
β ◎ Move the work holder to A point to be modified with [JOG +] and [JOG -], and then press the key.
◆ Display changes

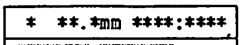
ﾊﾘｽｳ	
STITCH	04E

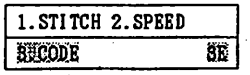
β ◎ Input the NUMERIC [4] key, and then press the [⟵]key. (A maximum of 99 stitches can be input.) Input the number of stitches for which the speed is to be changed.
◆ Display changes
After correcting the speed, the left display appears, and corrections can be continued.

1.STITCH 2.SPEED	
3.CODE	1E

(12) Code data delete (To delete the input code data) The display is 3.CODE → 1. CODE DEL
The halt code (STOP) is deleted from the pattern as shown on the left.
Execute the following procedure when the work holder is lowered after home return or when the following is indicated for during pattern input.





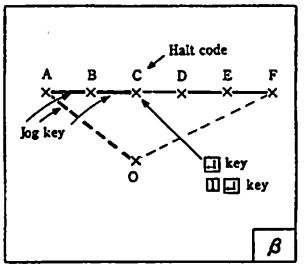


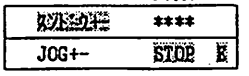
α ◎ Turn the [MODIFY] key on.

♦ Display changes (MODIFY LED lights)

α ◎ Input the NUMERIC [3] key, and then press the [⟵] key.
1. Modification of pattern
2. Modification of stitching speed
3. Modification of code data

♦ Display changes





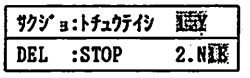
α ◎ Input the NUMERIC [1] key, and then press the [⟵] key.
1. CODE DEL : Code data is deleted
2. CODE ADD : Code data is added

♦ Display changes

β ◎ Move the work holder to code data point to be deleted with [JOG +] and [JOG –], and then press the [⟵] key. The following alphabetical characters display in the code data display:

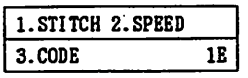
Code data	Display	Code data	Display
Stitching data	ホウセイ SEW	Baste code	シツケ BAT
Feed data	カラオクリ FEED	link code	レンケツ LNK
Thread trimming data	イトキリ TRIM	Function code 2	キノウ2 FUN2
End data	シュウリョウ END	Function code 3	キノウ3 FUN3
Stop data	トチュウテイシ STOP	Function code 4	キノウ4 FUN4
Function code 1	ハンテン FUN1	———	———
No.2 home position code	ダイ2ゲンテン 2HP	———	———

Note: 1. Function code 1 is used for the reverse shaft rotation.
2. The stitching data and feed data cannot be deleted in this item.



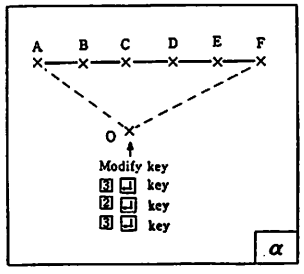
♦ Display changes

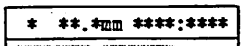
β ◎ Input the NUMERIC [1] key, and then press the [⟵] key: Code data is deleted.
Input the NUMERIC [2] key, and then press the [⟵] key: Display returns to previous display.

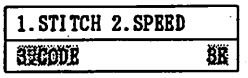


♦ Display changes
After deleting the code data, the left display appears and corrections can be continued.

(13) Code data addition (To add to the input code data) The display is 3.CODE → 2. CODE ADD
The function code 1 (reverse shaft rotation data) is added to the pattern as shown on the left.
Execute the following procedure when the work holder is lowered after home return or when the following is indicated for during pattern input.



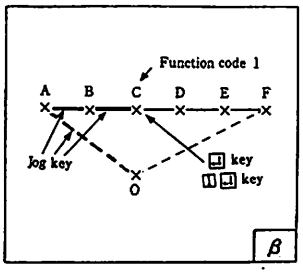




α ◎ Turn the [MODIFY] key on.

♦ Display changes (MODIFY LED lights)

α ◎ Input the NUMERIC [3] key, and then press the [⟵] key.
1. Modification of pattern
2. Modification of stitching speed
3. Modification of code data



1.ｺｰﾄﾞｻｸｼﾞｮ･CODE DEL
2ｺｰﾄﾞﾃﾝｿｳ･CODE ADD

◆ Display changes

α ◎ Input the NUMERIC [2] key, and then press the [⟵] key.

1. CODE DEL : Code data is deleted
2. CODE ADD : Code data is added

1.TRIM 2.STOP 3.FUN1
4.2HP 5.NEXT 03E

◆ Display changes

α ◎ Input the NUMERIC [3] key, and then press the [⟵] key.

3 refers to the function code 1 (reverse shaft rotation)

NEXT indicates to move to the next display.

When 5 is input and then the [⟵] key turned ON

6.BAT 7.LNK 8.END
9.FUN2 10.NEXT 00E

When 10 is input and then the [⟵] key turned ON

11.FUN3 12.FUN4
13.CODE NO E

When 13 is input and then the [⟵] key turned ON

ｺｰﾄﾞ ﾊﾞﾝｺﾞｳ ｾｯﾃｲ
SET CODE NO. 00E

Code data	Display	Code data	Display
Stitching data	ﾎｳｾｲ SEW	Baste code	ｼﾂｹ BAT
Feed data	ｶﾗｵｸﾘ FEED	link code	ﾚﾝｹﾂ LNK
Thread trimming data	ｲﾄｷﾘ TRIM	Function code 2	ｷﾉｳ2 FUN2
End data	ｼｭｳﾘｮｳ. END	Function code 3	ｷﾉｳ3 FUN3
Stop data	ﾄﾁｭｳﾃｲｼ STOP	Function code 4	ｷﾉｳ4 FUN4
Function code 1	ﾊﾝﾃﾝ FUN1	———	———
No.2 home position code	ﾀﾞｲ2ﾎﾟｼﾞｼｮﾝ 2HP	———	———

Note: 1. Function code 1 is used for the reverse shaft rotation.
2. The link code cannot be added currently.
3. Input with the code number designation is not possible currently.
The sewing machine may operate abnormally when inputs are made with code numbers. Never input with this method.

Stitch number

ｽﾃｯﾁ ****
JOG ****

◆ Display changes

β ◎ Move the work holder to the point to be added with [JOG +] and [JOG -], and then press the [⟵] key.

The alphabetic characters shown above will display in the code data display.

Code data display

ｻｲｶ:ﾊﾝﾃﾝ NEW
ADD:FUN1 2.NIE

◆ Display changes

β ◎ Input the NUMERIC [1] key, and then press the [⟵] key: Code data is added.

Input the NUMERIC [2] key, and then press the [⟵] key: Returns to previous display.

1.STITCH 2.SPEED
3.CODE 1E

◆ Display changes

After executing code data addition, the left display appears and corrections can be continued.

Note) The places where additions with code data is possible are limited.
Refer to the following table.

Code data	Addable place
Thread trimming data	Inside stitching data (SEW)
End data	Inside feed data (FEED)
No.2 home position code	Inside feed data (FEED)

4.4 Write Mode

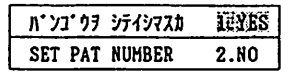
A pattern which is being created or which has been created can be written to a floppy disk or P-ROM.
The floppy disk which has not been used should be formatted (initialized) using the input unit PTN-A40, PTN-A10 or this sewing machine.
For instruction of formatting the floppy disk, see the 4.6 (1) Floppy disk format.

(1) Media writable

Type of floppy disk		Type of P-ROM
3.5" high density record type (2HD)		27C256
Memory	: 1.4 MB	27C512
Byte/sector	: 512 bytes	
Sector/track	: 18 sectors	
Track density:	135 TPI	

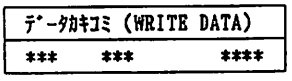
(2) Write method 1 (When specifying pattern number)

The write mode is entered by turning on the [WRITE] key (the LED lights) after home position return. Pattern numbers 100 to 249, register patterns 300 to 339, and compound patterns 500 to 549 in the floppy disk can be specified. Refer to section 4.4.(3) for other programs. The flow of the write operation is shown below.



◎ Press the [WRITE] key. (The WRITE LED lights.)

◎ Specify the write method.
Press the NUMERIC [1] key.



◆ Display changes

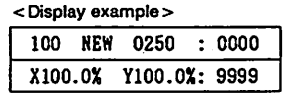
◎ Specify the pattern number.
Input the pattern number with the number keys, and then press the [↵]key.
The pattern number must be set within the following range:
Floppy disk: 100 ~ 249 (patterns), 300 ~ 339 (register patterns), 500 ~ 549 (compound patterns)

◆ Set the write conditions
The following details are automatically set.
1. Check write area
2. Check pattern number
3. Set pattern name
The pattern is named "NEW" when the pattern number is between 100 to 249 or 500 to 549 in the floppy disk.

◆ Error check
An error message will appear on the LCD if an error occurs. Refer to section "5. Message table" for details on the error. The error mode can be exited by pressing the [↵]key.

◆ Specified number check
Prior use of the specified number is automatically checked.

<Display example>

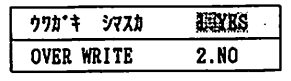


★ When specified number is not used

◆ Display changes
The pattern number, pattern name and number of stitches is displayed and writing is completed.
Example in figure: Pattern number 100, Pattern name NEW, No. of stitches 250.

★ When specified number is found

* To overwrite



◆ Display changes
By pressing the NUMERIC [1] key, the new pattern is automatically overwritten on the existing pattern number.

♦ Error check
An error message will appear on the LCD if an error occurs. Refer to section "5. Message table" for details on the error. The error mode can be exited by pressing the [⏎] key.

♦ Writing is completed. (WRITE LED goes out.)

* To not overwrite
By pressing the NUMERIC [2] key, the state before the pattern number was specified is returned to.

> **Note**
> When overwrite is executed, the previous pattern data will be erased.

(3) Write method 2 (When not specifying pattern number)
The write mode is entered by turning on the [WRITE] key (the LED lights) after home position return. The mode is exited automatically when turned off. The flow of the write operation is shown below.

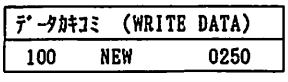
◎ Press the [WRITE] key. (The WRITE LED lights.)

◎ Specify the pattern number.
Press the [NUMERIC 2] key.

♦ Set the write conditions
The following details are automatically set.
1. Determines whether to write data to P-ROM or floppy disk (P-ROM has a higher precedence).
2. Determines the P-ROM type (27C256 or 27C512)
3. Check write area
4. Setting of pattern number
   P-ROM: 0 ~ 15
   Floppy disk : 100 ~ 249 (pattern), 300 ~ 339 (register patterns), 500 ~ 549 (compound patterns).
   The youngest number of the unused numbers is automatically set as the pattern number.
5. Setting of the pattern name.
   The pattern is named "NEW" when the pattern number is between 100 to 249 in the floppy disk.

♦ Error check
An error message will appear on the LCD if an error occurs. Refer to section "5. Message table" for details on the error. The error mode can be exited by pressing the [⏎] key.

<Display example>



♦ Display changes
The pattern number, pattern name and number of stitches is displayed. Example in figure: Pattern number 100, Pattern name NEW, No. of stitches 250.

◎ Start writing
Press the [⏎] key.

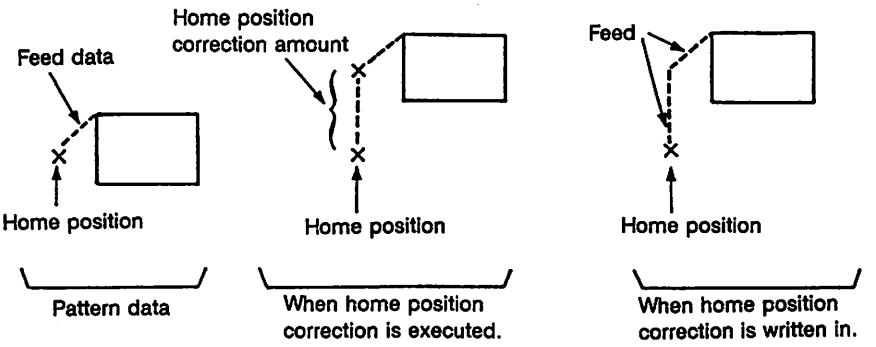
♦ Error check
An error message will appear on the LCD if an error occurs. Refer to section "5. Message table" for details on the error. The error mode can be exited by pressing the [⏎] key.

♦ Writing is completed. (WRITE LED goes out.)

(4) Write Method 3 (To write in home position correction)

The write mode is entered by pressing the [WRITE] key (LED lights) after name position return. The write mode is exited automatically by turning off the key.

The flow of the write operation with home position correction ON (pattern number not specified) is shown below.



ｹﾞﾝﾃﾝﾎｾｲ(CORRECTION)
X:+**.*mm Y:+**.*mm

◎ Press the work holder switch (following operation is prohibited when the work holder isn't lowered.)

◎ Press the [CORRECT] key. (CORRECT LED flickers)

◎ Input the desired modification amount with the [ARROW] keys.

◎ Press the [CORRECT] key again. (CORRECT LED lights)

◎ Press the [RESET HOME] key.

◎ Press the [WRITE] key. (WRITE LED lights)

ｹﾞﾝﾃﾝ ﾎｾｲ ｶｷｺﾐ 1.YES
READY ? (CORR.) 2.NO

◆ Display changes

◎ Start home position correction

Home position correction write will start when the NUMERIC [1] key is pressed.

Press the NUMERIC [2] key when the home position correction is not to be written.

ﾊﾟﾀｰﾝﾊﾞﾝｺﾞｳｦ ｼﾃｲｼﾏｽｶ 1.YES
SET PAT NUMBER 2.NO

◎ Set the pattern number

Press the NUMERIC [2] key.

Refer to section 4.4 (2) when setting the pattern number.

◆ Set the write conditions

The following details are automatically set.

1. Determines whether to write data to P-ROM or floppy disk (P-ROM has a higher precedence).
2. Determines the P-ROM type (27C256 or 27C512)
3. Check write area
4. Setting of pattern number
   P-ROM: 0 ~ 15
   Floppy disk: 100 ~ 249, 300 ~ 349 (register pattern), 500 ~ 549 (compound pattern).
   The youngest number of the unused numbers is automatically set as the pattern number.
5. Setting of the pattern name.
   The pattern is named "NEW" when the pattern number is between 100 to 249 in the floppy disk.

◆ Error check

An error message will appear on the LCD if an error occurs. Refer to section "5. Message table" for details on the error. The error mode can be exited by pressing the [⏎] key.

<Display example>

ﾃﾞｰﾀｶｷｺﾐ (WRITE DATA)		
100	NEW	0250

◆ Display changes

The pattern number, pattern name and number of stitches is displayed. Example in figure: Pattern number 100, Pattern name NEW, No. of stitches 250.

◎ Start writing
Press the [⟵] key.

◆ Writing of the corrections is completed. (CORRECT LED, WRITE LED go out.)

◎ Press the [RESET HOME] key.
Return to the mechanical home position from the corrected home position.

Note

If stitching is performed without pressing the [RESET HOME] key, the sewing machine may operate abnormally or the home position correction amount may not be set properly. Always press the [RESET HOME] key.

4.5 Delete Mode

By specifying a pattern number stored on the floppy disk, the pattern can be deleted.
After the home position return motion, by turning on the [DELETE] key (the LED lamp lights), the sewing machine enters the data delete mode. By turning off the [DELETE] key, the sewing machine exits from the data delete mode.
The data delete operation should be executed in the following manner.

000	ﾃﾞｰﾀｼｮｳｷｮ
	DELETE DATA

◎ Press the [DELETE] key. (DELETE LED lights.)

◎ Set pattern number
Set the number of the pattern to be deleted with the [NUMERIC] keys.
100 ~ 249: Pattern data, 300 ~ 339: Register pattern data, 500 ~ 549: Compound pattern data

◎ Press the [⟵] key.
The data deletion starts. (DELETE LED flickers.)

◆ Error check
An error message will appear on the LCD if an error occurs. Refer to section "5. Message table" for details on the error and remedy. The error mode can be exited by pressing the [⟵] key.

◆ Deletion is completed (LED lights)
Set the pattern number if another pattern is to be deleted.

◎ Press the [DELETE] key. (DELETE LED goes out.)

Note

P-ROM cannot be erased from the main unit of sewing machine. A special erasing device is necessary.
This device is available as an accessory for the input device PTN-A40. Please contact your dealer for further detail.

4.6 Function Mode

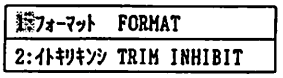
(1) Floppy disk format

If the [FUNCTION] key is turned on after the home position return motion, it enters in the function mode and you can format the floppy disk.

Note

Remember that all data in a floppy disk is lost if that disk is formatted.

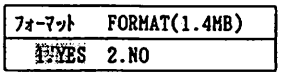
The flow of the formatting operation is shown below.



◎ Press the [FUNCTION] key.

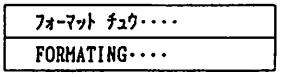
♦ Display changes

◎ Press the NUMERIC [1] key.



♦ Display changes

◎ Press the NUMERIC [1] key, and then[⟵].
Press the NUMERIC [2] key, and then[⟵] when not formatting.



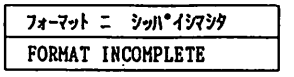
♦ Display changes

♦ Error check
An error message will display on the LCD if the floppy disk is not inserted or if the write protect of the floppy disk is applied.
Refer to section "5. Message Table" and remedy in this case.
The error mode can be exited by pressing the [⟵] key.

♦ Format completed normally

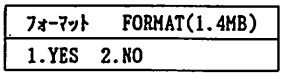
◎ Press the [⟵] key.

♦ Format error
The following will display, so repeat formatting.

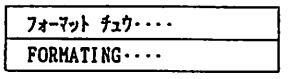


Cautions

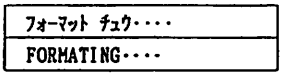
1. When the floppy disk is 1.4 MB or 1.0 MB, the selection of type can be switched automatically with the state of disk selection of dip switch.
   The dip switch should be turned to OFF normally, which is for the format of 1.4 MB disk.
2. As the format is performed, all data on the floppy disk is lost.
   Therefore, the format should be conducted only with any newly bought disks or to re-use any old disks which contain apparently unnecessary pattern data.
3. When the format was selected by mistake. If the NUMERIC [2] key is turned on followed with the [⟵] key ON, you can get out of this mode.

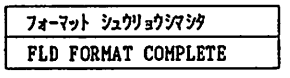
   If the following LCD display is not yet shown, take out the floppy disk from the drive and turn off the power so that the format is aborted.

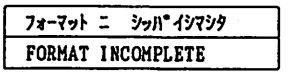
4. Handling of floppy disk
   It is prohibited to take out the floppy disk when the following message is shown on LCD.

   Confirm the following message is read on LCD before taking out the floppy disk.

   or

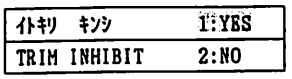
   

(2) Thread trimming prohibit

Thread trimming motion will be prohibited it the function mode is selected by turning on the [FUNCTION] key after the home position return motion.

◎ Press the [FUNCTION] key.

◎ Press the NUMERIC [2] key.



◎ Press the NUMERIC [1] key.

Cautions

1. When the thread trimming motion is released, confirm that both dip switches SW 3-5 and SW 4-3 are turned off.
2. When the thread trimming prohibit motion was input with the function mode, the prohibit motion will be valid for about a week.
   However, when the following message is displayed, the thread trimming prohibit motion is released.

ｻｲｾｯﾃｲ ﾏﾀﾊ ﾆｭｳﾘｮｸ
RESETTIG/TEACHING

(3) Alternate stitching

By entering the function mode and pressing the [⟵] key after home return, alternate stitching (compound data) can be created and confirmed.
Alternate stitching refers to stitching by reading out the compound data created with an I/O unit (optional) in order. Refer to the I/O unit instruction manual for details.

The flow of the alternate stitching data (compound data) and confirmation method is shown below.

1) To create alternate stitching (compound data) (when pattern number is not specified)

1:ﾌｫｰﾏｯﾄ FORMAT
2:ｲﾄｷﾘｷﾝｼ TRIM INHIBIT

◎ Press the [FUNCTION] key.
◎ Press the [⟵] key.

3:ﾌﾟﾛｸﾞﾗﾑﾇｲ PROG.SEW

◎ Press the NUMERIC [3] key.
◎ Press the NUMERIC [1] key.

1:ﾃﾞｰﾀｻｸｾｲ MAKE DATA
2.ﾃﾞｰﾀｶｸﾆﾝ CHECK DATA

◆ Display changes
◎ Input the pattern number, and then press[⟵].
To input another pattern number, repeat this step.
A maximum of 24 patterns can be selected.
If the wrong number is input, press the [CANCEL] key, and the specified pattern can be deleted one by one.
(If no numbers are specified, the display will return to the normal display.)

1.

<Display example>

1.101 2.102 3.104
4.105 5.

◎ Press the [⟵] key.
In the display example, four pattern data is created as compound data.
◎ Press the [WRITE] key. (WRITE LED lights.)

ﾊﾟﾀｰﾝﾊﾞﾝｺﾞｳﾖ ｼﾃｲｼﾏｽｶ 1.YES
SET PAT NUMBER 2.NO

◎ Set the pattern number.
Press the NUMERIC [2] key.
Refer to section 4.4 (2) on how to set the pattern number.

◆ Setting of writing conditions
The following details are automatically set.
   1. Check write area
   2. Setting of pattern number 500 ~ 549 (compound patterns).
      The youngest number of the unused numbers is automatically set as the pattern number.

◆ Error check
An error message will appear on the LCD if an error occurs. Refer to section "5. Message table" for details on the error and remedy. The error mode can be exited by pressing the [⟵] key.

ﾃﾞｰﾀ ｶｷｺﾐ (WRITE DATA)
500 *** ****

◎ Start writing
Press the [⟵] key.

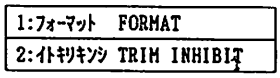
◆ Error check
An error message will appear on the LCD if an error occurs. Refer to section "5. Message table" for details on the error and remedy. The error mode can be exited by pressing the [⟵] key.

◆ Writing is completed. (WRITE LED goes out.)

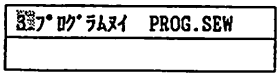
Cautions

1. The stitching data will not be created properly if each designated pattern is larger than the stitching area or if the No. 2 home position is included in the pattern when creating alternate stitching data (compound data).
2. The maximum number of stitches that can be created in one alternate stitching data (compound data) pattern is 8000 stitches.

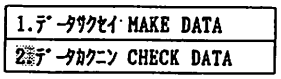
2) To confirm alternate stitching data (compound data)



◎ Press the [FUNCTION] key.
◎ Press the [←┘]key.



◎ Press the NUMERIC [3] key.



◎ Press the NUMERIC [2] key.

<Display example>

1.101	2.102	3.103
4.104	5.	6.

♦ Display changes
◎ If there are many pattern numbers, press the key and the next page will display on the LCD. The display will return to the first page from the last page.

3) To sew using alternate stitching

◎ Press the [RESET HOME] key.
◎ Press the [SET] key. (Pattern number LED lights)

<Display example>

500 NEW	0123	:0000
X100.0%	Y100.0%	:9999

◎ Set the alternate stitching pattern number with the [NUMERIC] keys (address 500).
◎ Press the [SET] key. (Pattern number LED goes out)
The alternate stitching data is called out.

<Display example>

101 NEW	0050	:0000
X100.0%	Y100.0%	:9999

◎ Turn the work holder (black foot switch) ON, press the start switch (red foot switch), and the following pattern can be stitched.
♦ Display changes
The pattern written in compound data No. 1 is stitched.

<Display example>

102 NEW	0040	:0000
X100.0%	Y100.0%	:9999

♦ Display change
The next pattern number is automatically read in when the stitching on one pattern is completed.
◎ The next pattern can be stitched by pressing the start switch (red foot switch) after turning on the work clamp switch (black foot switch).
To confirm the data one by one with the [JOG] keys, lift the work clamp and perform the following:
The alternate stitching data will be read out from No. 1 with each press of the UP [ARROW] key.
The alternate stitching data will be read out from the last with each press of the DOWN [ARROW] key.
When the number of the pattern to be confirmed is displayed, turn the work holder switch on, and confirm the operation with the [JOG] keys.

5. Message Table

(1) Messages in sewing operation

Message	Cause and countermeasures
ｼﾃｲ ﾊﾟﾀﾝ ｶﾞ ｱﾘﾏｾﾝ CAN'T FIND DATA-FILE	The pattern number is not found. Check the pattern number. This message also appears when an unformatted floppy disk is inserted. Use a correctly formatted floppy disk.
ﾃﾞｨｽｸ ｶﾞ ﾐｿｳﾆｭｳﾃﾞｽ DISK ISN'T IN FDD	The floppy disk is not inserted. Correctly insert the floppy disk.
ﾃﾞｨｽｸ ｶﾞ ﾖﾒﾏｾﾝ DISK READ ERROR	The content of the floppy disk cannot be read. The content of the floppy disk may be destroyed.
ｾｯﾃｲ ｶﾞ ﾁｶﾞｲﾏｽ ILLEGAL SET VALUE	A mistaken setting was made. Input the correct setting.
ｾｯﾃｲﾁ ｶﾞ ﾁｲｻｽｷﾞﾏｽ ILLEGAL SET VALUE	This occurs when the fraction less than 10% is input at the setting of reduction ratio. Input the ratio properly.
ｾｯﾃｲﾁ ｶﾞ ｵｵｷｽｷﾞﾏｽ ILLEGAL SET VALUE	This occurs when a value exceeding 200% is input at the setting of enlargement ratio. Input the ratio properly.
ｴｱ ｱﾂ ﾃｲｶ ﾃﾞﾝｹﾞﾝ ｵﾌ LESS PRESSURE SW OFF	The presser sensor (option) is activated. Check the air pressure.
ﾐｼﾝ ﾛｯｸｼﾁｭｳ MACHINE WAS LOCKED	Machine is locked. Turn off the power and remove the cause of trouble.
ｳﾜｲﾁ ﾖ ﾊｽﾞﾚﾃｲﾏｽ NOT UP POSITION	Needle is displayed from the UP position. Use the [⟵] key to trip the needle UP position detector.
ｴﾘｱ ﾘﾐｯﾄ ｵｰﾊﾞｰ OUT OF AREA LIMIT	The work holder exceeds the sewing area. Check the XY scale and home position.
ｶﾃﾞﾝﾘｭｳ ﾄﾘｯﾌﾟ OVER CURRENT	The overcurrent sensor is activated. Check the solenoid, motor clutch, and brake of the sewing machine.
PMD ｶﾃﾞﾝﾘｭｳ ﾄﾘｯﾌﾟ PMD OVER CURRENT	The PMD overcurrent sensor is activated. Turn off the power and check the PMD connector connection.
ｼｭﾝﾃﾃﾞﾝﾜｰｵﾌｼﾃｸﾀﾞｻｲ POWER OFF THEN ON	Momentary power failure protector has been tripped. Turn off the power and back on again.
ｶｳﾝﾀ ｷｰ ﾖ ｵｼﾃ ｸﾀﾞｻｲ PRESS COUNT-KEY	The counter is counted up. Press the [COUNTER] key.
ｵｻｴ ﾖ ｵﾛｼﾃ ｸﾀﾞｻｲ PRESS FOOT SW	While the dip switch SW3-4 is being turned on, this message appears. Lower the foot switch.
ｹﾞﾝﾃﾝ ﾌｯｷ ｼﾃｸﾀﾞｻｲ PUSH RESET SW	Press the [RESET HOME] key.
ｻｲｾｯﾃｲ ﾏﾀﾊ ﾆｭｳﾘｮｸ RESETTING / TEACHING	The contents of the back up memory are destroyed. Set with the [SET] key or input the pattern again.
ﾐｼﾝ ｷﾞｬｸﾃﾝ REVERSE ROTATION	Machine is rotating reversely. Turn off the power and change the reverse rotation plug.
PG ﾀﾞﾝｾﾝ SYNCHRONIZER DEFECT	The PG signal of the sewing machine detector is broken. Inspect the sewing machine detector.
ｳﾜｲﾄ ｾﾝｻﾞﾝ THREAD BROKEN	The needle thread sensor (option) is activated. Connect the needle thread and set the sensor.
ｹﾞﾝﾃﾝﾎｾｲ(CORRECTION) X:+**.*mm Y:+**.*mm	This message appears when the [CORRECT] key is pressed. Execute the home position correction operation.

(2) Messages in teaching operation

Message	Cause and countermeasures
ｼﾃｲ ﾊﾟﾀﾝ ｶﾞ ｱﾘﾏｾﾝ CAN'T FIND DATA-FILE	The pattern number is not found. Check the pattern number. This message also appears when an unformatted floppy disk is inserted. Use a formatted floppy disk.
ﾃﾞｰﾀ ﾚｽ DATA LESS	Only one point was input for the curve or broken line input points. Always input two or more points for the curve or broken line input points.
ﾃﾞｰﾀ ｵｰﾊﾞ DATA OVER	Over 64 points were input for the curve or broken line input points.
ﾃﾞｰﾀ ｿｳｼﾝﾁｭｳﾃﾞｽ DATA TRANSMITTING	Data is being sent. Wait a moment.
ﾃﾞｰﾀ ｼﾞｭｼﾝﾁｭｳﾃﾞｽ DATA RECEIVING	Data is being received. Wait a moment
ﾃﾞｨｽｸ ｶﾞ ﾐｿｳﾆｭｳﾃﾞｽ DISK ISN'T IN FDD	The floppy disk is not inserted. Correctly insert the floppy disk.
ﾌｫｰﾏｯﾄ ﾆ ｼｯﾊﾟｲｼﾏｼﾀ FORMAT INCOMPLETE	Format was incomplete. Confirm the floppy disk, and reformat.
ｺｰﾄﾞ ﾊﾞﾝｺﾞｳｶﾞ ﾁｶﾞｲﾏｽ ILLEGAL CODE NUMBER	The code number is incorrect. Input the correct code number.
ﾃﾞｰﾀｴﾗｰ ILLEGAL INPUT DATA	Data that cannot be created was input. Cancel the error with the [⏎] key.
ｼﾃｲ ﾊﾞﾝｺﾞｳ ｶﾞ ﾁｶﾞｲﾏｽ ILLEGAL NUMBER	A mistaken pattern number was specified. Specify a correct pattern number.
ｾｯﾃｲ ｶﾞ ﾁｶﾞｲﾏｽ ILLEGAL SET DATA	A mistaken setting was made. Make a correct setting.
ｾｯﾃｲ ｶﾞ ﾁｶﾞｲﾏｽ ILLEGAL SET VALUE	A mistaken value was set. Input the correct setting.
ｾｯﾃｲﾁ ｶﾞ ﾁｲｻｽｷﾞﾏｽ ILLEGAL SET VALUE	This displays when a mistaken value or data was input during modification. Input the correct value.
ｾｯﾃｲﾁ ｶﾞ ｵｵｷｽｷﾞﾏｽ ILLEGAL SET VALUE	This displays when a mistaken value or data was input during modification. Input the correct value.
ｱｷｴﾘｱ ｶﾞ ﾌｿｸｼﾃﾏｽ MEMORY IS FULL	The write memory is insufficient. Check the data size. Format and use a new floppy disk.
ﾃﾞｰﾀ ｻｸｾｲﾁｭｳﾃﾞｽ NOW DATA MAKING	The data is being created. Please wait a moment.
ｴﾘｱ ﾘﾐｯﾄ ｵｰﾊﾞｰ OUT OF AREA LIMIT	The work holder exceeds the sewing area. Check the XY scale and home position.
ﾊﾟﾀｰﾝﾊﾞﾝｺﾞｳ ｶﾞ ﾌﾙﾃﾞｽ PATT. NO IS FULL	A pattern number cannot be obtained. Use a new floppy disk.
ﾇｲﾒﾅｶﾞｻ ｶﾞ ｵｵｷｽｷﾞﾏｽ TOO LARGE STITCHES	The stitch length exceeded 12.7mm. Set a value below 12.7mm.
ﾊﾘｽｳ ｶﾞ ｵｰﾊﾞｰｼﾏｼﾀ TOO MANY STITCHES	Number of stitches exceeds over 8000 stitches. Reduce the number of stitches.
ﾇｲﾒﾅｶﾞｻ ｶﾞ ﾁｲｻｽｷﾞﾏｽ TOO SMALL STITCHES	The stitch length is 0. Set a value other than 0.
ﾀﾞｲ2ｹﾞﾝﾃﾝ ｾｯﾃｲ ｻﾚﾃﾏｽ U ARE IN 2ND-ORG POS	Second home position has already been set.
ｶｷｺﾐ ﾃﾞｷﾏｾﾝ WRITE ERROR	Writing is prohibited. Format the floppy disk or check the floppy disk unit.
ｶｷｺﾐ ﾃﾞｷﾏｾﾝ WRITE PROTECT	Data cannot be written. The floppy disk is write-protected.
ｼｮｳｷｮ ﾃﾞｷﾏｾﾝ WRITE PROTECT	Data cannot be deleted. The floppy disk is write-protected.

6. Maintenance

6.1 Sewing Machine Drive Motor

(1) Filter

Dust which is collected on the end cover and the pulley side dust filter should be periodically removed. (Otherwise, the motor may overheat.)

(2) Sewing machine drive motor (Z motor)

Although it is not necessary to disassemble the motor, if the stop accuracy is degraded, the motor does not equally rotate, or the brake section generates an abnormal sound due to long time use of the sewing machine, inspect the sewing machine motor in the following manner.

1) Turn off the power and stop the motor (it takes for around 2 minutes after the power is turned off until the motor completely stops).
2) Remove the belt and motor pulley.
3) Remove the plug (for brake) which is connected to the control box.
4) Remove the three bracket mounting screws.
5) Using the bracket clearance, remove the bracket.
   The brake section is also removed along with the bracket.
6) In this state, check the conditions of the brake lining and brake plate. If the brake lining is worn, replace it with a new one in accordance with the brake lining replacement procedure described in the following paragraph.

(3) Replacing brake lining

1) Hand the clutch shaft and gradually pull it toward you. The driven member (cup section) and moving plate (brake lining) can be removed along with the clutch shaft.
2) In replacing the moving plate with a new one, remove the bearing on the pulley and also replace the bearing with a new one.
   Make sure to replace the bearing being removed with a new one.
3) Assemble the parts in the reverse order. If the clutch shaft cannot be manually inserted, lightly knock the end of the clutch shaft with a wooden hammer.
4) When the moving plate has been replaced with a new one and has been assembled, manually turn the clutch shaft and check that it lightly turns.
   After that, execute the test run of the motor in accordance with the following 5).
5) Test run
   In the condition where the sewing machine is in the thread winding mode, turn on and off the start switch 100 times to start and stop the motor.
6) In disassembling or assembling the motor, take care not to deform the cap section.
7) Use the specified bearing. When replacing it with a new one, contact your dealer.

6.2 Floppy Disk Unit

This unit employs a highly reliable floppy disk device which does not need and specific maintenance. On the other hand, the floppy disk sheet is highly sensitive. Observe following points in order to protect important data.

1) Never put it closer to a magnet.
2) Do not bend.
3) Keep away from cigarette smoke.
4) Avoid the direct exposure to sun light or do not put closer to a heating device.
5) Keep the back up memory.
6) Attach a correct label on the sheet.
7) Reserve it in a case after use.

6.3 Troubleshooting and Repair

Dip switches, etc. are provided on CPU for confirmation and adjustment of switch signals of sewing machine, solenoid motion and revolutions of sewing machine.
To operate the troubleshooting function, turn on the dip switch SW5-1 on CPU circuit board, while the power is turned off. If the power is backed on, the troubleshooting mode is selected.
To get out of the mode, turn off the power first, turn off the dip switch SW5-1 and then back on the power.

(1) Check of input switch signal

◎ Turn off the power switch.

◎ Turn dip switch SW5-1 on.
The troubleshooting mode is set.

◎ Turn on the power switch.
Elevate the presser foot after the copyright screen is displayed.
Home position detection is not performed.

ｼﾞｺｼﾝﾀﾞﾝ (TEST MODE)
1.IN 2.OUT 3.SPEED

◆ Display changes (RUN LED flickers.)

◎ Press the NUMERIC [1] key.
The inspection process routing of the input switch signal is entered and the sewing machine switch signals are inspected.

S0	S1	S2	STP
0	0	0	0

◆ Display changes
The upper line indicates the name of the signal and the lower line the state of the switch connection. 0 indicates that the switch is off, and 1 that the switch is on.
The number on the lower line will change from 1 to 0 if any switch is turned on or off.

Signal name

S0 : Work holder switch
S1 : Two-step work holder
S2 : Start switch
STP: Halt switch

◎ Press the [⏎] key.
The sewing machine position detection signal will be checked.

UP	DN	RO	PG
0	0	0	0

◆ Display changes
The upper line indicates the name of the signal and the lower line the ON/OFF state of the signal. 0 indicates that the signal is off, and 1 that the signal is on.
Manually rotate the sewing machine to confirm that each signal turns to 1 at the specified position.

Signal name

UP : Needle UP position
DN : Needle DOWN position
RO: Thread release signal
PG: Speed detection signal (64 P/turn)

◎ Press the [⏎] key.
The home position detection signal is checked.

XH	YH	ZH	XLM	YLM	ZLM
0	0	0	0	0	0

◆ Display changes
The upper line indicates the name of the signal and the lower line the ON/OFF state of the signal. 0 indicates that the signal is off, and 1 that the signal is on.
The state of each signal when the power is turned on is displayed. The power must be turned off once to change the state.

Signal name

XH : X axis home position detection signal
YH : Y axis home position detection signal
ZH : Z axis home position detection signal (not used)
XLM: Z axis limit signal (not used)
YLM: Y axis limit signal (not used)
ZLM: Z axis limit signal (not used)

◎ Press the [⏎] key.
The status of the dip switch SW3 function will display.

SW3- 1 2 3 4 5 6 7 8
0 0 0 0 0 0 0 0

♦ Display changes
The upper line indicates the name of the signal and the lower line the ON/OFF state of the signal. 0 indicates that the signal is off, and 1 that the signal is on. The display will change when the dip switch is turned on and off.
Refer to section "3.4 Dip Switch Function Table" for the function names (signal names).

◎ Press the [⟵] key.
The status of the dip switch SW4 function will display.

SW4- 1 2 3 4 5 6 7 8
0 0 0 0 0 0 0 0

♦ Display changes
The upper line indicates the name of the signal and the lower line the ON/OFF state of the signal. 0 indicates that the signal is off, and 1 that the signal is on. The display will change when the dip switch is turned on and off.
Refer to section "3.4 Dip Switch Function Table" for the function names (signal names).

◎ Press the [⟵] key.
The status of the dip switch SW5 function will display.

SW5- 1 2 3 4 5 6 7 8
0 0 0 0 0 0 0 0

♦ Display changes
The upper line indicates the name of the signal and the lower line the ON/OFF state of the signal. 0 indicates that the signal is off, and 1 that the signal is on. The display will change when the dip switch is turned on and off.
Refer to section "3.4 Dip Switch Function Table" for the function names (signal names).

◎ Press the [CANCEL] key.
Press the [⟵] key to reconfirm the above details, and the display will return to the switch signal check status.

ｼﾞｺｼﾝﾀﾞﾝ (TEST MODE)
1. IN 2. OUT 3. SPEED

♦ Display changes
The troubleshooting mode is displayed.

♦ The inspection of the input switch signal is completed.

(2) Check of output signals

ｼﾞｺｼﾝﾀﾞﾝ (TEST MODE)
1.IN 2.OUT 3.SPEED

♦ The test mode is displayed.

◎ Press the NUMERIC [2] key.
The check process routine of the output signal is entered, and the sewing machine solenoids and XY table drive signals are inspected.

W1 W2 W3 W4 W5 W6 W7
0 0 0 0 0 0 0

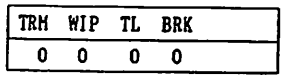
♦ Display changes
The upper line shows the signal name and the lower line the solenoid or XY table output signal. 0 indicates OFF, and 1 ON.
The presser solenoids are checked.
Turn the signal on and off with the [NUMERIC] keys and check the operation with the sewing machine.

Signal name
- W1: Work holder solenoid ON/OFF with the NUMERIC [1] key
- W2: Presser foot solenoid ON/OFF with the NUMERIC [2] key
- W3: Reverse rotation shaft solenoid ON/OFF with the NUMERIC [3] key
- W4: Two-step work holder solenoid ON/OFF with the NUMERIC [4] key
- W5: Reverse work holder solenoid ON/OFF with the NUMERIC [5] key
- W6: WHLD6 ON/OFF with the NUMERIC [6] key
- W7: WHLD7 ON/OFF with the NUMERIC [7] key

Caution

Do not leave the solenoids on for a long period or they may be damaged.

◎ Press the [⏎]key.
The sewing machine solenoid is checked.



◆ Display changes
The upper line shows the signal name and the lower line the solenoid or XY table output signal. 0 indicates OFF, and 1 ON.
The presser solenoids are checked.
Turn the signal on and off with the numeric keys and check the operation with the sewing machine.

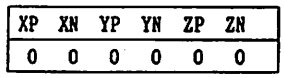
Signal name

TRM: Thread trimming solenoid	ON/OFF with the NUMERIC [1] key
WIP : Wiper solenoid	ON/OFF with the NUMERIC [2] key
TL : Thread release solenoid	ON/OFF with the NUMERIC [3] key
BRK: Brake solenoid	ON/OFF with the NUMERIC [4] key

Caution

Do not leave the solenoids on for a long period or they may be damaged.

◎ Press the [⏎]key.
The XY table drive system is checked.

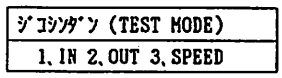


◆ Display changes
The upper line shows the signal name and the lower line the solenoid or XY table output signal. 0 indicates OFF, and 1 ON.
The presser solenoids are checked.
Turn the signal on and off with the [ARROW] and [NUMERIC] keys. The XY table will move while the key is held down. Check the operation with the sewing machine.

Signal name

XP: X axis (+) direction	Move with the [ARROW ←] key
XN: X axis (—) direction	Move with the [ARROW →] key
YP: Y axis (+) direction	Move with the [ARROW ↓] key
YN: Y axis (—) direction	Move with the [ARROW ↑] key
ZP: Z axis (+) direction	(Not used)
ZN: Z axis (–) direction	(Not used)

◎ Press the [CANCEL] key.
To reconfirm the above details, press the [⏎]key and the display will return to the solenoid output signal check state.



◆ Display changes
Display the troubleshooting mode.

◆ Complete the output signal check.

(3) Confirmation and adjustment of sewing speed

ｼﾞｺｼﾝﾀﾞﾝ (TEST MODE)
1.IN 2.OUT 3.SPEED

<Display example>

ﾐｼﾝｶｲﾃﾝｽｳ(VELOCITY)
SPEED = 3(H) 0000SPM

- ♦ Display the troubleshooting mode.
- ◎ Press the NUMERIC [3] key.
  The sewing speed confirmation and adjustment routine will be entered.
  The machine speed can be measured.
- ♦ Display changes
  - 3 : Speed dial value
    The speed from 0 to 9 can be set with the speed dial.
  - H : Relative speed H, MD1, MD2 or L can be set with the [SPEED] key on the teaching operation keys.
    Select H for the normal sewing speed confirmation.
- ◎ Set the conditions
  Set the speed dial and relative speed while referring to the above example.
- ◎ Press the work holder switch (black foot switch).
  The work holder will lower.
- ◎ Press the start switch (red foot switch)
  The sewing speed with the set conditions will display on the LCD.
  The sewing machine will run only while the start switch is held down.
  When released, the needle will stop at the UP position.
  The setting conditions can be changed with the speed dial and the [SPEED] key.
- ◎ Press the work holder switch (black foot switch).
  The work holder will rise.
- ◎ Press the [CANCEL] key.

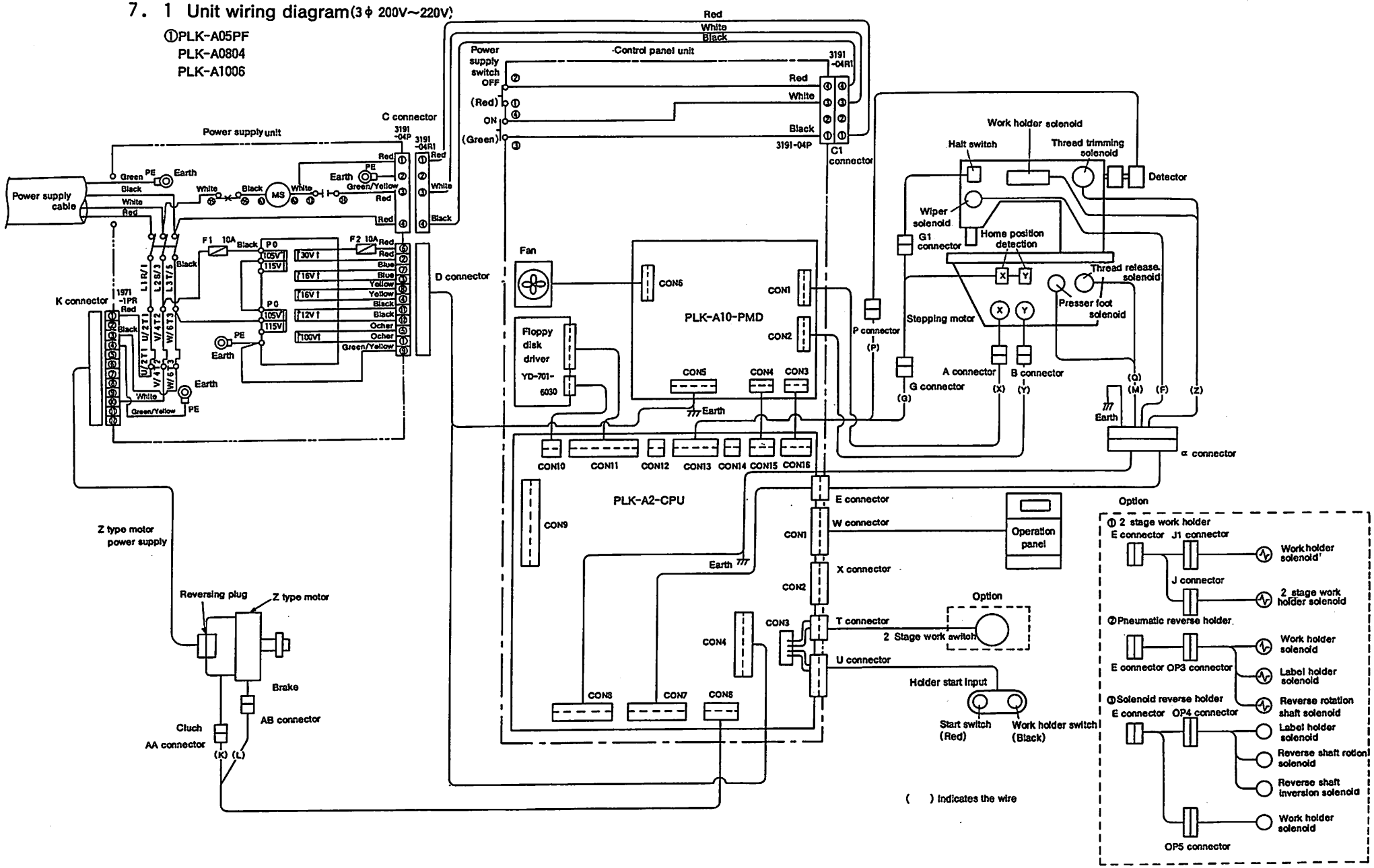
ｼﾞｺｼﾝﾀﾞﾝ (TEST MODE)
1、IN 2、OUT 3、SPEED

- ♦ Display changes
  The troubleshooting mode will display.
- ♦ Complete confirmation and adjustment of the sewing speed.

7. Control Unit

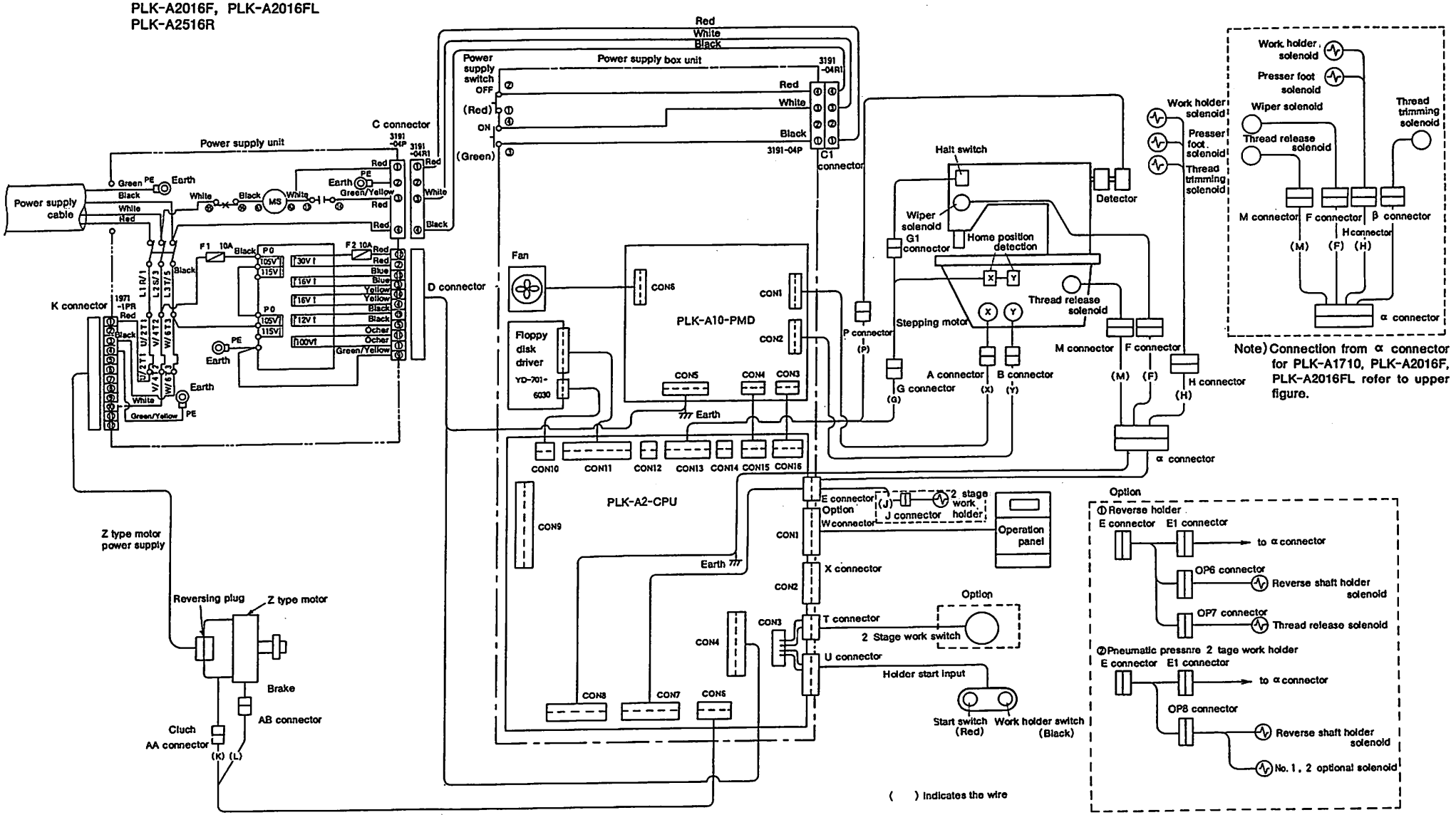
7. 1 Unit wiring diagram(3φ 200V~220V)

①PLK-A05PF
PLK-A0804
PLK-A1006

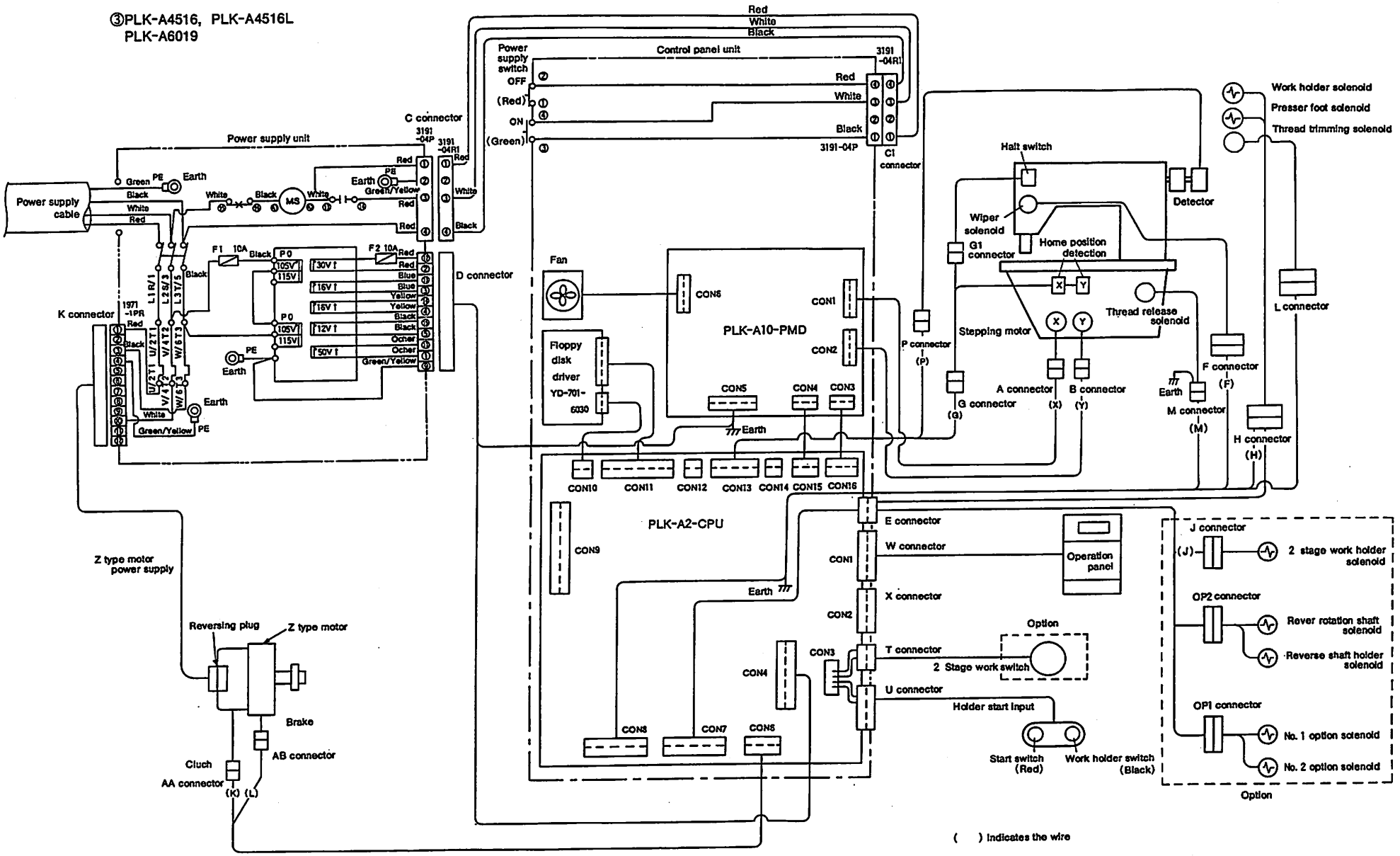


Appendix 1

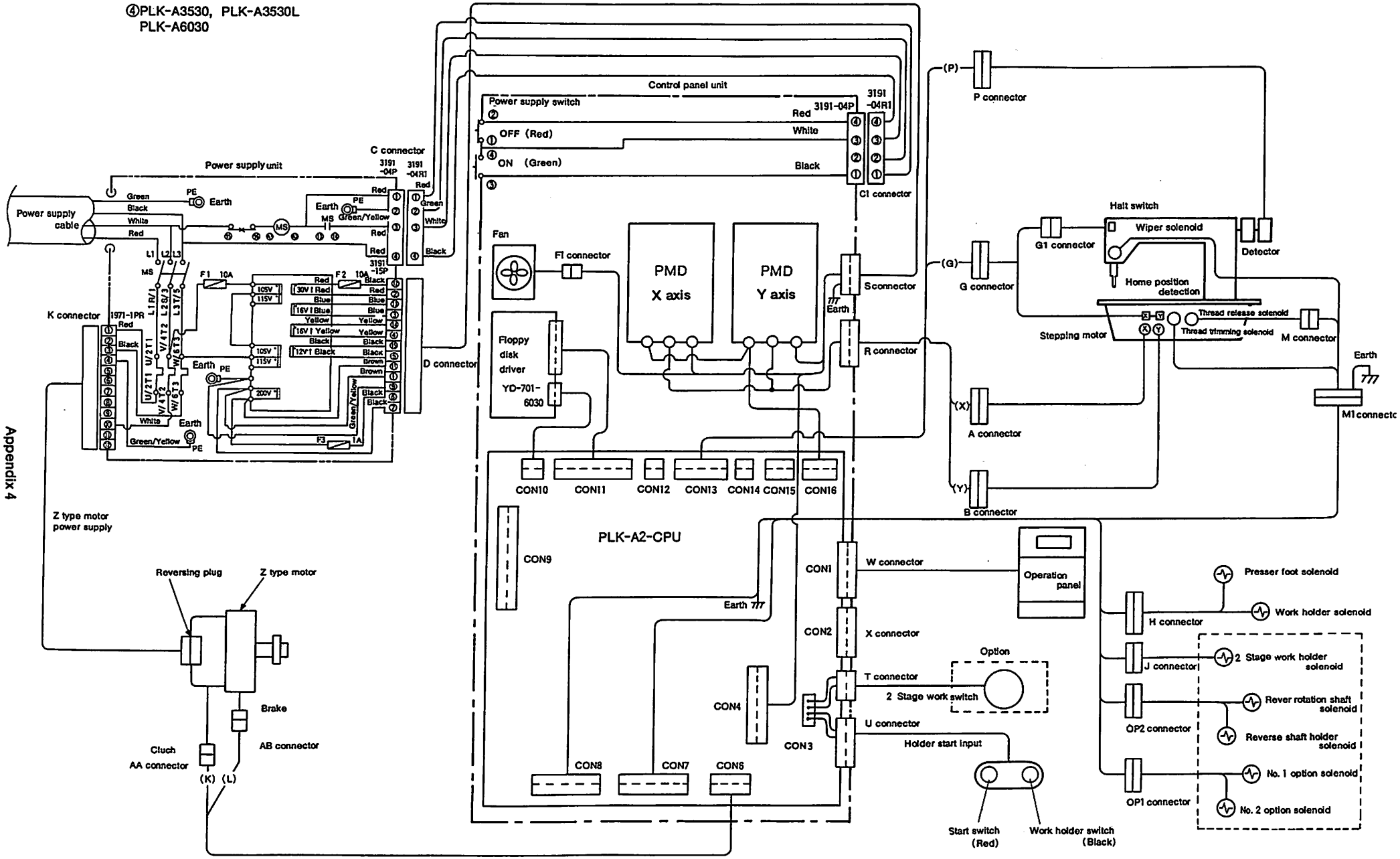
②PLK-A1710, PLK-A1710R
PLK-A2016F, PLK-A2016FL
PLK-A2516R



③PLK-A4516, PLK-A4516L
PLK-A6019



④PLK-A3530, PLK-A3530L
PLK-A6030



7. 2 Connecting diagram of connector pins

Connectors of control unit and power unit are arranged as shown by Fig. 7. 1 and the purpose of each connector is as shown by Table 7. 1.
No. and signal name of each connector pin are as shown by table 7. 2—7. 11.
Names of connecting signal between printed circuit boards are as shown Table 7. 12—7. 38.

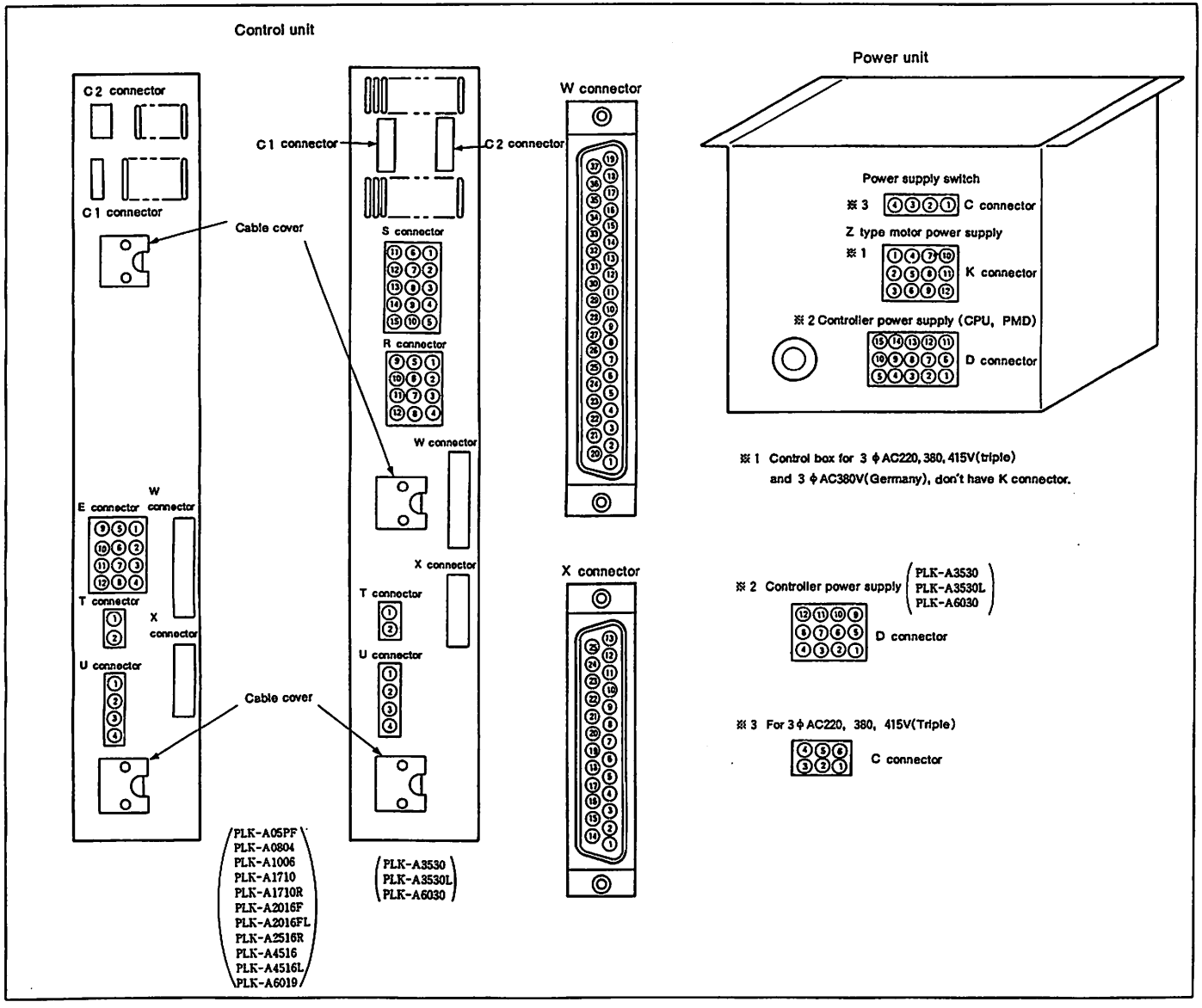


Fig. 7.1

Control unit

Connector name	purpose
E	Connectors for each solenoid
R	Stepping motor
S	Controller power supply
T	2 stage work holder input (switch)
U	Holder, start input (switch)
W	Operation panel
X	Communication connector (RS-232C)

Power unit

Connector name	purpose
C	Power supply switch
D	Controller power supply
K	Z type motor power supply

Table 7.1

Appendix 5

Control unit

E connector 5025-12P

Pin No.	Signal	CPU PCB
1	Work holder	CON 7 - 1
2	+30V	CON 7 - 2
3	+30V	CON 7 - 2
4	2 stage work holder	CON 7 - 4
5	+30V	CON 7 - 3
6	Reverse shift status	CON 7 - 5
7	Reverse shift holder	CON 7 - 7
8	+30V	CON 7 - 3
9	+30V	CON 7 - 6
10	Option 1	CON 7 - 8
11	+30V	CON 7 - 6
12	Option 2	CON 7 - 9

Table 7.2

R connector
1360R-12P

Pin No.	Signal
1	—
2	X axis
3	X axis
4	X axis
5	X axis
6	X axis
7	—
8	Y axis
9	Y axis
10	Y axis
11	Y axis
12	Y axis

Table 7.3

S connector
3191-15P

Pin No.	Signal
1	AC100V
2	30V
3	15V
4	15V
5	12V
6	—
7	—
8	—
9	FG
10	—
11	AC100V
12	30V
13	15V
14	15V
15	12V

Table 7.4

T connector 1545R

Pin No.	Signal	CPU PCB
1	2 stage work holder	CON 3 - 2
2	GND	CON 3 - 4

Table 7.5

U connector 1490R

Pin No.	Signal	CPU PCB
1	Work holder	CON 3 - 1
2	GND	CON 3 - 4
3	GND	CON 3 - 4
4	Start	CON 3 - 3

Table 7.6

W connector RDCD-37S-LN

Pin No.	Signal	CPU PCB
1	R0	CON 1 - 1
2	R1	CON 1 - 2
3	R2	CON 1 - 3
4	R3	CON 1 - 4
5	R4	CON 1 - 5
6	R5	CON 1 - 6
7	R6	CON 1 - 7
8	R7	CON 1 - 8
9	S0	CON 1 - 9
10	S1	CON 1 -10
11	S2	CON 1 -11
12	BD	CON 1 -12
13	0A0	CON 1 -13
14	0A1	CON 1 -14
15	0A2	CON 1 -15
16	B2	CON 1 -16
17	+5V	CON 1 -17
18	+5V	CON 1 -18
19	GND	CON 1 -19
20	GND	CON 1 -20
21	−12V	CON 1 -21
22	E	CON 1 -22
23	R/W	CON 1 -23
24	RS	CON 1 -24
25	D8	CON 1 -25
26	D9	CON 1 -26
27	D10	CON 1 -27
28	D11	CON 1 -28
29	D12	CON 1 -29
30	D13	CON 1 -30
31	D14	CON 1 -31
32	D15	CON 1 -32
33	D1R	CON 1 -33
34	PANEL OE	CON 1 -34
35	—	CON 1 -35
36	—	CON 1 -36
37	+12V	CON 1 -37

Table 7.7

X connector RDBD-25S-LN

Pin No.	Signal	CPU PCB
1	FG	CON 2 - 1
2	SD	CON 2 - 2
3	RD	CON 2 - 3
4	RS	CON 2 - 4
5	CS	CON 2 - 5
6	DR	CON 2 - 6
7	SG	CON 2 - 7
8	—	CON 2 - 8
9	—	CON 2 - 9
10	—	CON 2 -10
11	—	CON 2 -11
12	—	CON 2 -12
13	—	CON 2 -13
14	—	CON 2 -14
15	—	CON 2 -15
16	—	CON 2 -16
17	—	CON 2 -17
18	—	CON 2 -18
19	—	CON 2 -19
20	CD	CON 2 -20
21	—	CON 2 -21
22	—	CON 2 -22
23	—	CON 2 -23
24	—	CON 2 -24
25	—	CON 2 -25

Table 7.8

Power unit

C connector

3191-04P

Pin No.	Signal
1	S1
2	FG
3	S2
4	S3

3191-06P

Pin No.	Signal
1	S1
2	FG
3	S2
4	S3
5	S4
6	S5

For 3φ AC220, 380, 415V (Triple)

K connector

1991-12R

Pin No.	Signal
1	U Phase
2	—
3	W phase
4	Earth
5	—
6	—
7	—
8	—
9	—
10	V phase
11	—
12	—

Table 7.10

D connector

3191-15P

Pin No.	Signal
1	AC100V
2	30V
3	16V
4	16V
5	12V
6	—
7	—
8	—
9	FG
10	—
11	AC100V
12	30V
13	16V
14	16V
15	12V

PLK-A1710
PLK-A1710R
PLK-A2016F
PLK-A2016FL
PLK-A2516R
PLK-A3530
PLK-A3530L
PLK-A4516
PLK-A4516L
PLK-A6019
PLK-A6030

3191-12P

Pin No.	Signal
1	AC50V
2	30V
3	AC16V
4	AC16V
5	AC50V
6	30V
7	AC16V
8	AC16V
9	FG
10	—
11	12V
12	12V

PLK-A05PF
PLK-A0804
PLK-A1006

Table 7.11

Appendix 6

Table of connections between printed circuit boards

※CPU connector 3

Pin No.	Signal
1	Work holder
2	2 stage work holder
3	Start
4	GND
5	—
6	—

Table 7.12

Connection between CPUand trans

CPU	Signal	Trans
4 - 1	AC15V	Trans AC15V
◆ 2	◆	◆
◆ 3	AC15V	Trans AC15V
◆ 4	◆	◆
◆ 5	AC12V	Trans AC12V
◆ 6	◆	◆
◆ 7	AC30V	Trans AC30V
◆ 8	◆	◆

Table 7.13

CPU connector 6

Pin No.	Signal
1	Clutch
2	+30V
3	+30V
4	Brake

Table 7.14

CPU connector 7

Pin No.	Signal
1	Work holder
2	+30V
3	+30V
4	2 stage work holder
5	Reverse shaft rotation
6	+30V
7	Reverse shaft holder
8	Option 1
9	Option 2

Table 7.15

CPU connector 8

Pin No.	Signal
1	Presser foot
2	+30V
3	+30V
4	Thread trimming
5	Wiper
6	+30V
7	+30V
8	Thread release

Table 7.16

CPU connector13

Pin No.	Signal
1	+12V
2	UP
3	DN
4	RO
5	PG
6	GND
7	GND
8	+12V
9	XHOME
10	YHOME
11	GND
12	GND
13	STOP

Table 7.17

※Connection between PMD and CPU

PMD	Signal	CPU
4 - 1	XAP	15- 1
◆ 2	XAN	◆ 2
◆ 3	XBP	◆ 3
◆ 4	XBN	◆ 4
◆ 5	SX1EN	◆ 5
◆ 6	SX2EN	◆ 6
◆ 7	SX3EN	◆ 7
◆ 8	SX4EN	◆ 8
◆ 9	YAP	◆ 9
◆ 10	YAN	◆ 10

Table 7.18

※Connection between PMD and

PMD	Signal	CPU
3 - 1	YBP	16- 1
◆ 2	YBN	◆ 2
◆ 3	SY1EN	◆ 3
◆ 4	SY2EN	◆ 4
◆ 5	SY3EN	◆ 5
◆ 6	SY4EN	◆ 6
◆ 7	XPD	◆ 7
◆ 8	YPD	◆ 8
◆ 9	P.M.OCT	◆ 9
◆ 10	+5V	◆ 10
◆ 11	◆	◆ 11
◆ 12	GND	◆ 12

Table 7.19

※PMD
(X axis motor)
connector 1

Pin No.	Signal
1	XB2
2	XB1
3	—
4	—
5	XA2
6	XA1

Table 7.20

※PMD
(Y axis motor)
connector 2

Pin No.	Signal
1	YB2
2	YB1
3	—
4	—
5	YA1
6	YA2

Table 7.21

※ Connection between PMD and trans.

PMD	Signal	Trans
5 - 1	AC15V	Trans AC15V
◆ 2	◆	◆
◆ 3	◆	◆
◆ 4	AC15V	Trans AC15V
◆ 5	AC100V	◆ AC100V
◆ 6	FG	Earth
◆ 7	AC100V	◆ AC100V

Excluded
PLK-A05PF
PLK-A0804
PLK-A1006

PMD	Signal	Trans
5 - 1	AC45V	Trans AC45V
◆ 2	◆	◆
◆ 3	AC15V	Trans AC15V
◆ 4	◆	◆

Adapted for only
PLK-A05PF
PLK-A0804
PLK-A1006

※PMD
(Fan power supply)
connector 6

Pin No.	Signal
1	+12V
2	GND

Table 7.23

CPU(Detector)
connector 12

Pin No.	Signal
1	+12V
2	AIR PRESS
3	GND
4	◆

Table 7.24

CPU(Detector)
connector 14

Pin No.	Signal
1	+12V
2	THRD BK
3	GND

Table 7.25

PMD
(Thermostat)
connector 7

Pin No.	Signal
1	ET35D040G30
2	◆

Table 7.26

CPU(Operationpanel)
connector 1

Pin No.	Signal
1	RO
2	◆ 1
3	◆ 2
4	◆ 3
5	◆ 4
6	◆ 5
7	◆ 6
8	◆ 7
9	S0
10	S1
11	S2
12	BD
13	OA0
14	◆ 1
15	◆ 2
16	BZ
17	+5V
18	◆
19	GND
20	◆
21	−12V
22	E
23	R/W
24	RS
25	D8
26	◆ 9
27	◆ 10
28	◆ 11
29	◆ 12
30	◆ 13
31	◆ 14
32	◆ 15
33	DIR
34	PANELOE
35	—
36	—
37	+12V

Table 7.27

CPU(communication)
connector 2

Pin No.	Signal
1	FG
2	SD
3	RD
4	RS
5	CS
6	DR
7	SG
8	—
9	—
10	—
11	—
12	—
13	—
14	—
15	—
16	—
17	—
18	—
19	—
20	CD
21	—
22	—
23	—
24	—
25	—

Table 7.28

FDD power supply

CPU	Signal	FDD
10- 1	+5V	2 - 1
◆ - 2	GND	◆ - 2
◆ - 3	◆	◆ - 3
◆ - 4	+12V	◆ - 4

Table 7.29

Connection between CPU and FDD

CPU	Signal	FDD
11- 1 A	GND	1 - 1
B	[illegible]	2
11- 2 A	GND	1 - 3
B	IN USE	4
11- 3 A	GND	1 - 5
B	HEAD LOOD	6
11- 4 A	GND	1 - 7
B	INDEX	8
11- 5 A	GND	1 - 9
B	DRIVE SELECT	10
11- 6 A	GND	1 - 11
B	—	12
11- 7 A	GND	1 - 13
B	—	14
11- 8 A	GND	1 - 15
B	MOTOR ON	16
11- 9 A	GND	1 - 17
B	[illegible]	18
11-10A	GND	1 - 19
B	STEP	20
11-11A	GND	1 - 21
B	WRITE DATA	22
11-12A	GND	1 - 23
B	WRITE GATE	24
11-13A	GND	1 - 25
B	TRACK 00	26
11-14A	GND	1 - 27
B	[illegible]	28
11-15A	GND	1 - 29
B	READ DATA	30
11-16A	GND	1 - 31
B	[illegible]	32
11-17A	GND	1 - 33
B	READY	34

Table 7.30

Indicates the signal is "Low Active".

※ Is aclapted for
PLK-A05PF
PLK-A0804
PLK-A1006
PLK-A1710
PLK-A1710R
PLK-A2016F
PLK-A2016FL
PLK-A2516R
PLK-A4516
PLK-A4516L
PLK-A6019

Option

IO1 board connector 2

Pin No.	Signal
1A	GND
B	+24V
2A	OOUT 8
B	◆ 7
3A	◆ 6
B	◆ 5
4A	◆ 4
B	◆ 3
5A	◆ 2
B	◆ 1
6A	OIN16
B	◆ 8
7A	◆ 15
B	◆ 7
8A	◆ 14
B	◆ 6
9A	◆ 13
B	◆ 5
10A	◆ 12
B	◆ 4
11A	◆ 11
B	◆ 3
12A	◆ 10
B	◆ 2
13A	◆ 9
B	◆ 1
14A	—
B	+24V

Table 7.31

IO2 board connector 2

Pin No.	Signal
1A	GND
B	+24V
2A	OOUT 8
B	◆ 7
3A	◆ 6
B	◆ 5
4A	◆ 4
B	◆ 3
5A	◆ 2
B	◆ 1
6A	OIN16
B	◆ 8
7A	◆ 15
B	◆ 7
8A	◆ 14
B	◆ 6
9A	◆ 13
B	◆ 5
10A	◆ 12
B	◆ 4
11A	◆ 11
B	◆ 3
12A	◆ 10
B	◆ 2
13A	◆ 9
B	◆ 1
14A	—
B	+24V

Table 7.32

Connection between CPU and

CPU	Signal	MBR
9-1A	AG	1-1A
B	◆	B
9-2A	DG	1-2A
B	◆	B
9-3A	DN	1-3A
B	UP	B
9-4A	PG1	1-4A
B	RESET	B
9-5A	CSTE	1-5A
B	CSTS	B
9-6A	ROM1NCS	1-6A
B	ROM02CS	B
9-7A	ROM01CS	1-7A
B	IO2CS	B
9-8A	IO1CS	1-8A
B	WR	B
9-9A	RD	1-9A
B	A2	B
9-10A	A1	1-10A
B	A0	B
9-11A	PD7	1-11A
B	◆6	B
9-12A	◆5	1-12A
B	◆4	B
9-13A	◆3	1-13A
B	◆2	B
9-14A	◆1	1-14A
B	◆0	B
9-15A	—	1-15A
B	—	B
9-16A	−12V	1-16A
B	◆	B
9-17A	+5V	1-17A
B	◆	B
9-18A	+12V	1-18A
B	◆	B
9-19A	SG	1-19A
B	◆	B
9-20A	+E1	1-20A
B	◆	B

Table 7.33

Connection between RWT and MBR

RWT	Signal	MBR
1-1A	+5V	2-1A
C	◆	C
1-2A	—	2-2A
C	—	C
1-3A	+12V	2-3A
C	◆	C
1-4A	—	2-4A
C	—	C
1-5A	—	2-5A
C	—	C
1-6A	—	2-6A
C	—	C
1-7A	PD0	2-7A
C	◆1	C
1-8A	◆2	2-8A
C	◆3	C
1-9A	◆4	2-9A
C	◆5	C
1-10A	◆6	2-10A
C	◆7	C
1-11A	—	2-11A
C	—	C
1-12A	A1	2-12A
C	A2	C
1-13A	—	2-13A
C	—	C
1-14A	RD	2-14A
C	WR	C
1-15A	—	2-15A
C	—	C
1-16A	RESET	2-16A
C	—	C
1-17A	—	2-17A
C	—	C
1-18A	—	2-18A
C	—	C
1-19A	—	2-19A
C	—	C
1-20A	—	2-20A
C	—	C
1-21A	ROM01CS	2-21A
C	ROM02CS	C
1-22A	ROM1NCS	2-22A
C	—	C
1-23A	—	2-23A
C	—	C
1-24A	—	2-24A
C	—	C
1-25A	—	2-25A
C	—	C
1-26A	CSTS	2-26A
C	CSTE	C
1-27A	—	2-27A
C	—	C
1-28A	—	2-28A
C	—	C
1-29A	+E1	2-29A
C	◆	C
1-30A	DG	2-30A
C	◆	C
1-31A	SG	2-31A
C	◆	C
1-32A	AG	2-32A
C	◆	C

Table 7.34

Connection between MBR CON5 and CON6

CON5	Signal	CON6
5-1	+5V	6-1
◆ 2	◆	◆ 2
◆ 3	DG	◆ 3
◆ 4	◆	◆ 4
◆ 5	+12V	◆ 5
◆ 6	◆	◆ 6
◆ 7	AG	◆ 7
◆ 8	◆	◆ 8
◆ 9	CSTS	◆ 9
◆ 10	CSTE	◆ 10
◆ 11	ROM02CS	◆ 11
◆ 12	ROM1NCS	◆ 12
◆ 13	ROM01CS	◆ 13
◆ 14	IO1CS	◆ 14
◆ 15	IO2CS	◆ 15
◆ 16	RESET	◆ 16
◆ 17	RD	◆ 17
◆ 18	WR	◆ 18
◆ 19	A1	◆ 19
◆ 20	A2	◆ 20
◆ 21	PD7	◆ 21
◆ 22	◆6	◆ 22
◆ 23	◆5	◆ 23
◆ 24	◆4	◆ 24
◆ 25	◆3	◆ 25
◆ 26	◆2	◆ 26
◆ 27	◆1	◆ 27
◆ 28	◆0	◆ 28
◆ 29	SG	◆ 29
◆ 30	◆	◆ 30

Table 7.35

Connection between RWT and CST—ROM

RWT	Signal	CST	ROM
2-1A	GND	2-1A	1A
B	CSTS/CE	B	1B
2-2A	—	—	—
B	—	—	—
2-3A	D4	2-3A	2B
B	—	—	—
2-4A	D3	2-4A	2A
B	—	—	—
2-5A	D5	2-5A	3B
B	—	—	—
2-6A	D2	2-6A	3A
B	—	—	—
2-7A	D6	2-7A	4B
B	—	—	—
2-8A	D1	2-8A	4A
B	—	—	—
2-9A	D7	2-9A	5B
B	—	—	—
2-10A	D0	2-10A	5A
B	—	—	—
2-11A	A1	2-11A	6B
B	A0	◆B	6A
2-12A	A2	2-12A	7B
B	—	—	—
2-13A	A10	2-13A	7A
B	—	—	—
2-14A	A3	2-14A	8B
B	—	—	—
2-15A	CSTE/A13	2-15A	8A
B	—	—	—
2-16A	A4	2-16A	9B
B	A11	◆B	9A
2-17A	A5	2-17A	10B
B	—	—	—
2-18A	A9	2-18A	10A
B	—	—	—
2-19A	A6	2-19A	11B
B	—	—	—
2-20A	A8	2-20A	11A
B	—	—	—
2-21A	A7	2-21A	12B
B	—	—	—
2-22A	OE/VPP	2-22A	12A
B	—	—	—
2-23A	A14	2-23A	13B
B	—	—	—
2-24A	A12	2-24A	13A
B	—	—	—
2-25A	VPP.A15	2-25A	14A
B	+5V	◆B	14B

Table 7.36

Connection between IO1 and

IO1	Signal	MBR
1-1A	+5V	3-1A
C	◆	C
1-2A	—	3-2A
C	—	C
1-3A	+12V	3-3A
C	◆	C
1-4A	—	3-4A
C	—	C
1-5A	—	3-5A
C	—	C
1-6A	—	3-6A
C	—	C
1-7A	PD0	3-7A
C	◆1	C
1-8A	◆2	3-8A
C	◆3	C
1-9A	◆4	3-9A
C	◆5	C
1-10A	◆6	3-10A
C	◆7	C
1-11A	—	3-11A
C	—	C
1-12A	A1	3-12A
C	A2	C
1-13A	—	3-13A
C	—	C
1-14A	RD	3-14A
C	WR	C
1-15A	—	3-15A
C	—	C
1-16A	RESET	3-16A
C	—	C
1-17A	IO1CS	3-17A
C	IO2CS	C
1-18A	—	3-18A
C	—	C
1-19A	—	3-19A
C	—	C
1-20A	—	3-20A
C	—	C
1-21A	—	3-21A
C	ROM01CS	C
1-22A	ROM02CS	3-22A
C	ROM1NCS	C
1-23A	—	3-23A
C	—	C
1-24A	—	3-24A
C	—	C
1-25A	—	3-25A
C	—	C
1-26A	CSTS	3-26A
C	CSTE	C
1-27A	—	3-27A
C	—	C
1-28A	—	3-28A
C	—	C
1-29A	+E1	3-29A
C	◆	C
1-30A	DG	3-30A
C	◆	C
1-31A	SG	3-31A
C	◆	C
1-32A	AG	3-32A
C	◆	C

Table 7.37

Connection between IO2 and MBR

IO2	Signal	MBR
1-1A	+5V	4-1A
C	◆	C
1-2A	—	4-2A
C	—	C
1-3A	+12V	4-3A
C	◆	C
1-4A	—	4-4A
C	—	C
1-5A	—	4-5A
C	—	C
1-6A	—	4-6A
C	—	C
1-7A	PD0	4-7A
C	◆1	C
1-8A	◆2	4-8A
C	◆3	C
1-9A	◆4	4-9A
C	◆5	C
1-10A	◆6	4-10A
C	◆7	C
1-11A	—	4-11A
C	—	C
1-12A	A1	4-12A
C	A2	C
1-13A	—	4-13A
C	—	C
1-14A	RD	4-14A
C	WR	C
1-15A	—	4-15A
C	—	C
1-16A	RESET	4-16A
C	—	C
1-17A	IO1CS	4-17A
C	IO2CS	C
1-18A	—	4-18A
C	—	C
1-19A	—	4-19A
C	—	C
1-20A	—	4-20A
C	—	C
1-21A	—	4-21A
C	ROM01CS	C
1-22A	ROM02CS	4-22A
C	ROM1NCS	C
1-23A	—	4-23A
C	—	C
1-24A	—	4-24A
C	—	C
1-25A	—	4-25A
C	—	C
1-26A	CSTS	4-26A
C	CSTE	C
1-27A	—	4-27A
C	—	C
1-28A	—	4-28A
C	—	C
1-29A	+E1	4-29A
C	◆	C
1-30A	DG	4-30A
C	◆	C
1-31A	SG	4-31A
C	◆	C
1-32A	AG	4-32A
C	◆	C

Table 7.38

Appendix 8

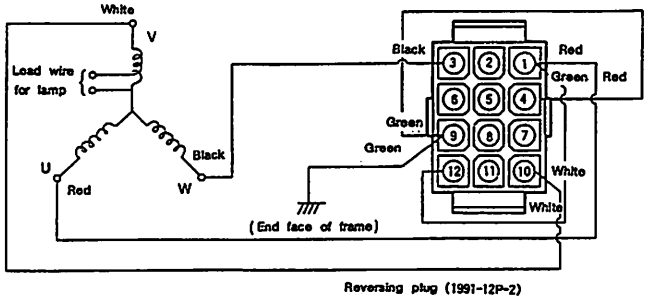
Indicates the signal is "Low Active"

7.3 Connecting diagram of each connector

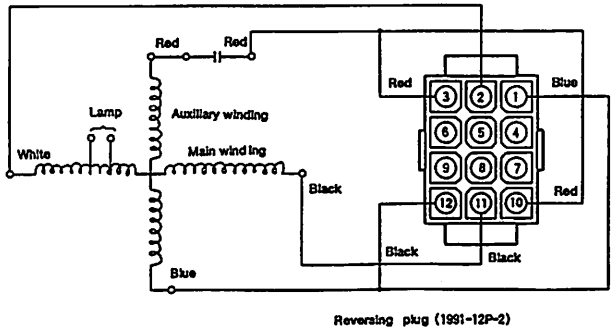
(1) Z type motor section

Connection of lead wires of each connector is seen from the direction to insert the lead wire.

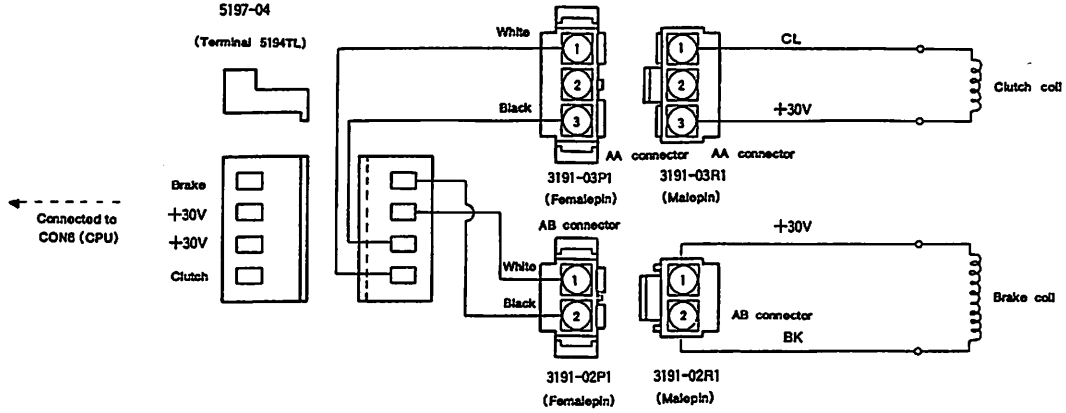
① For 3 phaes (200V, 220V)



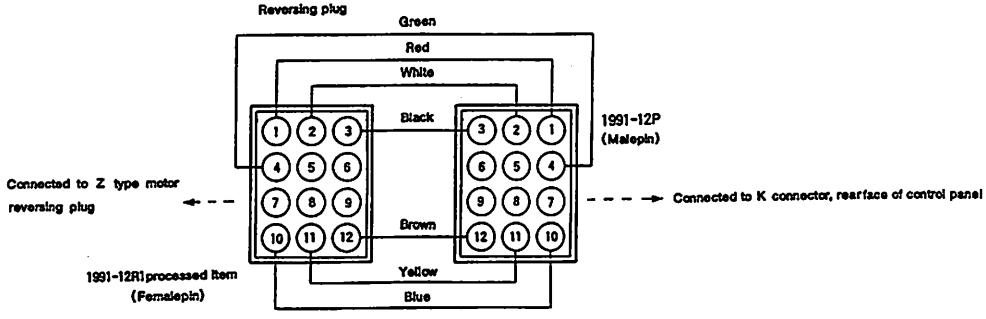
② For single phase (100V, 110V)



③ Z type motor clutch , brake



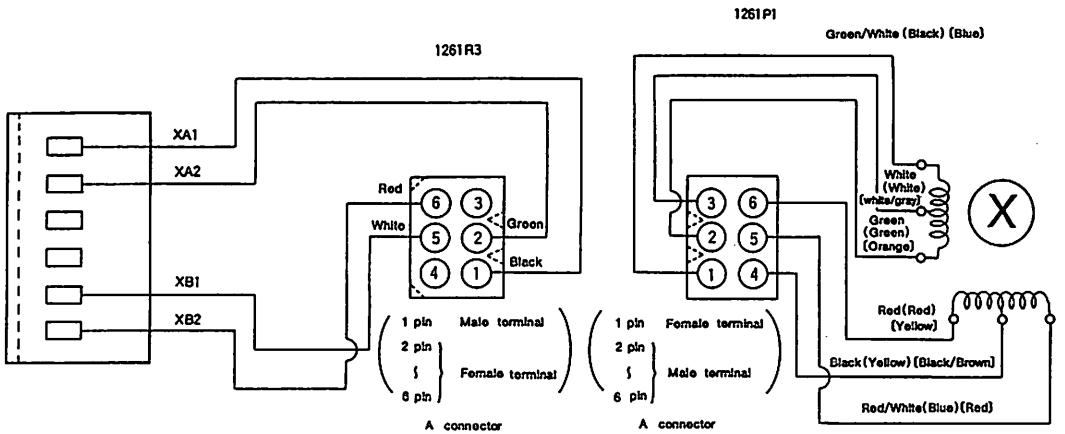
④ Z type motor power supply (reversing plug)



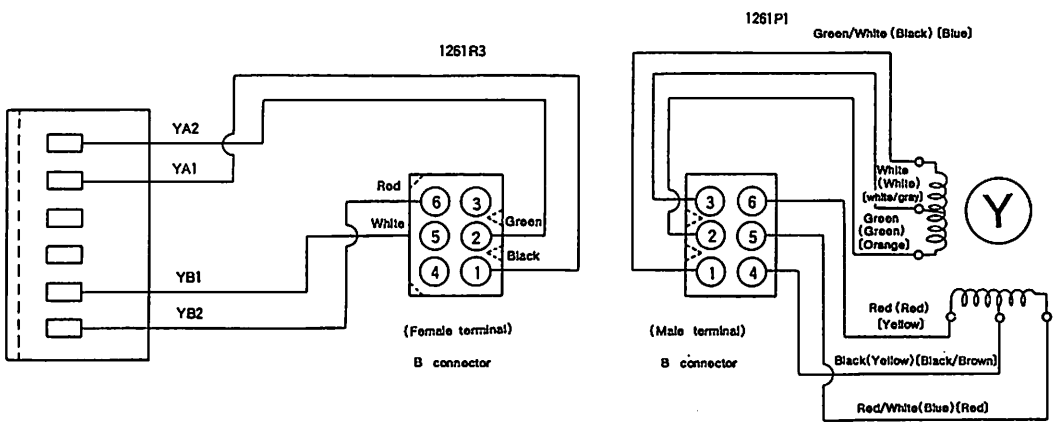
Appendix 9

(2) Stepping motor section

①PLK-A05PF, PLK-A0804, PLK-A1006, PLK-A1710
PLK-A1710R, PLK-A2016F, PLK-A2016FL, PLK-A2516R
PLK-A4516, PLK-A4516L, PLK-A6019



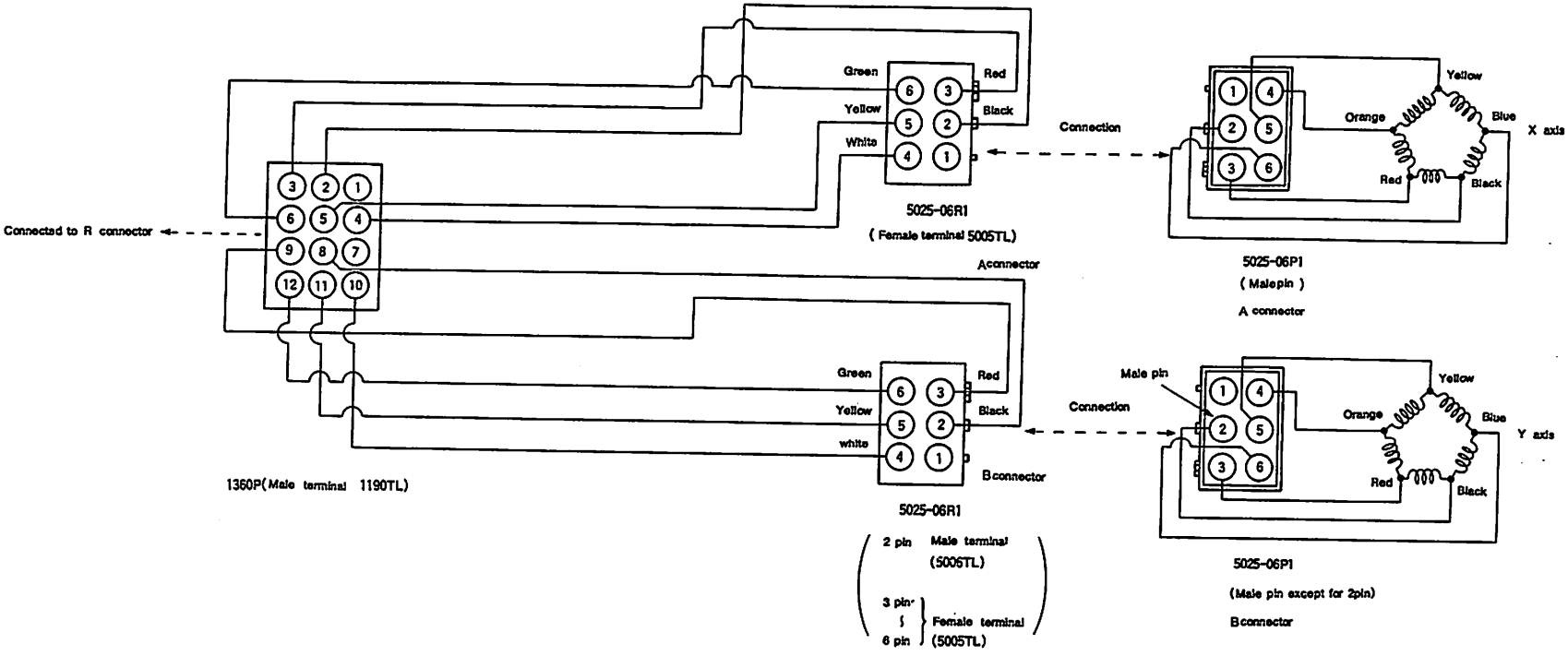
X axis stepping motor



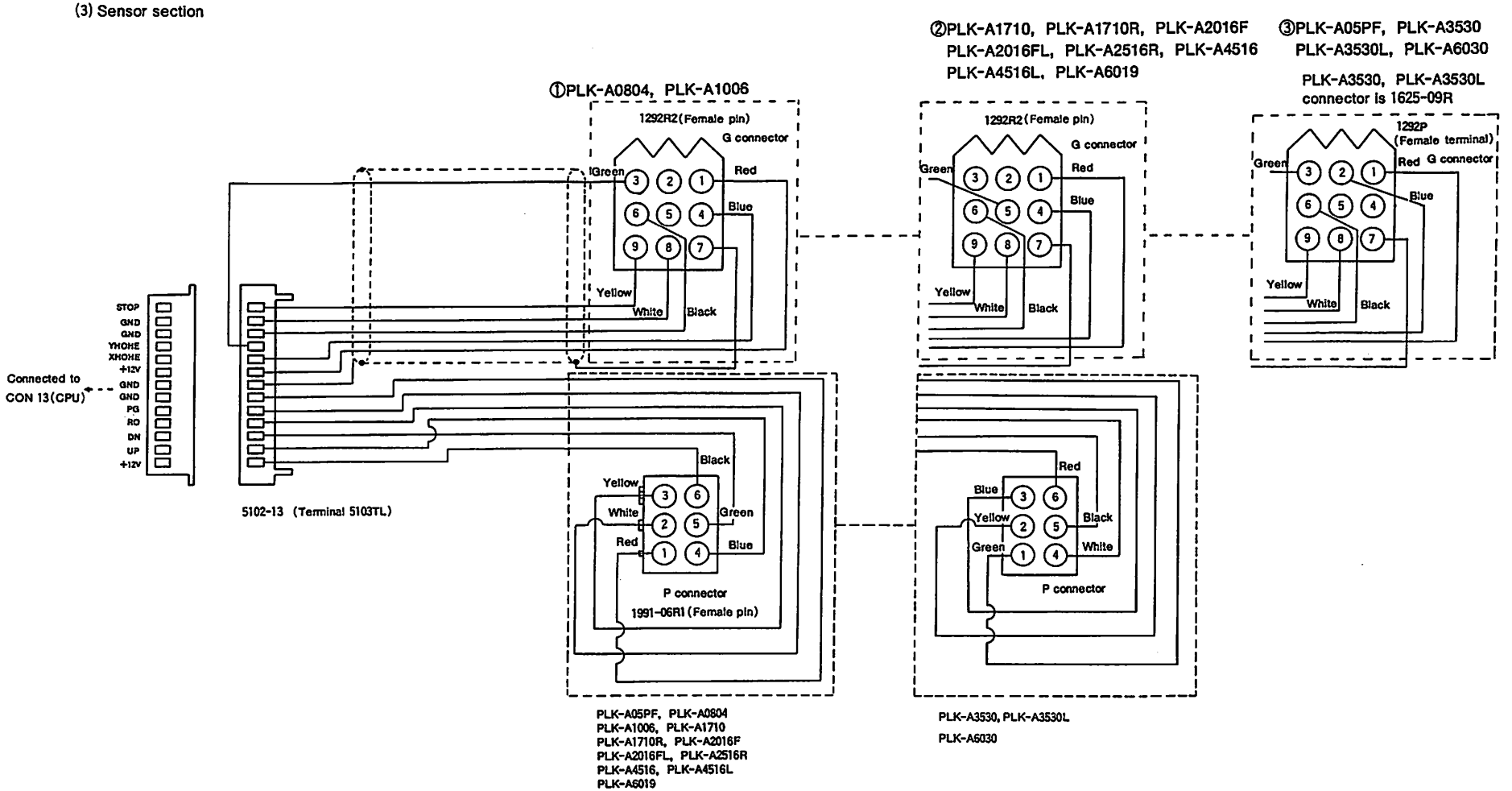
Y axis stepping motor

(Color) indicates PLK-A1710 PLK-A1710R
[Color] indicates PLK-A2016F PLK-A2016FL PLK-A2516R

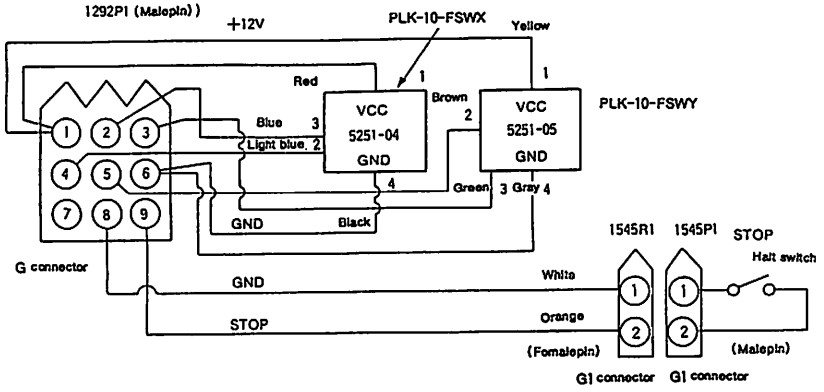
②PLK-A3530, PLK-A3530L, PLK-A6030



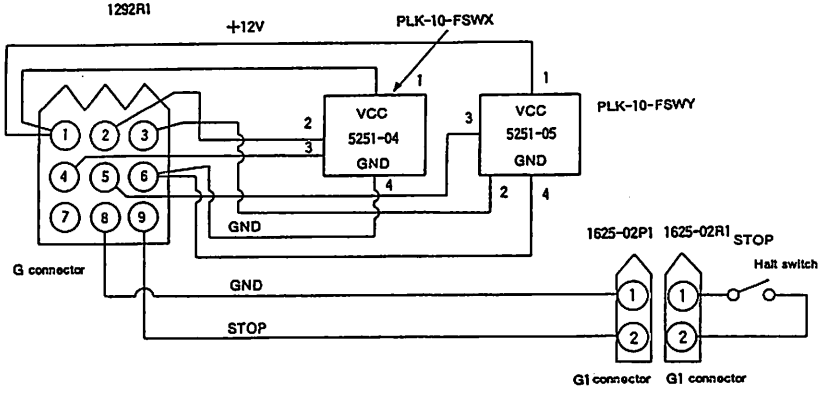
(3) Sensor section

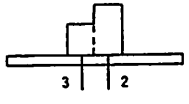


Ⓐ Stepping motor position detector ①PLK-A05PF, PLK-A0804, PLK-A1006, PLK-A1710, PLK-A1710R, PLK-A2016F PLK-A2016FL, PLK-A2516R, PLK-A4516 PLK-A4516L, PLK-A6019



②PLK-A3530, PLK-A3530L, PLK-A6030



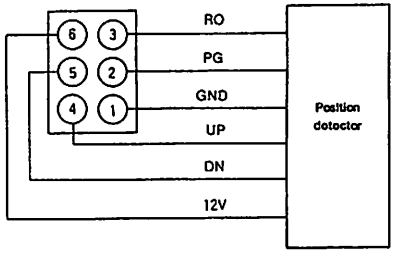


X, Y home position detector

Detector board	Pin No.
Shield board	2
Circle board	3

Ⓑ Needle position detector section

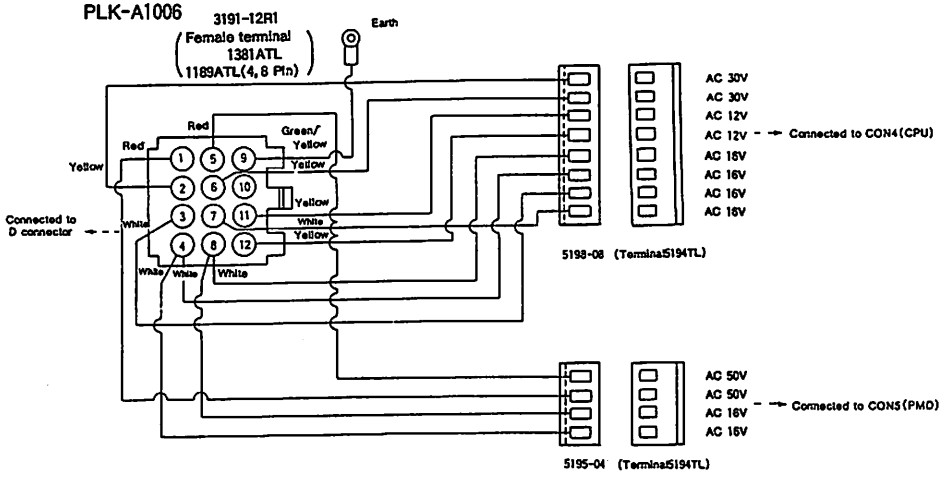
P connector
1991-06P1
(Malepin)



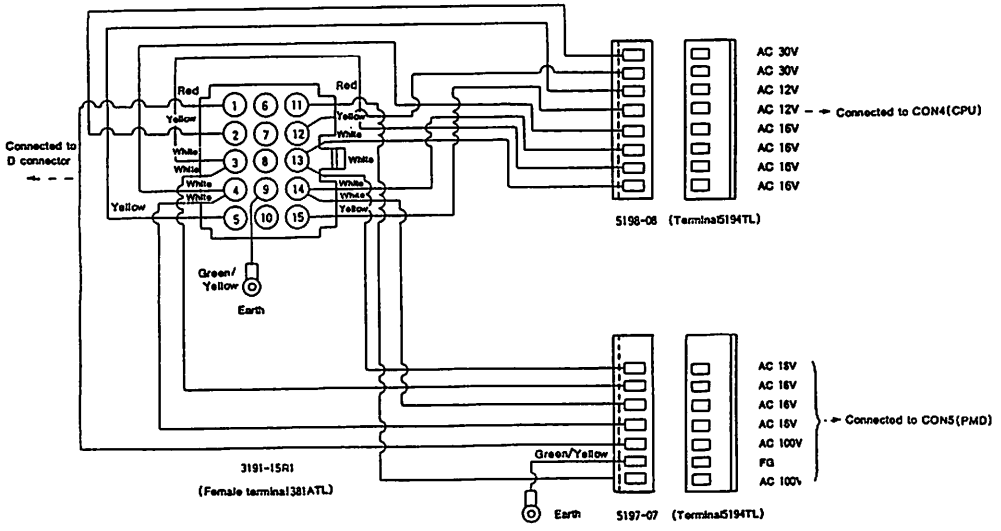
Appendix13

(4) Controller power pupply

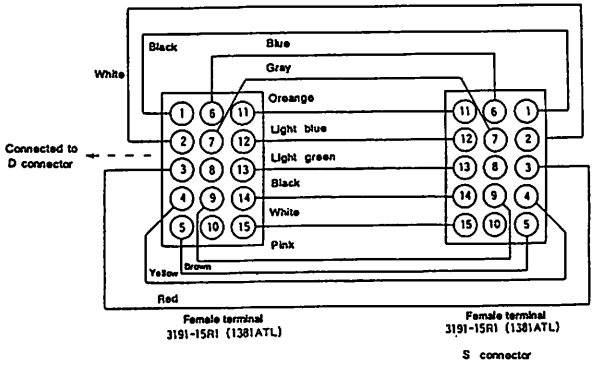
①PLK-A05PF
PLK-A0804
PLK-A1006

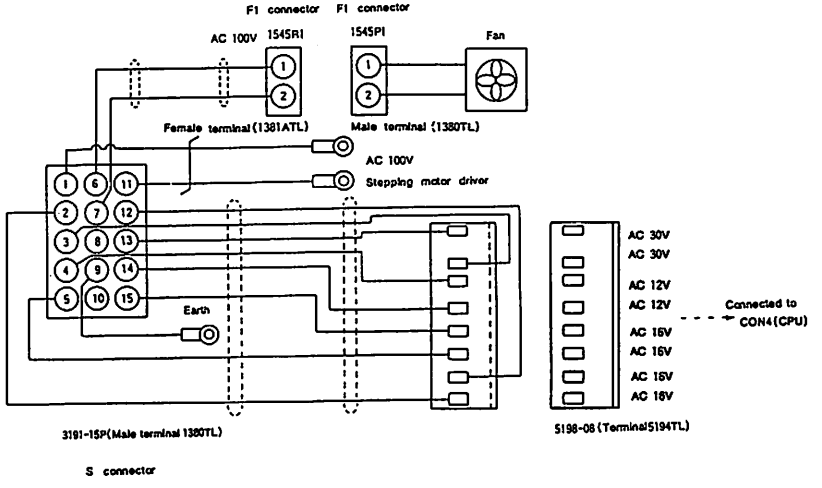


②PLK-A1710, PLK-A1710R, PLK-A4516
PLK-A4516L, PLK-A6019, PLK-A2516R
PLK-A2016F, PLK-A2016FL

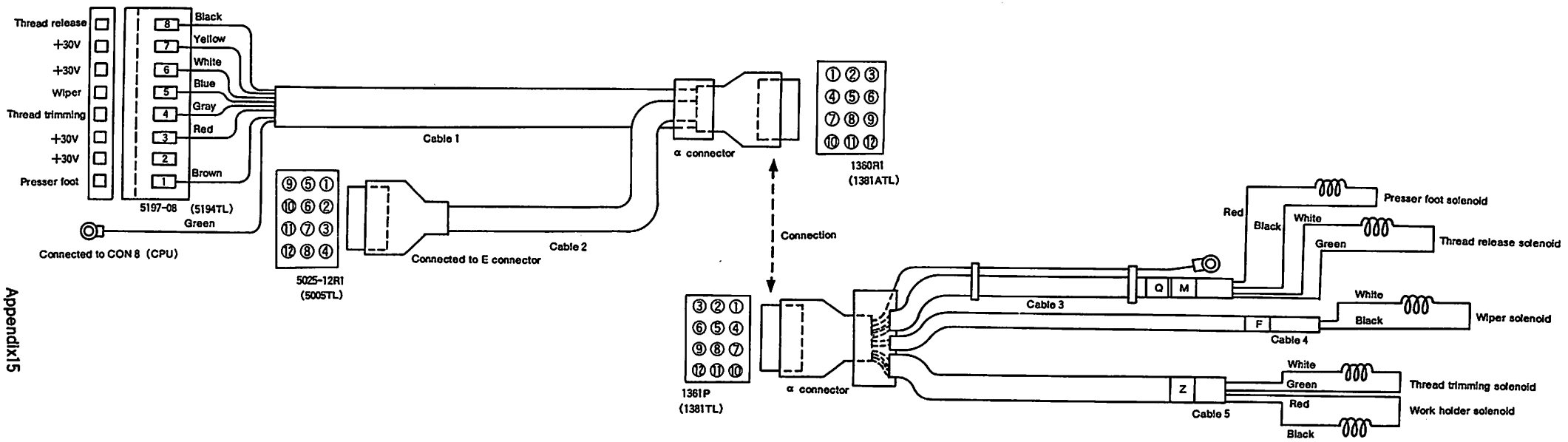


③PLK-A6030





Thread trimming, Wiper, Thread release, Presser foot, Work holder, 2 stage work holder,
Reverse shaft holder, Option section.
①PLK-A05PF, PLK-A0804, PLK-A1006



Appendix15

CPU CON 8

Pin No.	Signal name	Wire color
1	Presser foot	Brown
2	+30V	—
3	+30V	Red
4	Thread trimming	Gray
5	Wiper	Blue
6	+30V	White
7	+30V	Yellow
8	Thread release	Black

E connector

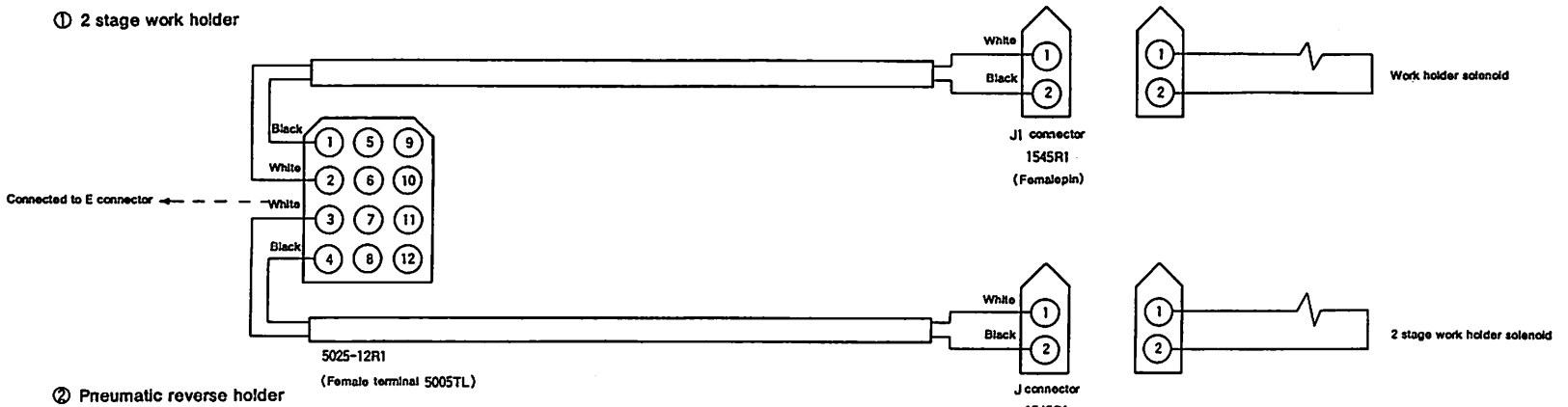
Pin No.	Signal name	Wire color
1	Work holder	Black
2	+30V	White
3	—	—
4	—	—
5	—	—
6	—	—
7	—	—
8	—	—
9	—	—
10	—	—
11	—	—
12	—	—

α connector

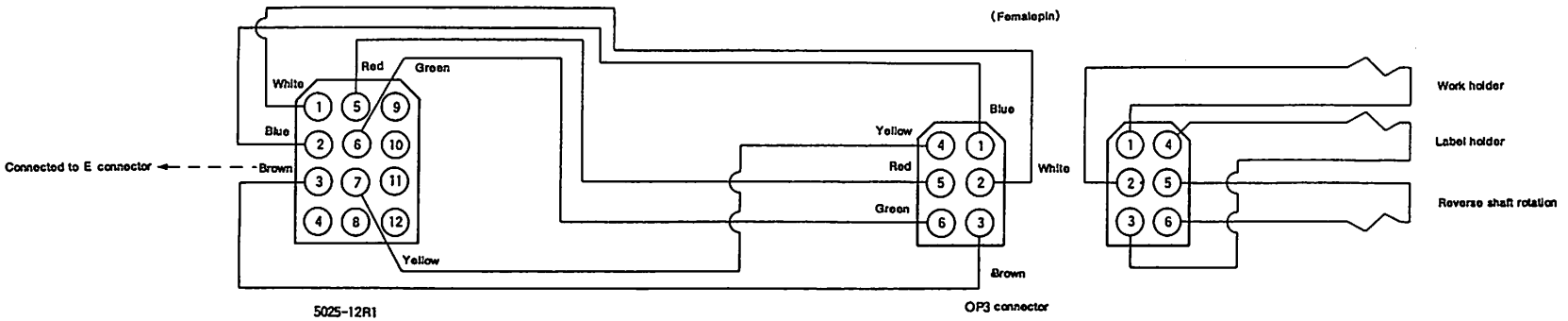
Pin No.	Signal name	Wire color	
		Cable 1	Cable 2
1	+30V	Red	—
2	+30V	—	White
3	+30V	Red	—
4	Wrok holder	—	Black
5	Thread trimming	Gray	—
6	Wiper	Blue	—
7	+30V	White	—
8	+30V	Yellow	—
9	FG	Green	—
10	Presser foot	Brown	—
11	Thread release	Black	—
12	Don't use	—	—

Pin No.	Signal name	Wire color		
		Cable 3	Cable 4	Cable 5
1	+30V	—	—	White
2	+30V	—	—	Red
3	+30V	—	White	—
4	Work holder	—	—	Black
5	Thread trimming	—	—	Green
6	Wiper	—	Black	—
7	+30V	Red	—	—
8	+30V	White	—	—
9	FG	—	—	—
10	Presser foot	Black	—	—
11	Thread release	Green	—	—
12	Don't use	—	—	—

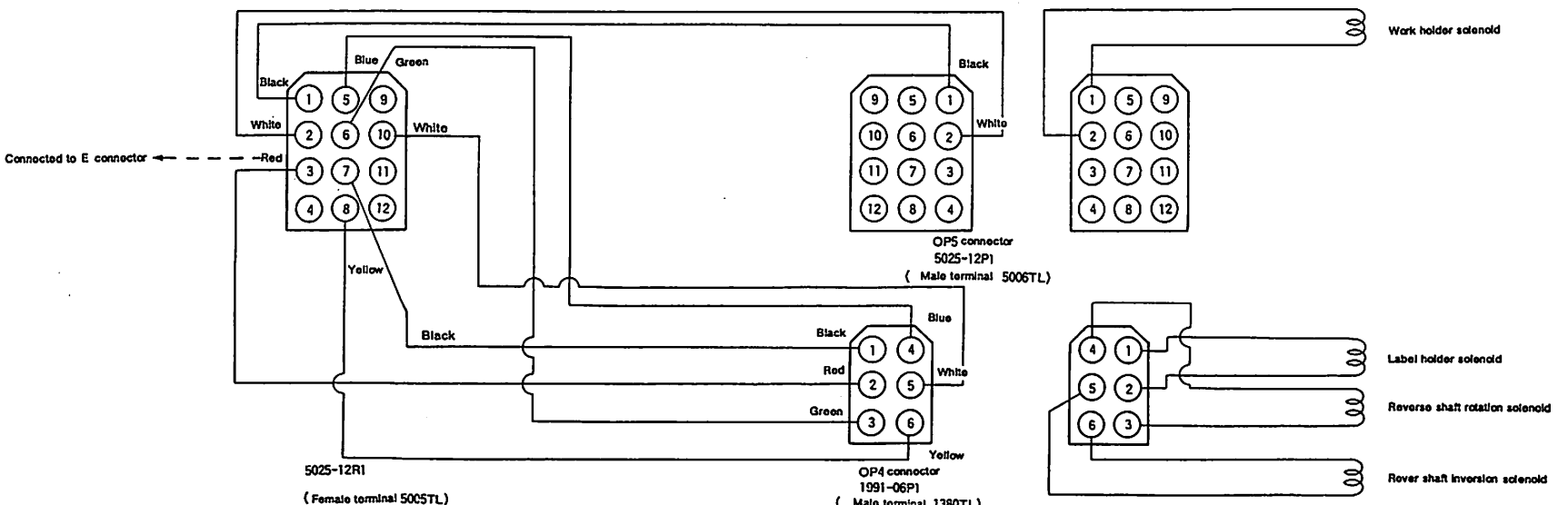
① 2 stage work holder



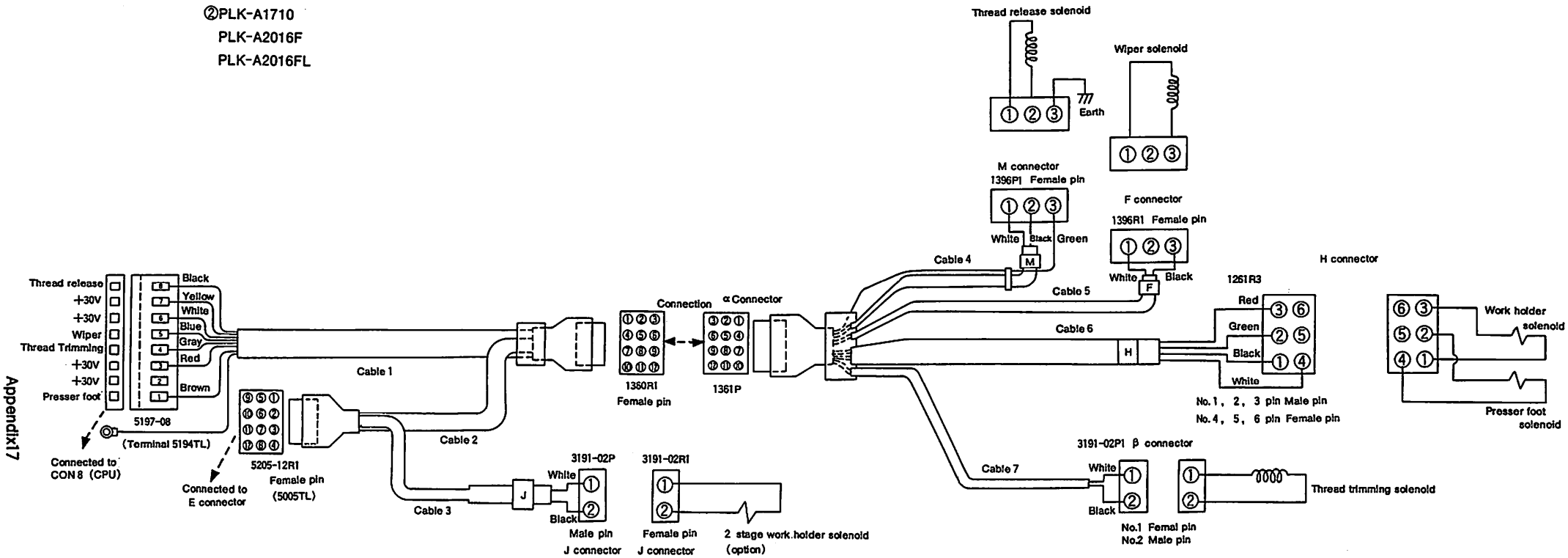
② Pneumatic reverse holder



③ Solenoid reverse holder



②PLK-A1710
PLK-A2016F
PLK-A2016FL



CPU CON 8

Pin No.	Signal name	Color
1	Presser foot	Brown
2	+30V	—
3	+30V	Red
4	Thread trimming	Gray
5	Wiper	Blue
6	+30V	White
7	+30V	Yellow
8	Thread release	Black

E connector

Pin No.	Signal name	Color
1	Work holder	Black
2	+30V	White
3	—	—
4	2 stage work holder	Black
5	+30V	White
6	—	—
7	—	—
8	—	—
9	—	—
10	—	—
11	—	—
12	—	—

α connector

Pin No.	Signal name	Cable 1	Cable 2	Cable 4	Cable 5	Cable 6	Cable 7
1	+30V	Red	—	—	—	Red	—
2	+30V	—	White	—	—	White	—
3	+30V	Red	—	—	White	—	—
4	Work holder	—	Black	—	—	Black	—
5	Thread trimming	Gray	—	—	—	—	Black
6	Wiper	Blue	—	—	Black	—	—
7	+30V	White	—	—	—	—	White
8	+30V	Yellow	—	White	—	—	—
9	FG	Green	—	Green	—	—	—
10	Presser foot	Brown	—	—	—	Green	—
11	Thread release	Black	—	Black	—	—	—
12	—	—	—	—	—	—	—

1360R1 1360P

J connector

Pin No.	Signal name	Color
1	+30V	White
2	2 stage work holder	Black

M connector

Pin No.	Signal name	Color
1	+30V	White
2	Thread release	Black
3	FG	—

F connector

Pin No.	Signal name	Color
1	+30V	White
2	—	—
3	Wiper	Black

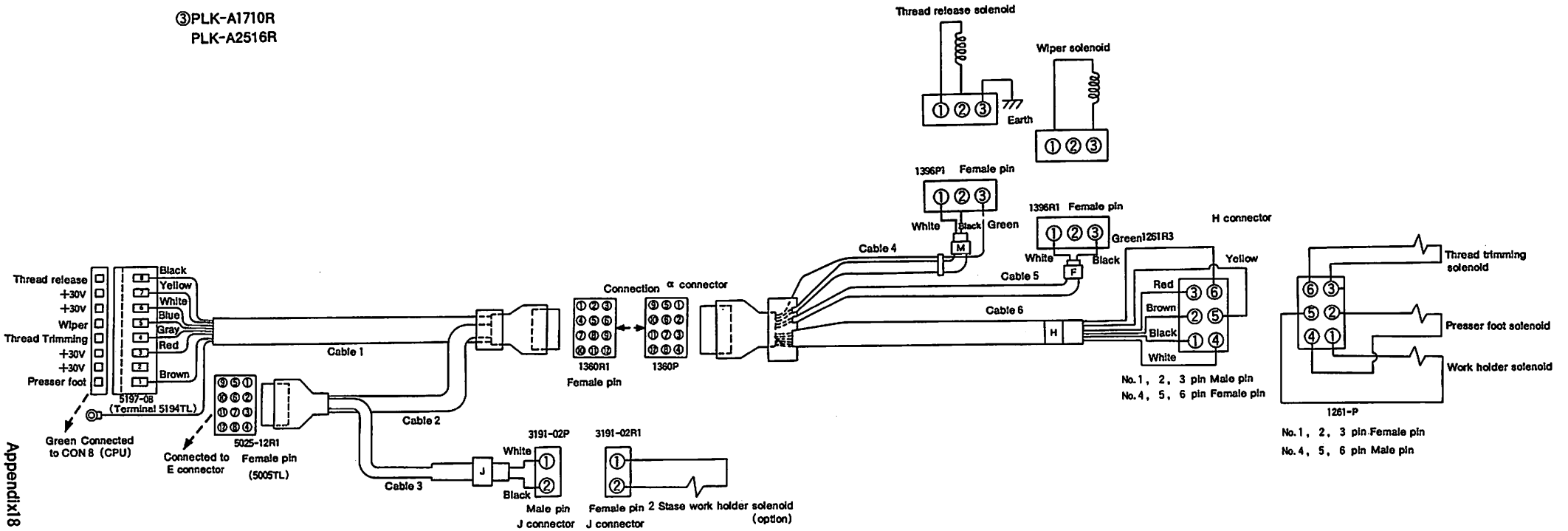
H connector

Pin No.	Signal name	Color
1	Work holder	Black
2	Presser foot	Brown
3	+30V	Red
4	+30V	White
5	—	—
6	—	—

β connector

Pin No.	Signal name	Color
1	+30V	White
2	Thread trimming	Black

③PLK-A1710R
PLK-A2516R



CPU CON 8

Pin No.	Signal name	Color
1	Presser foot	Brown
2	+30V	—
3	+30V	Red
4	Thread trimming	Gray
5	Wiper	Blue
6	+30V	White
7	+30V	Yellow
8	Thread release	Black

E connector

Pin No.	Signal name	Color
1	Wrok holder	Black
2	+30V	White
3	—	—
4	2 stage work holder	Black
5	+30V	White
6	—	—
7	—	—
8	—	—
9	—	—
10	—	—
11	—	—
12	—	—

α connector

Pin No.	Signal name	Cable 1	Cable 2	Cable 4	Cable 5	Cable 6
1	+30V	Red	—	—	—	Red
2	+30V	—	White	—	—	White
3	+30V	Red	—	—	White	—
4	Work holder	—	Black	—	—	Black
5	Thread trimming	Gray	—	—	—	Green
6	Wiper	Blue	—	—	Black	—
7	+30V	White	—	—	—	Yellow
8	+30V	Yellow	—	White	—	—
9	FG	Green	—	Green	—	—
10	Presser foot	Brown	—	—	—	Brown
11	Thread release	Black	—	Black	—	—
12	—	—	—	—	—	—

J connector

Pin No.	Signal name	Color
1	+30V	White
2	2 stage work holder	Black

M connector

Pin No.	Signal name	Color
1	+30V	White
2	Thread release	Black
3	FG	—

F connector

Pin No.	Signal name	Color
1	+30V	White
2	—	—
3	Wiper	Black

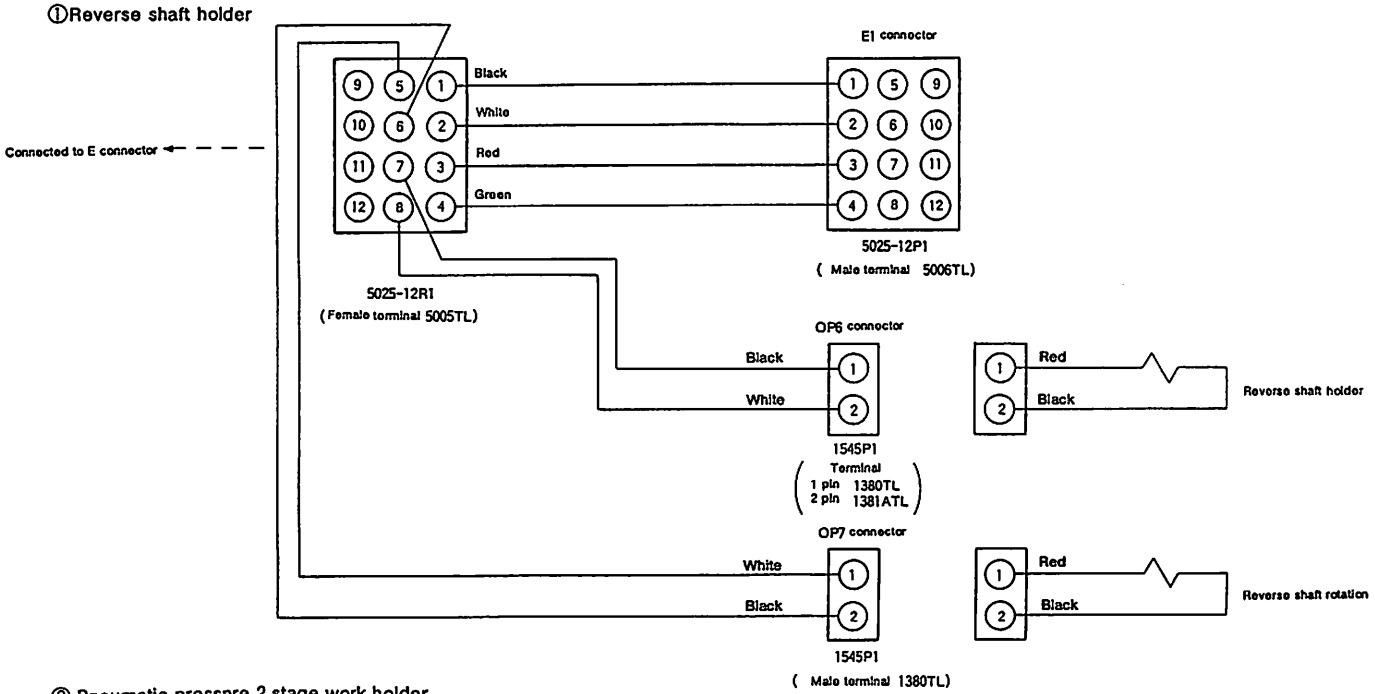
H connector

Pin No.	Signal name	Color
1	Work holder	Black
2	Presser foot	Brown
3	+30V	Red
4	+30V	White
5	+30V	Yellow
6	Thread trimming	Green

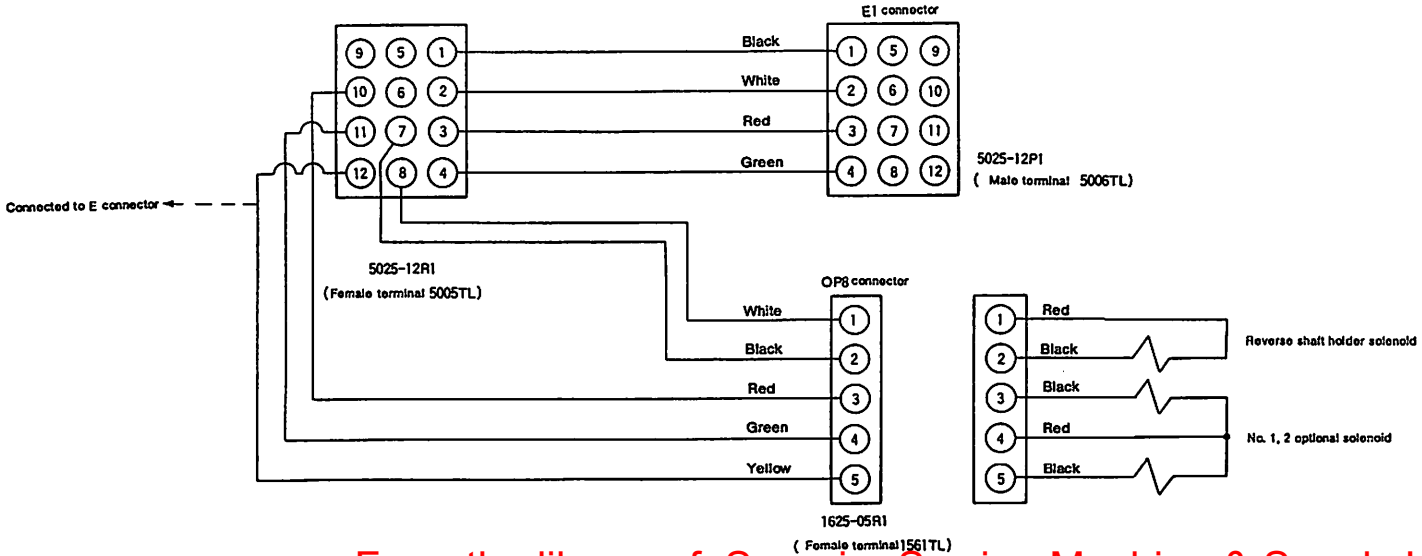
Option section

PLK-A1710, PLK-A1710R, PLK-A2016F, PLK-A2016FL, PLK-2516R

①Reverse shaft holder

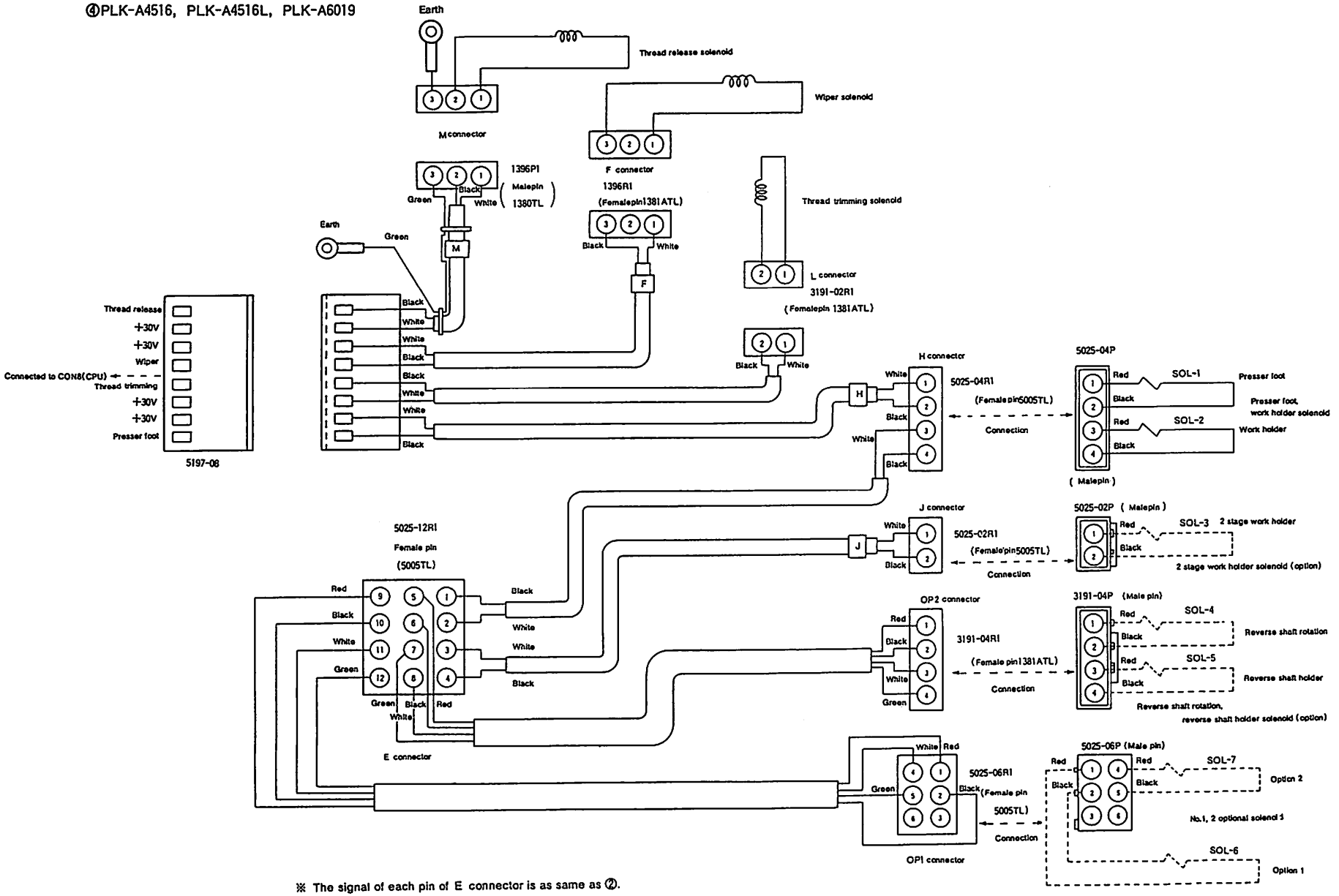


② Pneumatic pressnre 2 stage work holder



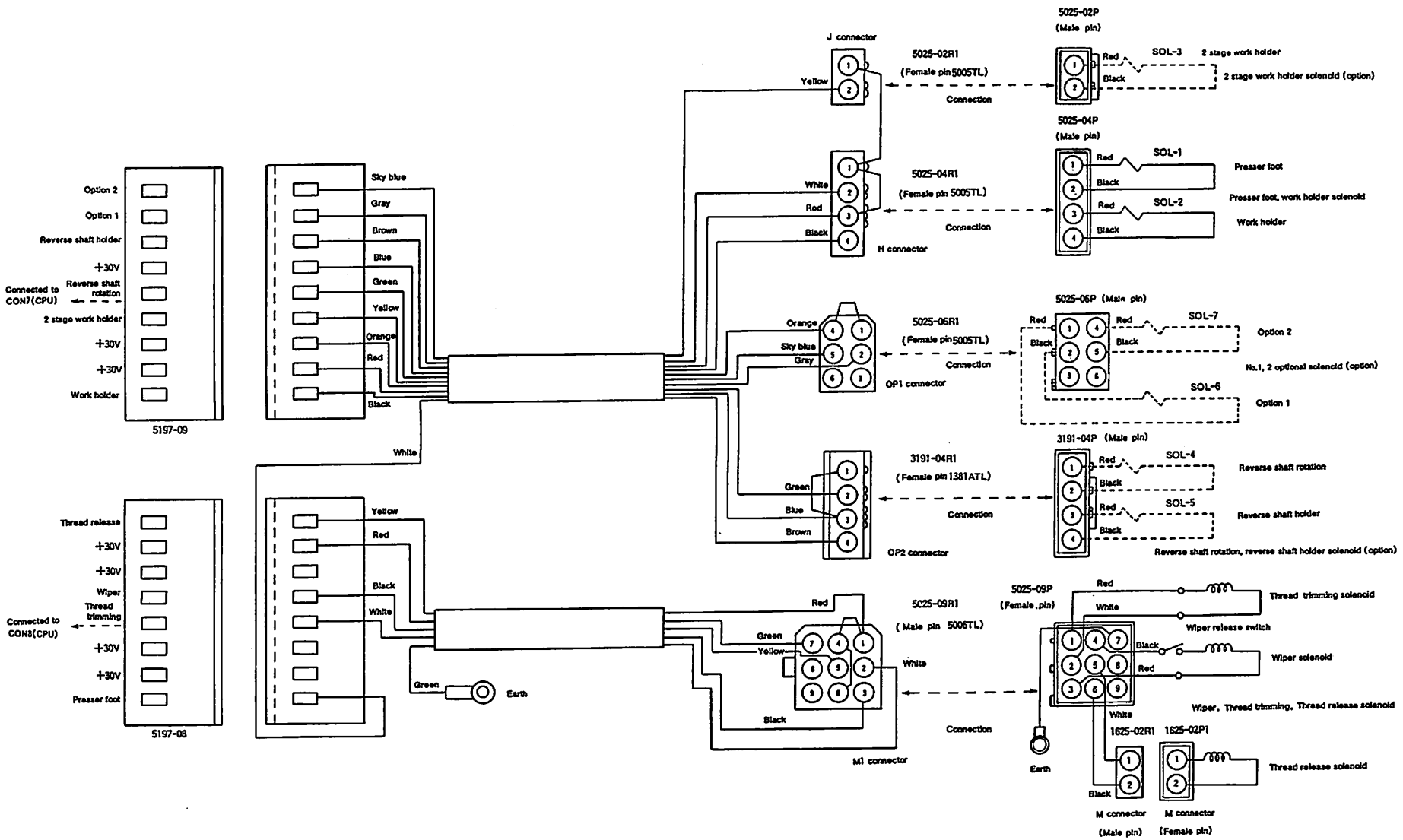
Appendix19

④PLK-A4516, PLK-A4516L, PLK-A6019



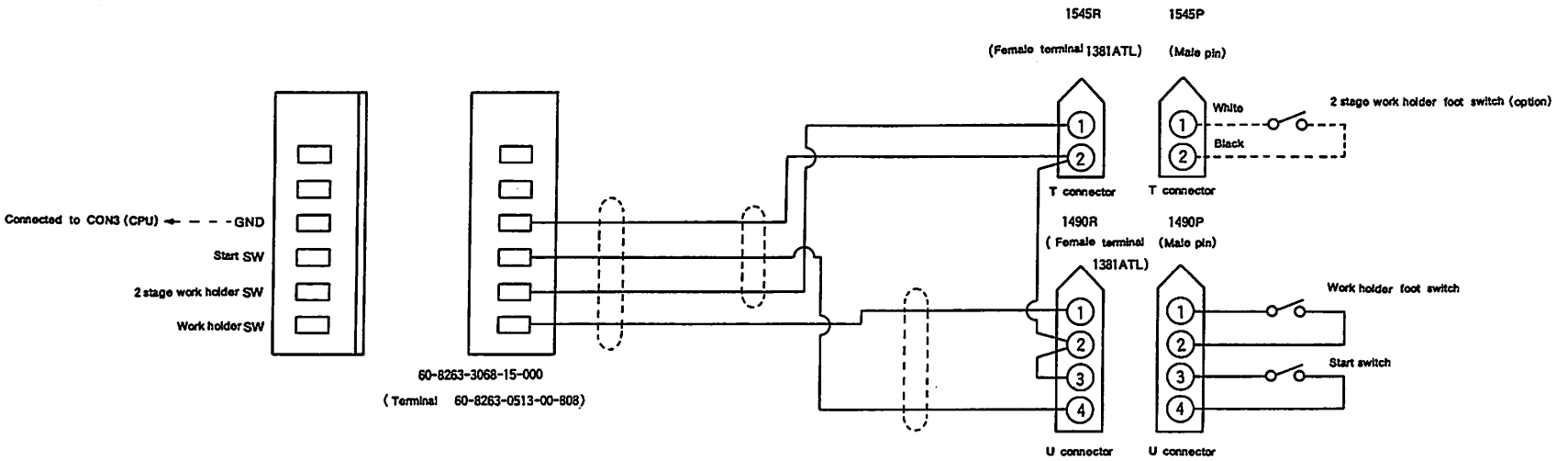
※ The signal of each pin of E connector is as same as ②.

⑤PLK-A3530, PLK-A3530L, PLK-A6030

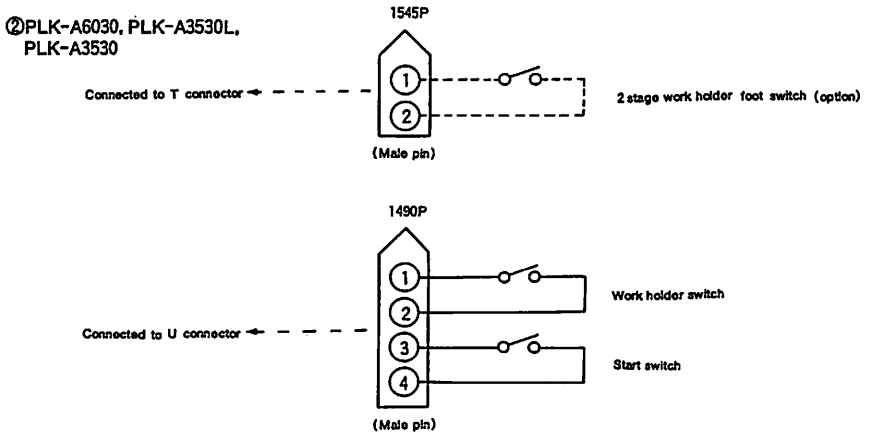


(6) Start, work holder (2 stage work holder) switch section

①PLK-A05PF, PLK-A0804, PLK-A1006,
PLK-A1710, PLK-A1710R, PLK-A2016F
PLK-A2016FL, PLK-A2516R, PLK-A4516
PLK-A4516L, PLK-A6019



②PLK-A6030, PLK-A3530L,
PLK-A3530



T connector

Pin No.	Signal name
1	2 stage work holder SW
2	GND

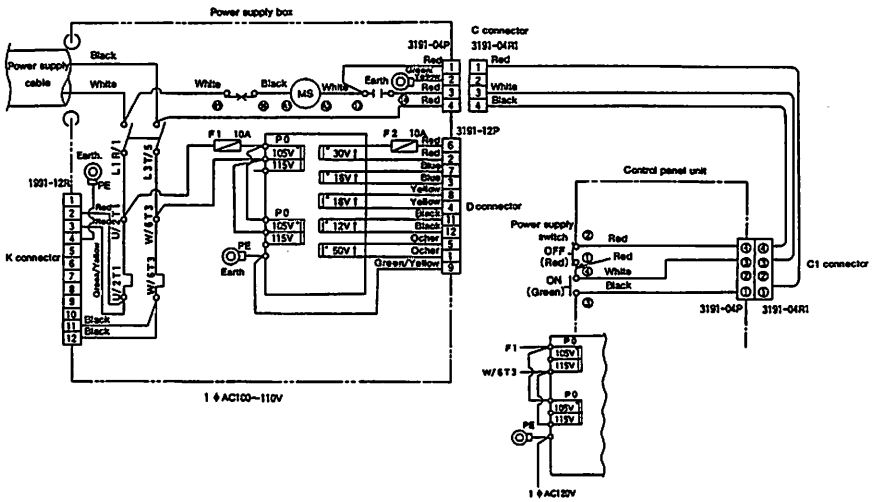
U connector

Pin No.	Signal name
1	Work holder SW
2	GND
3	GND
4	Start SW

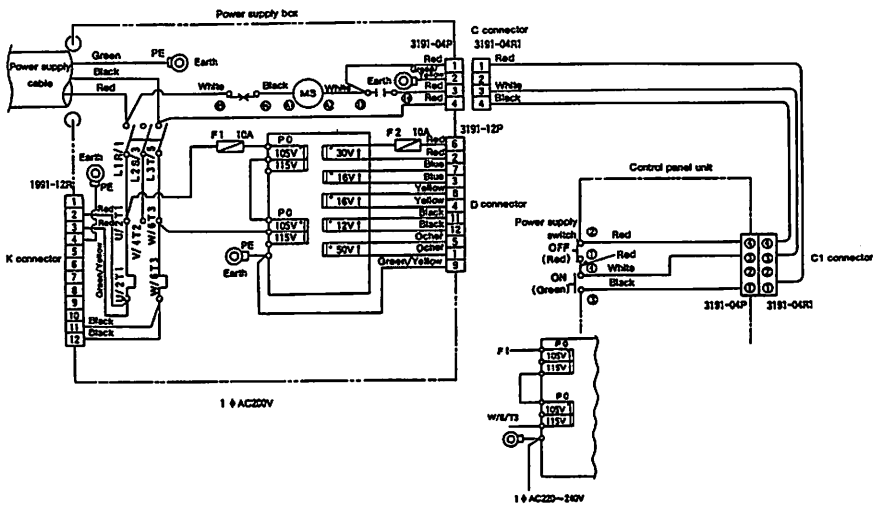
(7) Connection of power unit

①PLK-A05PF, PLK-A0804,PLK-A1006

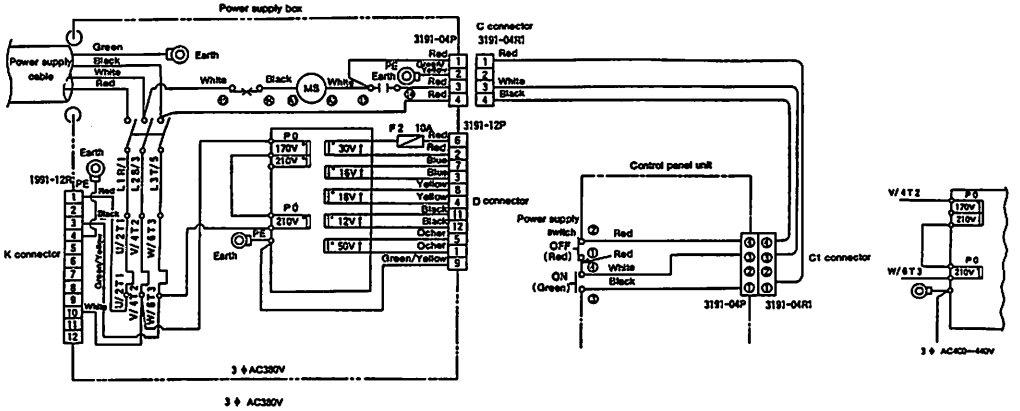
(a) For 1 φ AC100~120V



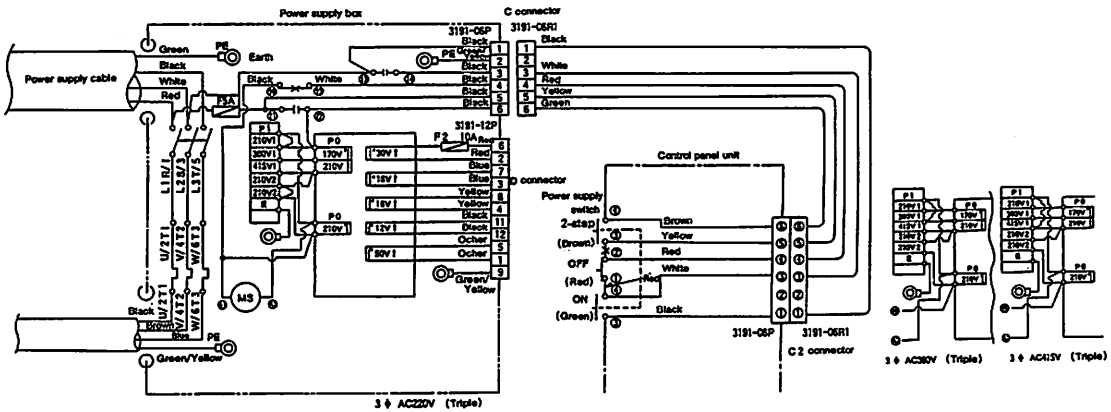
(b) For 1 φ AC200, 220~240V



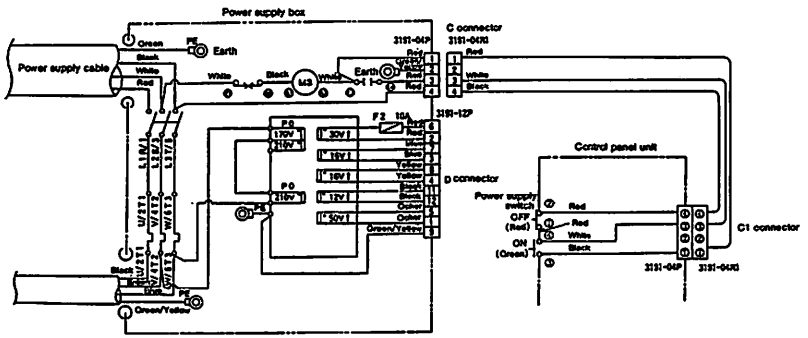
(c) For 3 φ AC380, 400~440V



(d) For 3 φ AC220, 380, 415V(Triple)



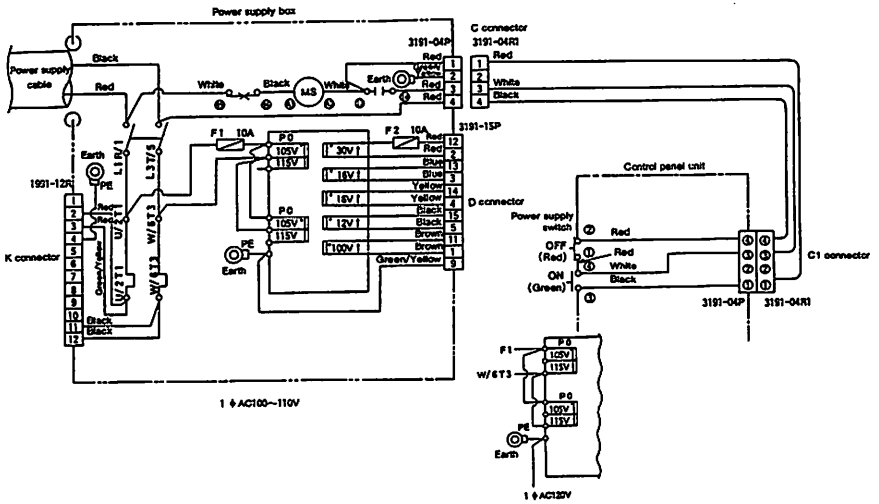
(e) For 3 φ AC380V(Germany)



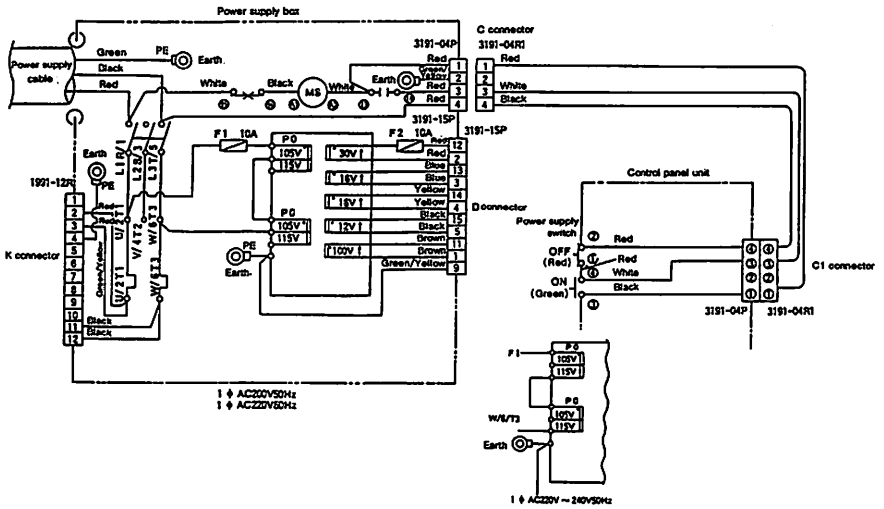
Appendix23

②PLK-A1710, PLK-A1710R, PLK-A2016F, PLK-2016FL PLK-A2516R, PLK-A4516, PLK-A4516L, PLK-A6019

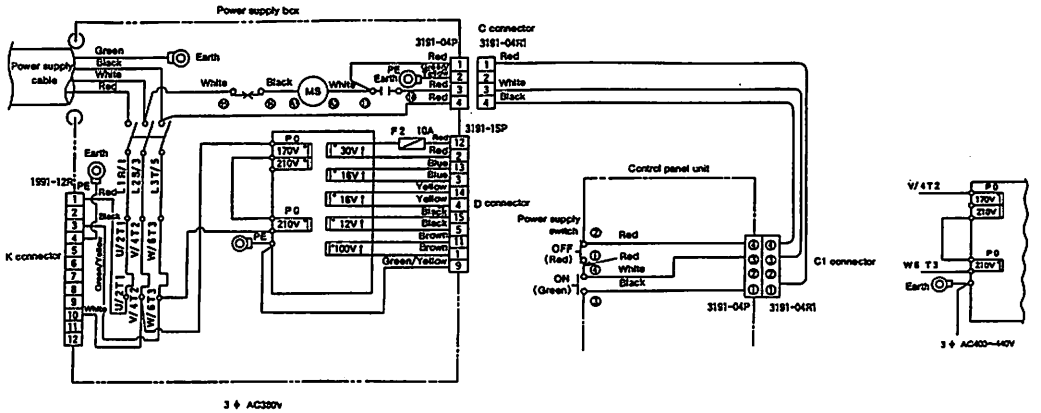
(a) For 1 φ AC100~120V



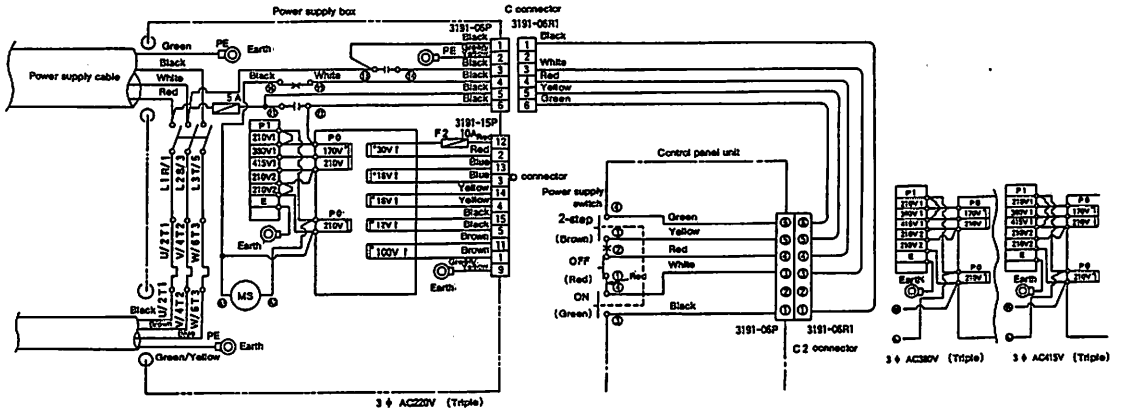
(b) For 1 φ AC200, 220~240V



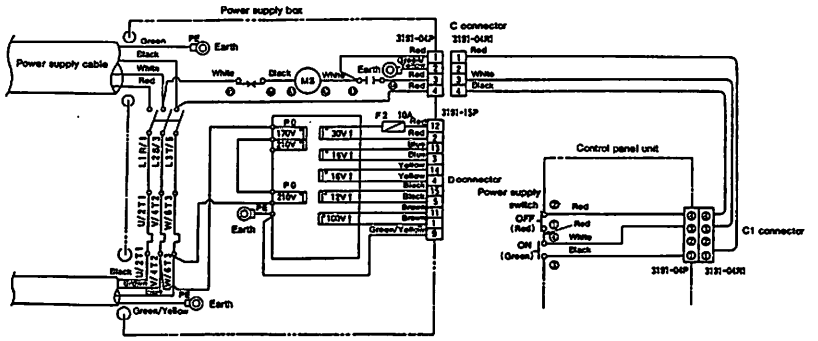
(c) For 3 φ AC380, 400~440V



(d) For 3 φ AC220, 380, 415V(Triple)

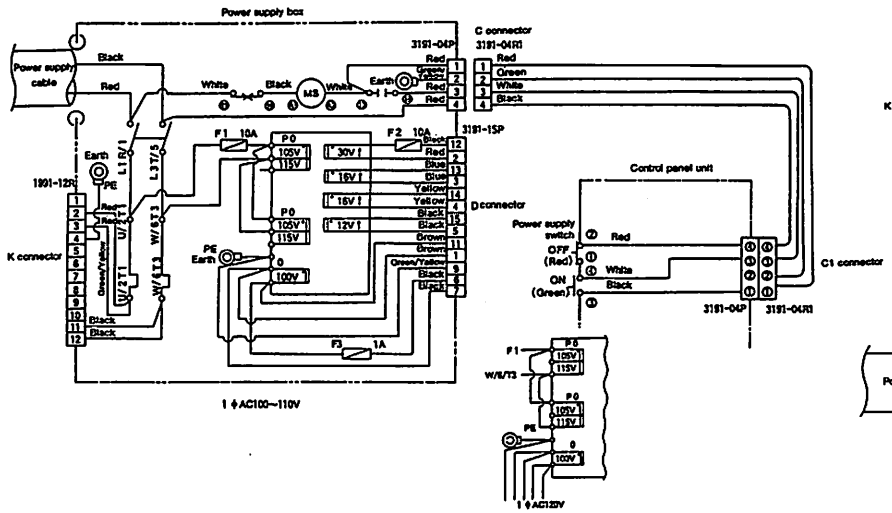


(e) For 3 φ AC380V(Germany)

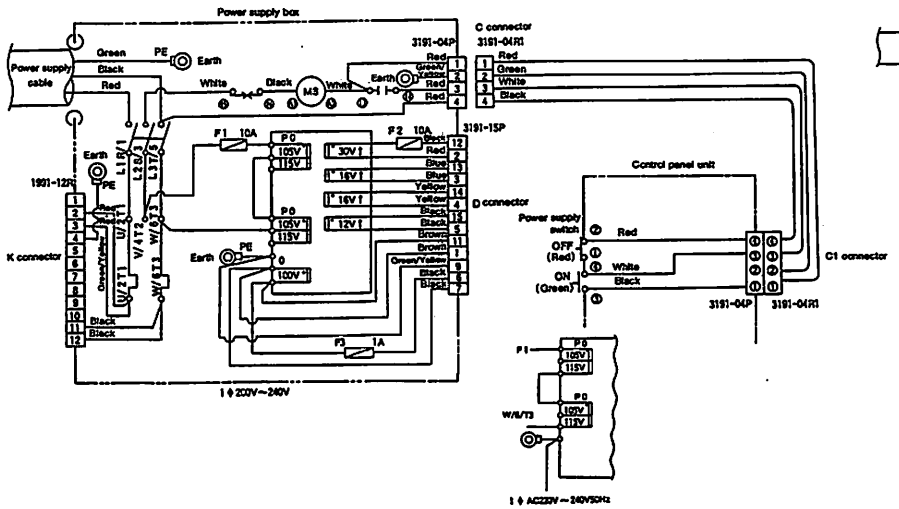


③PLK-A3530, PLK-A3530L, PLK-A6030

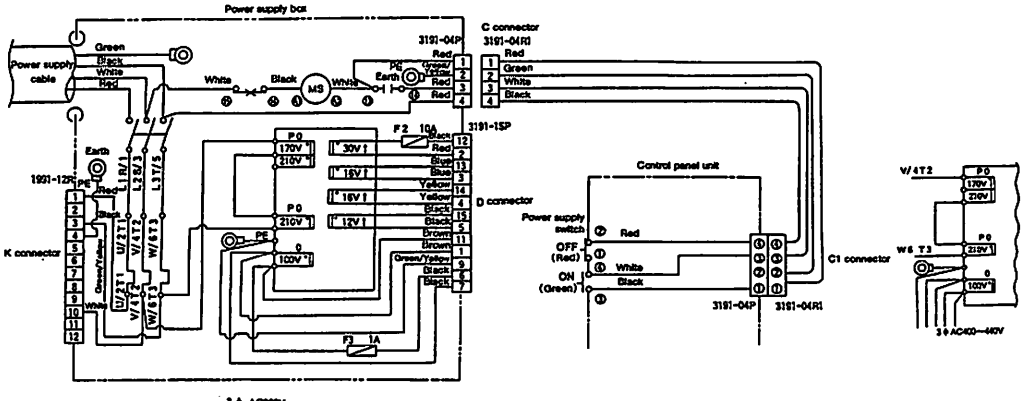
(a) For 1 φ AC100~120V



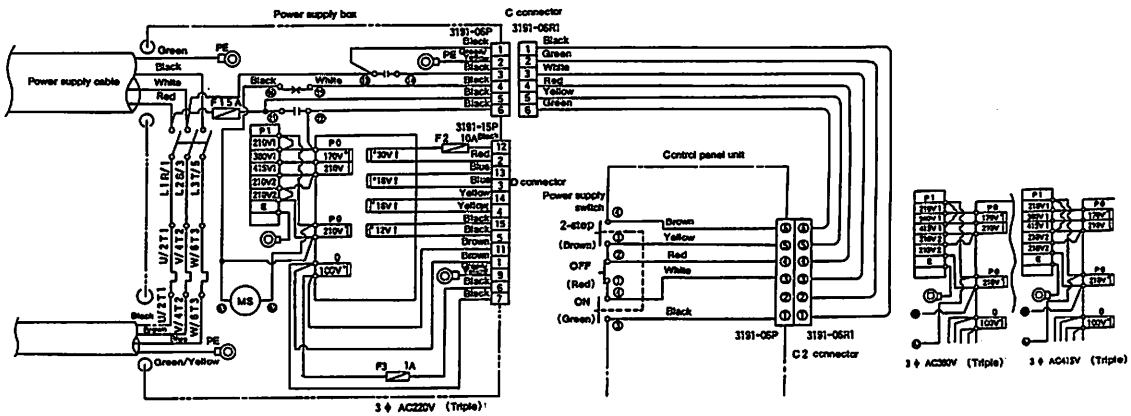
(b) For 1 φ AC200, 220~240V



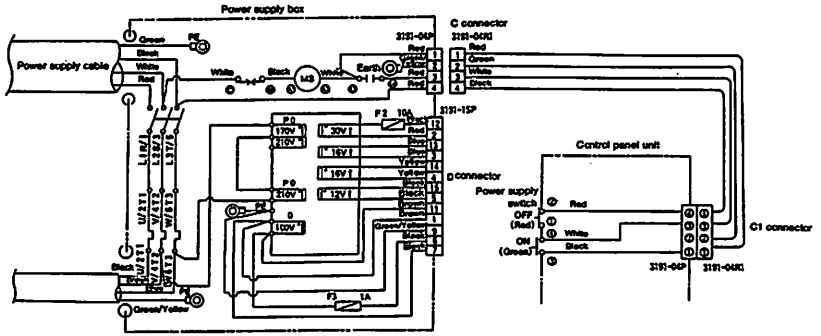
(c) For 3 φ AC380, 400~440V



(d) For 3 φ AC220, 380, 415V(Triple)



(e) For 3 φ AC380V(Germany)



Floppy disk No. _____

Pattern No.	Pattern name	Remarks

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