MITSUBISHI ELECTRIC

Mitsubishi Limiservo X G series

TECHNICAL INFORMATION MANUAL

Motor XL-G554-10(Y), XL-G554-20(Y), XL-G754-20(Y)

Control box XC-GMFY

Induction type AC servo motor and control box with automatic needle positioner

Thank you for purchasing this product.

Please read this manual thoroughly before use to ensure safe and proper use.

Please read the instruction manual for the machine head together with this manual.

Save this manual for future reference.

E723D700-C(201407)

1 Contents

1 Contents 1
2 Safety Instructions 2
3 Points of Caution 3
4 Names of Each Part 4
5 Installation 5
1. Installation of the motor 5
2. Installation of the control box 5
3. Installation of the pulley 5
4. Mounting of the belt 5
5. Installation of the protective cover 6
6. Installation of the position detector 7
7. Connection of the Mitsubishi sewing machine and control box 7
6 Wire and Grounding 8
1. Insertion of the power connector 8
2. Connection of 3-phase power 8
3. Current capacity 8
4. When using the 3-phase 200 - 240V class Limiservo X with single phase 200 - 240V class 8
7 Confirmation 9
1. Before turning switches on..... 9
2. Turn on the power..... 9
8 Adjustments 10
1. Adjustment of stopping position 10
2. Adjustment of pedal toe down pressure, and heeling pressure 10
3. Adjustment of operation speed 11
9 Changing the solenoid voltage and output voltage 12
1. To change solenoid voltage DC24V/DC30V 12
2. Changing the output voltage between 0VDC and 5VDC 12
10 Operation of the Control switch Panel Keys 13
1. Displays during normal mode and functions of each key 13
2. Selection of each mode 13
(1) Types of program mode 13
(2) Selection of each program mode from the normal mode. 14
(3) Direct number call function 15
3. Using the normal mode 16
4. Changing to the tacking, preset, pattern NO. selection mode 17
(1) Tacking setting mode 17
(2) No. of tacking stitches setting mode 17
(3) Preset stitching setting mode 18
(4) Pattern No. selection mode 18
5. Using the program mode [1] simple setting 19
6. Using the program mode [2] simple setting 21
7. Using the program mode [3] simple setting 23
11 Function List 25
12 How to Use the Option Connector 29
1. Connector Layout 29
2. To use as a standing work type sewing machine 30
13 Error Display 31
14 Specifications 32

<Reference> Table of digital display 32
Dimensions (MOTOR and CONTROL BOX) .....

2 Safety Instructions

1. To ensure safe use

*Always observe the following items to ensure safe use of the industrial sewing machine drive unit (motor and control box).

1.1 Before starting

Read all instruction manuals thoroughly before starting use of this drive unit, and follow the technical manuals. Also read the instruction manuals for the installed sewing machine.

1.2 Application and purpose

This drive unit is designed to drive a sewing machine and must not be used for other applications or purposes. Do not use this drive unit until it can be confirmed that safety measures for the installed sewing machine have been taken.

1.3 Work environment

Use this drive unit in dry and well-kept clean locations, e.g. in the clothing industry, and which process dry sewing material.
Avoid using this control unit in the following types of environments.

(1) Power voltage	- Place where voltage fluctuation exceeds ±10% of the rated voltage.
	- Place where the specified power capacity cannot be secured. (Refer to page 8)
(2) Electromagnetic noise	- Place where strong electric or magnetic fields are generated such as near a large-output high frequency oscillator or high frequency welding machine.
(3) Temperature and humidity	- Place where atmospheric temperature is 35 degree or higher and 5 degree or lower.
	- Place subject to direct sunlight or outdoors.
	- Near a heat source such as a heater.
	- Place where relative humidity is 45% or less and 85% or more, or where dew condensation occurs.
(4) Atmosphere	- Atmosphere with dust or corrosive gases.
	- Atmosphere with combustible gases or explosive atmosphere.
(5) Altitude	- Place where altitudes exceeds 1,000m above mean sea level.
(6) Storage	- Place where storage temperature is 55 ℃ or higher and -25℃ or lower.
(7) Vibration	- If excessive vibration occurs when the control box is installed on the sewing machine, install it separately.

2. Installation

2.1 Motor and control box

- Correctly install according to the attached technical manuals.

2.2 Accessories

- Always disconnect this control unit from the main power supply when installing any accessories listed in the technical manual. (Turn the main switch OFF, and remove the plug from the outlet (power supply line).)

2.3 Cable

(1) Arrange the connection cable so that excessive force is not applied during use, and do not excessively bend the cable.
(2) Cables near moving parts (e.g., pulley) must be wired at a minimum distance of 25mm.
(3) Confirm that the power voltage of the power cable for supplying to the control box meets the specifications on the motor and control box rating nameplates before connecting it to the power line. Connect it to the designated places to supply the power. Perform this step with the power switch turned OFF.

2.4 Grounding

- Correctly connect the power cable grounding to the power supply grounding.

2.5 Accompanying appliances and accessories

- Electric accompanying appliances and accessories must be connected to the place listed in this manual.

2.6 Removal

(1) Turn the power switch OFF and remove the plug from the outlet (power supply line) before removing the motor or control box.
(2) Do not pull on the cord when removing the plug. Always hold the plug itself.
(3) There is a high voltage applied inside the control box, so always **wait at least 10 minutes after running the power switch OFF** and remove the plug from the outlet (power supply line) before opening the control box panel.

3. Maintenance, inspection and repairs

- Follow the technical manuals for maintenance and inspection of this control unit.
- Repairs and maintenance must be done and approved by specially trained personnel.
- Do not run this control with the ventilation openings of the motor's dust-proof filter blocked or clogged with dust, loose cloth, etc.
- Always turn the power switch OFF and remove the plug from the outlet (power supply line) before replacing the sewing machine needle or bobbin, etc.
- Always use original replacement parts for repairs or maintenance.

4. Other safety measures

- Keep fingers away from all moving machine parts (especially near sewing machine needle, etc.).
- Do not drop this control unit.
- Do not operate this product without parts such as the protective cover or protective devices such as the safety breaker.
- The servomotor surface may reach high temperatures depending on the operation conditions and loads. Do not touch directly.
- If any damage is observed on this control unit, if the drive does not run properly or if operator is uncertain about operation, do not operate the drive unit. Operate the drive only after adjustments, repairs and approvals have been made by qualified personnel.
- The user must avoid making modifications or changes based on user's judgment.
- When system have to be stop in case of emergency, remove the power supply plug from the power supply line.

5. Hazard display, warning display

(1) This symbol indicates risk that may cause personal injury or risk to the machine when mishandling of products.

(2) This symbol indicates electrical risks and warnings.

(3) This symbol indicates thermal risks and warnings.

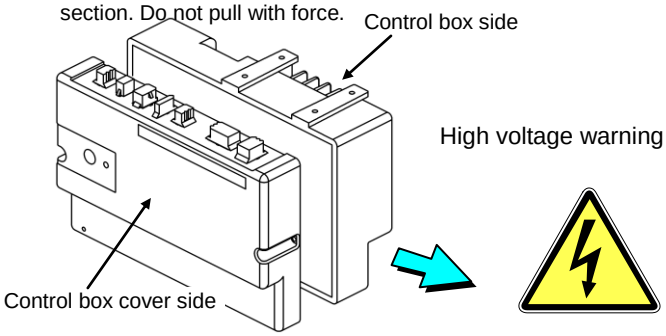
- Always deliver this instruction manual to the end user.
- Save these technical manuals for future reference.

3 Points of Caution

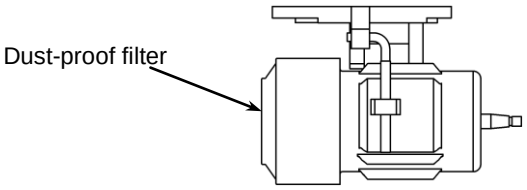
Caution

1. Please remove your foot from the pedal when turning the power ON.
2. Always turn the power OFF when leaving the machine.
3. Do not inspect the control circuit with a tester.
4. Always turn the power switch OFF before tilting the sewing machine, replace the needle or threading the needle.
5. Always ground the grounding wire.
6. Do not use branched wiring.
7. The brakes may not function when the power is turned OFF or when there is a power failure during sewing machine operation.
8. Match the connector shape and direction, and insert securely.
9. Keep the signal wire as short as possible when connecting the external switch to the connector of control box. If it is long, malfunctions may occur. Use a shield wire when possible.
10. Install the sewing machine away from sources of strong noise such as high-frequency welders.
11. An optical method is used for the detector's detection element so take care not to let dust or oils get on the detection plate when removing the cover for adjustment, etc. If these do get on the plate, wipe off with a soft cloth and do not scratch the plate. Take care not to let oils enter between the detector discs.
12. When the position detector connector or the belt has come off or when the sewing machine is completely locked, the motor will be automatically turned OFF after a set time to prevent damage to the motor. (The motor may not turn OFF if the locking is not complete.) After the problem has been resolved, turn the power OFF and ON and normal operation will be possible. The same operation should be taken when the position detector or wires are broken.
13. Be sure to ground the lever unit when using it to separate from the control box.
14. **Always turn off the power switch before connecting or disconnecting each connector**
15. **Do not alter this motor and control box including accessories to avoid any accident**
    The altered examples: To connect the power supply to the other device through the push button switch, to take out signals of the encoder and the detector to use the external devices.
    Our company does not assume the responsibility on any accident caused by altering.

16. A high voltage is applied inside the machine, so **wait at least 10 minutes after turning the power OFF** before opening the control box. There is a cable connecting the PCB on the cover side with the PCB on the box side. When disconnecting the cable, gently disconnect at the connector section. Do not pull with force.

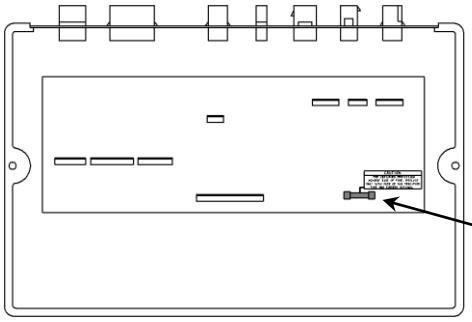


17. Remove the dust that has adhered on the motor's dust-proof filter once every two to three weeks.



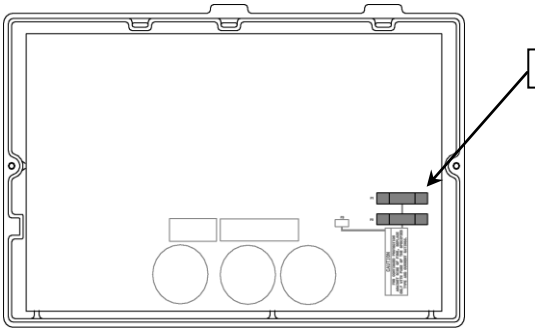
If the motor is run while the filter is clogged, the motor may overheat and affect the motor life.

18. If the fuse blows, remove the cause, and replace the blown fuse with one having the same capacity.



* The above 2.5A fuse is for protection of the 12V power supply section.

(Front view of cover side PCB with control box cover removed.)

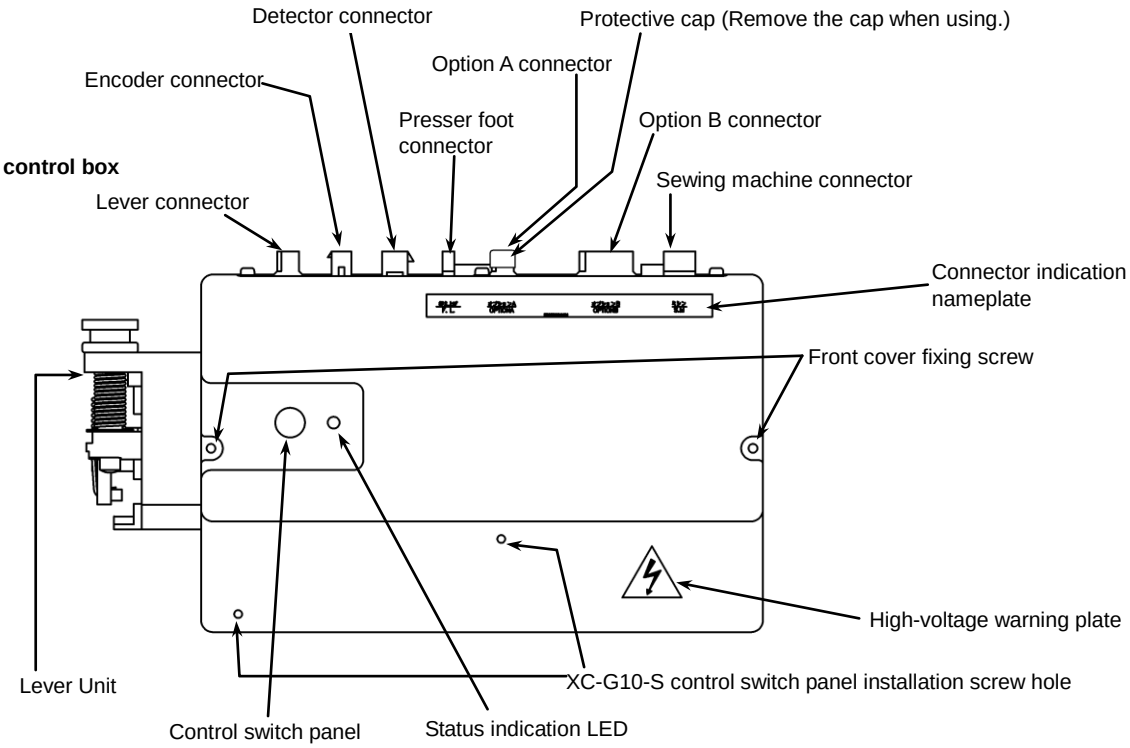


* The above fuses are for protection of the control box power supply section.

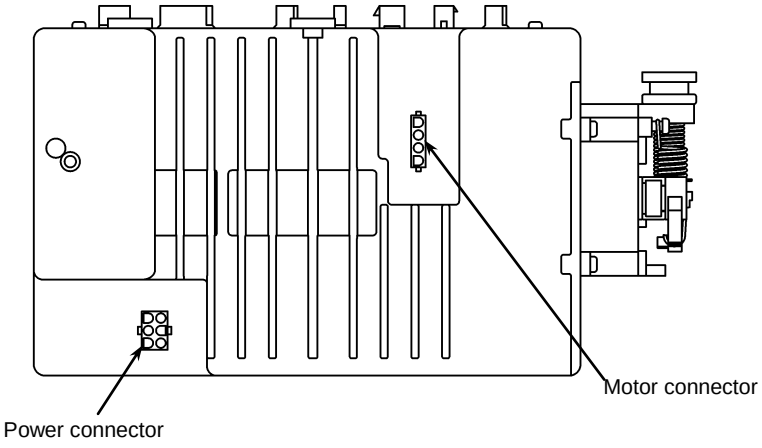
(Front view of box side PCB with control box cover removed.)

Always **wait at least 10 minutes after turning the power switch OFF** before opening the control box cover.

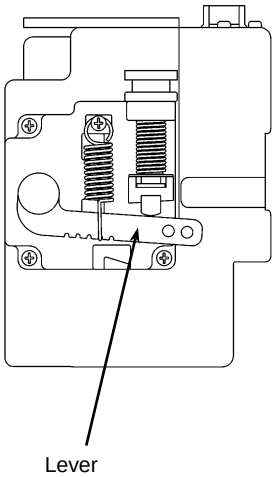
1. Front side of control box



2. Back side of control box



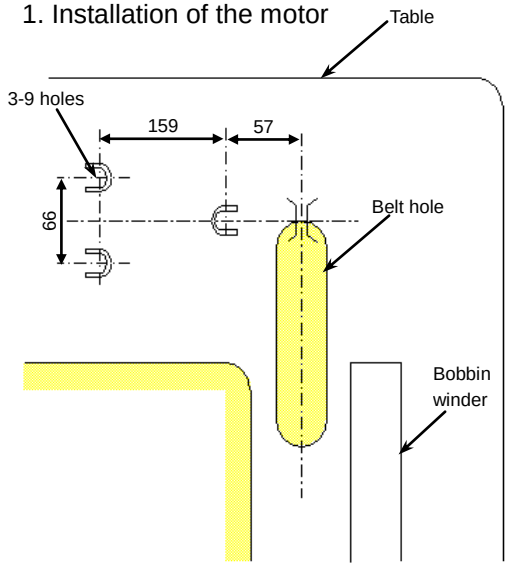
3. Left side of control box



Be sure to ground the lever unit when using it to separate from the control box.

5 Installation

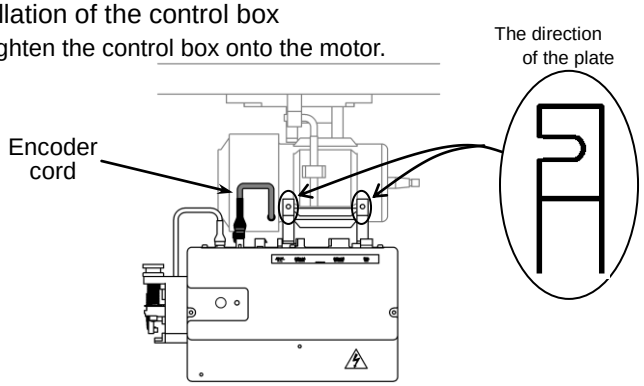
1. Installation of the motor



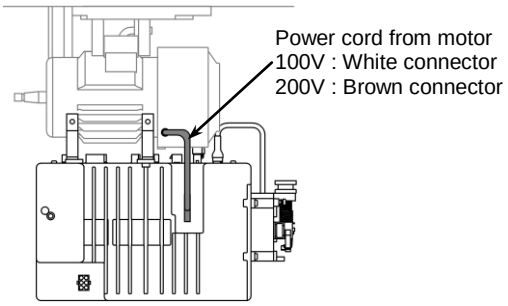
Open three 9mm holes on the table as seen from the above. Install the motor securely using the installation bolts, washers, spring washers and nuts.
The installation bolts, etc., are included with the motor as accessories.

2. Installation of the control box

(1) Tighten the control box onto the motor.



(2) Insert the power cord from the motor into the connector on the back of the control box. Insert the encoder cord from the motor into the encoder connector on the front of the control box.

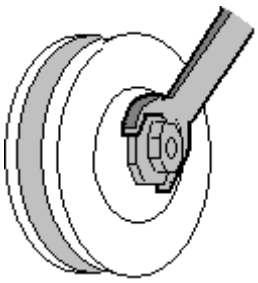


3. Installation of the pulley

* To properly install, the protective cover A (motor side of the protective cover) must be installed onto the motor before the pulley is installed. (Refer to "5. Installing the protective cover".)

Securely tighten the pulley.

Caution
Incomplete tightening may cause malfunctions.



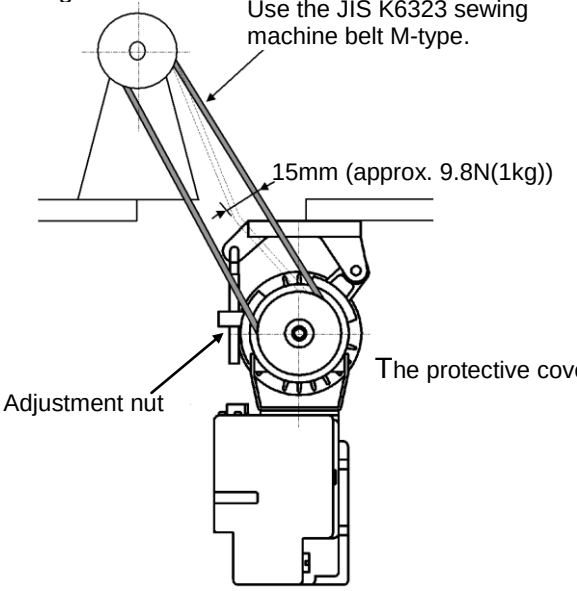
Select the correct pulley diameter to ensure complete use of the motor performance.

Selection of the motor pulley:

$$\text{Motor pulley outer diameter (mm)} = \frac{\text{Normal sewing machine speed}}{\text{(*) Motor speed}} \times \text{Sewing machine pulley diameter (effective diameter)} + 5\text{ mm}$$

(*) The motor speed should be set at 3,600rpm. When the motor pulley diameter is selected with the above method and the pulley diameter is too small, select the minimum pulley in the range that the belt will not slip.
(**) Refer to page 20 for the pulley diameter to be used when using the Mitsubishi thread trimming sewing machine.

4. Mounting of the belt



To adjust the belt tension, press down on the center of the belt with your hand, and turn the upper and lower nuts of the adjustment nut to increase or decrease the center height of the motor so that the belt dips approximately 15mm.

Caution
If the belt tension is too low, the medium and low speeds will be inconsistent, and the stopping precision will be poor. When too tight, the motor bearings will deteriorate.

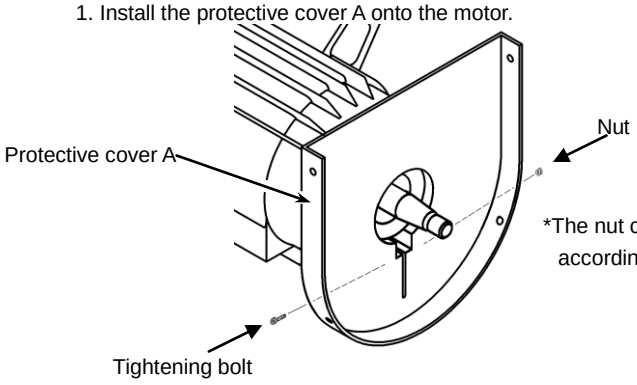
The protective cover A is not shown.

Caution
For safety always turn the power switch off, before adjusting the belt.

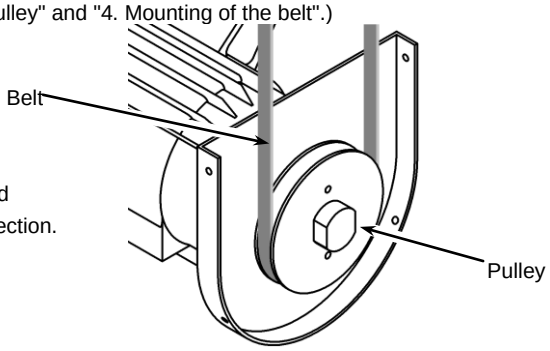
5. Installation of the protective cover (with belt slip off prevention part)

The protective cover is enclosed with the motor as an accessory.

1. Install the protective cover A onto the motor.



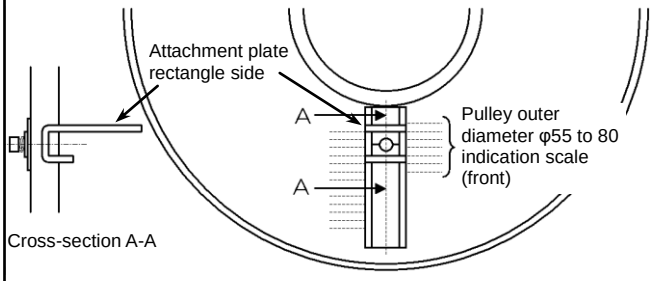
2. Install the pulley and attach the belt. (Refer to "3. Installing the pulley" and "4. Mounting of the belt".)



3. Install the "belt slip off prevention part mounting plate" onto protective cover B with the following procedures.

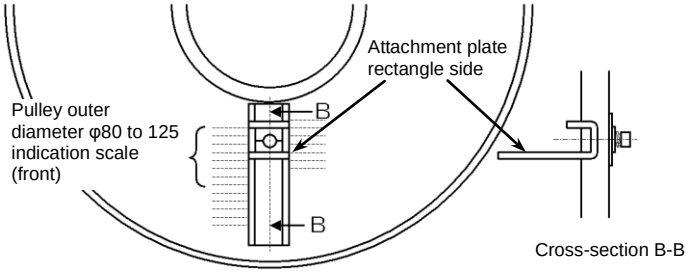
* Change the direction of the long and short side of the attachment plate according to the motor pulley outer diameter.

(a) For motor pulley outer diameter φ55 to φ80



(View from back of protective cover)

(b) For motor pulley outer diameter φ80 to φ125



(View from back of protective cover)

* Set the center of the washer to the pulley diameter indication scale and tighten the bolt.

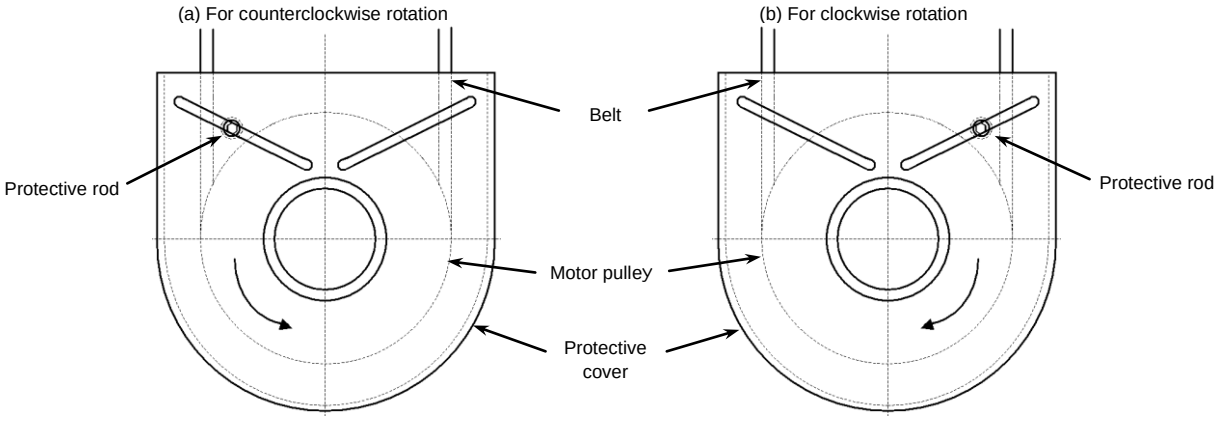
* Confirm that the belt does not contact the attachment plate.

4. Install the "protective rod" onto the protective cover B with the following steps.

* Set the protective rod to the motor pulley rotation direction and install between the belt and motor pulley.

(a) For counterclockwise rotation

(b) For clockwise rotation



(View from front of protective cover)

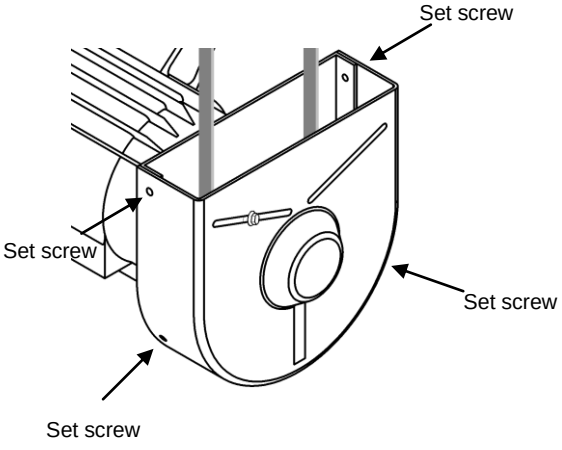
(View from front of protective cover)

* Set the center of the protective rod to the position at the center of the belt and motor pulley and tighten the bolt

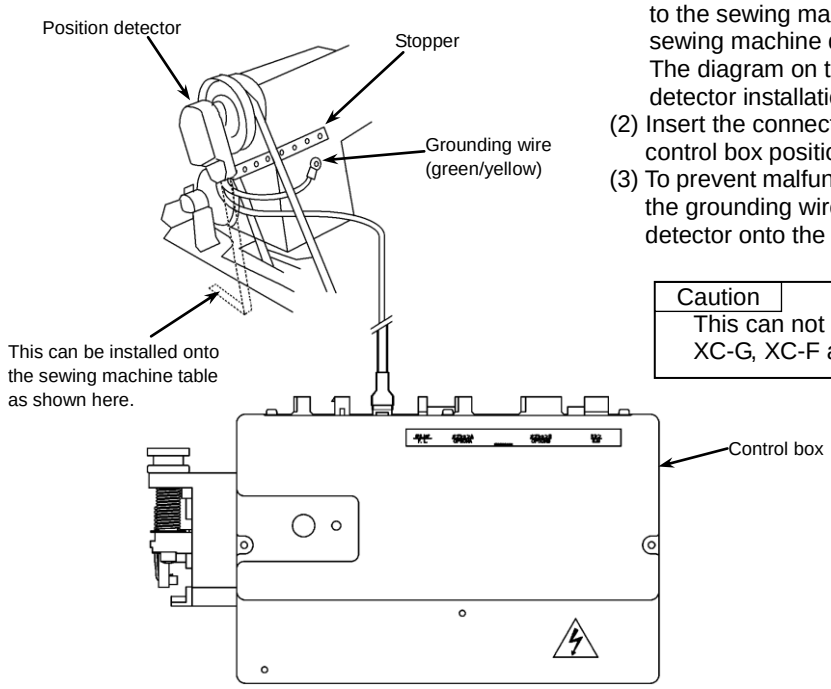
5. Set protective cover B onto protective cover A, and tighten with the four set screws.

* Confirm that the belt and motor pulley do not contact the protective rod.

6. If necessary, adjust the position of the "protective rod" and "belt slip off prevention part mounting plate". Securely tighten after adjusting.



6. Installation of the position detector



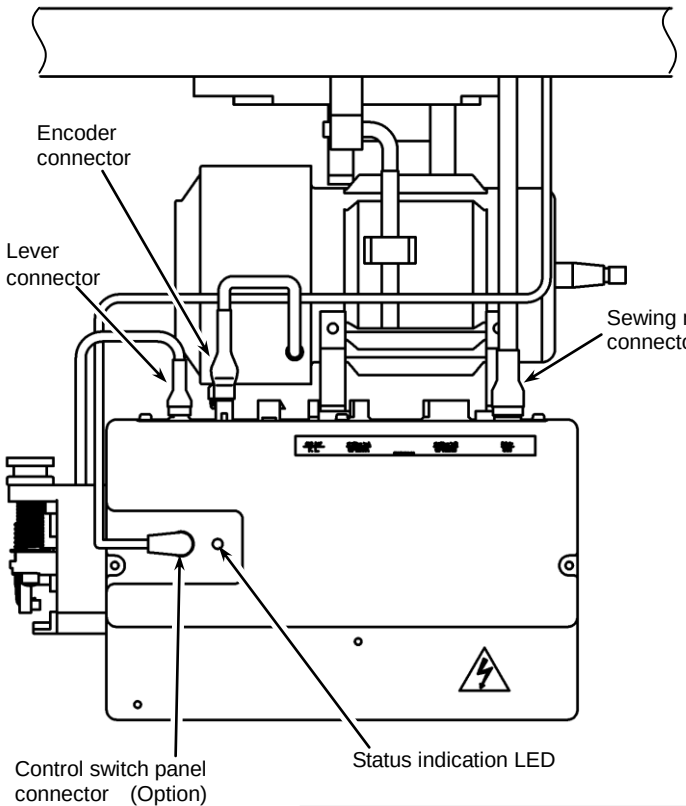
(1) The installation of the position detector will differ according to the sewing machine model, so please consult with your sewing machine dealer for details.
The diagram on the left shows an example of the position detector installation.
(2) Insert the connector from the position detector into the control box position connector.
(3) To prevent malfunctions caused by static electricity, connect the grounding wires (green/yellow) from the position detector onto the sewing machine head.

Caution
This can not be used with except XC-G, XC-F and XC-E Series.

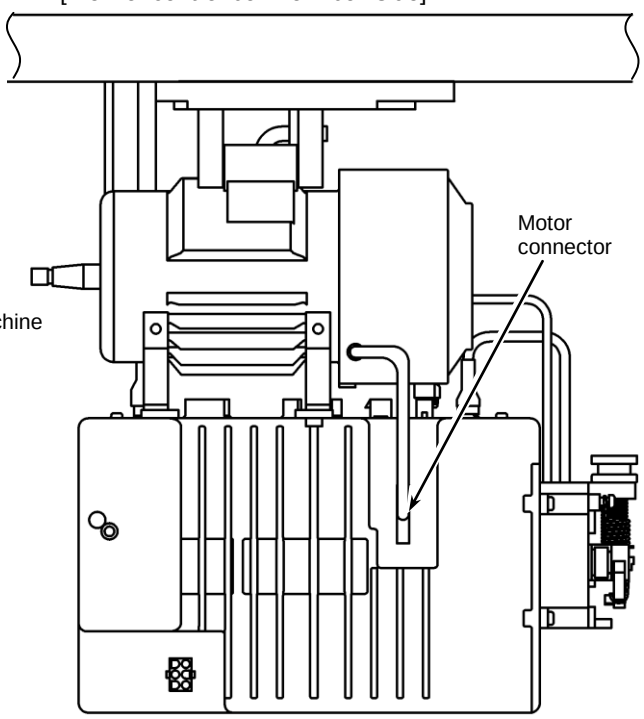
7. Connection of the Mitsubishi sewing machine and control box.

Wire the units as shown below.
Align the connector shape and direction, and securely insert it.

[View of control box from cover side]



[View of control box from box side]

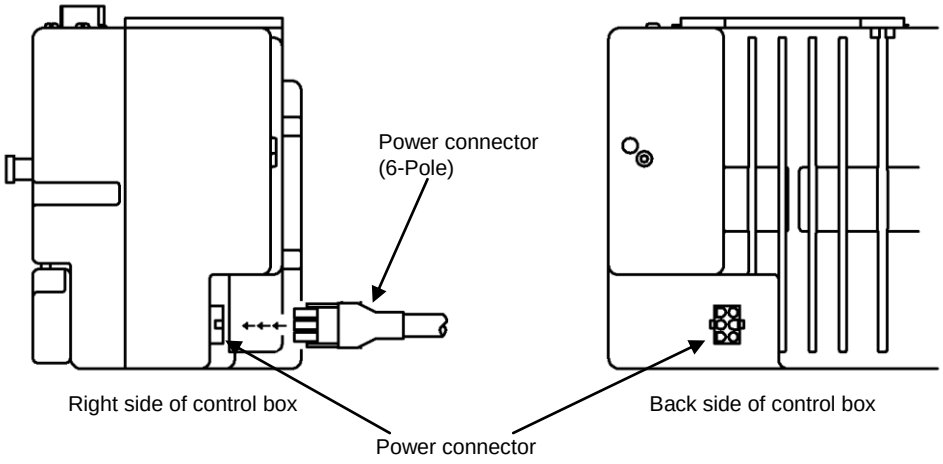


Caution
For safety purposes, always turn the power switch OFF and wait for the status indication LED or the [PWR. OF] (displayed for approx. 10 seconds) LED display on the control switch panel to turn OFF before connecting or disconnecting each connector.
This [PWR.OF] display is not an error.

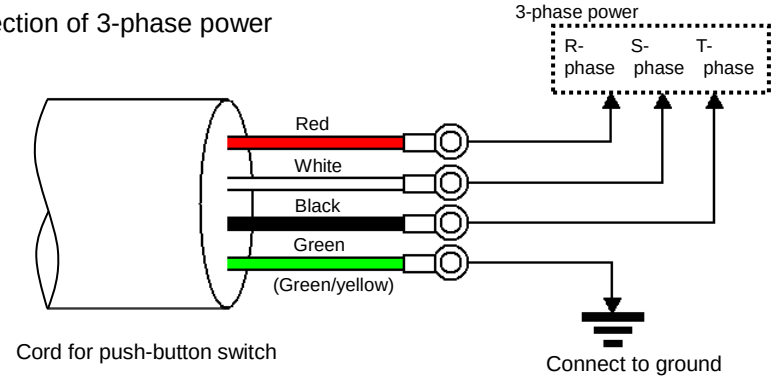
6 Wire and Grounding

1. Insertion of the power connector

Confirm the connector form and insertion direction when inserting the power connector into the control box and insert completely.



2. Connection of 3-phase power



Ground the green (green/yellow) wire to the grounding terminal. Consult with an electrician for the grounding wires.

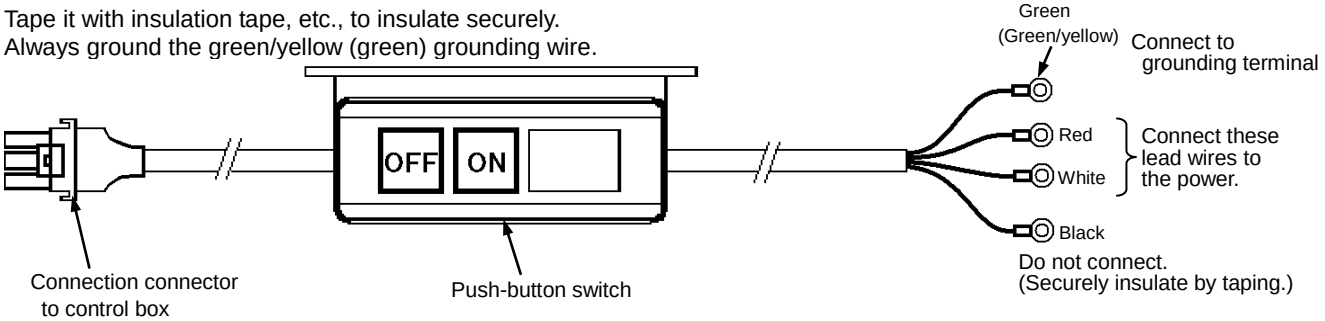
3. Current capacity

Use a fuse or complete breaker for the power.

Power	Recommended current capacity
Single phase 100 to 120V 550W 200 to 240V 550W / 750W	15A
3- phase 200 to 240V 550W / 750W	10A

4. When using the 3-phase 200 - 240V class Limiservo X with single phase 200 - 240V class

Connect the "red" and "white" lead wires from the push-button switch to the power.
The black wire is not used.
Tape it with insulation tape, etc., to insulate securely.
Always ground the green/yellow (green) grounding wire.



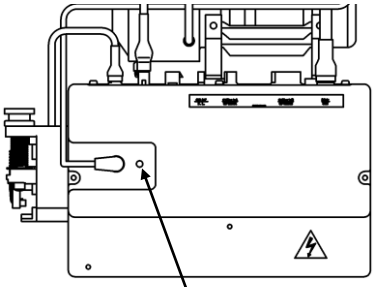
7 Confirmation

1. Before turning switches on.....

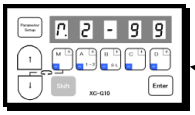
Places to confirm	Reference
(1) Is the power and capacity suitable ?	Current capacity on page 8.
(2) Is the power voltage the same as the factory preset voltage of the rated nameplate on the side of the control box?	Voltage value given on rated nameplate on side of control box. XC-GMFY-20-05 : 200 to 240V XC-GMFY-10-05 : 100 to 120V
(3) Are the connectors inserted correctly? -Power connector from push-button switch -Motor connector -Motor encoder connector -Position detection connector	Insertion of the power connector on page 8. Connection of the Mitsubishi sewing machine and control box on page 7. Insertion of the position detector on page 7.
(4) Is the lead wire contacting the V belt ?	–
(5) Is the belt tension okay ?	Mounting of the belt on page 5.
(6) Are the pulley nuts securely tightened ?	Installation of the pulley on page 5.
(7) Can the sewing machine be rotated lightly by hand ?	–

2. Turn on the power.....

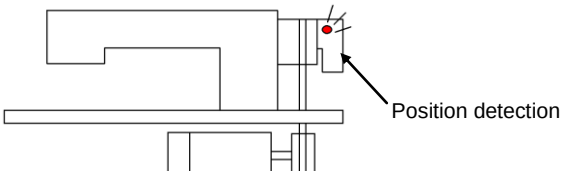
(1) Does the status indication LED on the control box light up in green?
There is a problem if the LED is flickering or is lit up in red.



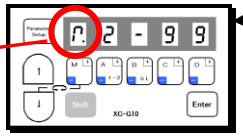
(2) Is the control switch panel LED turning ON?
(When control switch panel is connected)



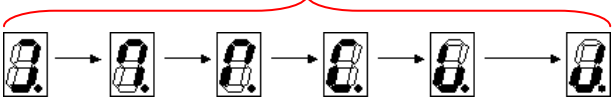
(3) Does the position detector lamp light ?



(4) Is the sewing machine rotation direction correct? (When control switch panel is connected)

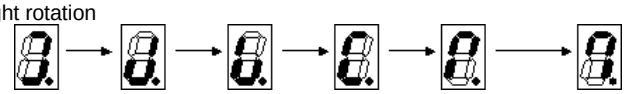


- For left rotation

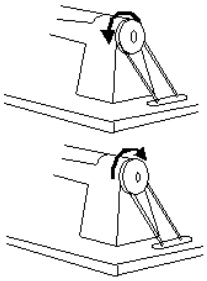


The sewing machine rotates to the left looking from the pulley side. The factory setting is left rotation.

- For right rotation

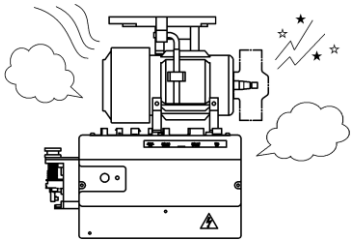


The sewing machine rotates to the right looking from the pulley side.



The rotation direction can be changed by pressing the [↓] key and [M] key simultaneously.

(5) Is there any heat, odors or abnormal sounds coming from the motor or control box?



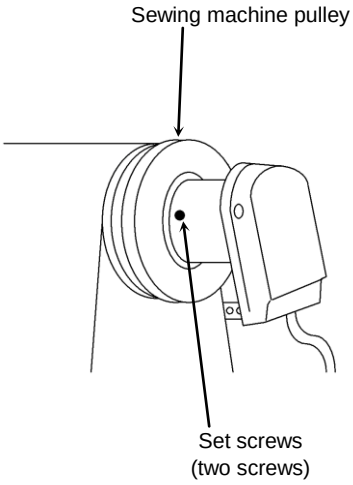
Turn the power OFF and disconnect the power plug from the socket if any heating, abnormal odors or abnormal noise is found. Contact your dealer immediately.

1. Adjustment of stopping position

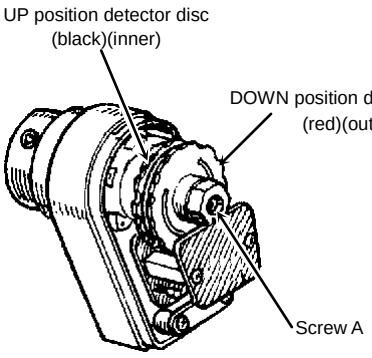
Adjust this position with the detector installed onto the sewing machine and while stopping at the UP and DOWN positions.
For safety, disconnect the connector for the sewing machine.

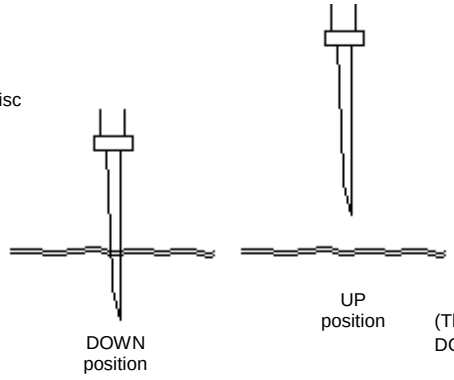
(1) Adjustment of UP position
- -Loosen the two set screws on the detector joint, and set the stop position by rotating by hand.
- -If adjustment is not possible by turning the joint, loosen the cross-recessed screw A shown of the following figure, and turn all detector plates simultaneously to adjust to the designated stop position.

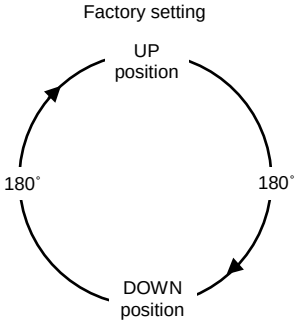
(2) Adjustment of DOWN position
- -The relation of the DOWN position and UP position will differ according to the model, so adjust this according to the sewing machine.
- -When changing the DOWN position, remove the detector cover, and turn only the red detector plate to adjust to the designated stop position. (The cross-recessed screw A does not need to be loosened at this time.)
- -Always replace the cover after adjustment.



Caution
Refer to the sewing machine instruction manual when adjusting for use with the Mitsubishi sewing machine.



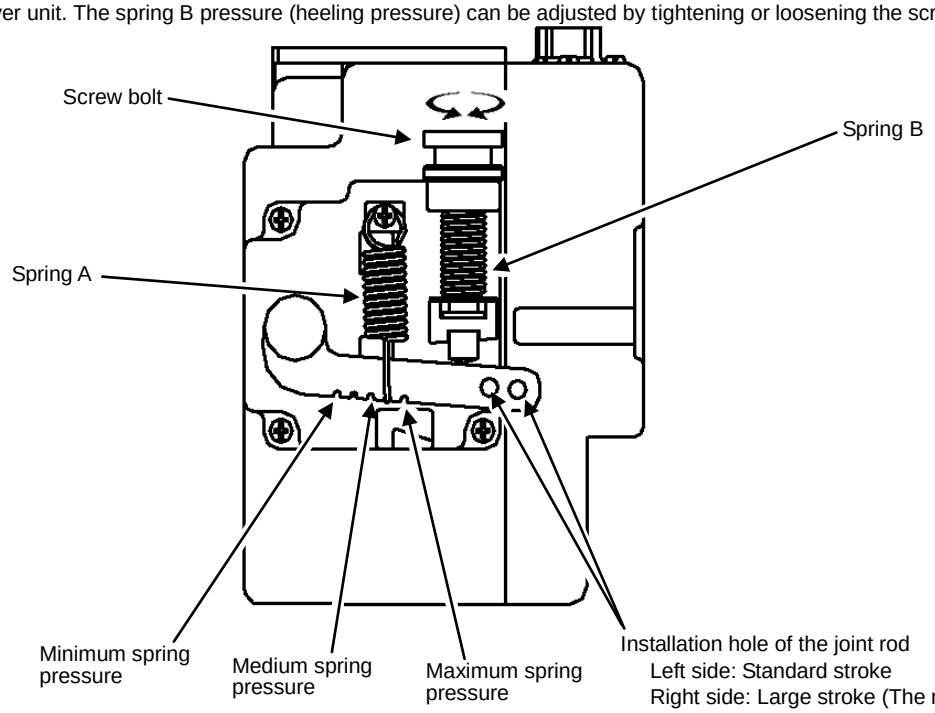




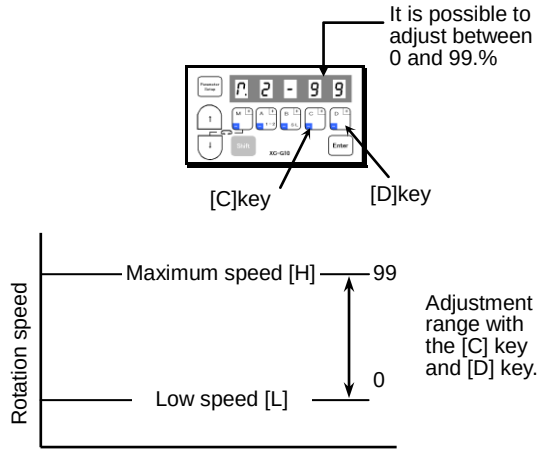
(The factory setting of the clearance from the DOWN position to UP position is approx. 180)

2. Adjustment of pedal toe down pressure, and heeling pressure

The spring A pressure (toe down pressure) can be adjusted in five levels by changing the position spring A whitch is hooked onto the lever unit. The spring B pressure (heeling pressure) can be adjusted by tightening or loosening the screw bolt.



3. Adjustment of operation speed

Adjustment of each speed		Reference	Factory setting (speed)
Maximum speed	H	Page25 “To change the maximum speed”	4000
Low speed	L	–	250
Thread trimming speed	T	–	200
Start tack speed	N	–	1700
End tack speed	V	–	1700
Slow start speed	S	–	250
Operation speed		Adjust between the low speed [L] and high speed [H] using the [C] and [D] keys on the control switch panel. 	

Caution

No matter how large the motor pulley diameter is, the speed will not rise higher than the maximum speed H and the speed set with the [C] key and [D] key.

9 Changing the solenoid voltage and output voltage

1. To change solenoid voltage DC24V/DC30V

To change solenoid voltage from 24V to 30V

(1) Remove the front cover from the control box.

(2) Reconnect the connector inserted in JP1 on the PCB to the 30V side.

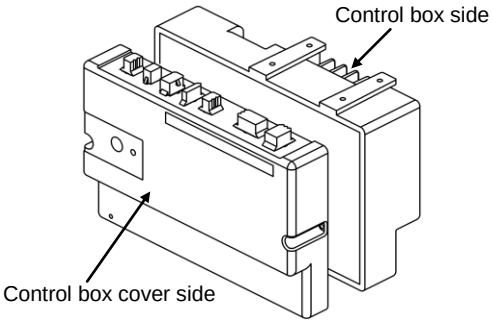
(3) Set the cover to the original position after change.

To change solenoid voltage from 30V to 24V

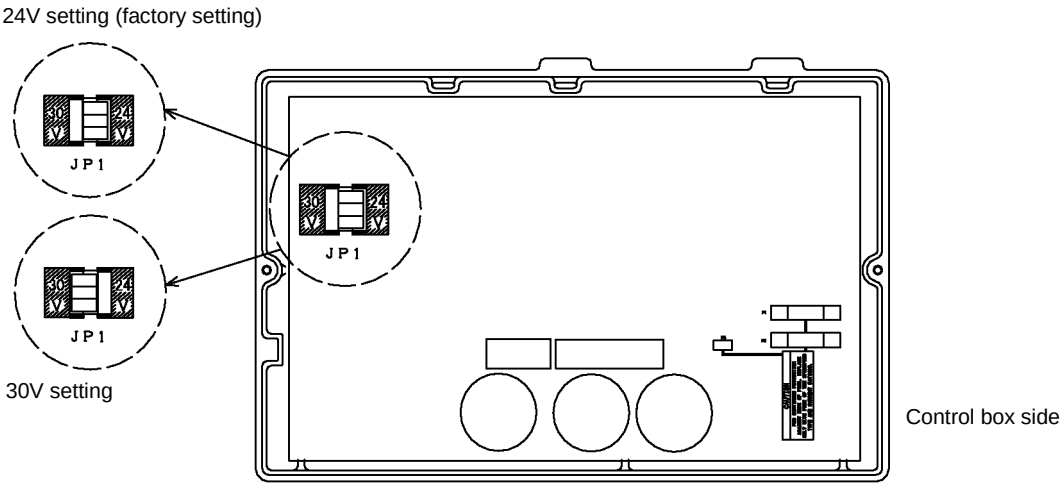
(1) Remove the front cover from the control box.

(2) Reconnect the connector inserted in JP1 on the PCB to the 24V side.

(3) Set the cover to the original position after change.



Wait at least 10 minutes after turning the power switch OFF before opening the control box.



2. Changing the output voltage between 0VDC and 5VDC

(1) Remove the control box cover.

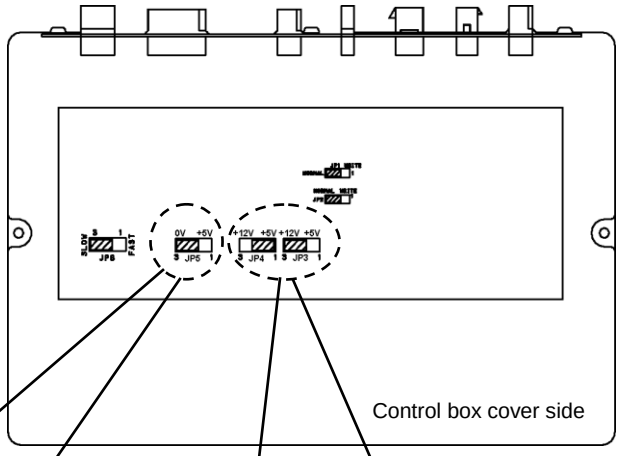
(2) Change the output voltage 5/12VDC with the jumper JP3 and JP4 on the front cover PCB as shown on the right. Change the output voltage 0/5VDC with the jumper JP5 on the front cover PCB.

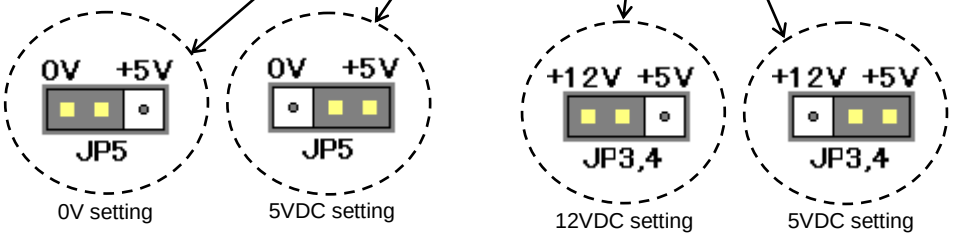
(3) The output voltage can be changed by reconnecting the connector as shown on the right.

(4) The factory setting

Connector	factory setting	Connector (Pin No.)
JP3	+12V	No.3 pin of the option A
JP4	+5V	No.7 pin of the option B
JP5	0V	No.10 pin of the sewing machine

(5) After change, always set the cover to the control box.





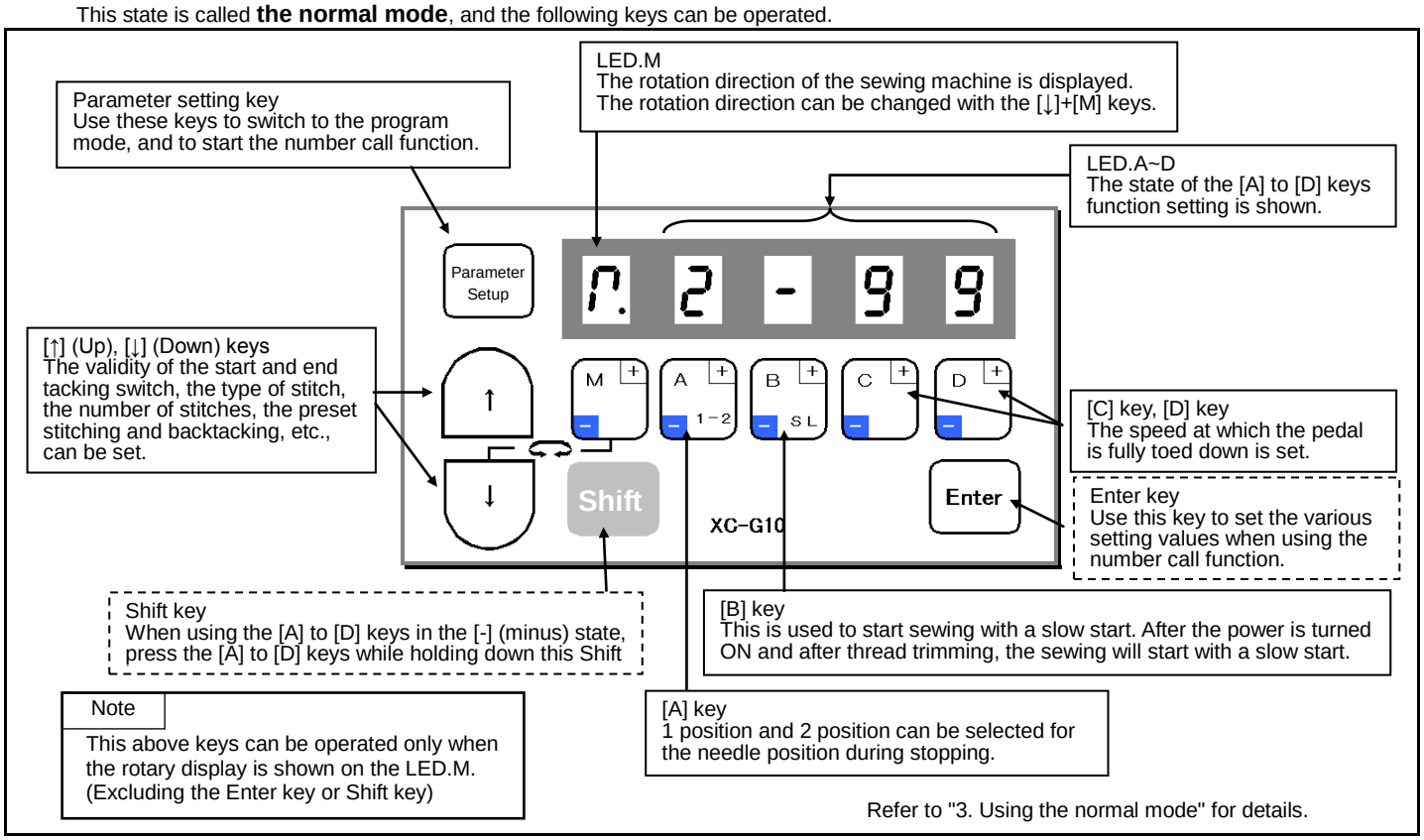
Wait at least 10 minutes after turning the power switch OFF before opening the control box.

Do not change the JP1,JP2 and JP6 from the factory setting.

10 Operation of the Control Switch Panel Keys(When using XC-G10 type control switch panel)

1. Displays during normal mode and functions of each key

When the power supply switch is turned ON, the rotation direction will display on the LED.M shown below.
When the rotation direction is not displayed on LED.M, press the [↓] key any time.
This state is called **the normal mode**, and the following keys can be operated.



Refer to "3. Using the normal mode" for details.

2. Selection of each mode

The modes can be changed from the normal mode to various program modes and various basic functions and application functions set with this control switch panel.
(Refer to the Technical Documents for details on each mode's function.)

(1) Types of program mode

Normal mode

(The rotation direction is displayed on LED.M)

Tacking setting, preset stitching setting, pattern No. selection modes

Program mode [P] The setting to often use 1 *Sewing machine, etc.

Program mode [A] The setting to often use 2 *Servo motor, etc.

Program mode [B] The setting to often use 3 *Counter/Speed display, etc.

Program mode [C] Applied function [C] setting mode * Customizing, etc.

Program mode [D] Tacking setting mode

Program mode [E] H/W checking mode * The input/output function can be checked, and the error statue during a fault can be investigated.

Program mode [I] Save mode of the setting data

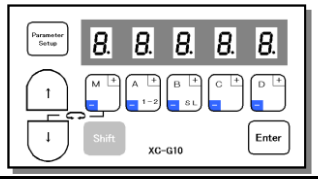
Program mode [R] Reset/returning to original data.
* The state set with each program mode can be returned to the original settings (factory settings).

Program mode [1] Simple setting mode for Mitsubishi thread trimming sewing machine.
Program mode [2] Simple setting mode for chain stitch sewing machine.
Program mode [3] Simple setting mode for other lock stitch sewing machine.

Caution

A program mode cannot be entered from an other program mode.
Always return to the normal mode once before changing the program mode.
Note that when the program mode is selected with the "Direct number call function", a selection exceeding the program mode type can be made with the number selection.

(2) Selection of each program mode from the normal mode.



Mode name	Key operation	Digital display	Return to the normal mode
Tacking type setting mode	Press the [↑] key one time from the normal mode.	b. - 2 - 2 *The tacking setting mode will be entered.	Press the [↓] key one time.
No. of tacking stitch setting mode	Press the [↑] key two times from the normal mode.	n. 4 4 4 4 *The tacking stitches setting mode will be entered. Note) Skipping about this menu at the time of pattern No.=4.	Press the [↓] key two times.
Preset stitching setting mode	Press the [↑] key three times from the normal mode.	- 4 4 *The preset stitching setting mode Note) Skipping about this menu at the time of pattern No.= A to H.	Press the [↓] key three times.
Pattern No. selection mode	Press the [↑] key four times from the normal mode.	P. S r r. 1. *The pattern No. selection mode will be entered.	Press the [↓] key four times.
Program mode [P]	While holding down the [↓] key, press the [↑] key for 2 seconds or more from the normal mode.	P - P H. 4 0 0 0 *The display will flicker. *The program mode [P] will be entered. Switch the function item with the [↓] or [↑] key.	Press down [↓] key, press [↑] key.
Program mode [A]	While holding down the [↓] key, press the [A] key for 2 seconds or more from the normal mode.	P - A G A . L *The display will flicker. *The program mode [A] will be entered. Switch the function item with the [↓] or [↑] key.	Press down [↓] key, press [↑] key.
Program mode [B]	While holding down the [↓] key, press the [B] key for 2 seconds or more from the normal mode.	P - b S. 0 *The display will flicker. *The program mode [B] will be entered. Switch the function item with the [↓] or [↑] key.	Press down [↓] key, press [↑] key.
Program mode [C]	While holding down the [↓] key, press the [C] key for 2 seconds or more from the normal mode.	P - C , A. P S U *The display will flicker. *The program mode [C] will be entered. Switch the function item with the [↓] or [↑] key.	Press down [↓] key, press [↑] key.
Program mode [D]	While holding down the [↓] key, press the [D] key for 2 seconds or more from the normal mode.	P - d d 1. n *The display will flicker. *The program mode [D] will be entered. Switch the function item with the [↓] or [↑] key.	Press down [↓] key, press [↑] key.
Program mode [E]	While holding down the [↓] key , press the [A] key and the [↑] key for 2 seconds or more from normal mode.	P - E 1. E - - *The display will flicker. *The program mode [E] will be entered. Switch the function item with the [↓] or [↑] key.	Press down [↓] key, press [↑] key.
Program mode [I]	While holding down the [↓] key, press the [↑] key and the [B] and the [C] key for 2 seconds or more from normal mode.	P - , S A u E. *The display will flicker. *The program mode [I] will be entered.	Press [D] key for 2 seconds or more. [*1]
Program mode [R]	While holding down the [↓] key, press the [B] and the [C] key for 2 seconds or more from normal mode.	P - r r E S E r. *The display will flicker. *The program mode [R] will be entered.	Press [D] key for 2 seconds or more. [*1]
Program mode [1] Simple setting	While holding down the [↓] key, press the [A] and the [B] key for 2 seconds or more from normal mode.	P - 1 2 8 0 n *The display will flicker. *The program mode [1] will be entered. Switch the function item with the [↓] or [↑] key.	Press [D] key for 2 seconds or more. [*1]
Program mode [2] Simple setting	While holding down the [↓] key, press the [C] and the [D] key for 2 seconds or more from normal mode.	P - 2 H U 2 *The display will flicker. *The program mode [2] will be entered. Switch the function item with the [↓] or [↑] key.	Press [D] key for 2 seconds or more. [*1]
Program mode [3] Simple setting	While holding down the [↓] key, press the [A] and the [D] key for 2 seconds or more from normal mode.	P - 3 d 6 9 n *The display will flicker. *The program mode [3] will be entered. Switch the function item with the [↓] or [↑] key.	Press [D] key for 2 seconds or more. [*1]

The mode can also be selected with the "Direct number call operation". (Refer to the next page.)

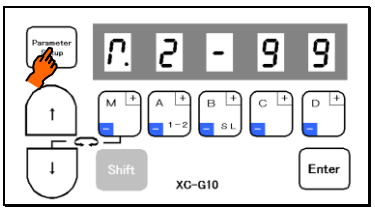
[*1] To return to the normal mode without executing each function in mode [I], [R], [1], [2]or [3], press the [↓] and [↑] keys simultaneously.

(3) Direct number call function (Directly selecting program mode function item from normal mode)

The number of each function listed in section "13 Function list" can be directly designated to call the function item.

[Basic procedures]

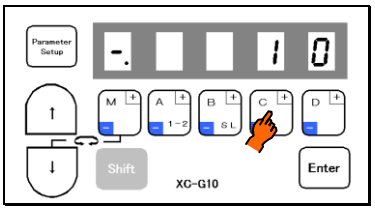
(1) Press Parameter Setup in the normal mode and switch to the number selection mode.



(The normal mode)

(2) Press the A 1-2 (1000th), B SL (100th), C (10th), and D (1st place) keys to display the target function item number.

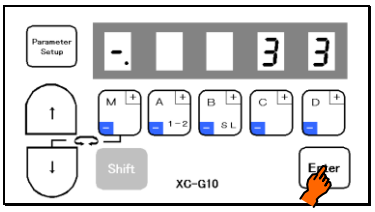
(To use the above "+/-" key as a "-" key, press A 1-2 to D while holding down Shift.)



(The number selection mode)

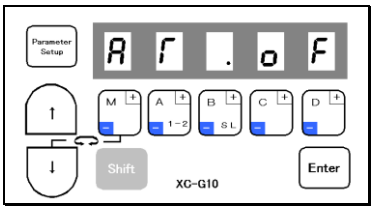
(3) When the target function item number appears, press Enter.

(Number 33 as shown on page 38 is called out in this example.)



(4) This completes calling of the function item.

(In this example, function name [AT.] was called out.)

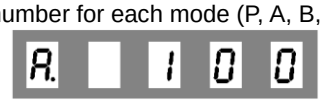


13 Function list

name	Function	No.
H.	Maximum speed	0000
L.	Low speed	0001
⋮	⋮	⋮
S6L.	Thread trimming protection signal (S6) logical changeover	0032
AT.	Automatic operation	0033
TL.	Thread trimmer cancel	0034

[Miscellaneous/Precautions]

- Press Parameter Setup to return to the normal mode.
  The display will return in the order of [Function item] → [number selection mode] → [normal mode].
- Press Enter after changing the setting for each function item.
  The display LED will flicker, and after the changed items are set, the mode will change to the [number selection mode].
  (The changed items will be canceled if the normal mode is returned to without pressing Enter.)
- The display LED will flicker if a function number that does not exist is displayed. Select a number that exists.
- The range of the number designation can be limited as shown below by pressing Parameter Setup, entering the [number selection mode] and then pressing the ↓ or ↑ key.
  (1) Selection of number for each mode (P, A, B, C...)



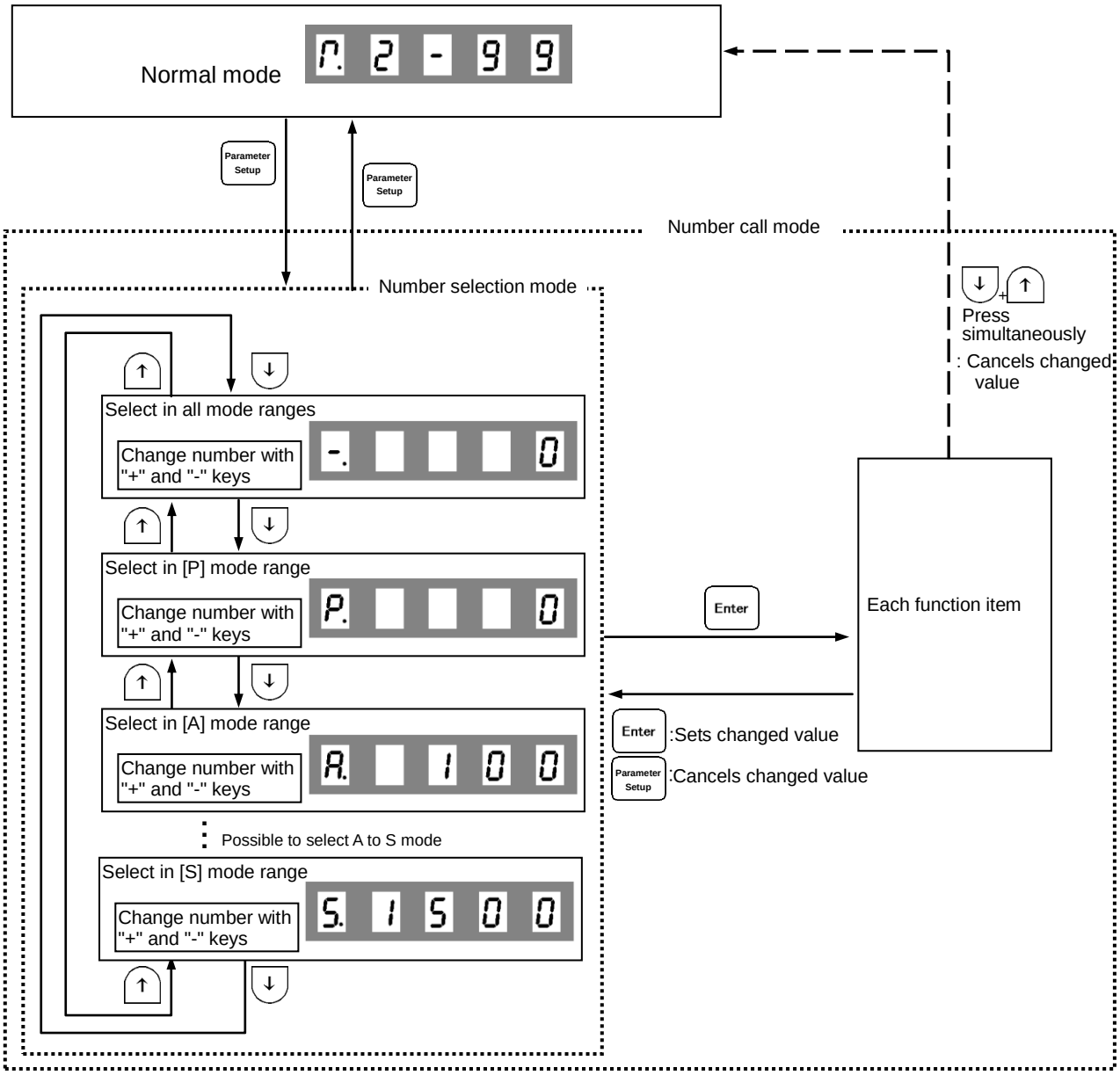
(Selection can be made in A mode range)

  (2) Selection of all mode numbers

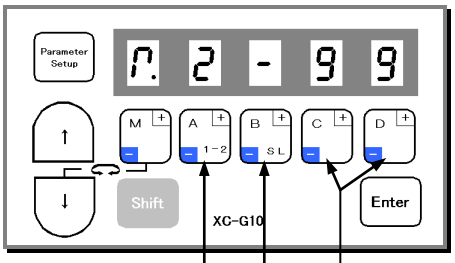
(Selection can be made in all mode ranges)

* Refer to the status transition diagram given on the next page.

Status transition diagram (Direct number call operation)



3. Using the normal mode



Speed adjustment

The operation speed will drop when the [C] key is pressed.
If the [D] key is pressed, the operation speed will increase when the pedal is pressed down to the fullest.
The speed ratio is displayed with the two digits LED.C and LED.D, and can be set in the range of 0 to 99.

Changing between position 1 and position 2

The position can be changed between position 1 and position 2 with the [A] key. The needle position (position 1/position 2) when stopping can be changed. Position 1 and position 2 are indicated with LED.A.
When position 1 is set, the needle stops at the UP position.
When position 2 is set, the needle stops at the DOWN position, and moves to and stops at the UP position after the thread is trimmed.

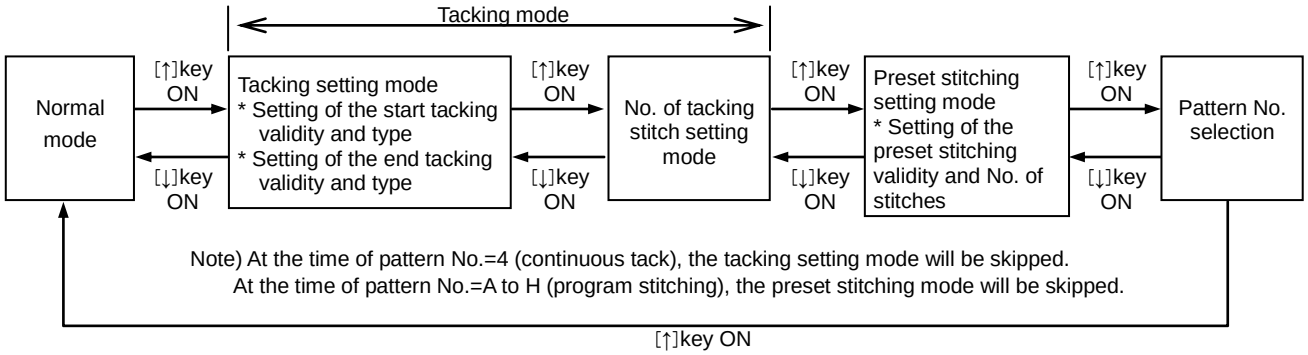
1 indicates position 1.
2 indicates position 2.

Slow start ON/OFF

Slow start can be turned ON or OFF with the [B] key.
Turn this function ON to start stitching with slow start.
Stitching will start slowly after the power is turned ON or after the thread is trimmed.
The slow start ON/OFF state is indicated with LED.B.

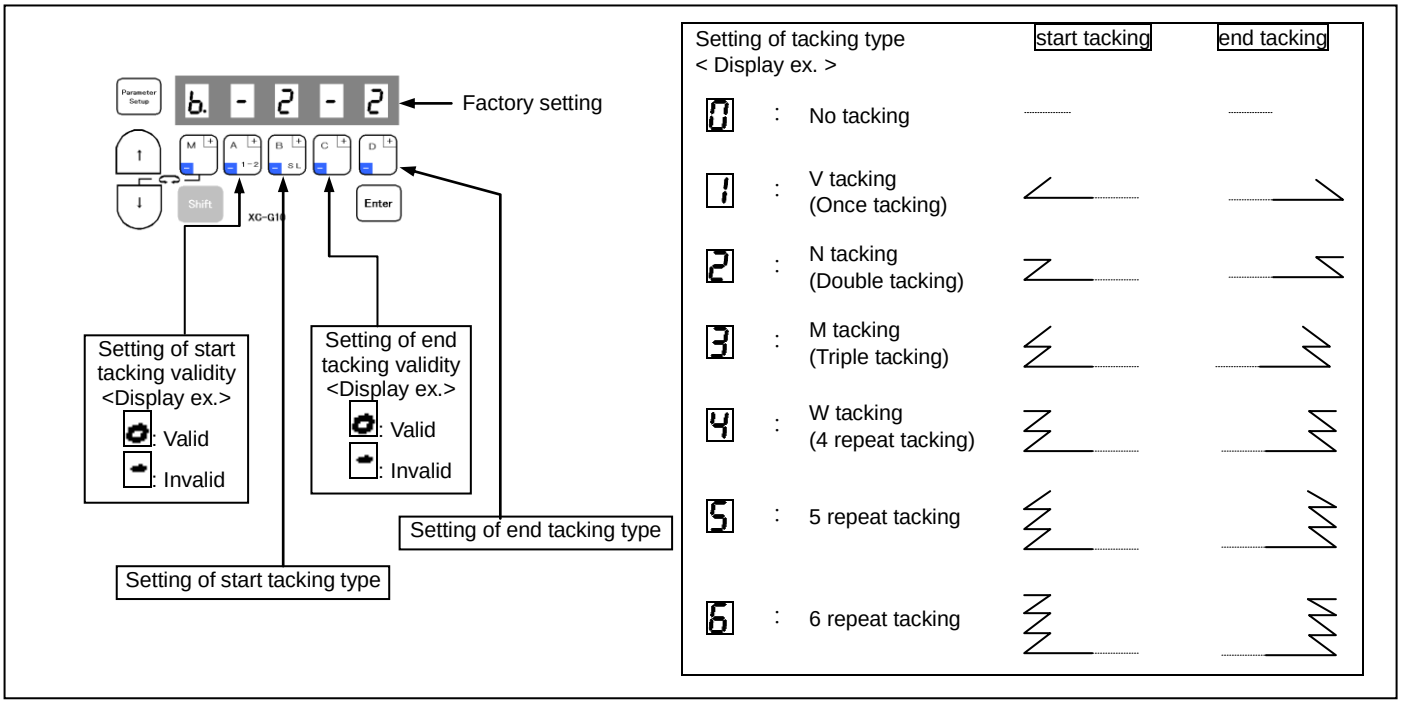
- indicates OFF.
0 indicates ON.

4. Changing to the tacking, preset, pattern NO. selection mode



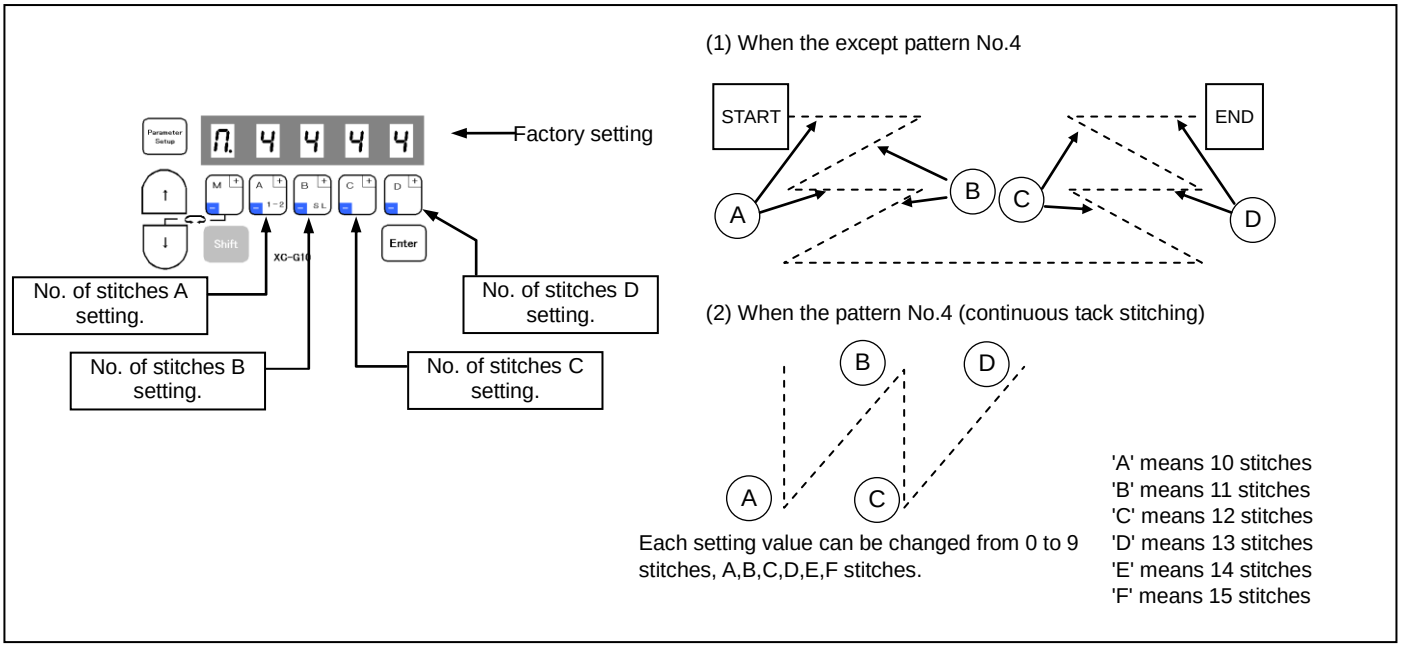
(1) Tacking setting mode (At the time of pattern No.=4, this mode will be skipped.)

When the [↑] key is turned ON, b. will display above the [M] key, and the tacking setting mode will be entered.
The validity and type of start and tacking can be set here.



(2) No. of tacking stitches setting mode

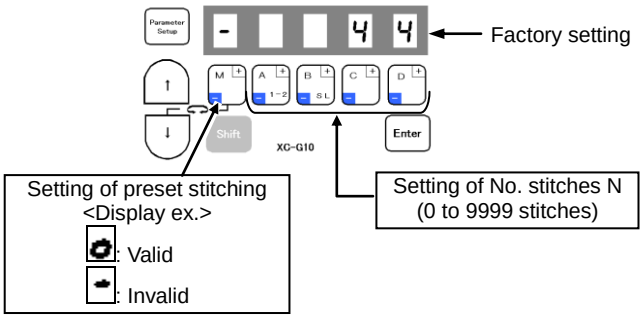
When the [↑] key is turned ON again, n. will display above the [M] key indicator, and the No. of stitches can be set.]

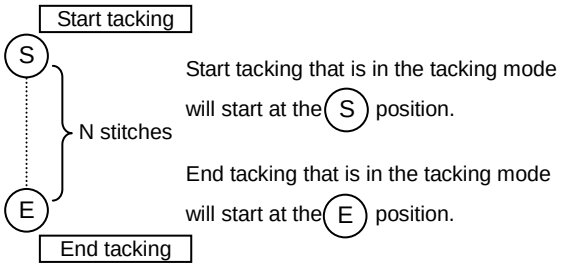


(3) Preset stitching setting mode

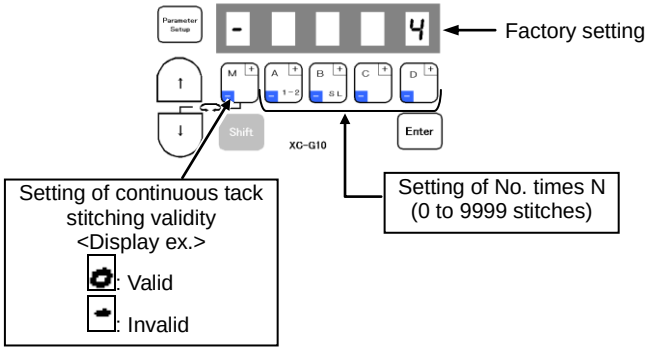
The preset stitching setting mode is entered when the [↑] key is turned ON again. The validity of preset stitching and the number of stitches N can be set.

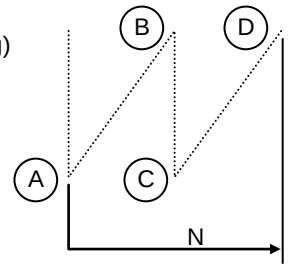
(1) When the pattern is the time except pattern No.4





(2) When the pattern is No.4 (continuous tack stitching)





In the No. of times (N) setting is N=3, the stitching will be in the order of A,B and C. If the setting is N=5, the stitching will be in the order of A,B,C,D,C. If the N is 6 or more, the order will be A,B,C,D,C,D.....(If N=0, tacking will continue in the order ABCDCD... while the pedal is pressed down.)

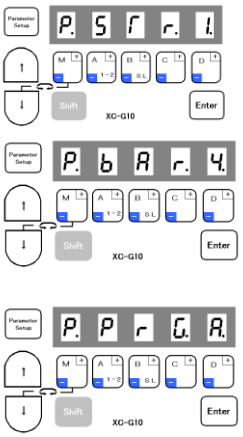
(4) Pattern No. selection mode

When the [↑] key is turned ON again, and the pattern No. selection mode will be entered. Selecting of preset stitching setting (pattern 1 to 3), continuous tack stitching (pattern 4), program stitching (pattern No. A to H).

(1) Display of preset stitching (Pattern 1 to 3)

(2) Display of continuous tack stitching (Pattern 4)

(3) Display of program stitching (Pattern A to H)



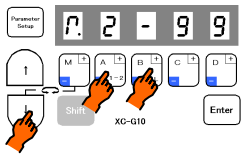
a. Patterns A to H correspond to the programs and teaching patterns A to H input with the XC-G500 type control panel. The control switch panel is used to change and confirm the settings. (Refer to the XC-G500 type control switch panel instruction manual for details on the program and teaching.)

Caution
For safety purposes, always turn off the power switch and confirm to turn off the display when connecting or disconnecting the control panel.

5. Using the program mode [1] simple setting

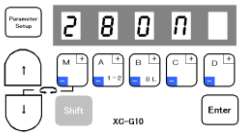
To set the settings to a specific machine in simple setting.
(For example, to set to "LU2-4410-B1T" ... Function setting [410B])

(1)



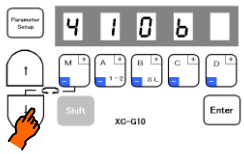
*Enter the program mode [1].
([↓] + [A] + [B] keys)

(2)



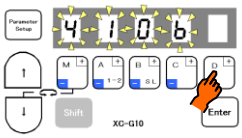
*The mode will change to the program mode [1].

(3)



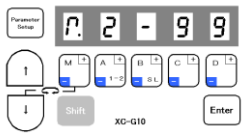
*Press the [↓] key or [↑] key to change the function to [410B].

(4)



*When the [D] key is held down, [410B] will flicker, and the changes to the setting will be set.

(5)



*The mode will return to the normal mode when the [D] key is held down over two seconds or more.
(This completes the settings.)

Description

A. Select the function name corresponding to the sewing machine model from the following simple setting table. The item will change sequentially each time the [↓] or [↑] key is pressed in step (3). (The factory setting is [280M].)

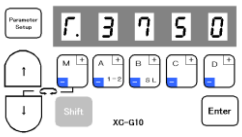
B. After selecting the function name, holds down the [D] key over 2 seconds or more. The function name's set speed and function setting will be set automatically. To return to the normal mode without setting the function name here, press the [↑] key while holding down the [↓] key.

> Caution
> When this function is set, all previously set details will be cleared. The set speed and function setting corresponding to the selected sewing machine model will be set automatically.

C. The set function settings (simple setting value (type)) can be confirmed with the function name corresponding to the set sewing machine model using the following procedures (E mode).

(1) Call out the program mode [E] function [T].
(The mode can also be called out directly with a number[772]. Refer to pages 14 to 16.)

(2)



The function name corresponding to the set sewing machine model will appear.
(For example when [3750] is set.)

(3) Return to the normal mode.

(Press [↓]+[↑] or Parameter Setup)

Simple setting table for Mitsubishi thread trimming sewing machine and motor pulley outside diameter.

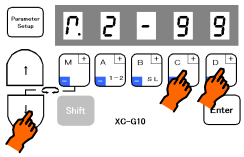
	Function name	Digital display	Sewing machine type	Speed setting					Function setting			Motor pulley outside diameter (mm)	
				High speed (H)	Low speed (L)	Thread trimming speed (T)	Start tacking speed (N)	End tacking speed (V)	D mode tack alignment (BM)	A mode weak brake (BK)	A mode gain selection (GA)		
*3	280M	280M	LS2-1280-M1T (W)	4000	250	200	1700	1700	OFF	OFF	L	85	*1
	280H	280H	LS2-1280-H1T(W)	3000	250	200	1200	1200	OFF	OFF	L		
	280B	280b	LS2-1280-B1T	3000	250	200	1200	1200	OFF	OFF	L		
	380M	380M	LS2-1380-M1T(W)	4000	250	200	1700	1700	OFF	OFF	L		
	380H	380H	LS2-1380-H1T(W)	3000	250	200	1200	1200	OFF	OFF	L		
	380B	380b	LS2-1380-B1T	3000	250	200	1200	1200	OFF	OFF	L		
	210M	210M	LS2-2210-M1T(W)	4000	250	200	1700	1700	OFF	OFF	L		
	230M	230M	LT2-2230-M1TW	3700	250	175	1200	1200	OFF	OFF	H		
	230B	230b	LT2-2230-B1T	3000	250	175	1200	1200	OFF	OFF	H		
	250M	250M	LT2-2250-M1TW	3000	250	175	1200	1200	OFF	OFF	H		
	250B	250b	LT2-2250-B1T	3000	250	175	1200	1200	OFF	OFF	H		
	3310	3310	LY2-3310-B1T	2000	250	225	700	700	ON	OFF	H	65	*2
	3319	3319	LY2-3319-B1T	2000	250	225	700	700	ON	OFF	H		
	3750	3750	LY2-3750-B1T	2000	250	200	700	700	ON	OFF	L		
	6840	6840	LY3-6840-B0T	2000	250	150	700	700	ON	OFF	H		
	6850	6850	LY3-6850-B1T	2000	250	150	700	700	ON	OFF	L		
	410B	410b	LU2-4410-B1T	2000	250	175	700	700	ON	OFF	L		
*8	412B	412b	LU2-4412-B1T	2000	250	175	700	700	ON	OFF	L		
	430B	430b	LU2-4430-B1T	2000	250	175	700	700	ON	OFF	L		
	4650	4650	LU2-4650-B1T	3000	250	175	700	700	ON	OFF	L	85	
*8	4652	4652	LU2-4652-B1T	3000	250	175	700	700	ON	OFF	L		
	4710	4710	LU2-4710-B1T	3000	250	175	700	700	ON	OFF	L		
	4730	4730	LU2-4730-B1T	2500	250	175	700	700	ON	OFF	L		
	630	630	LX2-630-M1	800	280	160	500	500	ON	ON	L	65	
	280E	280E	LS2-1280-M1T(W)	5000	250	200	1700	1700	OFF	OFF	H	110	
	FL	FL	*5	5000	250	200	1700	1700	OFF	OFF	L		
	N	n	*6	5000	250	200	1700	1700	OFF	OFF	L		
	LOAD2	Lod2	*7										
*4	LOAD1	Lod1	*7										

*1 Factory setting is [280M].
*2 The effective diameter of the sewing machine pulley is 70 mm.
(Note : In case of LY2-3310/3319/3750 is 80 mm, LU2-4410/4412/4430/4650/4652/4710/4730 is 85 mm.)
*3 A function name is displayed in order to the direction of ↓ every time it presses a [↓] key.
*4 A function name is displayed in order to the direction of ↑ every time it presses a [↑] key.
*5 For sewing machine with foot lifter, without thread trimmer.
*6 For needle positioner.
7 It is possible to load the saved setting data by the function of [SAVE] in the program mode [I].
(Program mode [I] : [↓]＋[↑]＋[B]＋[C] key)
(The factory setting of [LOAD1] is the setting data of [412B] and the factory setting of [LOAD2] is the setting data of [280M].)
*8 The short remaining thread trimming function is set.

6. Using the program mode [2] simple setting (for chain stitch trimming machine)

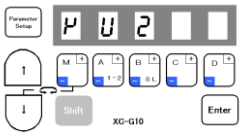
To set the function for chain stitch sewing machine in simple setting.
(Ex. To set for the VC2800, VC3800 class, "YAMATO") ..... Function setting [YU4]

(1)



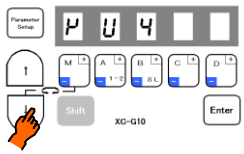
*Enter the program mode [2].
([↓] + [C] + [D] keys)

(2)



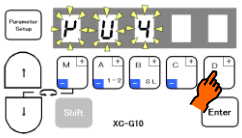
*The mode will change to the program mode [2].

(3)



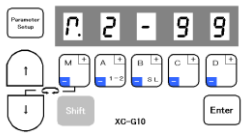
*Press the [↓] key or [↑] key to change the function to [YU4].

(4)



*When the [D] key is held down, [YU4] will flicker, and the changes to the setting will be set.

(5)



*The mode will return to the normal mode when the [D] key is held down over two seconds or more.
(This completes the settings.)

Description

A. Select the function that corresponds to the sewing machine model for "Simple setting table for chain stitch sewing machine" on the page 22. After selecting the function name, holds down the [D] key over 2 seconds or more. The function name's set speed and function setting will be set automatically (Refer to the simple setting table for "YAMATO" on page 22.)

B. To return to the normal mode from the [YU4] display, press the [↑] key while holding down [↓]. In this case, [YU4] will not be set, and the last settings will be used.

C. Each time the [↓] key is pressed in step (3), the function will change in order from [YU2], [YU3], [YU4].....[JMH].

Caution

To use this mode, please ask your dealer or look at "TECHNICAL INFORMATION MANUAL" about simple setting, I/O signal, Junction wiring in detail.

Simple setting table for chain stitch sewing machine

	Function name	Digital display	Sewing machine maker	Model name of sewing machine and device	Needle position	High speed (H)	Low speed (L)	Thread trimming speed (T)	Start condensed speed (N)	End condensed speed (V)
*1 ↓	YU2		YAMATO	VC2600, VC2700 class Solenoid-operated under thread trimmer	2	6000	200	200	1400	1400
	YU3		YAMATO	VC2600, VC2700 class Air-operated under thread trimmer with air wiper	2	6000	200	200	1400	1400
	YU4		YAMATO	VC3845P,2845P,2840P class Air-operated under thread trimmer with air wiper	2	6000	200	200	1400	1400
	YU5		YAMATO	Solenoid-operated under thread trimmer with solenoid wiper	2	6000	200	200	1400	1400
	NO1		PEGASUS	W(T) series /UT device Electric under thread trimmer	1	6000	200	200	1400	1400
	NO1A		PEGASUS	W(T) series /UT device Pneumatic under thread trimmer with pneumatic top cover thread trimmer	1	6000	200	200	1400	1400
	NO2		PEGASUS	***Do not use !!***						
	NO3		PEGASUS	FW series /UT device Electric under thread trimmer	1	4500	200	200	1400	1400
	NO3A		PEGASUS	FW series /UT device Pneumatic under thread trimmer	1	4500	200	200	1400	1400
	NO4		PEGASUS	W674/UT device Super tack	1	4000	200	200	1400	1400
	NO5		PEGASUS	W(T)562-82/UT device Angled stitch Electric under thread trimmer	1	6000	200	200	1400	1400
	NO5A		PEGASUS	W(T)562-82/UT device Angled stitch Pneumatic under thread trimmer with pneumatic top cover thread trimmer	1	6000	200	200	1400	1400
	NO6		PEGASUS	***Do not use !!***						
	NO7		PEGASUS	W(T)600,200 series /UT device condensed stitch Electric under thread trimmer	1	6000	200	200	1400	1400
	NO7A		PEGASUS	W(T)600,200 series /UT device condensed stitch Pneumatic under thread trimmer with pneumatic top cover thread trimmer	1	6000	200	200	1400	1400
	NO8		PEGASUS	***Do not use !!***						
	NOD		PEGASUS	W(T) series /SL device Stitch lock Pneumatic under thread trimmer	1	6000	200	200	1400	1400
	NOF		PEGASUS	EX/BL500,600 series	1	6000	200	200	1400	1400
	KA1		KANSAI	M, RX series Automatic thread trimmer with solenoid wiper	2	6000	250	250	1400	1400
	KA2		KANSAI	D series Automatic thread trimmer with air wiper	2	6000	250	250	1400	1400
	KA3		KANSAI	F series Air-operated under thread trimmer with air wiper	2	6000	250	250	1400	1400
	KA4		KANSAI	DX series Air-operated under thread trimmer with air wiper	2	6000	250	250	1400	1400
	UN1		UNION SPECIAL	33700, 34500 class Solenoid-operated under thread trimmer	2	4000	200	200	1400	2999
	UN2		UNION SPECIAL	34800skcc class Solenoid-operated under thread trimmer	2	5500	200	200	1400	2999
	UN3		UNION SPECIAL	34700 class Push and Pull air-operated under thread trimmer with air wiper	2	4000	200	200	1400	2999
	U345			***Do not use !!***						
	U346			***Do not use !!***						
	U348			***Do not use !!***						
	U347			***Do not use !!***						
	U160			***Do not use !!***						
	U16			***Do not use !!***						
	U362			***Do not use !!***						
	UFCW			***Do not use !!***						
↑	BR1		BROTHER	FD3, FD4 series	2	6000	200	200	1400	1400
	RM1		RIMOLDI	----	1	6000	200	200	1400	1400
	SRB1		SIRUBA	----	2	6000	200	200	1700	1700
*2	JMH		JUKI	MH-481-4-4, MH-484-4-4 class	2	5500	200	200	1700	1900

*1 A function name is displayed in order to the direction of [↓] every time it presses a [↓] key.

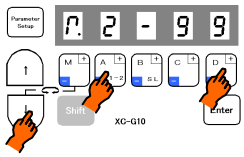
*2 A function name is displayed in order to the direction of [↑] every time it presses a [↑] key.

Note : Please refer to the "TECHNICAL INFORMATION MANUAL" for the Junction wiring, I/O signals and details.

7. Using the program mode [3] simple setting (for lock stitch trimming machine except Mitsubishi sewing machine)

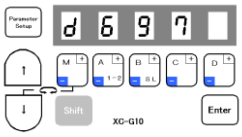
To set the function for DÜ RKOPP ADLER thread trimming sewing machine in simple setting
(For example, to set for the 271 class, "DÜ RKOPP ADLER") ..... Function setting [D271]

(1)



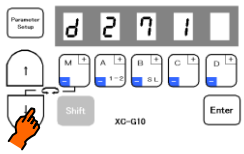
*Enter the program mode [3].
([↓] + [A] + [D] keys)

(2)



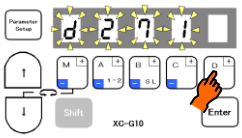
*The mode will change to the program mode [3].

(3)



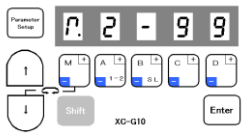
*Press the [↓] key or [↑] key to change the function to [D271].

(4)



*When the [D] key is held down, [D271] will flicker, and the changes to the setting will be set.

(5)



*The mode will return to the normal mode when the [D] key is held down over two seconds or more.
(This completes the settings.)

Description

A. Select the model name that corresponds to the sewing machine model for the simple setting values for the DÜRKOPP ADLER thread trimming sewing machine on the "Technical manual". After selecting the function name, holds down the [D] key over 2 seconds or more. The function name's set speed and function will be set automatically.

B. To return to the normal mode from the [D271] display, press the [↑] key while holding down [↓]. In this case, [D271] will not be set, and the last settings will be used.

C. Each time the [↓] key is pressed in step 3, the function will change in order from [D697], [D271], [D273].....[750].

Caution

To use this mode, please ask your dealer or look at "TECHNICAL INFORMATION MANUAL" about simple setting, I/O signal, Junction wiring in detail.

Simple setting table for thread trimming sewing machine

	Function name	Digital display	Sewing machine maker	Model name of sewing machine and device	Needle position	High speed (H)	Low speed (L)	Thread trimming speed (T)	Start tacking speed (N)	End tacking speed (V)
*1 ↓	D697		DÜRKOPP ADLER	697-15000 class	2	1500	250	150	700	700
	D271		DÜRKOPP ADLER	271-14000,272-14000 class	2	3000	170	250	1500	1500
	D273		DÜRKOPP ADLER	273-14000,274-14000 class	2	3000	170	250	1500	1500
	B715		BROTHER	DB2-B705,DB2-B707,DB2-B715 class	2	4300	215	215	1800	1800
	B716		BROTHER	DB2-B716-?,DB2-B716-1,DB2-B716-?,DB2-B716-5 class	2	3500	215	215	1800	1800
	B737		BROTHER	DB2-B737-1,DB2-B737-3,DB2-B737-5 class	2	4000	215	215	1800	1800
	B740		BROTHER	DB2-B746-5,DB2-B746-7,DB2-B746-8,DB2-B747-5,DB2-B748-5,DB2-B748-7 class	2	2000	215	215	1800	1800
	B757		BROTHER	DB2-B757 class	2	5000	215	215	1800	1800
	B770		BROTHER	DB2-B772,DB2-B774,DB2-B7740,DB2-B778 class	2	4500	215	215	1800	1800
	B790		BROTHER	DB2-B790,DB2-B791-3,DB2-B791-5,DB2-B7910-3,DB2-B7910-5,DB2-B792,DB2-B793-403,DB2-B795,DB2-B798 class	2	3500	215	215	1800	1800
	B830		BROTHER	DB2-B837,DB2-B838 class	2	3000	215	215	1800	1800
	BLT		BROTHER	LT2-B841-1,LT2-B841-3,LT2-B841-5,LT2-B842-1,LT2-B842-3,LT2-B842-5,LT2-B845,LT2-B8450,LT2-B8480,LT2-B847,LT2-B848,LT2-B872,LT2-B875,LT2-B8750 class	2	3000	185	185	1000	1000
	BLZ		BROTHER	LZ2-B852,LZ2-B853,LZ2-B854,LZ2-B856,LZ2-B857 class	2	3000	185	185	1800	1800
	J500		JUKI	DDL-500,DMN-5420NFA-6-WB class	2	5000	200	200	1700	1900
	J505		JUKI	DDL-505,DDL-505A,DDL-506,DDL-506A,DDL-506E,DDL-560-5,DDL-5600,DLU-5494NBB-6-WB,PLW-1245-6,PLW-1246-6,PLW-1257-6,PLW-1264-6,PLW-1266-6 class	2	4000	200	200	1700	1900
	J555		JUKI	DDL-555-2-2B,DDL-555-2-4B,DDL-555ON,DDL-5570,DDL-5571,DDL-5580 class	2	4000	200	200	1700	1900
	JDL		JUKI	DLD-432-5,DLD-436-5,DLM-5400N-6,DLM-5400-6,DLN-415-5,DLN-5410N-6,DLN-5410-6,DLU-450,DLU-490-5,DLU-491-5,DLU-5490BB-6-OB,DLU-5490BB-6-WB,DLU-5490N-6,DMN-530-5,DMN-531-5 class	2	4200	200	200	1700	1900
	JDU		JUKI	DNU-241H-5,DNU-241H-6,DSC-244-6,DSC-244V-6,DSC-245-5,DSC-245-6,DSC-246-6,DSC-246V-6,DSU-142-6,DSU-144-6,DSU-145-5,DSU-145-6,DU-141H-4,DU-141H-5,DU-141H-6,DU-161H-6 class	2	2000	200	200	1700	1900
	JLH		JUKI	LH-1172,LH-1180-5,LH-1182-5,LH-1150,LH-1152,LH-1160,LH-1162 class	1	2300	200	200	1700	1900
	JLU1		JUKI	DDL-5560NL-6,LU-1114-5,LU-1114-6,LZH-1290-6 class	2	2800	200	200	1700	1900
	JLU2		JUKI	LU-2210-6-0B class	2	3500	200	200	1700	1900
	T100		TOYOTA	AD1012,AD1012B,AD1012G,AD1013,AD1013A,AD1013G,AD1020,AD1102,AD1102B,AD1102G,AD1103,AD1103A,AD1202,AD1203,AD1204S,AD1205,AD1205S,AD1212G,AD1213,AD2200,AD5010S class	2	3500	200	200	1700	1700
	T157		TOYOTA	AD157,AD157G class	2	4000	200	200	1700	1700
	T158		TOYOTA	AD158,AD158-2,AD158-22,AD158A-3,AD158A-32,AD158B-2,AD158B-22,AD158G-2,AD158G-22,AD158-3,AD158-32 class	2	3500	200	200	1700	1700
	T300		TOYOTA	AD3110,AD3110P,AD320-2,AD320-22,AD320-202,AD331,AD3310,AD3310P,AD332,AD340-2,AD340-22,AD340-202,AD340B-2,AD340B-22,AD340B-202,AD341-2,AD341-22,AD341-202,AD345-2,AD345-22,AD345-202,AD352 class	2	1900	200	200	1700	1700
	U639		UNION SPECIAL	Class 63900 Solenoid-operated needle feed under trimmer	2	4000	250	180	1700	1700
	SLH2		SEIKO	SLH-2B	2	570	100	100	1700	1700
	457G		SINGER	457 Wiper	2	4000	250	160	1500	1500
	457F		SINGER	457 Thread pull	2	4000	250	160	1500	1500
	591		SINGER	591, 1591	2	4000	250	200	1500	1500
	211A		SINGER	211A	2	2300	200	180	1000	1000
	212A		SINGER	212A	2	3500	200	180	1000	1000
	411U		SINGER	411U	2	4000	250	180	1500	1500
↑	412U		SINGER	412U	2	4500	250	180	1500	1500
	591V		SINGER	591V	2	4000	250	200	1500	1500
	691A		SINGER	1691D250	2	4000	250	200	1500	1500
	691B		SINGER	1691D210, 1691D200	2	4000	250	200	1500	1500
*2	750		SINGER	750	2	4500	250	215	1500	1500

*1 A function name is displayed in order to the direction of [↓] every time it presses a [↓] key.
*2 A function name is displayed in order to the direction of [↑] every time it presses a [↑] key.

Note : Please refer to the "TECHNICAL INFORMATION MANUAL" for the Junction wiring, I/O signals and details.

11 Function List

Refer to the Technical Documents for details on each function.
The numbers in the table are used with the direct number call function.

	name	Function	No.
P mode (For sewing machine): [↓]+[↑] key	**H.**	Maximum speed	0000
	L.	Low speed	0001
	T.	Thread trimming speed	0002
	N.	Start tacking speed	0003
	V.	End tacking speed	0004
	M.	Medium speed	0005
	S.	Slow start speed	0006
	SLN.	No. of slow start stitches	0007
	SLM.	Slow start operation mode	0008
	SLP.	Slow start when power is turned ON	0009
	SH.	One shot	0010
	SHM.	One shot operation mode	0011
	PSU.	No. of stitches after PSU input	0012
	PSD.	No. of stitches after PSD input	0013
	PS1.	Sensor input signal PS1 operation mode	0014
	1.	No. of stitches after PS1 input	0015
	PS2.	Sensor input signal PS2 operation mode	0016
	2.	No. of stitches after PS2 input	0017
	PSN.	Restart after PSD,SEN input PSN	0018
	SEN.	Input sensor function valid / invalid	0019
	SE.	Setting stitch amount to stop by "SEN"	0020
	FUM.	Presser foot lift momentary	0021
	FU.	FUM operation mode	0022
	FCT.	Time setting for FUM operation mode	0023
	FD.	Time to motor drive after presser foot lifter bring down	0024
	FO.	Full wave time of presser foot lifter output	0025
	S3D.	Delay time of presser foot signal S3 input	0026
	FUD.	Presser foot lifting output chopping duty	0027
	PFU.	Presser foot lifting output when power is turned ON	0028
	FL.	Cancel the presser foot lifting with full heeling	0029
	S3L.	Cancel presser foot lifting with light heeling	0030
	S2L.	Cancel of thread trimming operation	0031
	S6L.	Thread trimming protection signal (S6) logical changeover	0032
	AT.	Automatic operation	0033
	TL.	Thread trimmer cancel	0034
	TLS.	Auto-stop of preset stitch sewing before trim	0035
	RU.	Reverse run needle lifting after thread trimming	0036
	R8.	RU reverse run angle	0037
	TB.	Thread trimming with reverse feed	0038
	TBJ.	Not used.	0039
	S2R.	Full heeling, S2 signal operation mode	0040
	IL.	Cancel of interlock after full pedal heeling	0041
	TR.	Thread trimming mode	0042
	POS.	Thread trimming validity at neutral pedal	0043
	P1P.	Operation when power is turned ON during 1 position setting.	0044
	P2P.	Operation when power is turned ON during 2 position setting.	0045
	C8.	Needle stop position before fabric	0046
	K8.	Reverse run angle from DOWN position to UP position	0047
	E8.	On angle of virtual "TM"	0048
	S8.	On start angle of virtual "TM"	0049
	SNM.	Setting sensor "SEN" input function	0050
	KD.	Virtual down setting	0051
	KDU.	Virtual width of up and down signal	0052
	PSJ.	Not used.	0053
	D8.	Needle DOWN position stop angle	0054
	U8.	Needle UP position stop angle	0055

	name	Function	No.
A mode (For servo motor) : [↓]+[A] key	**GA.**	Gain high/low selection	0100
	PDC.	Pedal curve	0101
	AC.	Acceleration time simple setting	0102
	ACT.	Acceleration time	0103
	DC.	Deceleration time simple setting	0104
	DCT.	Deceleration time	0105
	SC.	S-character cushion	0106
	SCT.	S-character cushion time setting	0107
	S2M.	Full heeling S2 signal operation mode when power is turned on or after thread trimming	0108
	PL.	Sewing machine shaft/motor shaft speed setting selection	0109
	MR.	Setting motor pulley diameter	0110
	SR.	Setting sewing machine pulley diameter	0111
	NOS.	Random stop is available without thread trimming.	0112
	STM.	First priority stop => speed control	0114
	BKT.	Brake time	0115
	B8.	Weak brake angle	0116
	BNR.	Reduction of weak brake sound	0117
	BKS.	Weak brake force	0118
	BKM.	Weak brake mode	0119
	BK.	Weak brake	0120
B mode (For counter/speed display) : [↓]+[B] key	**S.**	Display sewing speed	0200
	N.	Down counter setting count amount	0201
	D.	Down counter display count amount	0202
	P.	Up counter setting count amount	0203
	U.	Up counter display count amount	0204
	CUP.	Up counter the selection of setting mode	0205
	USC.	Up counter the selection of counter operation	0206
	UCM.	Up counter changing sewing pattern	0207
	UPC.	Up counter valid / invalid	0208
	NXU.	Up counter operation after counting over	0209
	CDN.	Down counter the selection of setting mode	0210
	DSC.	Down counter the selection of counter operation	0211
	DCM.	Down counter changing sewing pattern	0212
	DNC.	Down counter valid / invalid	0213
	NXD.	Down counter operation after counting over	0214
	PCM.	Counter condition turning on power switch	0215
	PRN.	Setting Thread trimming times "N"	0216
	CNU.	Setting Number of stitches "N"	0217
	CCI.	Count modification (to use IO1, IO2)	0218
	PMD.	Display condition turning on power switch	0219
	CCM.	Reset for Up / Down counter during operation	0220

Program mode [I] (Save mode of the setting data): [↓]+[↑]+[B]+[C] key

	name	Function	No.
	SAVE1	Save mode of the setting data 1	-
	SAVE2	Save mode of the setting data 2	-
	CCR	Copy of the current data	-
	CU1	Copy of user's 1 data	-
	CU2	Copy of user's 2 data	-

Program mode [R] (Reset): [↓]+[B]+[C] key

	name	Function	No.
	RESET.	Reset	-

Program mode [1] (Mitsubishi sewing machine): [↓]+[A]+[B] key

	name	Function	No.
	280M	LS2-1280-M1T(W)	-
	:	**:**	-
	LOD1	Load of the saved setting data1	-

Program mode [2] (Chain stitch sewing machine): [↓]+[C]+[D] key

	name	Function	No.
	YU2	YAMATO VC2600,VC2700 class	-
	:	**:**	-
	JMH	JUKI	-

Program mode [3] (other lock stitch sewing machine): [↓]+[A]+[D] key

	name	Function	No.
	D697	DÜRKOPP ADLER 697-15000 class	-
	:	**:**	-
	750	SINGER	-

C mode (For setting input/output signal to function): [↓]+[C] key

name	Function	No.
IA.	IA input function selection	0300
IAL.	IA input logic changeover	0301
IAA.	IA input alternating operation	0302
IB.	IB input function selection	0303
IBL.	IB input logic changeover	0304
IBA.	IB input alternating operation	0305
IC.	IC input function selection	0306
ICL.	IC input logic changeover	0307
ICA.	IC input alternating operation	0308
ID.	ID input function selection	0309
IDL.	ID input logic changeover	0310
IDA.	ID input alternating operation	0311
IE.	IE input function selection	0312
IEL.	IE input logic changeover	0313
IEA.	IE input alternating operation	0314
IF.	IF input function selection	0315
IFL.	IF input logic changeover	0316
IFM.	Setting the function for IF	0317
RFS.	Set condition of RS F/F for IF	0318
RFR.	Reset condition of RS F/F for IF	0319
RFN.	RS F/F reset stitch amount for IF	0320
IG.	IG input function selection	0321
IGL.	IG input logic changeover	0322
IGA.	IG input alternating operation	0323
IH.	IH input function selection	0324
IHL.	IH input logic changeover	0325
IHA.	IH input alternating operation	0326
II.	II input function selection	0327
IIL.	II input logic changeover	0328
IIA.	II input alternating operation	0329
IJ.	Not used.	0330
IJL.	Not used.	0331
IJA.	Not used.	0332
IK.	Not used.	0333
IKL.	Not used.	0334
IKA.	Not used.	0335
IL.	Not used.	0336
ILL.	Not used.	0337
ILA.	Not used.	0338
IM.	IM input function selection	0339
IML.	IM input logic changeover	0340
IMA.	IM input alternating operation	0341
IN.	IN input function selection	0342
INL.	IN input logic changeover	0343
INA.	IN input alternating operation	0344
IO.	IO input function selection	0345
IOL.	IO input logic changeover	0346
IOA.	IO input alternating operation	0347
IP.	IP input function selection	0348
IPL.	IP input logic changeover	0349
IPA.	IP input alternating operation	0350
IQ.	IQ input function selection	0351
IQL.	IQ input logic changeover	0352
IQA.	IQ input alternating operation	0353
IR.	IR input function selection	0354
IRL.	IR input logic changeover	0355
IRA.	IR input alternating operation	0356
I1.	I1 input function selection	0357
I1L.	I1 input logic changeover	0358
I1M.	Setting the function for I1	0359
I1O	Special setting for input signal "I1"	0360
I1F	Special setting for input signal "I1" is ON	0361
I1C	RS F/F clear setting	0362
1CT	RS F/F delay time setting	0363
F1P	Input signal I1 virtual F/F circuit operation 1	0364
F1C	Input signal I1 virtual F/F circuit operation 2	0365
F1S	Input signal I1 virtual F/F circuit operation 3	0366
R1S	Set condition of RS F/F for I1	0367
R1R	Reset condition of RS F/F for I1	0368
R1N	RS F/F reset stitch amount for I1	0369
I2.	I2 input function selection	0370
I2L.	I2 input logic changeover	0371
I2M.	Setting the function for I2	0372
I2C	RS F/F clear setting	0373
2CT	RS F/F delay time setting	0374
R2S	Set condition of RS F/F for I2	0375
R2R	Reset condition of RS F/F for I2	0376
R2N	RS F/F reset stitch amount for I2	0377

C mode (For setting input/output signal to function): [↓]+[C] key

name	Function	No.
I4.	I4 input function selection	0378
I4L.	I4 input logic changeover	0379
I4A.	I4 input alternating operation	0380
I5.	I5 input function selection	0381
I5L.	I5 input logic changeover	0382
I5A.	I5 input alternating operation	0383
I6.	I6 input function selection	0384
I6L.	I6 input logic changeover	0385
I6A.	I6 input alternating operation	0386
I7.	I7 input function selection	0387
I7L.	I7 input logic changeover	0388
I7A.	I7 input alternating operation	0389
OA.	OA output function selection	0390
OAL.	OA output logic changeover	0391
OAC.	OA output chopping operation	0392
OAT.	OA output forced OFF	0393
DA.	OA output delay time	0394
OB.	OB output function selection	0395
OBL.	OB output logic changeover	0396
OBC.	OB output chopping operation	0397
OBT.	OB output forced OFF	0398
DB.	OB output delay time	0399
OC.	OC output function selection	0400
OCL.	OC output logic changeover	0401
OCC.	OC output chopping operation	0402
OCT.	OC output forced OFF	0403
DC.	OC output delay time	0404
OD.	OD output function selection	0405
ODL.	OD output logic changeover	0406
ODC.	OD output chopping operation	0407
ODT.	OD output forced OFF	0408
DD.	OD output delay time	0409
OF.	OF output function selection	0410
OFL.	OF output logic changeover	0411
FUD.	Presser foot lifter output chopping duty	0412
FO.	Presser foot lifter FU full wave output time	0413
FU.	Presser foot lifter FU momentary mode	0414
DF.	OF output delay time	0415
O1.	O1 output function selection	0416
O1L.	O1 output logic changeover	0417
O1C.	O1 output chopping function	0418
O1T.	O1 output forced OFF	0419
D1.	O1 output delay time	0420
O2.	O2 output function selection	0421
O2L.	O2 output logic changeover	0422
O2C.	O2 output chopping function	0423
O2T.	O2 output forced OFF	0424
D2.	O2 output delay time	0425
O3.	O3 output function selection	0426
O3L.	O3 output logic changeover	0427
O3C.	O3 output chopping function	0428
O3T.	O3 output forced OFF	0429
D3.	O3 output delay time	0430
O4.	O4 output function selection	0431
O4L.	O4 output logic changeover	0432
O4T.	O4 output forced OFF	0433
D4.	O4 output delay time	0434
O5.	O5 output function selection	0435
O5L.	O5 output logic changeover	0436
O5T.	O5 output forced OFF	0437
D5.	O5 output delay time	0438
O6.	O6 output function selection	0439
O6L.	O6 output logic changeover	0440
O6C.	O6 output chopping function	0441
O6T.	O6 output forced OFF	0442
D6.	O6 output delay time	0443
O7.	O7 output function selection	0444
O7L.	O7 output logic changeover	0445
O7C.	O7 output chopping function	0446
O7T.	O7 output forced OFF	0447
D7.	O7 output delay time	0448
OM.	OM output function selection	0449
OML.	OM output logic changeover	0450
OMT.	OM output forced OFF	0451
DM.	OM output delay time	0452
ON.	ON output function selection	0453
ONL.	ON output logic changeover	0454
ONT.	ON output forced OFF	0455

	name	Function	No.
C mode (For setting input/output signal to function): [↓]+[C] key	**DN.**	ON output delay time	0456
	OO.	OO output function selection	0457
	OOL.	OO output logic changeover	0458
	OOT.	OO output forced OFF	0459
	DO.	OO output delay time	0460
	OP.	OP output function selection	0461
	OPL.	OP output logic changeover	0462
	OPT.	OP output forced OFF	0463
	DP.	OP output delay time	0464
	OQ.	OQ output function selection	0465
	OQL.	OQ output logic changeover	0466
	OQT.	OQ output forced OFF	0467
	DQ.	OQ output delay time	0468
	O.R.	OR output function selection	0469
	O.RL.	OR output logic changeover	0470
	O.RT.	OR output forced OFF	0471
	DR.	OR output delay time	0472
	PO.	Full wave output time for each output	0473
	POD.	Output chopping duty except of FU output	0474
	OTT.	Forced OFF timer setting function for each output	0475
	FCT.	Time setting for FUM operation mode	0476
	A1.	Logic [AND] module input function selection	0477
	A1L.	Logic [AND] module setting of Hi/Low logic	0478
	A1A.	Logic [AND] module Alternate	0479
	N1.	Logic [AND] module output function selection	0480
	N1L.	Logic [AND] module setting of Hi/Low logic	0481
	N2.	Logic [AND] module output function selection	0482
	N2L.	Logic [AND] module setting of Hi/Low logic	0483
	A2.	Logic [AND] module input function selection	0484
	A2L.	Logic [AND] module setting of Hi/Low logic	0485
	A2A.	Logic [AND] module Alternate	0486
	N3.	Logic [AND] module output function selection	0487
	N3L.	Logic [AND] module setting of Hi/Low logic	0488
	N4.	Logic [AND] module output function selection	0489
	N4L.	Logic [AND] module setting of Hi/Low logic	0490
	A3.	Logic [AND] module input function selection	0491
	A3L.	Logic [AND] module setting of Hi/Low logic	0492
	A3A.	Logic [AND] module Alternate	0493
	N5.	Logic [AND] module output function selection	0494
	N5L.	Logic [AND] module setting of Hi/Low logic	0495
	N6.	Logic [AND] module output function selection	0496
	N6L.	Logic [AND] module setting of Hi/Low logic	0497
	OR.	Logic [OR] module input function selection	0498
	ORL.	Logic [OR] module setting of Hi/Low logic	0499
	ORA.	Logic [OR] module Alternate	0500
	R1.	Logic [OR] module output function selection	0501
	R1L.	Logic [OR] module setting of Hi/Low logic	0502
	R2.	Logic [OR] module output function selection	0503
	R2L.	Logic [OR] module setting of Hi/Low logic	0504
	CSP.	Variable speed command for digital input	0505
	CSG.	Variable speed command for digital input (Gray code)	0506
	LB.	Thread release + backstitch output	0507
	T1C.	Virtual output OT1 forced OFF function	0508
	T1T.	Forced OFF timer setting function for virtual output OT1	0509
	T2C.	Virtual output OT2 forced OFF function	0510
	T2T.	Forced OFF timer setting function for virtual output OT2	0511
	T3C.	Virtual output OT3 forced OFF function	0512
	T3T.	Forced OFF timer setting function for virtual output OT3	0513
	D11.	ON delay time setting function for virtual output OT1	0514
	D12.	OFF delay time setting function for virtual output OT1	0515
	D21.	ON delay time setting function for virtual output OT2	0516
	D22.	OFF delay time setting function for virtual output OT2	0517
	D31.	ON delay time setting function for virtual output OT3	0518

	name	Function	No.
C mode : [↓]+[C] key	**D32.**	OFF delay time setting function for virtual output OT3	0519
	CPK.	Feed pulse output (CP) cancel function	0520
	CP.	Setting CP pulse amount	0521
	CPC.	Prohibited angle of output CP pulse	0522
	PSW.	Panel switch operation prohibit	0523
	CKB.	O4, O5 output cancel during backtack term	0524
	CPB.	CP output cancel during backtack term	0525
	C.	Speed setting for the [SPC] output	0526
	D.	Speed setting for the [SPD] output	0527
	E.	Speed setting for the [SPE] output	0528
	CNF.	F key function on control panel	0529
	PDS.	Variable speed pedal changeover setting	0530
	V2C.	Speed instruction VC2 cancellation	0531

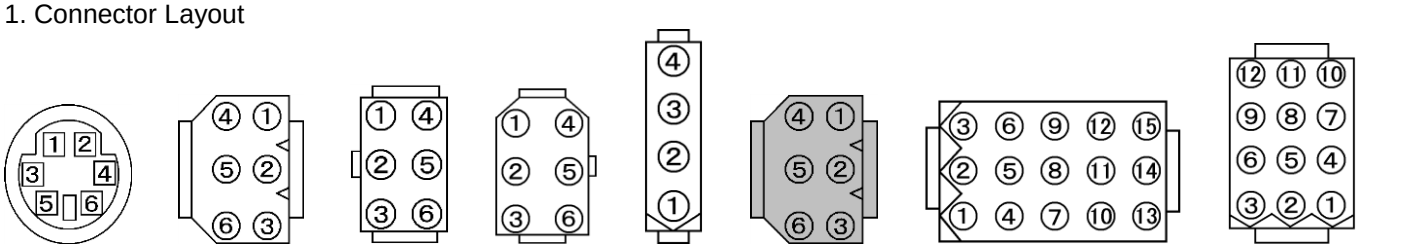
	name	Function	No.
D mode (For tacking setting mode): [↓]+[D] key	**D1.**	Operation mode during tacking	0600
	D2.	Operation mode during start tack completion	0601
	CT.	Stop time at each corner during start and backtacking	0602
	BM.	Tack alignment	0603
	BT1.	No. of stitch compensation for start tacking alignment	0604
	BT2.	No. of stitch compensation for start tacking alignment	0605
	BT3.	No. of stitch compensation for end tacking alignment	0606
	BT4.	No. of stitch compensation for end tacking alignment	0607
	BTP.	No. of tacking stitches (+) 15 stitches function	0608
	BTO.	No. of tacking stitches addition stitches function	0609
	BTT.	Full heeling function immediately after start tacking stop	0610
	CSJ.	Not used.	0611
	SPN.	The speed operation mode when both the medium speed signal and S5V signal is ON	0612
	BTM.	Set table types of tacking	0613
	S7M.	Input signal S7 operation mode during preset stitching	0614
	S7U.	Manual backstitch ON timing 1	0615
	S7D.	Manual backstitch ON timing 2	0616
	7BD.	The OFF timing setting of output B when the backstitching signal (S7) is OFF setting.	0617
	BTN.	The maximum tacking stitches (maximum stitches is 99 stitches)	0618
	BCC.	No. of end tacking stitches during direct heeling	0619
	TLS.	Operation mode during thread trimmer cancel signal [TL] setting	0620
	BTS.	Input signal BTL quick pressing operation	0621
	BS.	Input signal SB and EB quick pressing operation	0622
	BTD.	Operation when input signal BTL is ON	0623
	BD.	Operation when input signal SB and EB tacking OFF are set	0624
	PNE.	End tacking cancel mode with input signal PSU	0625
	BZ.	The buzzer of control panel validity	0626

	name	Function	No.
E mode (For H/W checking mode): [↓]+[↑]+[A] key	**1.**	Error code (The last error code)	0700
	2.	Error code (The second to last code)	0701
	3.	Error code (The third to last code)	0702
	4.	Error code (The fourth to last code)	0703
	P.	Total integration time of power on	0704
	M.	Total integration time of motor run	0705
	IA.	Input display	0706
	IB.	Input display	0707
	IC.	Input display	0708
	ID.	Input display	0709
	IE.	Input display	0710
	IF.	Input display	0711
	IG.	Input display	0712
	IH.	Input display	0713
	II.	Input display	0714
	IJ.	Input display	0715
	IK.	Input display	0716
	IL.	Input display	0717
	IP.	Input display	0718
	IQ.	Input display	0719
	IR.	Input display	0720
	I1.	Input display	0721
	I2.	Input display	0722
	I4.	Input display	0723
	I5.	Input display	0724
	ECA.	Encoder signal display (A phase)	0725
	ECB.	Encoder signal display (B phase)	0726
	UP.	Detector signal display (UP signal)	0731
	DN.	Detector signal display (DN signal)	0732
	DR.	Display the angle from down position	0733
	VC.	Display the voltage of VC	0734
	V2.	Display the voltage of VC2	0736
	OAD.	Output signal display	0737
	OBD.	Output signal display	0738
	OCD.	Output signal display	0739
	ODD.	Output signal display	0740
	OFD.	Output signal display	0741
	O1D.	Output signal display	0742
	O2D.	Output signal display	0743
	O3D.	Output signal display	0744
	O4D.	Output signal display	0745
	O5D.	Output signal display	0746
	O6D.	Output signal display	0747
	O7D.	Output signal display	0748
	OPD.	Output signal display	0749
	OQD.	Output signal display	0750
	ORD.	Output signal display	0751
	OAO.	Solenoid output	0752
	OBO.	Solenoid output	0753
	OCO.	Solenoid output	0754
	ODO.	Solenoid output	0755
	OFO.	Solenoid output	0756
	O1O.	Solenoid output	0757
	O2O.	Solenoid output	0758
	O3O.	Solenoid output	0759
	O4O.	Solenoid output	0760
	O5O.	Solenoid output	0761
	O6O.	Solenoid output	0762
	O7O.	Solenoid output	0763
	OPO.	LED output for G500 type control panel	0764
	OQO.	LED output for G500 type control panel	0765
	ORO.	LED output for G500 type control panel	0766
	WT.	Rated output display	0767
	VL.	Voltage display	0768
	TP.	Model display	0769
	DV.	Data version No.	0770
	RV.	Software version No.	0771
	T.	Display previous simple setting selected.	0772

12 How to Use the Option Connector

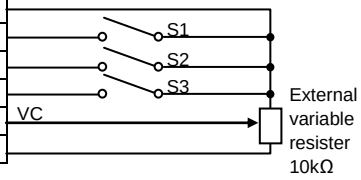
Variable operations are possible by adding external signals to the option connector.
A current of approximately 1.5 mA flows through the switches used for the input signal, so please use switch for minute current.

1. Connector Layout



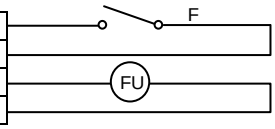
Lever

Signal name	Factory setting	
0V	0V	1
IG	S1 : Run (Variable speed)	2
IH	S2 : Thread trimming	3
I I	S3 : Presser foot lifter	4
VC	VC : Variable speed command	5
+12V	+12V	6



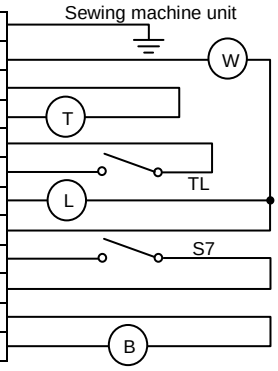
Presser foot lifter

0V	0V	1
IF	F : presser foot input	2
OF	FU+ : presser foot lifter output +	3
	FU- : presser foot lifter output -	4



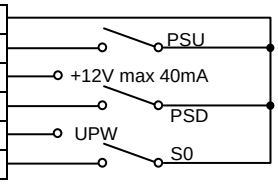
Sewing machine

Ground	Ground	1
OB	W : Wiper output	2
+24V/(+30V)	+24V	3
OA	T : Thread trimming output	4
0V	0V	5
ID	TL : Thread trimmer cancel input	6
OD	L : Thread release output	7
+24V/(+30V)	+24V	8
IE	S7 : Backstitch input	9
0V/(+5V)	0V	10
+24V/(+30V)	+24V	11
OC	B : Backstitch output	12



Option A (Black)

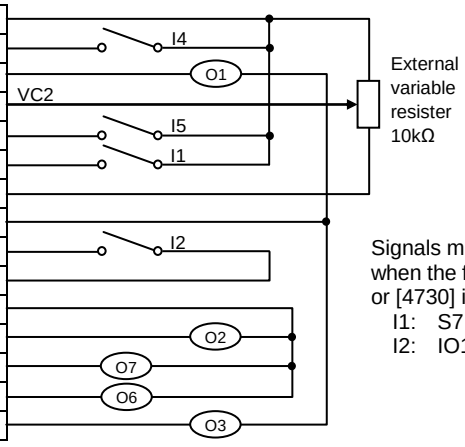
0V	0V	1
IA	PSU : Up position stop input	2
+12V/(+5V)	+12V	3
IB	PSD : Down position stop input	4
O4	UPW : Needle Up position output	5
IC	S0 : Low speed input	6



Note 1 : Pin number 5 is for the signal output.

Option B

0V	0V	1
I4	No setting	2
O1	OT1 : Output	3
VC2	VC2 : Variable speed command	4
I5	No setting	5
I1	(*) IO1 : Input	6
+5V/(+12V)	+5V	7
+24V/(+30V)	+24V	8
I2	(*) U : Needle lift signal	9
0V	0V	10
+24V/(+30V)	+24V	11
O2	NCL : Needle cooler output	12
O7	No setting	13
O6/CP	No setting	14
O3	TF : "TF" output	15



Signals marked (*) will be changed as follows when the function of name [4650], [4652], [4710] or [4730] is selected in simple setting
I1: S7 Backstitch input
I2: IO1input

Note 2 : Pin number 3,12,15 are for the solenoid output.

Note 3 : Pin number 13,14 are for the air valve output. (not for the solenoid output)

Communication / Control panel (Note 4)

RXD1	1
RXD0	2
TXD1	3
0V	4
+12V	5
TXD0	6

Encoder (Note 4)

0V	1
EA	2
EB	3
+12V	4
Ground	5
-	6

Detector (Note 4)

0V	1
-	2
Ground	3
UP	4
DN	5
+12V	6

Note4 : Please do not connect the connector of the control panel /communication, the encoder, and detector excluding our company's products with the above connectors. Moreover, please do not take out these signals besides an original usage, and do not connect them with other devices. It causes the malfunction and the control box breakdown, and our company doesn't assume the responsibility.

2. To use as a standing work type sewing machine. (Turn the program mode [C] function [PDS] ON.)

The sewing machine can be used as a standing work type sewing machine with the three connections below using the lever connector. However, take special care to the intrusion of noise, and use the shortest wiring possible.

【Note: Procedure for changing the lever connector】

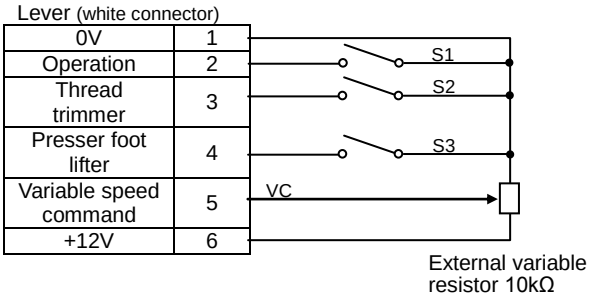
- Be sure to turn OFF the power switch when connecting or disconnecting the lever connector.
- Do not connect the lever connector when you set the function [PDS] to ON in the program mode [C] (Direct call number = "530")

［Basic procedure］

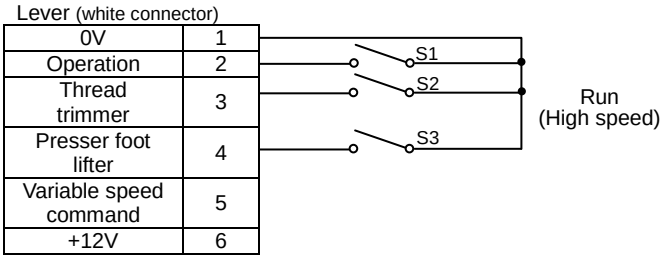
(1) Disconnect the lever connector after turning OFF the power switch
(2) Turn ON the power switch and then, set the function [PDS] to ON. The lever connector still disconnects.
(3) Connect the lever connect after turning OFF the power switch.
(4) Turn ON the power switch and confirm the operation.

※ When the error code MA is displayed, press D key and then, it is released.

(1) When operating with an external variable resistor
("XC-G500" Control switch panel [auto] and
AT in [P] mode is OFF)



(2) For operating with a high speed
("XC-G500" Control switch panel [auto] or
AT in [P] mode is ON)



13 Error Display

When the control box detects an error, the error code is flickered on the control switch panel display.
Confirm the error code, and investigate with the following table.

Error code	Probable cause	Inspection
PWr.oF /POWER.OF	Is the power voltage too low? Is the power supply capacity too small? Note: It does this display when power supply is turned OFF, but this is not an error.	Check the power voltage. Check the power supply capacity.
E 1 / E1	Is the wire to the motor short-circuited? Is the sewing machine load torque too high?	Check the motor wiring. Check the sewing machine.
E2 / E2	Is the power voltage too high? Is the sewing machine inertia too high?	Check the power voltage. Lengthen the deceleration time.
E3 / E3	Is the connector to the motor encoder securely inserted? Are the signals from the motor encoder broken ? Is the sewing machine locked? Is the motor locked?	Check the connector insertion. Check the ECA and ECB signal. (Refer to the E mode.) Check the sewing machine. Check the motor.
E4 / E4	Is the motor connector securely inserted? Are the signals from the motor connector correct?	Check the motor connector insertion. Check the motor connector.
E6 / E6	Is an extraordinary signal inputted? (The signal as it repeats ON/OFF at the high frequency.) Does the noise from outside enter an input signal?	Check the input signal. Remove a noise source.
E8 / E8	Is the position detector connector securely inserted? Are the signals from the detector broken ? (UP/DOWN signal interruption)	Check the detector connector insertion. Check the detector UP/DOWN signals. (Refer to the E mode.)
E9 / E9	Is the solenoid wiring short-circuited? Solenoid defect (coil defect)	Check the solenoid wiring. Replace the solenoid.
E 11 / E11	Is the fuse for +12V power supply broken?	Check the fuse for the 12V power supply.
*E11 error code is not confirmed on the control switch panel when it happens because the LEDs on the control switch panel is turned OFF, but the status display LED on the control box flickers in orange colored as the interval of 0.3 sec. It will be confirmed in error code history after returning to a normal condition.		

M5 / M5	An error of the copy mode using the control switch panel. Is the control switch panel connector securely inserted? The voltage or the type of control switch panel is difference.	 Check the connector insertion. Check the voltage and the type are right.
MA / MA	The position data of the lever unit is defective. When power supply is turned ON, the pedal is not neutral position. (The status display LED on the control box turn on in orange colored.)	The pedal is neutralized. (It returns automatically 1 second later.)

Others	Probable cause	Inspection
The sewing machine does not run when the pedal pressed.	Are the operation signals from the lever unit broken? Is the input signal S6 broken ?	Check the lever unit signal. (Refer to [E] mode S1 signal.) Check the status display LED. If flickering, reset the signal. Confirm the sewing machine connector.
The sewing machine does not run at the high speed.	It does not display 99 in normal mode. Is the variable speed voltage with the pedal toed down low? Is the motor pulley diameter too small?	Change 99 using control box [D] key. Check the variable speed voltage. (Refer to [E] mode.) Check the motor pulley diameter.(Refer to [5]-3)
The thread is not trimmed even with heeling.	Is the thread trimming signal (S2) from the lever unit broken? Is the cancel thread trimmer operation S2L(mode[P]) ON? Is the trim key of the control switch panel OFF?	Check the signal S2. (Refer [E] mode.) Set S2L(mode[P]) to OFF. Set the trim key to ON.
The presser foot lifter output does not operate.	Is the light heeling signal (S3) or the thread trimming signal (S2) from the lever unit broken? Is the presser foot lift signal (F) broken? Is the presser foot output (FU) broken?	Check signals S2 and S3. (Refer [E] mode.) Check signal F. (Refer [E] mode.) Check FU output. (Refer [E] mode.)

14 Specifications

Specifications \ Voltage and Frequency			110V single phase 50/60 Hz	230V single phase, 3-phase 50/60 Hz	
Motor	Model name		XL-G554-10 (Y)	XL-G554-20 (Y)	XL-G754-20 (Y)
	Voltage		100 to 120 V	200 to 240 V	
	Rated output		550W		750W
	Rated torque		1.47N⊙m (0.15kg⊙m)		1.96N⊙m (0.2kg⊙m)
	Rated speed		3,600 rpm		
	Weight		6.9 kg (Main unit)		
Control box	Model name	General purpose automatic thread trimmer	XC-GMFY-10-05	XC-GMFY-20-05	XC-GMFY-20-07
	Voltage		100 to 120 V	200 to 240 V	
	Speed control range	Sewing machine shaft	70 to 4,000 (MAX 8,999) rpm		
		Motor shaft	50 to 3,600 rpm		
	Solenoid voltage		DC 24 V / 30 V		
	Range of rating Voltage		±10%		
	Ambient temperature		5 ~ 35 °C		
	Ambient humidity		45 - 85%RH (with no dew condensation)		
	Storage temperature		-25 ~ 55°C (no freezing)		
	Altitude		Under 1000m above mean sea level		
	Weight		3.5kg (Main unit)		
Position detector			XC-KE-01P		

Solenoid output

Solenoid	Impedance (Ω)	
	24VDC Setting	30VDC Setting
OF (Presser foot lifter output FU)	8 or more (continuous time rating)	10 or more (continuous time rating)
OA (Thread trimming output T)	4 or more (short time rating)	5 or more (short time rating)
OB (Wiper output W)	4 or more (short time rating)	5 or more (short time rating)
OC (back stitch output B)	4 or more (short time rating)	5 or more (short time rating)
OD (Thread release L)	4 or more (short time rating)	5 or more (short time rating)
O1 (Output)	4 or more (short time rating)	5 or more (short time rating)
O2 (Needle cooler output NCL)	4 or more (short time rating)	5 or more (short time rating)
O3 (TF output TF)	4 or more (short time rating)	5 or more (short time rating)

Note 1. In the brackets of solenoid output, it is a factory setting.
2. The continuous time rating of "OF" output is 50 percentage of chopping duty.
3.The maximum output current rating is 2.0A for 24VDC and 1.6A for 30VDC.
4.24VDC setting is a factory setting.

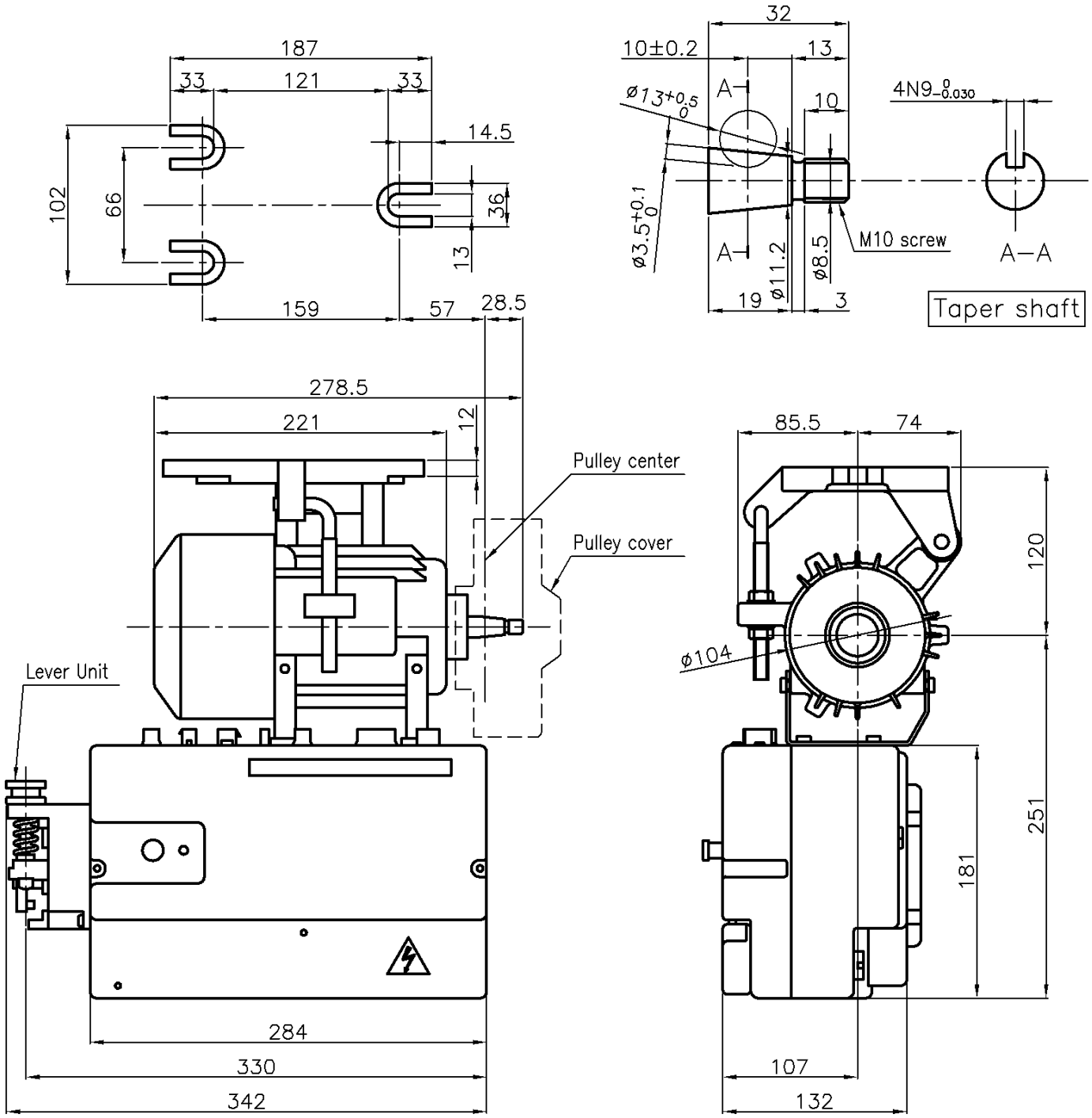
Rated output current of value output

Rated maximum output current	O6, O7 : Total maximum current is 0.3 A.

<Reference> Table of digital display

No.	0	1	2	3	4	5	6	7	8	9
Digital display										
No.	A	B	C	D	E	F	G	H	I	J
Digital display										
No.	K	L	M	N	O	P	Q	R	S	T
Digital display										
No.	U	V	W	X	Y	Z				
Digital display										

<Reference> Dimensions
*MOTOR and CONTROL BOX



MITSUBISHI ELECTRIC CORPORATION

Printed in Japan