



Mitsubishi Limiservo X G series

TECHNICAL INFORMATION MANUAL

Motor XL-G554-10(Y), XL-G554-20(Y)
Control box XC-GMFY(CE)

**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.

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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 $\pm 10\%$ of the rated voltage.
- Place where the specified power capacity cannot be secured. (Refer to page 10) |
| (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. |
| (4) Atmosphere | - Place where relative humidity is 45% or less and 85% or more, or where dew condensation occurs.
- 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 °C or higher and -25°C 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



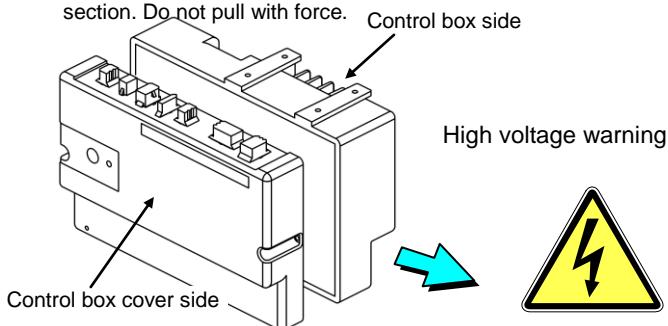
Caution

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**

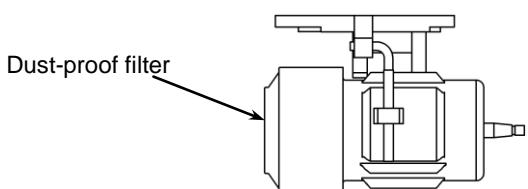
The altered examples: To connect the power supply to the other device through the push button switch, to take out signals of the encoder and the detector to use the external devices.

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.

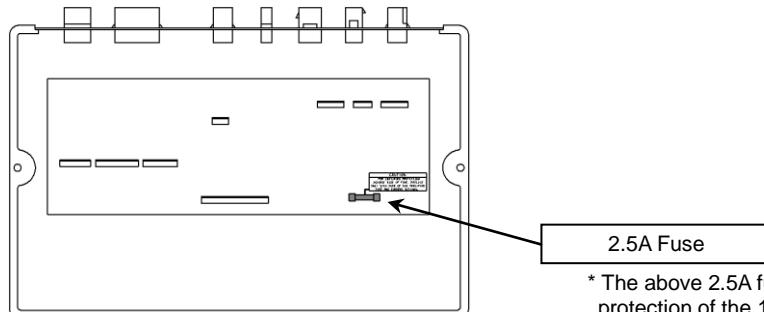


17. Remove the dust that has adhered on the motor's dust-proof filter once every two to three weeks.



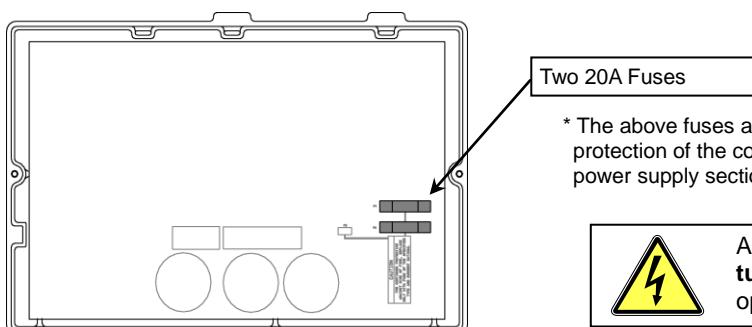
If the motor is run while the filter is clogged, the motor may overheat and affect the motor life.

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.)

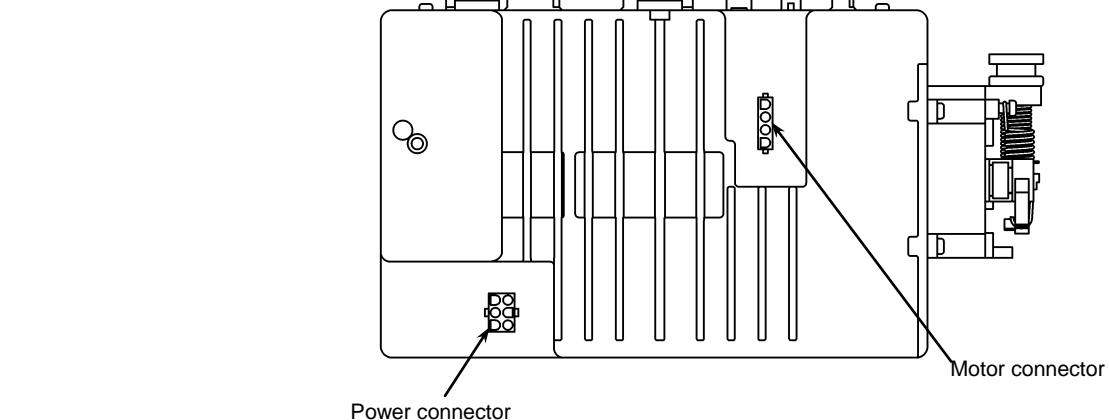
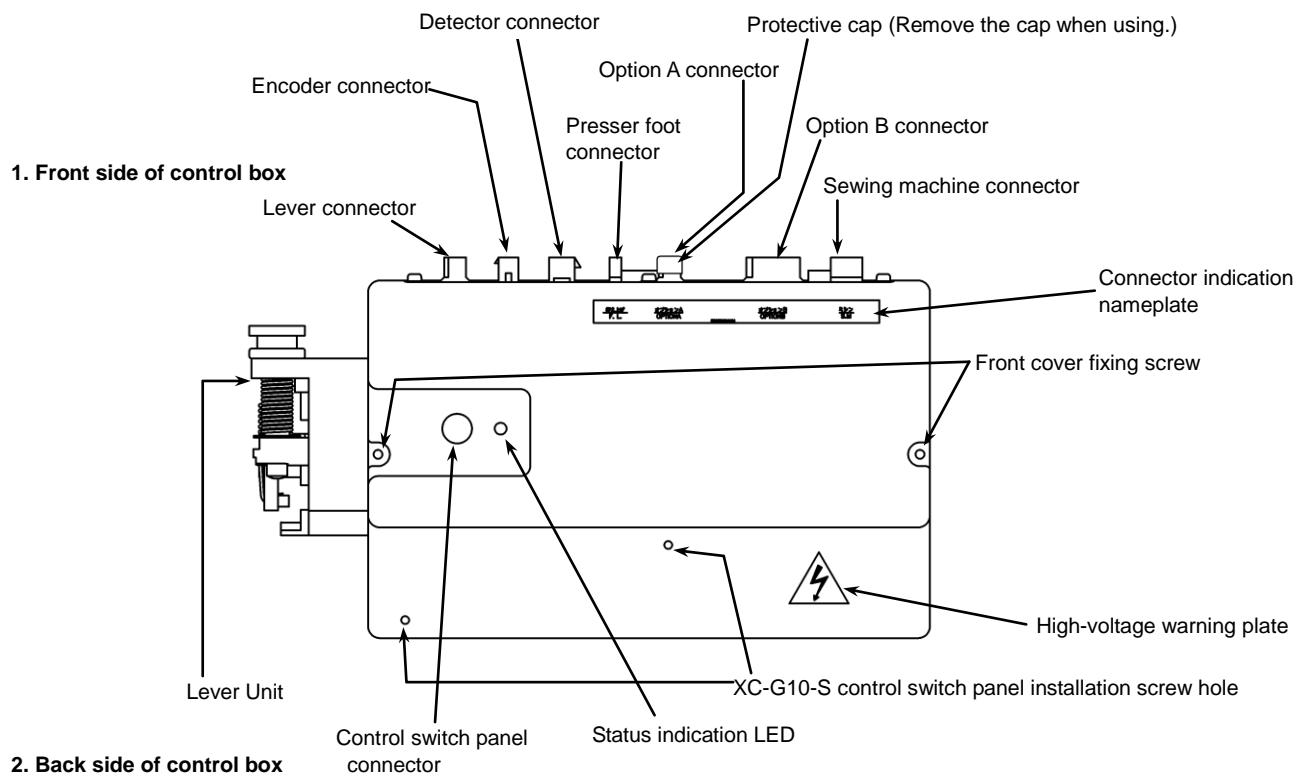


* The above fuses are for protection of the control box power supply section.

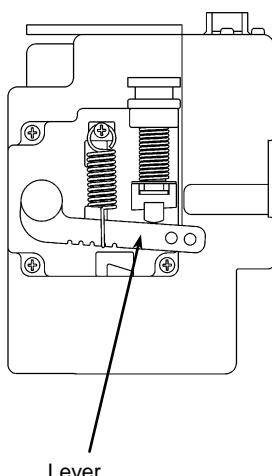
Always wait at least 10 minutes after turning the power switch OFF before opening the control box cover.

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

4 Names of Each Part



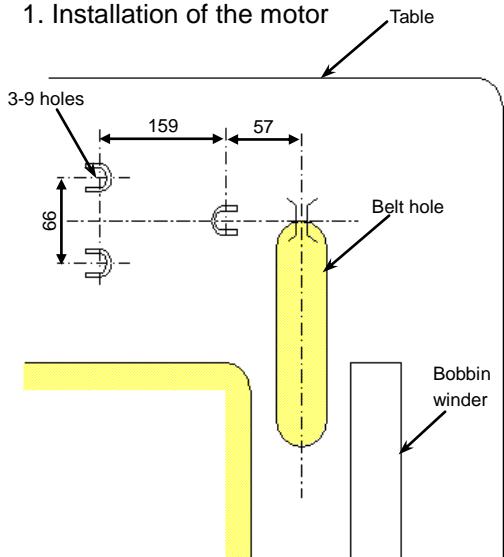
3. Left side of control box



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

5 Installation

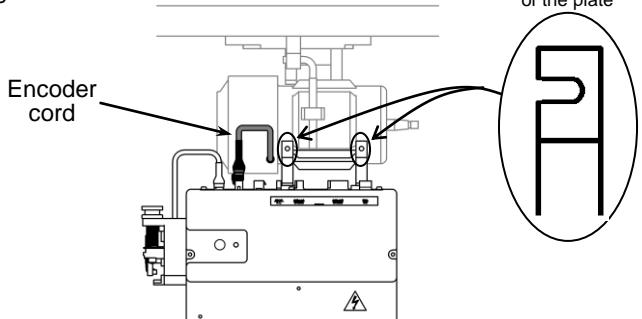
1. Installation of the motor



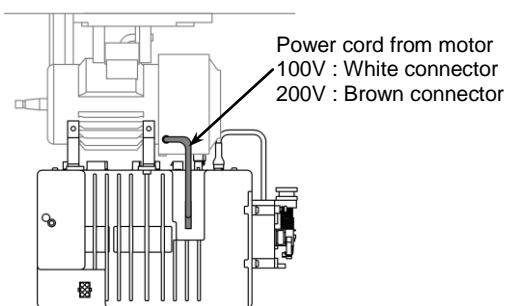
Open three 9mm holes on the table as seen from the above. Install the motor securely using the installation bolts, washers, spring washers and nuts.
The installation bolts, etc, are included with the motor as accessories.

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.



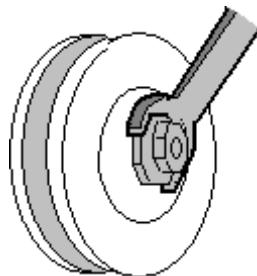
3. Installation of the pulley

* 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.

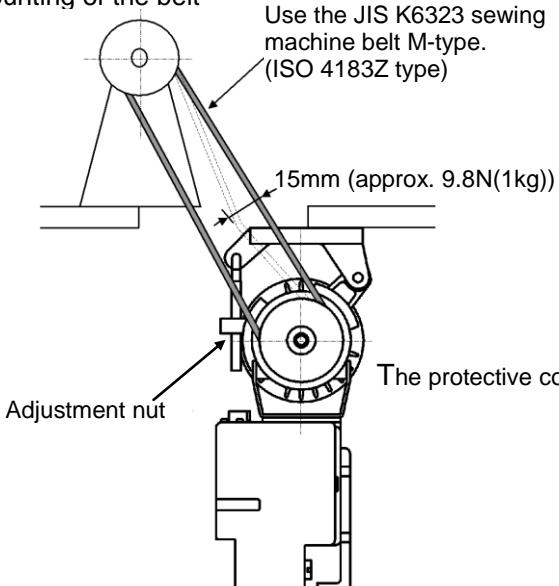
Selection of the motor pulley:

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

(*) 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 24 Simple setting table for Mitsubishi thread trimming sewing machine and motor pulley outside diameter.

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.

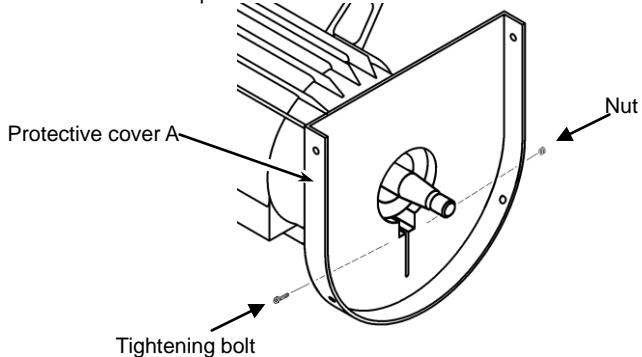
Caution

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

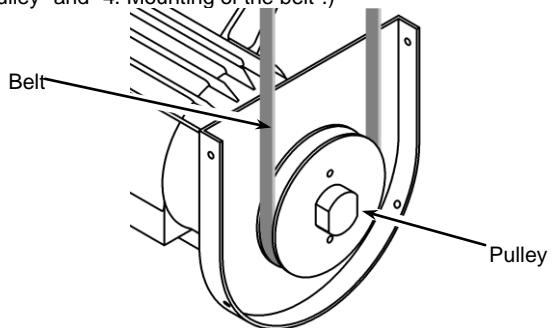
5. Installation of the protective cover (with belt slip off prevention part)

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

1. Install the protective cover A onto the motor.



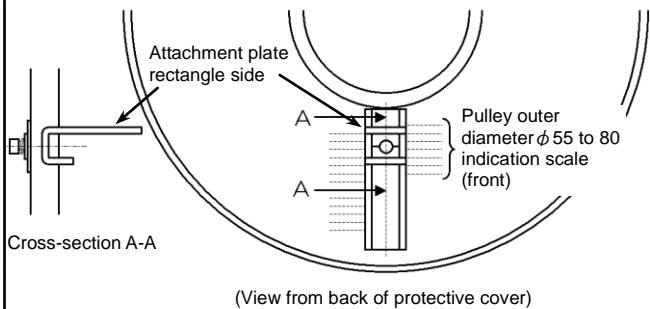
2. Install the pulley and attach the belt. (Refer to "3. Installing the pulley" and "4. Mounting of the belt".)



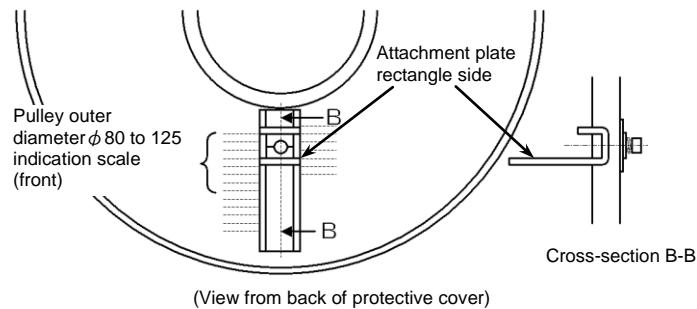
3. Install the "belt slip off prevention part mounting plate" onto protective cover B with the following procedures.

* 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 $\phi 55$ to $\phi 80$



- (b) For motor pulley outer diameter $\phi 80$ to $\phi 125$

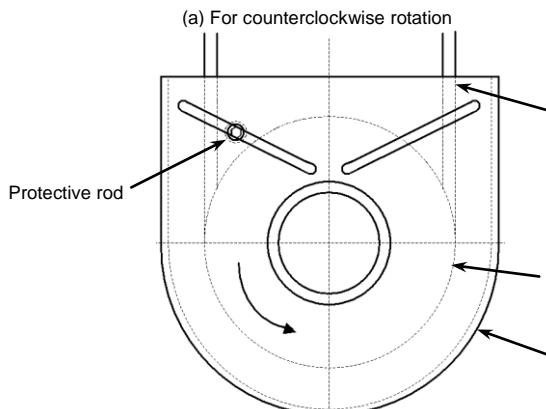


* Set the center of the washer to the pulley diameter indication scale and tighten the bolt.

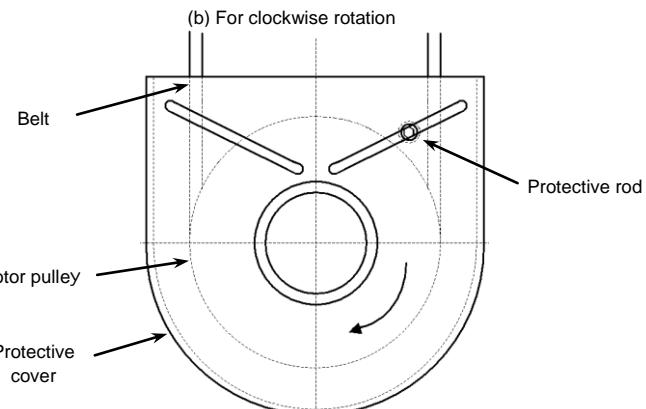
* Confirm that the belt does not contact the attachment plate.

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.



(View from front of protective cover)



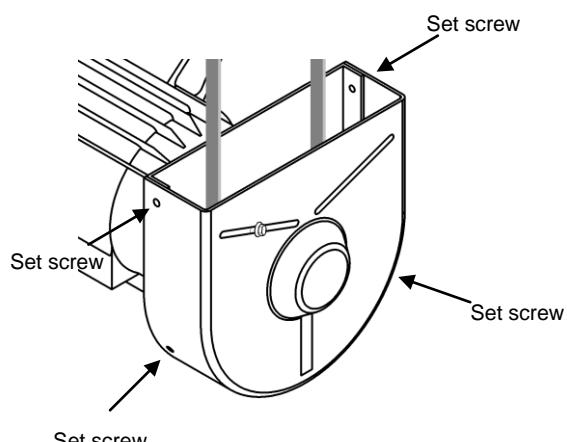
(View from front of protective cover)

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

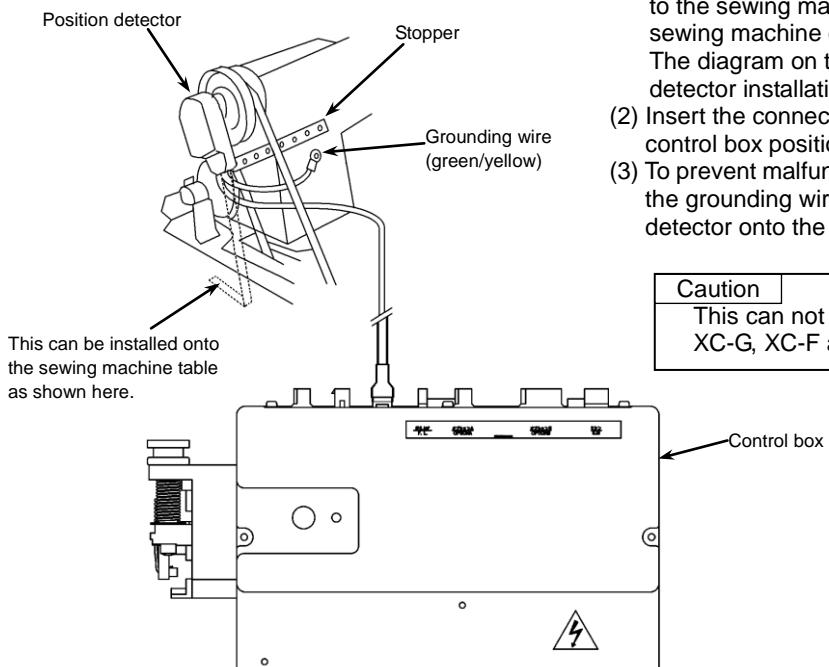
5. Set protective cover B onto protective cover A, and tighten with the four set screws.

* 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.
- (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

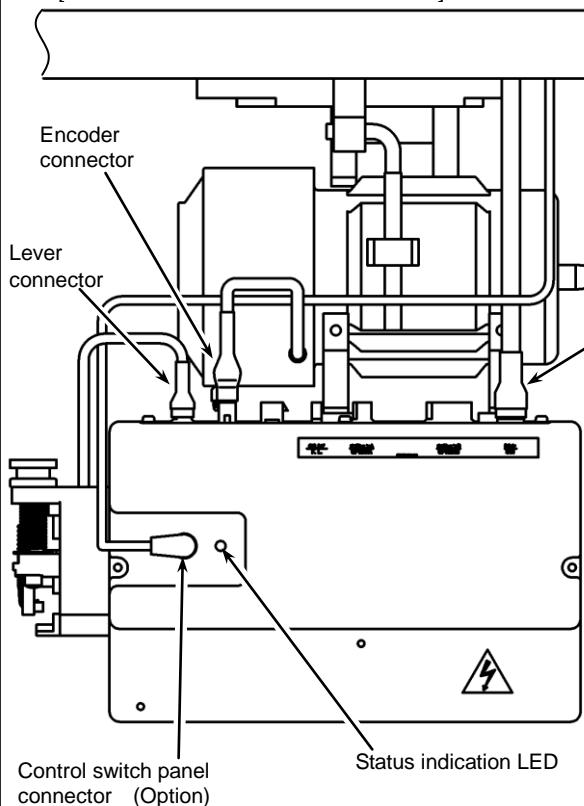
This can not be used with except
XC-G, XC-F and XC-E Series.

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

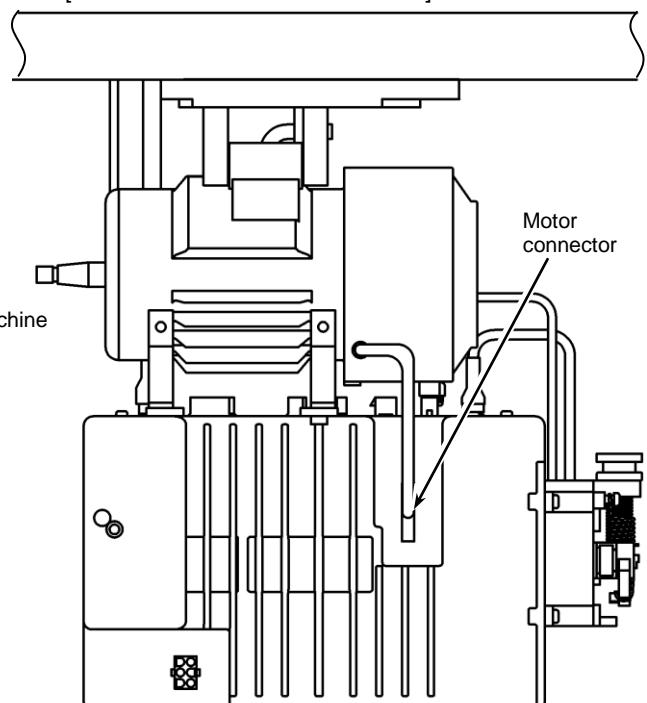
Wire the units as shown below.

Align the connector shape and direction, and securely insert it.

[View of control box from cover side]



[View of control box from box side]



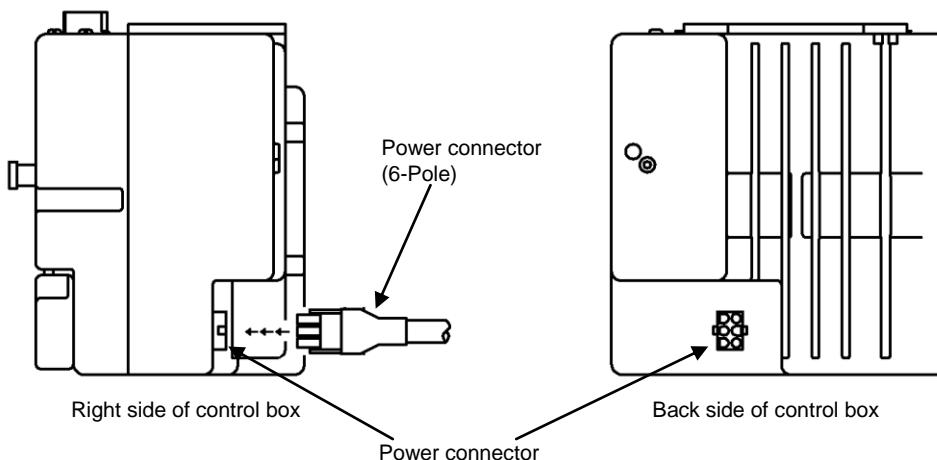
Caution

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.

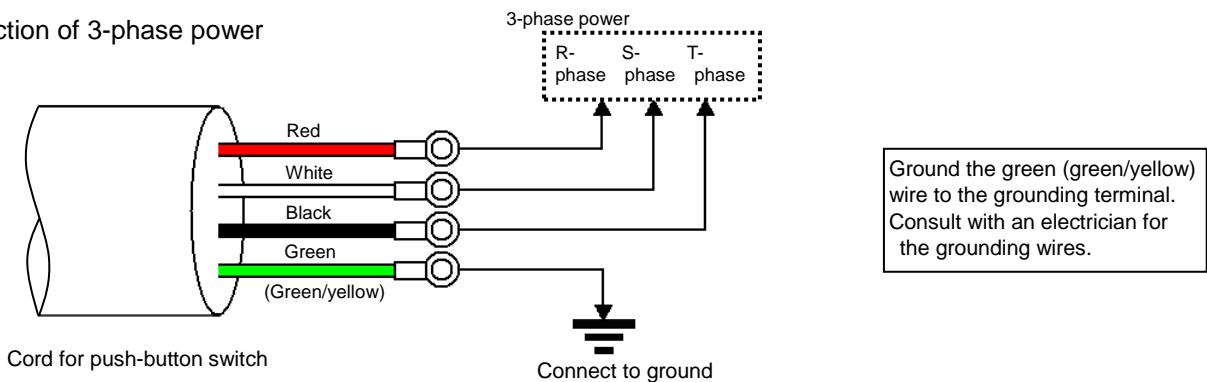
6 Wire and Grounding

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



3. Current capacity

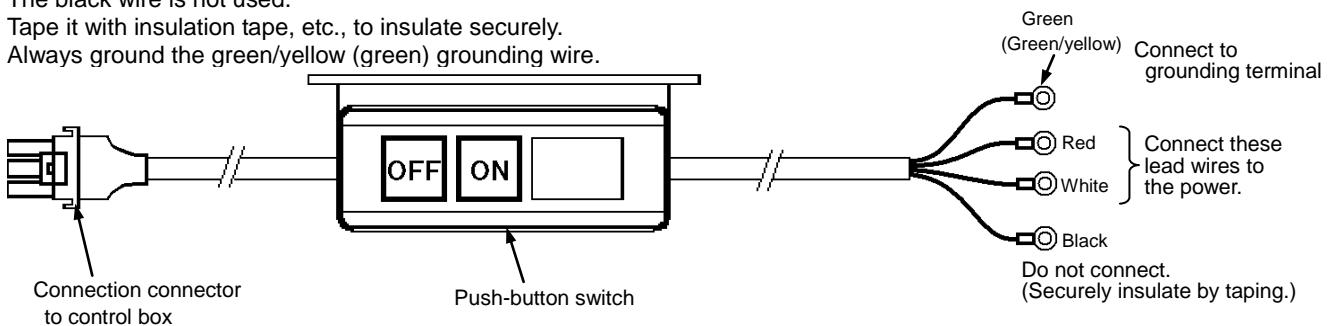
Use a fuse or complete breaker for the power.

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

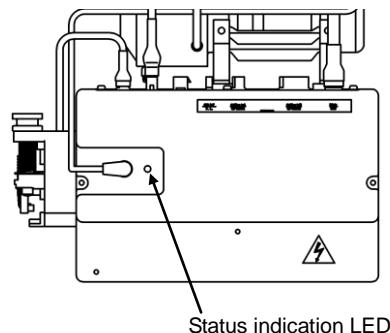
1. Before turning switches on.....

Places to confirm	Reference
(1) Is the power and capacity suitable ?	Current capacity on page 10.
(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 10. Connection of the Mitsubishi sewing machine and control box on page 9. Insertion of the position detector on page 9.
(4) Is the lead wire contacting the V belt ?	-
(5) Is the belt tension okay ?	Mounting of the belt on page 7.
(6) Are the pulley nuts securely tightened ?	Installation of the pulley on page 7.
(7) Can the sewing machine be rotated lightly by hand ?	-

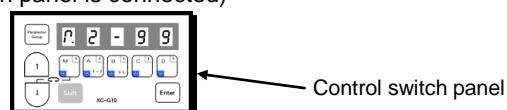
2. Turn on the power.....

(1) Does the status indication LED on the control box light up in green?

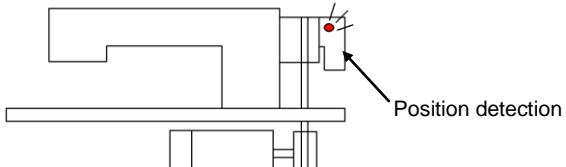
There is a problem if the LED is flickering or is lit up in red.



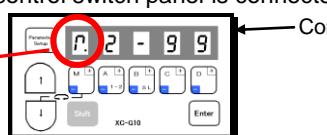
(2) Is the control switch panel LED turning ON?
(When control switch panel is connected)



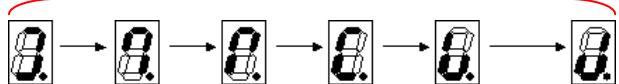
(3) Does the position detector lamp light ?



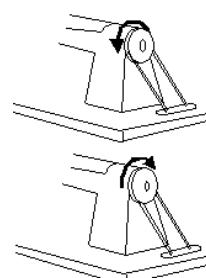
(4) Is the sewing machine rotation direction correct? (When control switch panel is connected)



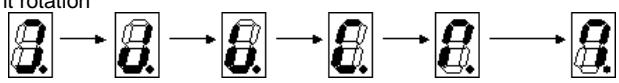
- For left rotation



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



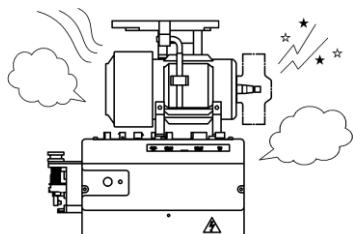
- For right rotation



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.

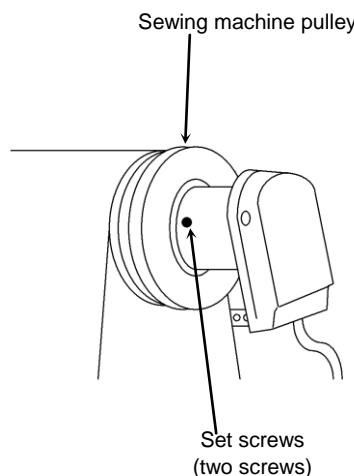
(2) Adjustment of DOWN position

- 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.

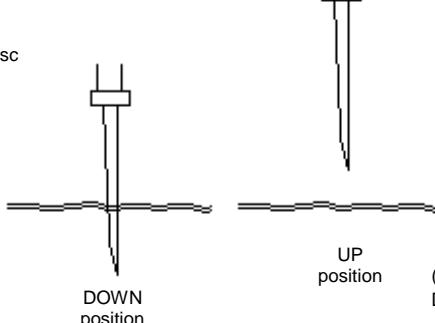
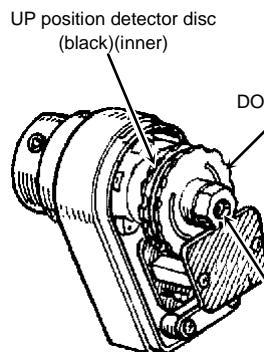
(The cross-recessed screw A does not need to be loosened at this time.)

- Always replace the cover after adjustment.

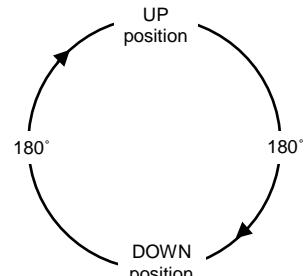


Caution

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



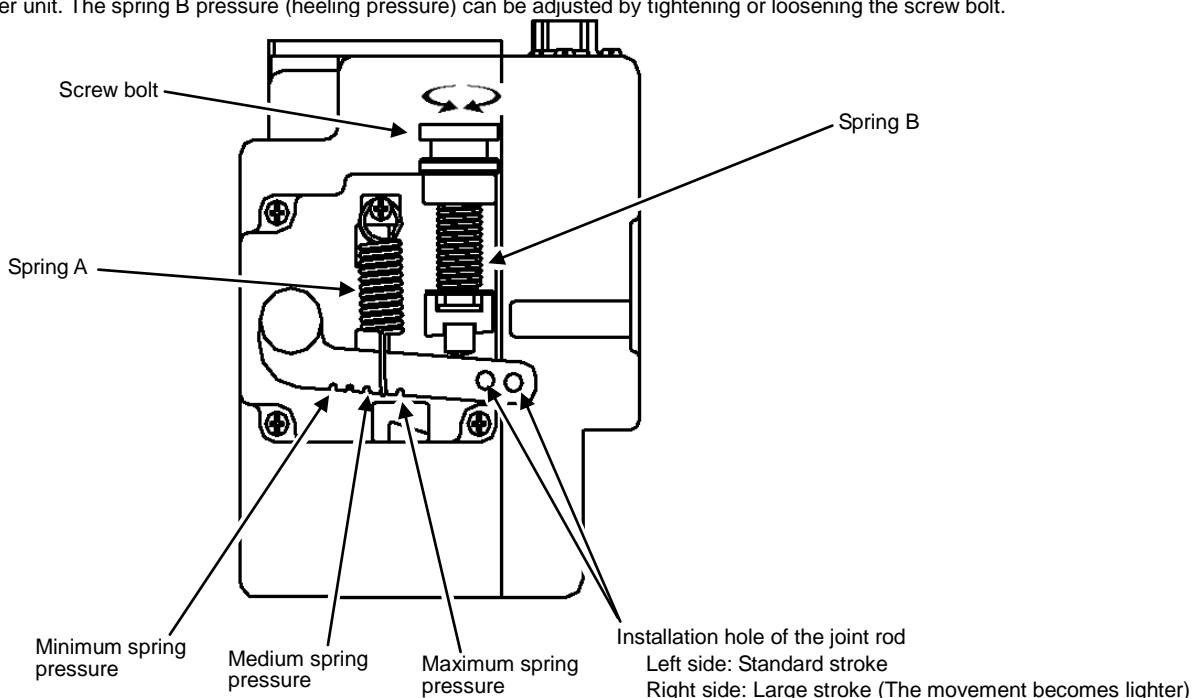
Factory setting



(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 which 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	Page 25 "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.	

It is possible to adjust between 0 and 99.%

[C]key [D]key

Rotation speed

Maximum speed [H] 99

Low speed [L] 0

Adjustment range with the [C] key and [D] key.

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

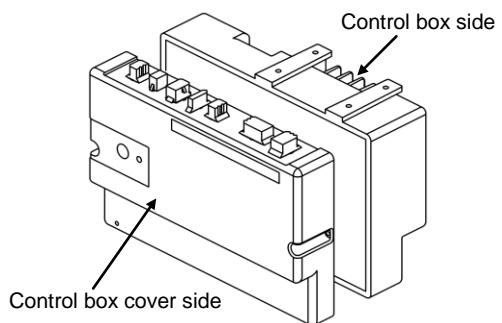
1. To change solenoid voltage DC24V/DC30V

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.

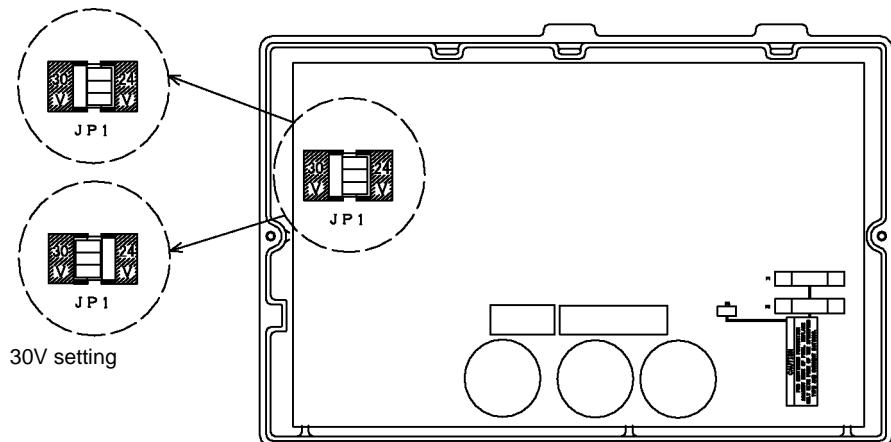
To change solenoid voltage from 30V to 24V

- (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.

24V setting (factory setting)



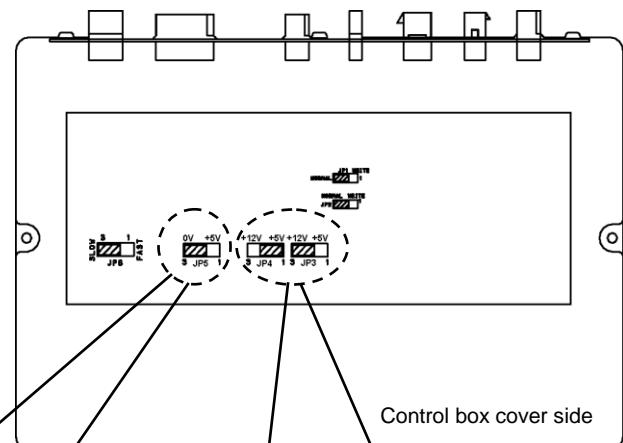
Control box side

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.

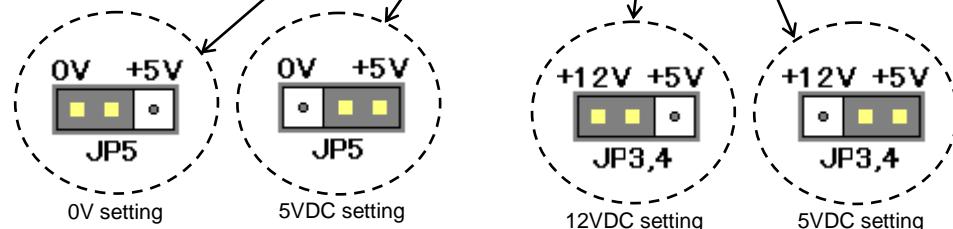
(4) The factory setting

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



Control box cover side

(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.



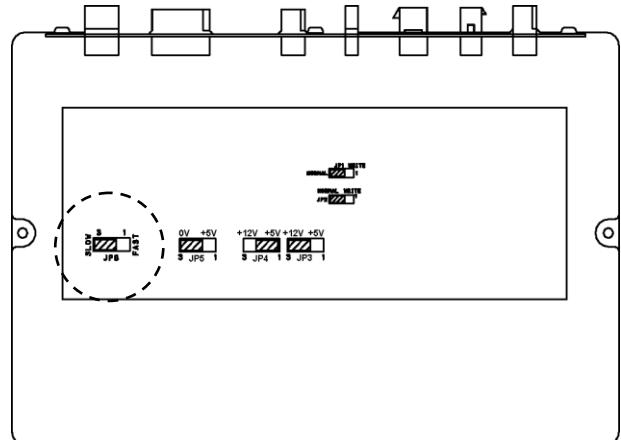
Do not change the JP1,JP2 and JP6 from the factory setting.

3. How to set the switch for increasing the solenoid return speed.

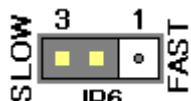
(1) Remove the cover.

 For safety, turn the power switch OFF before opening cover

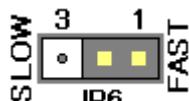
(2) The solenoid return speed can be increased with the setting of the JP6 connector on the front cover PCB as shown on the right.



(3) To change the solenoid return speed, pull out the connector and reinsert it into the FAST side.



Normal setting



FAST setting

(4) Connector factory settings and solenoid return

Connector	Factory setting	Output during simple setting	Solenoid return	Output
JP6	SLOW	Sewing machine connector 3-4 pin output	Normal	OA

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

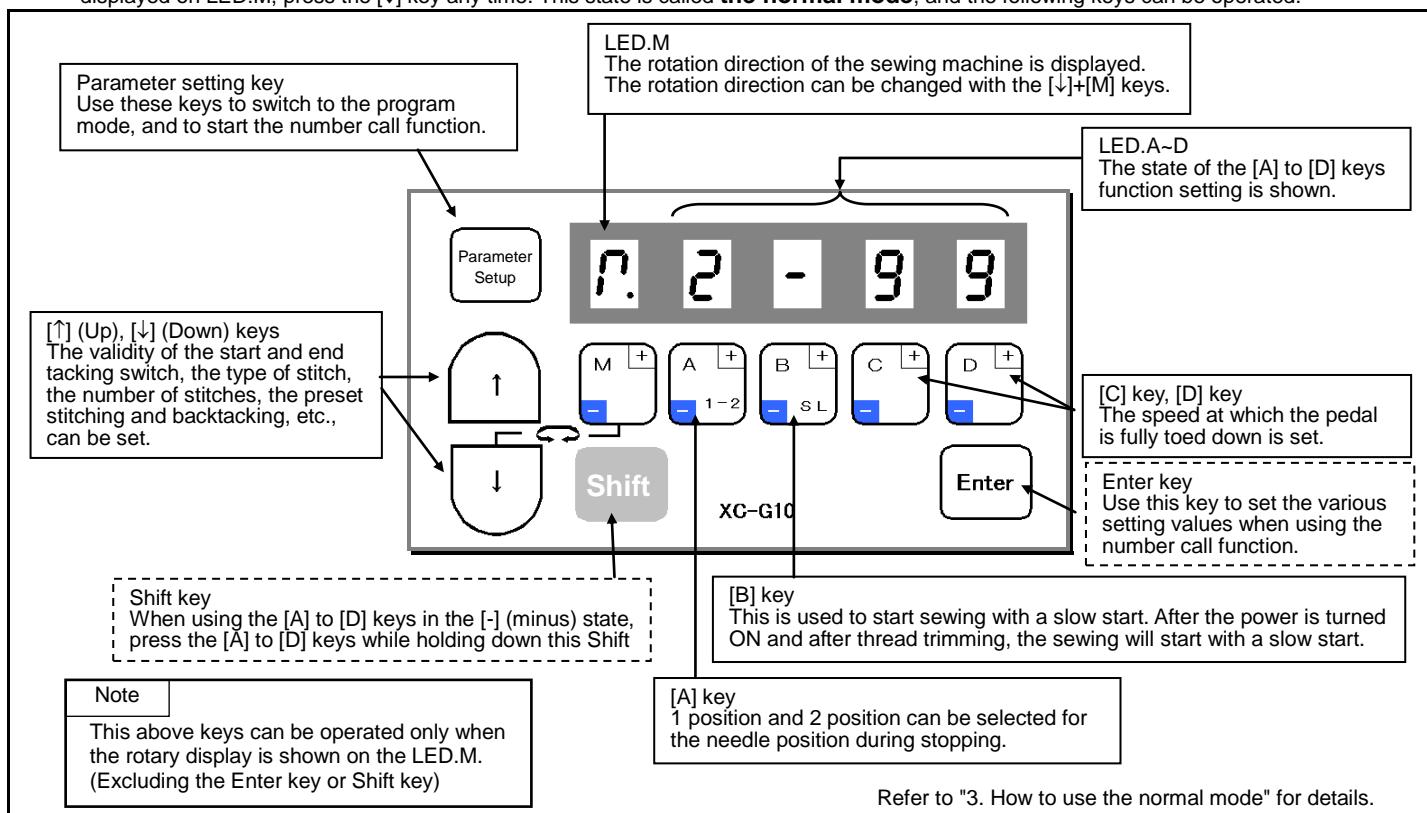


When you set the JP6 connector to the FAST side, be sure to set the function [OAC] to [OF] in the program mode [C]. If the [OAC] is still set to [ON], which means chopping duty [OAC] still operates, the resistance on the PWB will be burnt out.

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

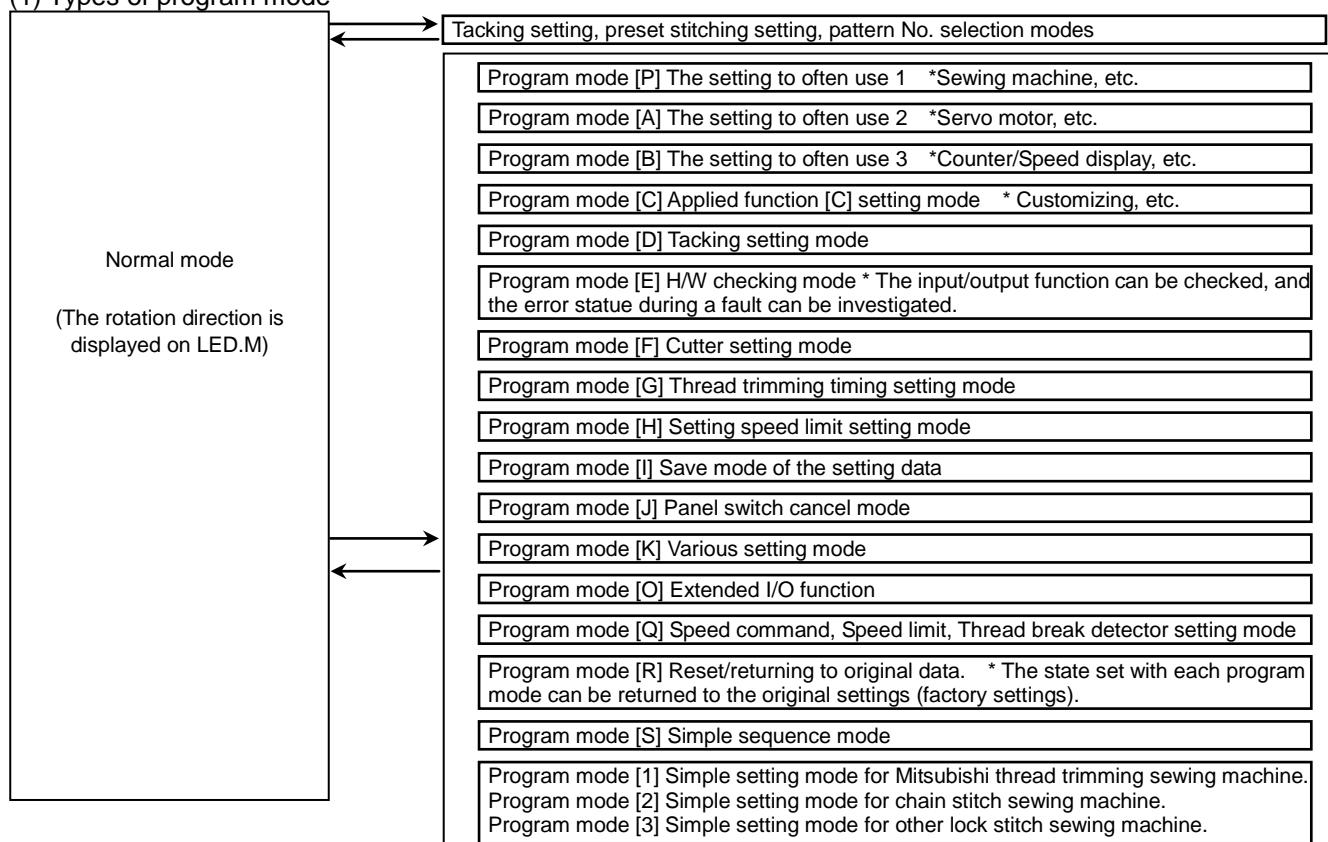
When the power supply switch is turned ON, the rotation direction will display on the LED.M shown below. When the rotation direction is not displayed on LED.M, press the [↓] key any time. This state is called **the normal mode**, and the following keys can be operated.



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 "Table of Program Mode Function" for details on each mode's function.)

(1) Types of program mode

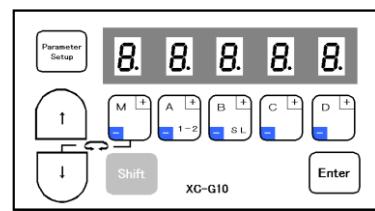


Caution : A program mode cannot be entered from an other program mode.

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 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 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. 5 f r. l	*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 , R. 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 l . . 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 I. ■ 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 [F]	While holding down the [↓] key , press the [B] key and the [↑] key for 2 seconds or more from normal mode.	■ ■ P - F C o R. ■ 0	*The display will flicker. *The program mode [F] will be entered. Switch the function item with the [↓] or [↑] key. Press down [↓] key, press [↑] key.
Program mode [G]	While holding down the [↓] key , press the [C] key and the [↑] key for 2 seconds or more from normal mode.	■ ■ P - G f r. . n l	*The display will flicker. *The program mode [G] will be entered. Switch the function item with the [↓] or [↑] key. Press down [↓] key, press [↑] key.
Program mode [H]	While holding down the [↓] key , press the [D] key and the [↑] key for 2 seconds or more from normal mode.	■ ■ P - H L H H. 9 0	*The display will flicker. *The program mode [H] will be entered. Switch the function item with the [↓] or [↑] key. Press down [↓] key, press [↑] key.

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

Program mode [J]	While holding down the [↓] key, press the [↑] key and the [A] and the [B] key for 2 seconds or more from normal mode.	The mode can also be selected with the "Direct number call operation". (Refer to the next section.)	 	*The display will flicker. *The program mode [J] will be entered. Switch the function item with the [↓] or [↑] key.	Press down [↓] key, press [↑] key.
Program mode [K]	While holding down the [↓] key, press the [↑] key and the [A] and the [C] key for 2 seconds or more from normal mode.		 	*The display will flicker. *The program mode [K] will be entered. Switch the function item with the [↓] or [↑] key.	Press down [↓] key, press [↑] key.
Program mode [O]	While holding down the [↓] key, press the [↑] key and the [B] and the [D] key for 2 seconds or more from normal mode.		 	*The display will flicker. *The program mode [O] will be entered. Switch the function item with the [↓] or [↑] key.	Press down [↓] key, press [↑] key.
Program mode [Q]	While holding down the [↓] key , press the [A] key and the [C] key for 2 seconds or more from normal mode.		 	*The display will flicker. *The program mode [Q] will be entered. Switch the function item with the [↓] or [↑] key.	Press down [↓] key, press [↑] key.
Program mode [S]	While holding down the [↓] key , press the [B] key and the [D] key for 2 seconds or more from normal mode.		 	*The display will flicker. *The program mode [S] 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.		 	*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.		 	*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.		 	*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.		 	*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.		 	*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]

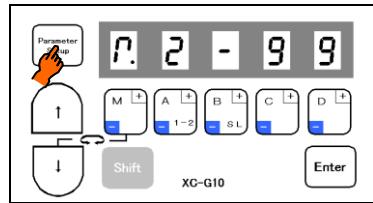
[*1] To return to the normal mode without executing each function in mode [I], [R], [1], [2]or [3], press the [↓] and [↑] keys simultaneously.

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

The number of each function listed in section "23 Function list" can be directly designated to call the function item.

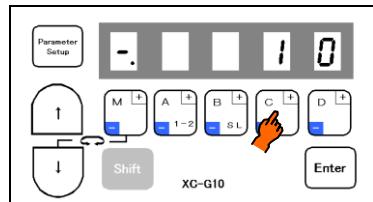
[Basic procedures]

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

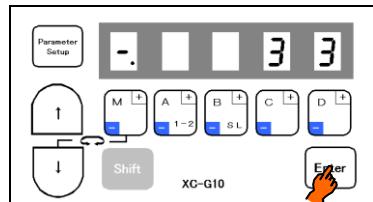


(The normal mode)

- (2) (1000th) (100th) (10th) (1st place)
Press the , , , and  keys to display the target function item number.
(To use the above "+/-" key as a "-" key, press  to  while holding down .)
- (3) When the target function item number appears,
press .
- (Number 33 is called out in this example.)



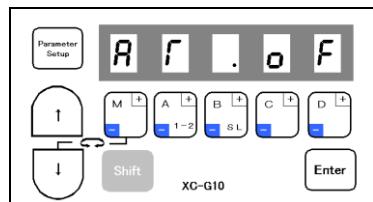
(The number selection mode)



- (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  to return to the normal mode.

The display will return in the order of [Function item] → [number selection mode] → [normal mode].

- Press  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 .)

- 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  or  key.

- (1) Selection of number for each mode (P, A, B, C...)



(Selection can be made in A mode range)

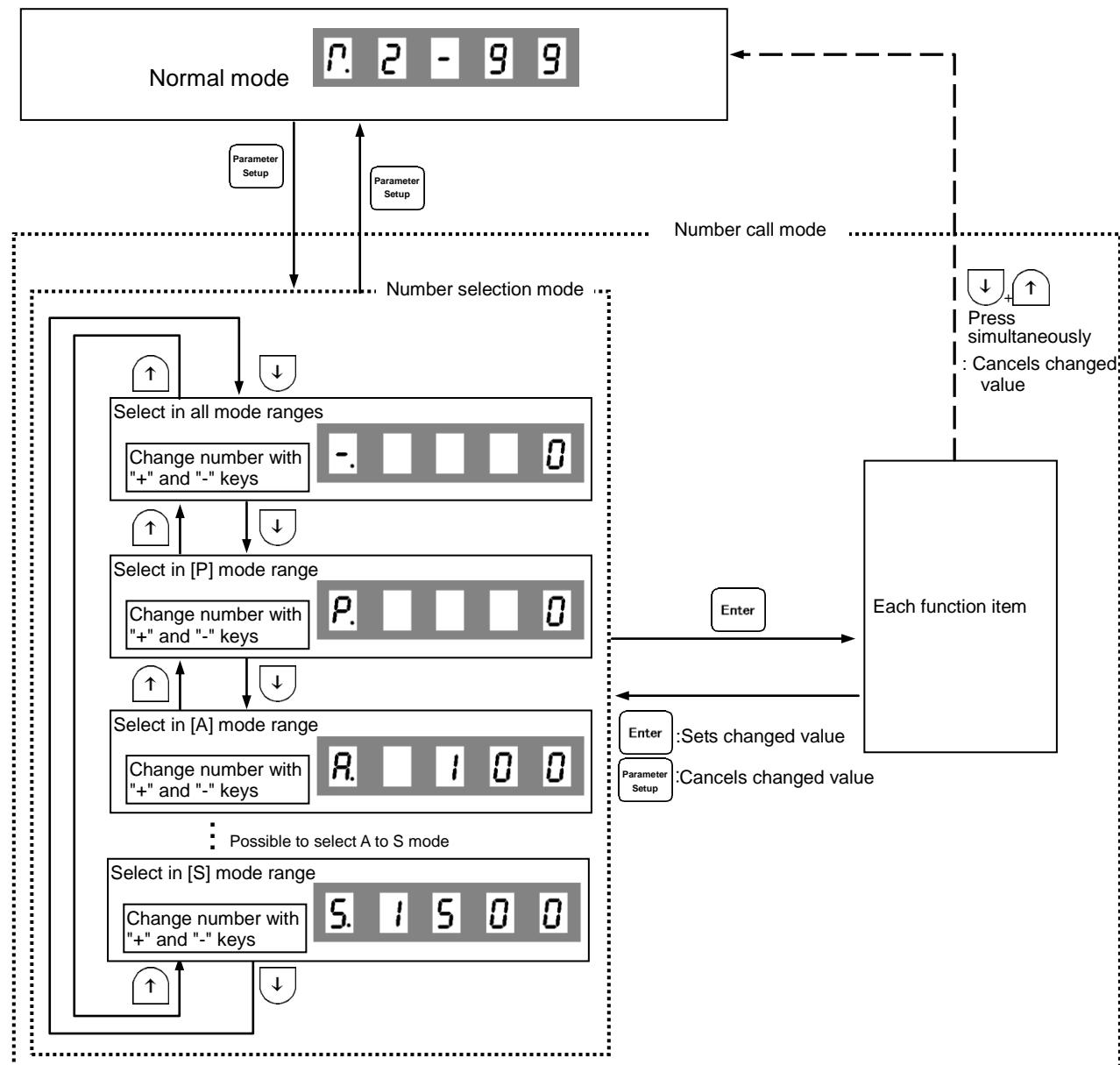
- (2) Selection of all mode numbers



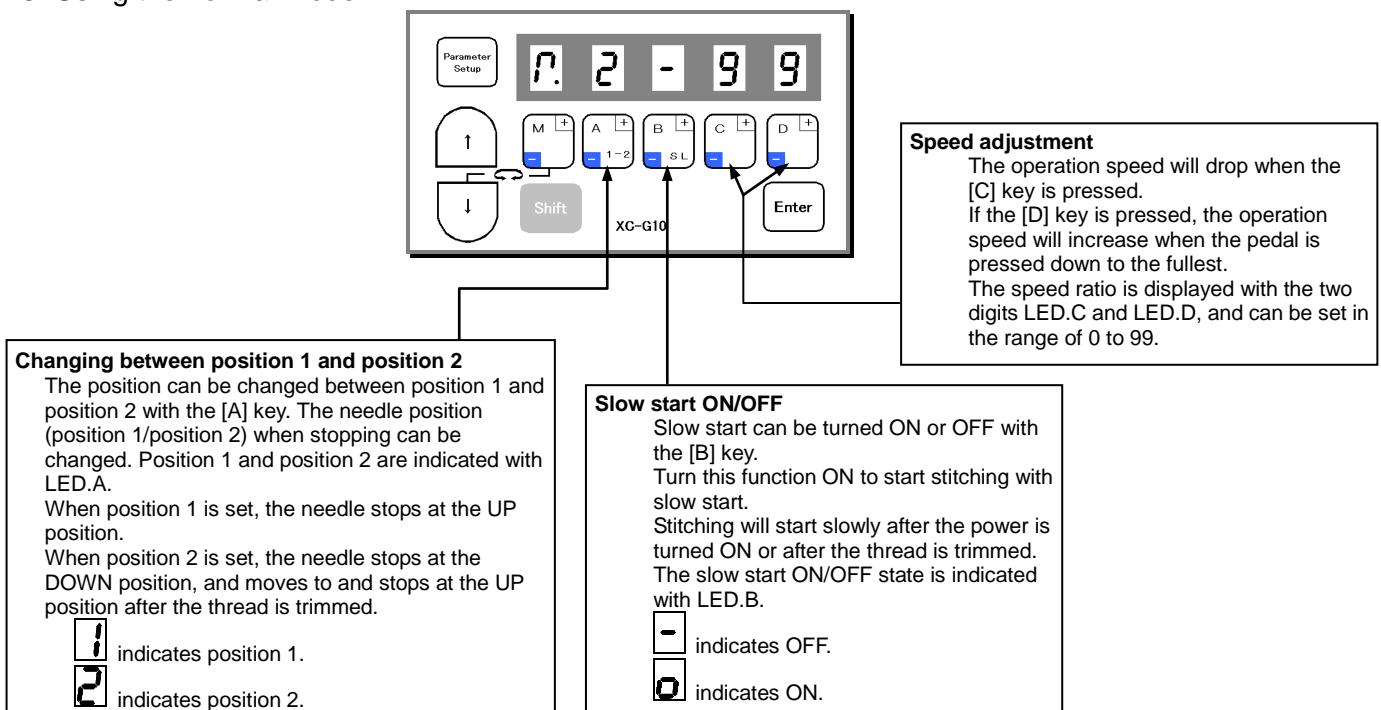
(Selection can be made in all mode ranges)

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

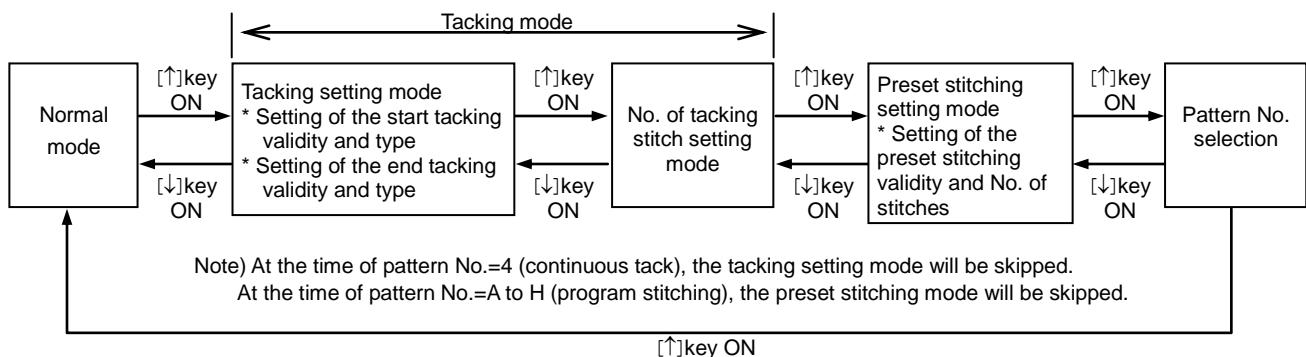
Status transition diagram (Direct number call operation)



3. Using the normal mode

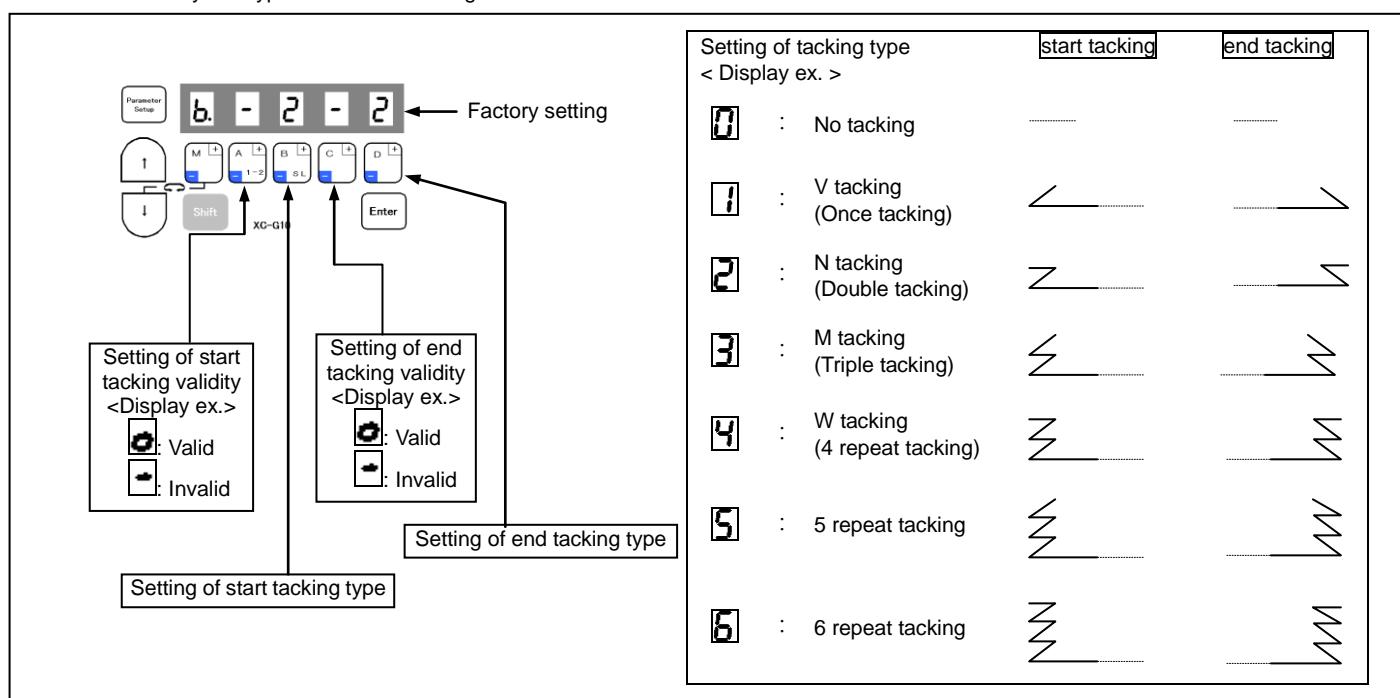


4. Changing to the tacking, preset, pattern NO. selection mode



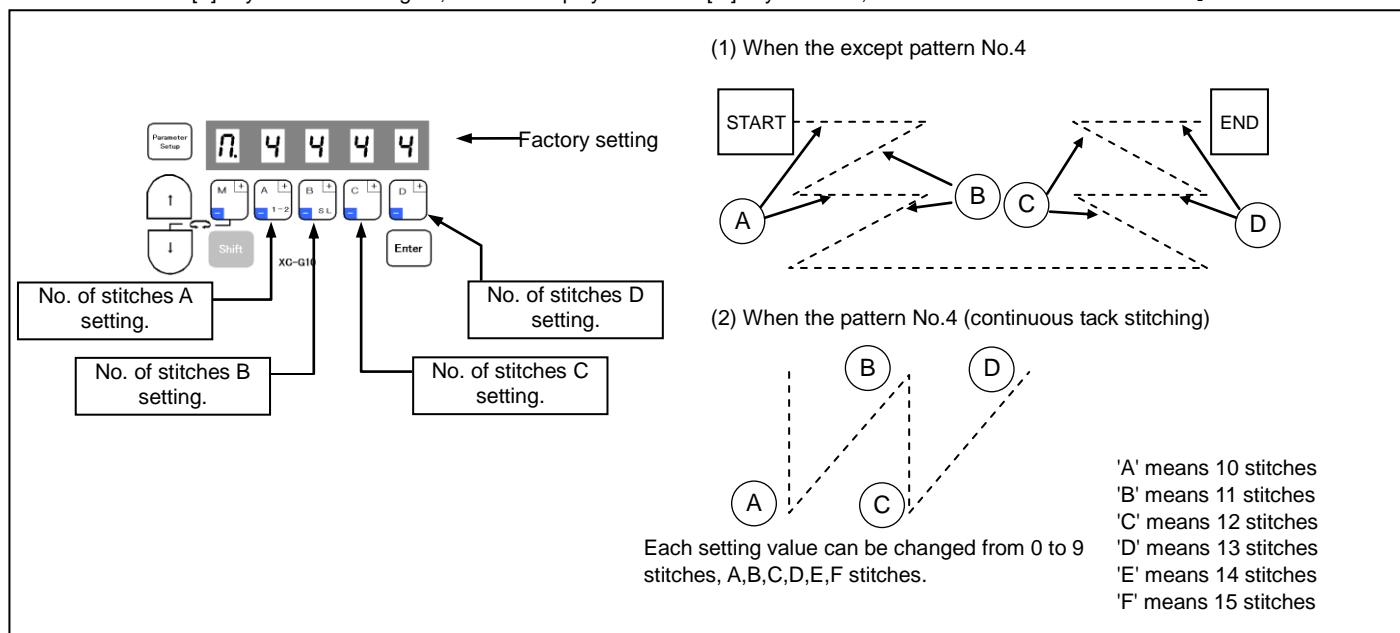
(1) Tacking setting mode (At the time of pattern No.=4, this mode will be skipped.)

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

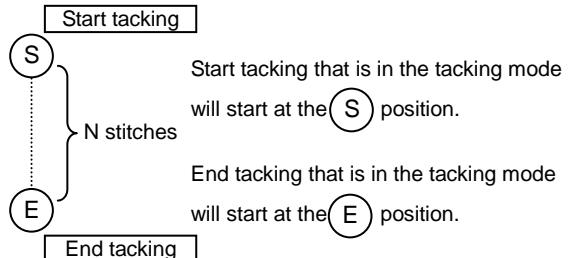
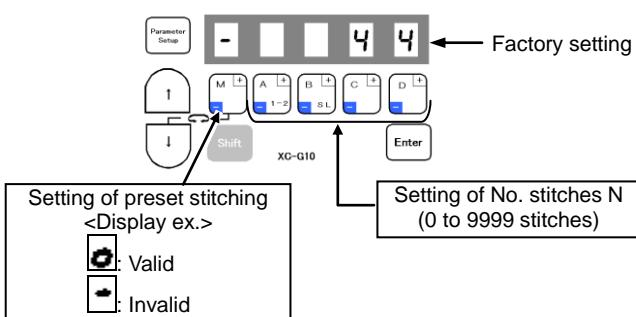
When the **[↑]** key is turned ON again, **n** will display above the [M] key indicator, and the No. of stitches can be set.]



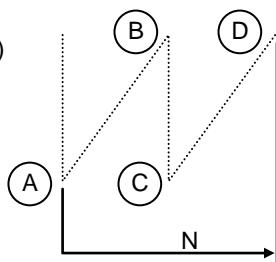
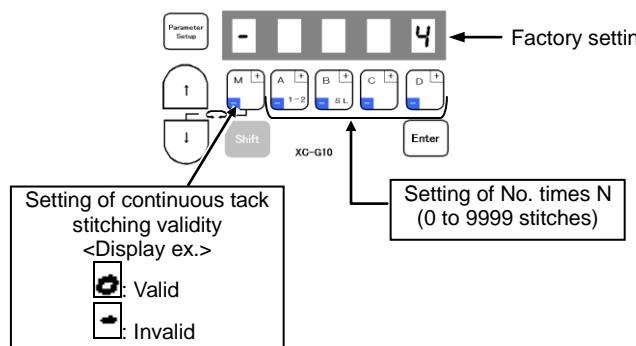
(3) Preset stitching setting mode

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 ABCD... while the pedal is pressed down.)

(4) Pattern No. selection mode

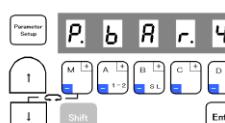
When the [↑] key is turned ON again, and the pattern No. selection mode will be entered. Selecting of preset stitching setting (pattern 1 to 3), continuous tack stitching (pattern 4), program stitching (pattern No. A to H).

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



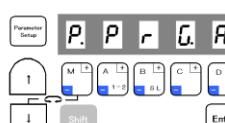
Display of pattern 1.
When pattern 2 or 3, display show 2 or 3.

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



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

(Note: Patterns A to H appear only when the XC-G500 type control panel has been connected even once.)



Display of pattern A
When pattern B, C, D, E, F, G or H, display show B, C, D, E, F, G or 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.)

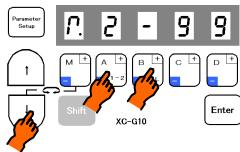
Caution

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

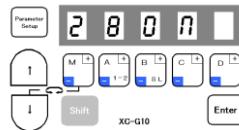
To set the settings to a specific machine in simple setting.
(For example, to set to "LU2-4410-B1T" ... Function setting [410B])

(1)



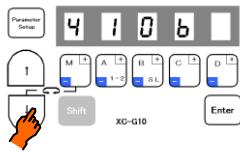
*Enter the program mode [1].
([↓] + [A] + [B] keys)

(2)



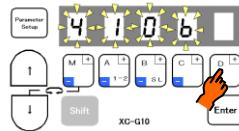
*The mode will change to the program mode [1].

(3)



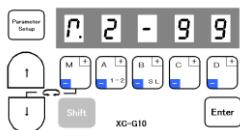
*Press the [↓] key or [↑] key to change the function to [410B].

(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

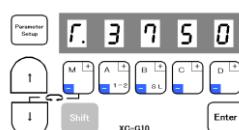
When this function is set, all previously set details will be cleared. The set speed and function setting corresponding to the selected sewing machine model will be set automatically.

- 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 17 to 20.)

(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

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)		
280M	280n	LS2-1280-M1T (W)	4000	250	200	1700	1700	OFF	OFF	L	*1 85	
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	380n	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	210n	LS2-2210-M1T(W)	4000	250	200	1700	1700	OFF	OFF	L		
230M	230n	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	250n	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	*2 65	
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		
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	*8 85	
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	*4
N	n		*6	5000	250	200	1700	1700	OFF	OFF	L	
LOAD2	Load2		*7									
LOAD1	Load1		*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 it is 80 mm, LU2-4410/4412/4430/4650/4652/4710/4730 it 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].)

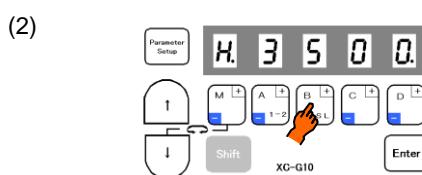
*8 The short remaining thread trimming function is set.

11 Example of setting the program mode

1. To change the maximum speed (Ex. to change to 3500 rotations) Function setting [H.3500]

(1) **Call out the program mode [P] function [H].**

(This can be called with mode call or direct number call. Refer to pages 17 to 20.
(Direct call number = "0000"))



Press the [+] and [-] keys ([A], [B], [C], [D]), and set to "3500".

(3) **Entering the normal mode**

For mode call: [↓] + [↑]

For direct number call: Set with **Enter** and then press **Parameter Setup**.

Description

- A. The setting range of the maximum speed is 0 to 8999 rotations.
- B. By pressing each of the [A], [B], [C] and [D] keys, the setting value will change between 0 and 9. (However, the [A] key is only between 1 and 8.) To lower the value, press the [A], [B], [C], [D] keys while holding down the [Shift] key.
- C. The factory setting is [4000 rotations].
- D. Low speed, thread trimming speed, start tacking speed, end tacking speed, medium speed and slow start speed can be set in the same manner.

Memo

The LED.D dot will flicker after the setting is changed.
This indicates that the factory setting value (default value) has been changed.

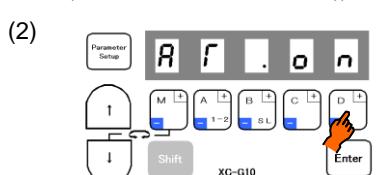
H. 3 5 0 0

(This explanation regarding the flickering dot is omitted in the following explanations.)

2. To set the standing work typeFunction setting [AT.ON]

(1) **Call out the program mode [P] function [AT].**

(This can be called with mode call or direct number call. Refer to pages 17 to 20.
(Direct call number = "0033"))



*Press the [D] key and set to "ON" for the setting value.

(3) **Entering the normal mode**

For mode call: [↓] + [↑]

For direct number call: Set with **Enter** and then press **Parameter Setup**.

Description

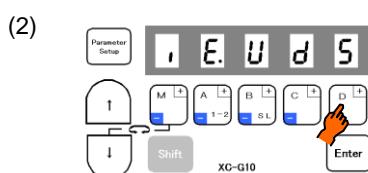
- A. This is used for high speed operation during standing operations.
When setting it to turning ON, it operates at the speed with the rate which has been set with the [C] and the [D] key in normal mode regardless of the pedal stepping quantity.
- B. This setting is first priority to the key switch [AUTO] of control switch panel (XC-G500 type).
- C. The setting value will alternate between [OF] and [ON] with each press of the [D] key in step (2). (The factory setting is [OF])

Note : The switches for standing operation are connected as shown on 27-3-(2) page 210. Be sure to set the function [PDS] to ON in the program mode [C] as shown on page 210.

3. To operate Half-stitch operation with a backstitching switch Function setting [IE.UDS]

(1) **Call out the program mode [C] function [IE].**

(This can be called with mode call or direct number call. Refer to pages 17 to 20.
(Direct call number = "0312"))



*Press the [D] key and set to "UDS" for the setting value.

(3) **Entering the normal mode**

For mode call: [↓] + [↑]

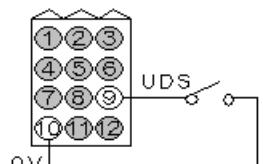
For direct number call: Set with **Enter** and then press **Parameter Setup**.

Description

- A. Turning ON the backstitching switch connected No.9 pin in sewing machine connector, backstitching (reverse feed) will start while the sewing machine is running. Half-stitch operation will start while the sewing machine is stopped.
- B. The setting value will be changed with each press of the [D] key in step (2). (The factory setting is [S7])

Note) When using this function, always return to the normal mode before starting operations.

sewing machine connector



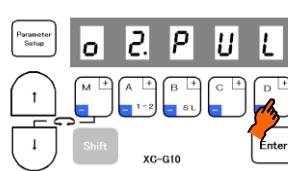
4. Outputting puller output to spare output 02 Function setting [O2.PUL] + [O2C.ON]

(Example: To set to half-wave 50%duty)

(1) **Call out the program mode [C] function [O2].**

(This can be called with mode call or direct number call. Refer to pages 17 to 20.
(Direct call number = "0421"))

(2)



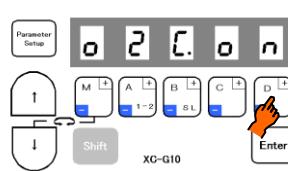
*Press the [D] key and set to "PUL" for the setting value.

(3) **Call out the program mode [C] function [O2C].**

For mode call: [↓]

For direct number call: Set with **Enter**, select the number
[423], and then press **Enter**.

(4)



*Press the [D] key and set to "ON" for the setting value.

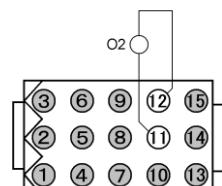
(5) **Entering the normal mode**

For mode call: [↓] + [↑]

For direct number call: Set with **Enter** and then press **Parameter Setup**.

Description

- A. Select puller output [PUL]. Set to connect [O2] and [PUL].
- B. The spare output O2 turns ON only when the presser foot lifter is operating.

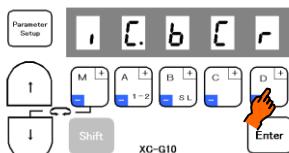


5. To confirm the position where the needle passed through the fabricated to raise the penetration strength of the first stitch with the external switch. function setting [IC.BCR]

(1) **Call out the program mode [C] function [IC].**

(This can be called with mode call or direct number call. Refer to pages 17 to 20.
(Direct call number = "0306"))

(2)



*Press the [D] key and set to "BCR" for the setting value.

(3) **Entering the normal mode**

For mode call: [↓] + [↑]

For direct number call: Set with **Enter** and then press **Parameter Setup**.

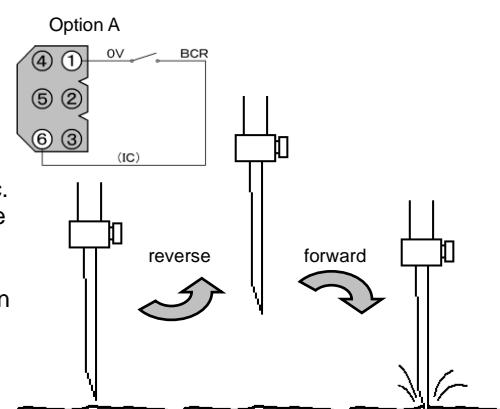
Description

A. This is used to increase the penetration strength of the first stitch when the fabric is thick. Each time the switch [BCR] connected to the No.6 pin in the option A connector is turned ON, the (forward)-(reverse) operation will be repeated, and the needle will stop right with forward operation, above the fabric. However, when the operation signal is turned ON and the needle is stopped the sewing machine will operate forward after reversing once. When stopped with reverse operation, forward operation will start from that position.

*The needle position stop angle is set with the needle position stop angle [C8] in the program mode [P]

B. Each time the [D] key is pressed in step 2), the set value will be changed.
(factory setting is [S0])

Note) When using this function, always return to the normal mode before starting operations.

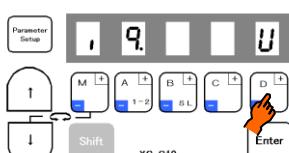


6. To operate Needle lift operation with a Q key of the control panel function setting [IQ. U]

(1) **Call out the program mode [C] function [IQ].**

(This can be called with mode call or direct number call. Refer to pages 17 to 20.
(Direct call number = "0351"))

(2)



*Press the [D] key and set to "U" for the setting value.

(3) **Entering the normal mode**

For mode call: [↓] + [↑]

For direct number call: Set with **Enter** and then press **Parameter Setup**.

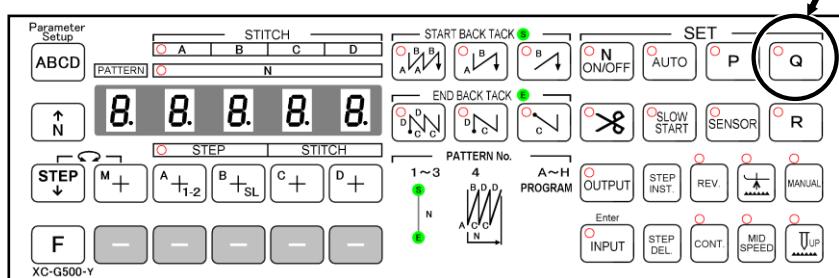
Description

A. When the [Q] key of the control panel is pushed, the needle lift operation will start.
B. The setting value will be changed with each press of the [D] key in step 2).

(Factory setting is [NO])

Note) When using this function, always return to the normal mode before starting operations.

[Q] key



7. Setting the number of stitches to the UP position stop after fabric end is detected with optical sensor, etc.

..... Function setting C mode [IA. PSU] and P mode [PSU.10]

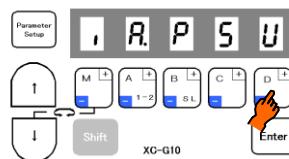
(Example: Setting to 10 stitches)

(1) Call out the program mode [C] function [IA].

(This can be called with mode call or direct number call. Refer to pages 17 to 20.)

(Direct call number = "0300")

(2)



* Press the [D] key and set the value to "PSU".

(3) Set the function [IA] settings.

For mode call: [↓] + [↑]

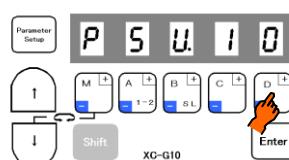
For direct number call: Set with

(4) Call out the program mode [P] function [PSU].

(This can be called with mode call or direct number call. Refer to pages 17 to 20.)

(Direct call number = "0012")

(5)



* Press the [C] and [D] keys and set the value to "10".

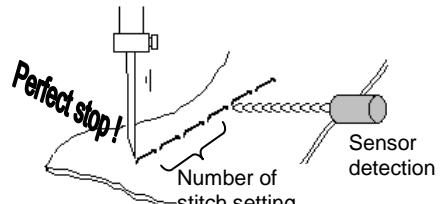
(6) Entering the normal mode

For mode call: [↓] + [↑]

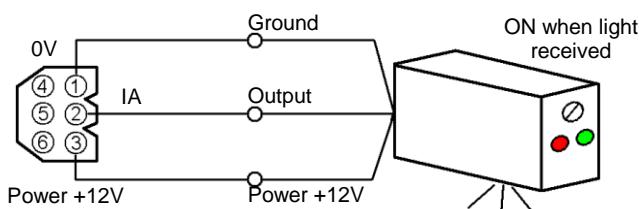
For direct number call: Set with and then press .

Description

- A. Set both the C mode [IA] and P mode [PSU] functions.
- B. When the output from the optical sensor, etc., connects with the No. 2 pin of the option A connector and the optical sensor turns ON, the thread will be trimmed and the needle will stop at the UP position after ten stitches.
- C. The setting value will change sequentially each time the [D] key is pressed in step (2). (The factory setting is [PSU].)
- D. The number of stitch setting range is 0 to 99 stitches.
- E. The setting value will change between 0 and 9 each time the [C] and [D] keys are pressed in step (5).



Connection example



Option A connector

Please choose the one of the following specification to be an optical sensor.

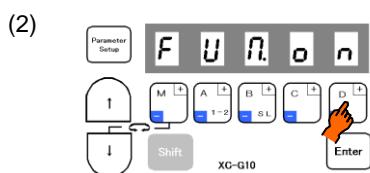
Sensor supply source : DC12V (40mA max.)
Sensor output type : NPN open collector type
(Residual voltage : 0.4V max. when 5V / 2.0mA)

(* Refer to the Instruction Manual enclosed with the sensor for details on handling the sensor.)

8. To continue presser foot lifting after the thread trimming, and to bring down the presser foot after the time set on the timer has passed Function setting [FUM.ON]+ [FU.C]

(1) **Call out the program mode [P] function [FUM].**

(This can be called with mode call or direct number call. Refer to pages 17 to 20.
(Direct call number = "0021"))

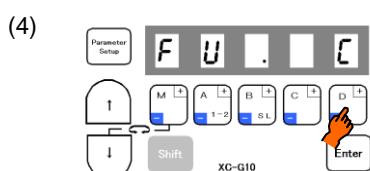


*Press the [D] key and set to "ON" for the setting value.

(2) **Call out the program mode [P] function [FU].**

For mode call: [↓]

For direct number call: Set with **Enter**, select the direct call number "0022",
and then press **Enter**.



*Press the [D] key and set to "C" for the setting value.

(3) **Entering the normal mode**

For mode call: [↓] + [↑]

For direct number call: Set with **Enter** and then press **Parameter Setup**.

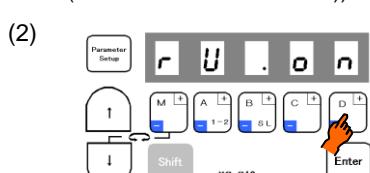
Description

- A. Set both [FUM](21) and [FU](22) functions.
- B. Each time of the [D] key is pressed in step (2), the set value will alternate between [OF] and [ON]. (The factory setting is [OF])
- C. Each time the [D] key is pressed in step (4), the set value will change in order of [M][C][A][T]. (The factory setting is [M])
- D. The timer time can be adjusted with the FUM timer setting [FCT](23) in the [C] mode. (The factory setting is 12 sec.)

9. When after trimming thread while sewing thick fabric, needle is stuck and fabric cannot be removed
..... Function setting [RU.ON]

(1) **Call out the program mode [P] function [RU].**

(This can be called with mode call or direct number call. Refer to pages 17 to 20.
(Direct call number = "0036"))



* Press the [D] key and set the value to "ON".

(2) **Entering the normal mode**

For mode call: [↓] + [↑]

For direct number call: Set with **Enter** and then press **Parameter Setup**.

Description

- A. After the thread is trimmed, the motor is run in reverse, and the needle is stopped near the needle bar top dead center. The reverse run angle can be set with [R8] in two-degree increments between 0 and 500. (The factory setting is [30 degrees].) [R8] can be set by pressing the [↓] key after setting the [RU] function in step (2).
- B. The setting value will alternate between [OF] and [ON] each time the [D] key is pressed in step (2). (The factory setting is [OF].)

10. To display the rotation speed on the control switch panel

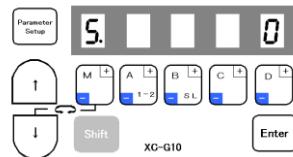
..... Function setting [S.***]

(1)

Call out the program mode [B] function [S].

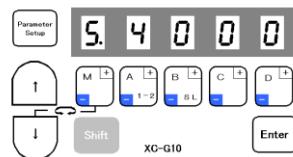
(This can be called with mode call or direct number call. Refer to pages 17 to 20.
(Direct call number = "0200"))

(2)



* The rotation speed is indicated as "0" when the sewing machine stops.

(3)



* For example, if the maximum speed setting is 4000 rotations, the displayed speed will be [S.4000] when the pedal is fully toed down as shown above.

(4)

Return to the normal mode after confirming

For mode call: [↓] + [↑]

For direct number call: Press **Parameter Setup** twice.

Description

A. The rotational speed at which the sewing machine is in running is displayed.

B. If the speed differs from the predicted speed, check the P mode's maximum speed setting [H.] or the speed adjustment setting for the normal mode.

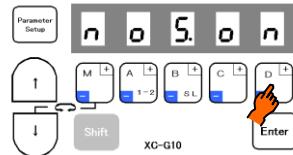
11. To run without the detector (when the detector is broken) function setting [NOS.ON]

(1)

Call out the program mode [A] function [NOS].

(This can be called with mode call or direct number call. Refer to pages 17 to 20.
(Direct call number = "0112"))

(2)



* Press the [D] key and set the value to "ON".

(3)

Entering the normal mode

For mode call: [↓] + [↑]

For direct number call: Set with **Enter** and then press **Parameter Setup**.

Description

A. Only variable-speed operation will be possible. Set position stopping and thread trimming will not be possible

B. Each time the [D] key is pressed, the setting will alternate between [OF] and [ON]

12. To adjust the tacking accurately

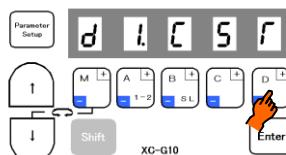
- (1) To adjust tacking surely Function setting [D1. CST] + [CT. 10]
 (To set the stop time at each tacking corner to 100 msec.)

(1)

Call out the program mode [D] function [D1].

(This can be called with mode call or direct number call. Refer to pages 17 to 20. (Direct call number = "0600"))

(2)



*Press the [D] key and set to "CST" for the setting value.

(3)

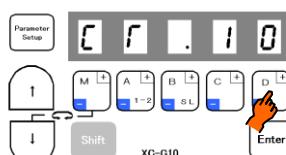
Call out the program mode [D] function [CT].

For mode call: [↓]



For direct number call: Set with , select the number "0602", and then press .

(4)



*Press the [C], [D] key and set to "10" for the setting value.

(5)

Entering the normal mode

For mode call: [↓] + [↑]

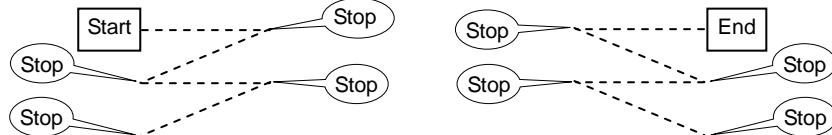


For direct number call: Set with and then press .

Description

A. Set the start/end tacking and No. of switches with Page 21 before making the above setting.

B. When using W tacking, the sewing machine will stop at each corner for 100msec, so the tacking is surely executed.



C. Each time the [D] key is pressed in step (2), the setting will change in the order of [M], [D], [N], [CST], [CSU] and [CSD]. (The factory setting is [M])

D. The setting range of the stop time is 0 to 990 msec. in 10-msec. intervals. The setting display 10 refers to 100 msec., and 20 to 200 msec. . (The factory setting is 50 msec.)

E. The setting value will change between 0 and 9 each time the [C] and [D] key is pressed in step (4). To lower the value, press the [C] or [D] key while holding down the [Shift] key.

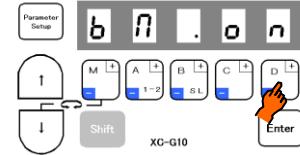
(2) To align tacking when start/end tacking speed is less than 1000 rpm. Function setting [BM. ON]

(1)

Call out the program mode [D] function [BM].

(This can be called with mode call or direct number call. Refer to pages 17 to 20.
 (Direct call number = "0603"))

(2)



*Press the [D] key and set to "ON" for the setting value.

(3)

Entering the normal mode

For mode call: [↓] + [↑]



For direct number call: Set with and then press .

Description

A. Set function [BM] to [ON] when start/end tacking speed is less than 1000rpm

B. Set function [BM] to [OF] when start/end tacking speed is 1000rpm or higher. This BM function can be used for a rough tacking alignment of the start and end tacking.

C. Each time the [D] key is pressed in step (2), the setting will alternate between [OF] and [ON]. (The factory setting is [OF].)

Note) This function can be used for normal tacking (not to stop at each corner).

When the function setting [D1. CST] is set, this function setting [BM. ON] will be invalidated.

13. Application example of the tacking function

(1) To adjust tacking accurately by the stop time at each tacking corner to short time

..... [D1. CST] + [CT. 1]

(To set the stop time at each tacking corner to 10 msec.)

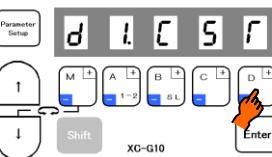
(1)

Call out the program mode [D] function [D1].

(This can be called with mode call or direct number call. Refer to pages 17 to 20.

(Direct call number = "0600")

(2)



*Press the [D] key and set to "CST" for the setting value.

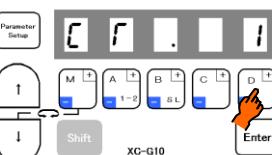
(3)

Call out the program mode [D] function [CT].

For mode call: [↓]

For direct number call: Set with , select the number "0602", and then press .

(4)



*Press the [C], [D] key and set to "1" for the setting value.

(5)

Entering the normal mode

For mode call: [↓] + [↑]

For direct number call: Set with and then press .

Description

- A. Set the type of start/end tacking and the no.of stitches before making the above setting. (Refer to page 21)
- B. This setting is good for adjust tacking accurately.
- C. Each time the [D] key is pressed in step 2), the setting will change in the order of [M], [D], [N], [CST], [CSU] and [CSD]. (factory setting is [M])
- D. The setting range of the stop time is 0 to 990 milliseconds in 10-millisecond intervals. The setting display 1 refers to 10 milliseconds, and 10 to 100 milliseconds. (factory setting is 50 milliseconds)
- E. Each time the [C] key is pressed in the step 6), the set value will change from 0 to 9, and each time the [D] key is pressed, will change from 0 to 9.

(2) To be continuous sewing the next straight line stitching without speed down when start tacking is completed. function setting [D1. N]

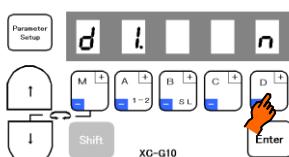
(1)

Call out the program mode [D] function [D1].

(This can be called with mode call or direct number call. Refer to pages 17 to 20.

(Direct call number = "0600")

(2)



*Press the [D] key and set to "N" for the setting value.

(3) **Entering the normal mode**

For mode call: [↓] + [↑]

For direct number call: Set with and then press .

Description

- A. This function is available when the start tacking speed is high.
- B. It can be continuous sewing the next straight line stitching without speed down when start tacking is completed. This is valid when the Operation mode during start tack completion D2 is [CON].
- C. Each time the [D] key is pressed in step 3), the setting will change in the order of [M], [D], [N], [CST], [CSU] and [CSD]. (factory setting is [M])

14. Setting the tacking stitch correction

To correct when the set number of tacking stitches does not match the number of actual stitches

.....Function setting [BT1.4] + [BT2.4] + [BT3.8]

(To stitch three start and end tacking stitches (Fig. 1), but actual stitches as shown in (Fig. 2).)

(1)

Call out the program mode [D] functions [BT1] to [BT4].

(This can be called with mode call or direct number call. Refer to pages 17 to 20.
(Direct call number = from "0604" to "0606"))

(2)

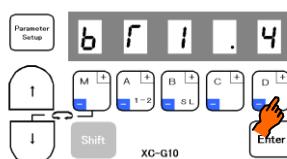
Confirm that [BT1] to [BT4] are all set to "0". If not set to "0", reset to "0", and then stitch to check the number of tacking stitches. (If the stitches does not match, correct with the following steps.)

(3)

In Fig.2, there are four stitches at the forward section of the start tacking. Since there is one extra stitch, decrement the number of correction stitches by 1. (Point A)

Call out the program mode [D] function [BT1].

(This can be called with mode call or direct number call "604". Refer to pages 17 to 20.)



In the following table, the number of correction stitches "-1" corresponds to 4. Set [BT1] to 4.

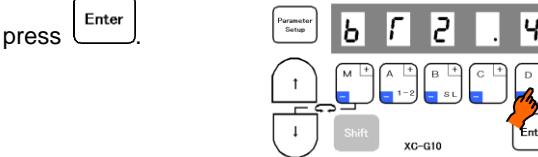
(4)

After (3) is set (Fig. 3), there will be one less stitch at the forward section. The backward section is then incremented by one stitch for a total of four stitches. Decrement the number of correction stitches by 1. (Point B)

Call out the program mode [D] function [BT2].

For mode call: [↓]

For direct number call: Set with **Enter**. select the number "605", and then



In the following table, the number of correction stitches "-1" corresponds to 4. Set [BT2] to 4. (This completes correction of the start tacking section.)

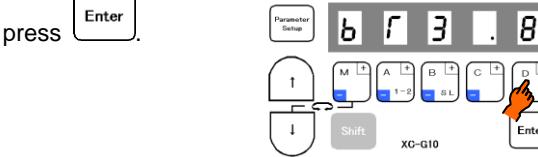
(5)

In Fig. 4, the backward section of the end tacking has five stitches, which is two stitches over. Decrement the number of correction stitches by 2. (Point C)

Call out the program mode [D] function [BT3].

For mode call: [↓]

For direct number call: Set with **Enter**, select the number "606", and then



In the following table, the number of correction stitches "-2" corresponds to 8. Set [BT3] to 8. (The backward section now has three stitches. The forward section is increased to two stitches for a total of three stitches.) (Fig. 1)

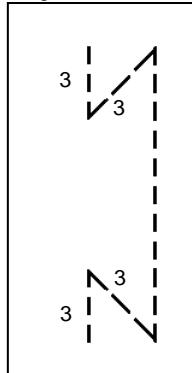
(6)

Entering the normal mode

For mode call: [↓] + [↑]

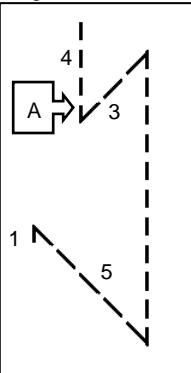
For direct number call: Set with **Enter** and then press **Parameter Setup**.

Fig. 1



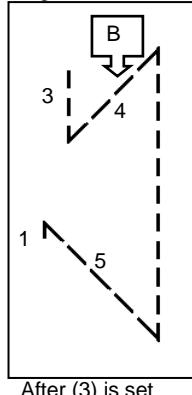
Set stitches

Fig. 2



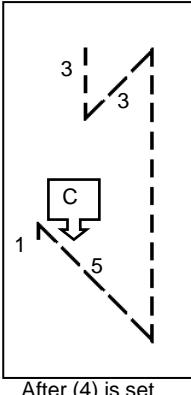
Actual stitches

Fig. 3

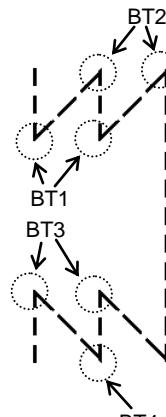


After (3) is set

Fig. 4



After (4) is set



BT1: Correction for forward start tacking.

BT2: Correction for backward start tacking.

BT3: Correction for backward end tacking.

BT4: Correction for forward end tacking.

Relation of number of correction stitches and setting value

Setting value	9	8	7	6	5	4	3	2	1	0	A	B	C	D	E	F
Number of correction stitches	-2 ¹ / ₄	-2	-1 ³ / ₄	-1 ² / ₄	-1 ¹ / ₄	-1	-3/ ₄	-2/ ₄	-1/ ₄	0	+1/ ₄	+2/ ₄	+3/ ₄	+1	+1 ¹ / ₄	+1 ² / ₄

15. Example of setting counter function

(1) UP counter for product amount (one hundred times)

[1] Up counter amount "U" is add at each thread trimming.

[2] When up counter amount "U" become the setting amount "P", sewing will be prohibited.

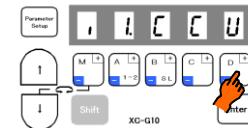
[3] When the input signal "I1" is turned on, Up counter amount become zero and sewing become possible.

(1) Call out the program mode [C] function [I1].

(This can be called with mode call or direct number call. Refer to pages 17 to 20.

(Direct call number = "0357")

(2)



* Press the [D] key and set the value to "CCU".

(3) Set the function [I1].

For mode call: $\downarrow + \uparrow$



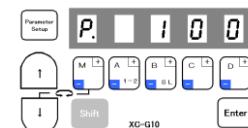
For direct number call: Set with

(4) Call out the program mode [B] function [P].

(This can be called with mode call or direct number call. Refer to pages 17 to 20.

(Direct call number = "0203")

(5)



* Press the [A] to [D] keys and set the value to "100".

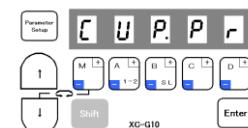
(6) Call out the program mode [B] function [CUP].

For mode call: \downarrow



For direct number call: Set with , select number [205], and then press .

(7)



* Press the [D] key and set the value to "PR".

(8) Call out the program mode [B] function [UPC].

For mode call: \downarrow



For direct number call: Set with , select number [208], and then press .

(9)



* Press the [D] key and set the value to "ON".

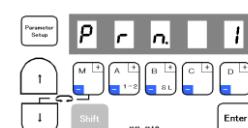
(10) Call out the program mode [B] function [PRN].

For mode call: \downarrow



For direct number call: Set with , select number [216], and then press .

(11)



* Press the [D] key and set the value to "1".

(12) Entering the normal mode

For mode call: $\downarrow + \uparrow$



For direct number call: Set with and then press



Note) [P] key function selection (Factory setting is [CCU].)[C] mode [IP]=[CCU] : Clear UP counter (counter with control panel [P] key clearness)

Description

[C] mode function selection

[I1.CCU]: Input signal "I1" is set to UP counter clear function.

[B] mode function selection

[P. 100] Set the setting amount of up counter "P". This amount become the target amount for up counter.

*[U. 0] Current up counter amount "0"

[CUP.PR]: "PRN" function is that up counter is added at each trimming time.

("PRN" is set "1", up counter is added each trimming time in this example)

*[USC. ST]:When the amount of current up counter "U" become setting amount "P", sewing will be prohibited Input signal "I1" is set to the following function. When it is turned on, sewing become possible.

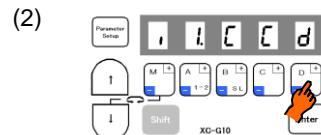
[UPC.ON] Set "UPC" to "ON" to use up counter.

[PRN. 1] one trimming time add one count amount.

Items marked with an asterisk * are the factory settings.

- (2) When using down counter as a bobbin thread level counter (Ending count after 10,000 stitches)
- [1] The current down counter value [D] is decremented by one each time ten stitches are stitched.
 - [2] When the remaining down counter [D] reaches 0, stitching is prohibited after trimming
(Stitching is possible until the thread is trimmed.)
 - [3] When the external switch I1, set with the [C] mode function selection, turns ON, the current down counter value [D] value is set to the down counter value [N], and the next stitching is enabled.

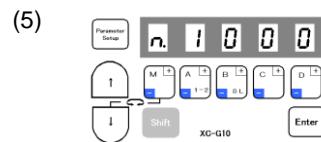
- (1) **Call out the program mode [C] function [I1].**
(This can be called with mode call or direct number call. Refer to pages 17 to 20.
(Direct call number = "0357"))



* Press the [D] key and set the value to "CCD".

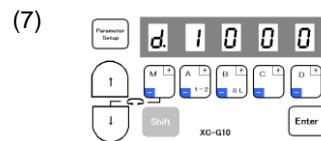
- (3) **Set the function [I1].**
For mode call: $\downarrow + \uparrow$
For direct number call: Set with **Enter**

- (4) **Call out the program mode [B] function [N].**
(This can be called with mode call or direct number call. Refer to pages 17 to 20.
(Direct call number = "0201"))



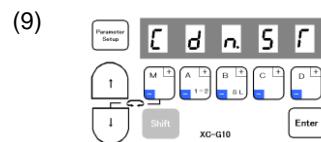
* Press the [A] to [D] keys and set the value to "1000".

- (6) **Call out the program mode [B] function [D].**
For mode call: \downarrow
For direct number call: Set with **Enter**, select number [202], and then press **Enter**.



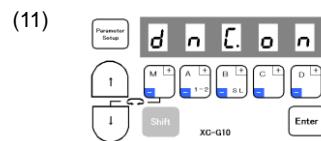
* Press the [A] to [D] keys and set the value to "1000".

- (8) **Call out the program mode [B] function [CDN].**
For mode call: \downarrow
For direct number call: Set with **Enter**, select number [210], and then press **Enter**.



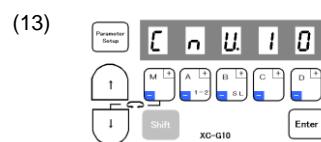
* Press the [D] key and set the value to "ST".

- (10) **Call out the program mode [B] function [DNC].**
For mode call: \downarrow
For direct number call: Set with **Enter**, select number [213], and then press **Enter**.



* Press the [D] key and set the value to "ON".

- (12) **Call out the program mode [B] function [CNU].**
For mode call: \downarrow
For direct number call: Set with **Enter**, select number [217], and then press **Enter**.



* Press the [C] and [D] keys and set the value to "10".

- (14) **Entering the normal mode**
For mode call: $\downarrow + \uparrow$
For direct number call: Set with **Enter** and then press **Parameter Setup**

Description

[C] mode function selection
[I1.CCD]: Sets the external input I1 to the counter clear signal [CCD].

[B] mode function selection
[N.1000]: Sets the down counter value. The down counter counts (subtracts) from the value set here.
[D.1000]: Current down counter value.
[CDN.ST]: The down counter is decremented by one each time the number of stitches set in [CNU] is stitched. (In this example, [CNU] is set to 10, so the down counter is decremented by one each time 10 stitches are stitched.)
* [DSC.ST]: When the current down counter [D] reaches 0, the next stitching is prohibited after trimming. The next stitching is enabled when the external input I1, set with [C] mode function selection, turns ON.
[DNC.ON]: Down counter is validated. Set this to ON to use the down counter.
[CNU.10]: Set this to count every 10 stitches.

Note) To clear the down counter with the P key on the control switch panel set the following.
[C] mode function selection
[IP.CCD]: Sets the P key on the control switch panel to the counter clear signal [CCD].

Items marked with an asterisk * are the factory settings.

16. To check the error code history and input/output signal

(1) How to view the error code history Function setting [1.E--], [2.E--], [3.E--], [4.E--]

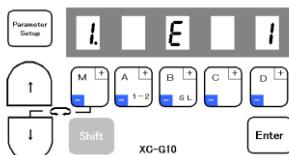
(1)

Call out the program mode [E] function [1].

(This can be called with mode call or direct number call. Refer to pages 17 to 20. (Direct call number = "0700"))

(2)

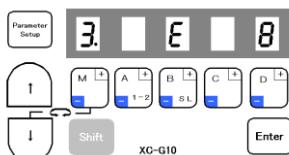
Call out function [1].



* The last error code is displayed.
(Ex. error code E1 is displayed.)

(4)

Call out function [3].



* The error code before the second is displayed.
(Ex. error code E8 is displayed.)

(6)

Entering the normal mode

For mode call: [↓] + [↑]



For direct number call: Press

Description

A. 4 times errors from the last to the fourth error can be viewed.

B. Refer to page 211 for the error code.

(2) To check input signals

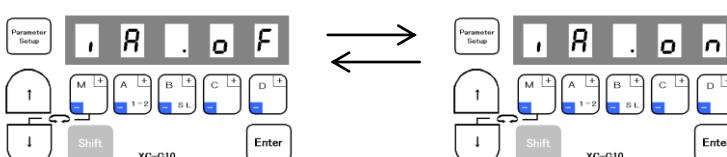
..... Function setting [IA] - [IL], [I1] - [I5], [IP] - [IR], [ECA], [ECB], [UP], [DN], [DR], [VC], [V2]

(1)

Call out the input signal in program mode [E] to be checked. (In this example, call out [IA].)

(This can be called with mode call or direct number call. Refer to pages 17 to 20. (Direct call number = "0706"))

(2)



* Turn the input for the input terminal to be viewed ON and OFF, and confirm that the LED C.D changes between [ON] and [OF].

* If the input to be viewed is UP or DN, turn the sewing machine shaft. If ECA or ECB, turn the motor shaft.

Caution To turn the signals related to the sewing machine operation ON and OFF when the signal is turned ON and OFF, normal operation will take place.

(3)

Entering the normal mode

For mode call: [↓] + [↑]



For direct number call: Set with **Enter** and then press **Parameter Setup**.

Input signal (Factory setting)	Display
Variable speed run signal (S1)	IG
Thread trimming (S2)	IH
Presser foot lifter (S3)	II
Presser foot lifter signal (F)	IF
Thread trimmer cancel signal (TL)	ID
Backstitching signal (S7)	IE
Needle UP position priority stop signal (PSU)	IA
Needle DOWN position priority stop signal (PSD)	IB
Low speed run signal (S0)	IC
Input signal (IO1)	I1
Needle lift signal (U)	I2
No setting (NO)	I4
No setting (NO)	I5
Encoder signal display (A phase)	ECA
Encoder signal display (B phase)	ECB
Detector signal display (UP signal)	UP
Detector signal display (DOWN signal)	DN
Display the angle from down position	DR
Display the voltage of VC	VC
Display the voltage of VC2	V2

Description

A. It is possible to check whether or not input signal is wired right.

When the display is not turned [ON][OF] even if the signal is turned ON/OFF, check wiring to a control box from the signal.

Note that the sewing machine will run when checking the input of signal terminals related to operation.

B. Refer to the "Connector layout" on page 208 for the input terminals, and "Table of input/output function for signal on C mode" on page 199 for details on the input function names.

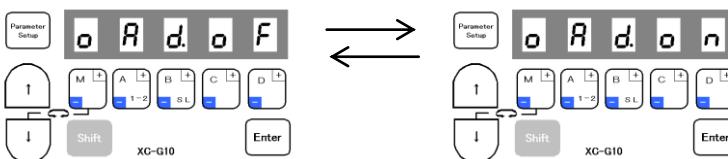
(3) To check output signal (check in operation)

..... Function setting [OAD] - [ODD], [OFD], [OPD] - [ORD], [O1D] - [O7D]

- (1) Call out the output signal in program mode [E] to be checked. (In this example, call out [OAD].)

(This can be called with mode call or direct number call. Refer to pages 17 to 20. (Direct call number = "737"))

(2)



*Confirm the display ON during full pedal heeling operation

Caution Be careful to sewing machine operation when turned ON the signal which the sewing machine operation relates to.

Output signal (Factory setting)	Display
Thread trimming output (T)	OAD
Wiper output (W)	OBD
Backstitch output (B)	OCD
Thread release output (L)	ODD
Presser foot lifter output (FU)	OFD
O1 output (OT1)	O1D
Output for needle cooler (NCL)	O2D
TF output (TF)	O3D

- (3) Entering the normal mode

For mode call: $\downarrow + \uparrow$

For direct number call: Set with and then press .

Description

- A. This is useful for setting the various items and checking the operation before connecting the output to the solenoid, etc.
B. Refer to the "Connector Layout" on page 208 for the output terminals, and "Table of input/output function for signal on C mode" on page 199 for details on the output function names.

(4) To check an output terminal (To forcibly turn the output ON without running the sewing machine.)

..... Function setting [OAO] - [ODO], [OFO], [OPO] - [ORO], [O1O] - [O7O]

- (1) Call out the output signal in program mode [E] to be checked. (In this example, call out [OAO].)

(This can be called with mode call or direct number call. Refer to pages 17 to 20. (Direct call number = "752"))

(2)



* Output signal is turned ON while pressing the [D] key.

Note) While displaying this function, sewing machine can not operate.

Output signal (Factory setting)	Display
Thread trimming output (T)	OAO
Wiper output (W)	ODO
Backstitch output (B)	OCO
Thread release output (L)	ODO
Presser foot lifter output (FU)	OFO
O1 output (OT1)	O1O
Output for needle cooler (NCL)	O2O
TF output (TF)	O3O

- (3) Entering the normal mode

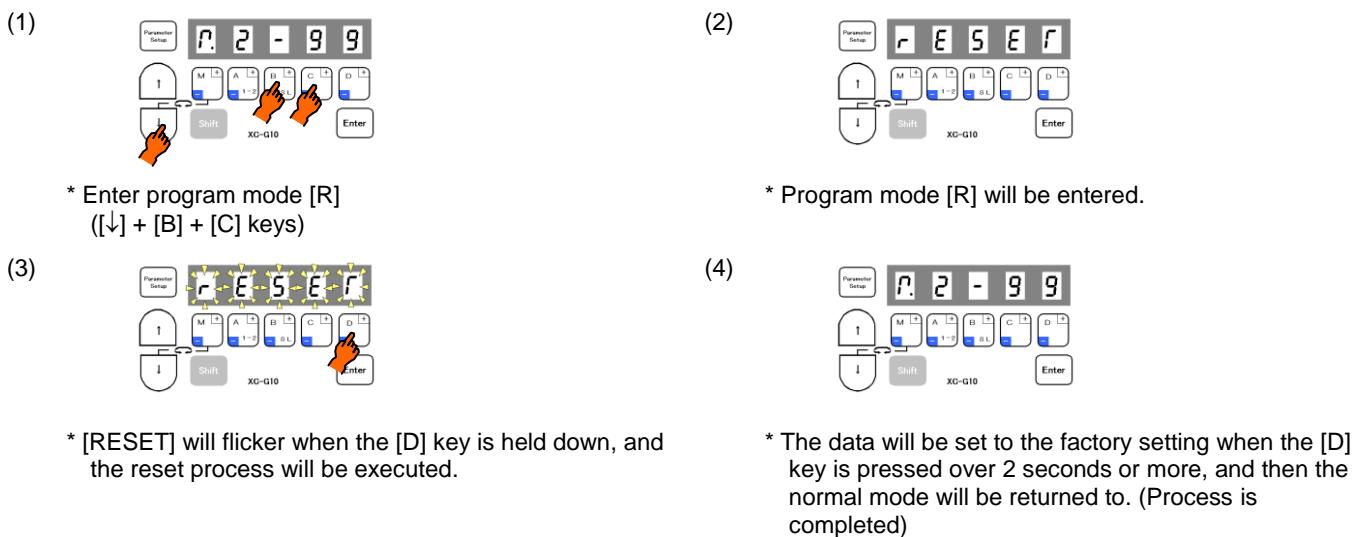
For mode call: $\downarrow + \uparrow$

For direct number call: Set with and then press .

Description

- A. This is useful for checking that the wiring to the solenoid, etc., from the control box's output terminals is correct.
B. Refer to the "Connector Layout" on page 208 for the output terminals, and "Table of input/output function for signal on C mode" on page 199 for details on the output function names.

17. To return all settings to the factory settings Function setting [RESET]



Description

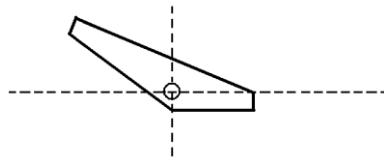
- A. All settings will be returned to the factory settings when the [D] key is held down for two or more seconds while [RESET] is displayed. The display will return to the normal mode.
- B. To return to the normal mode from the [RESET] display without executing the reset process, press the [↑] key while holding down the [↓] key. In this case, the settings will not be returned to the factory setting.

Caution

When this function is set, the contents of all settings to this point will be cleared, and will return to the factory settings. Please take care when using this function.

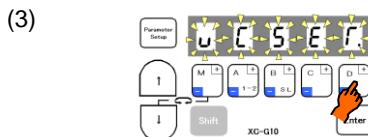
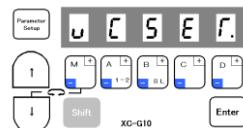
18. To adjust the position data for the lever unit Function setting [VCSET]

- (1) Set the pedal (lever unit) to the neutral position.



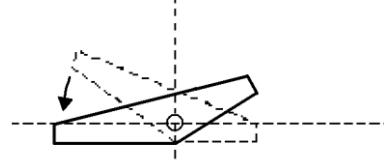
- (2) Call out the program mode [Q] function [VCSET].

(This can be called with mode call or direct number call. Refer to pages 17 to 20. (Direct call number = "1427"))

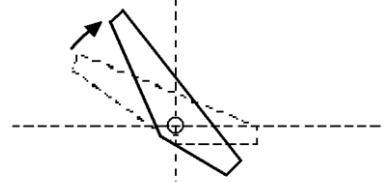


[VCSET] will flicker when the [D] key is held down.

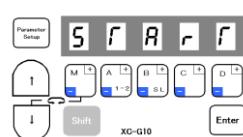
- (5) Fully toe down the pedal (lever unit).
(The maximum toe down position is saved.)



Fully heeling the pedal (lever unit).
(The maximum heeling position is saved.)

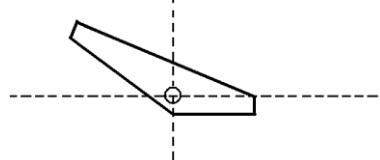


- (4)



The display will change to [START].
(The neutral position is saved at this point.)

- (6) Return the pedal (lever unit) to the neutral position.



Entering the normal mode

For mode call: [↓] + [↑]

For direct number call: Set with **Enter** and then press **Parameter Setup**.

Description

The lever's neutral, toe down and heeling positions can be adjusted.

If the [D] key is held down when the pedal is at the neutral position, the display will flicker and change to the [START] display.
(The neutral position is saved at that point.)

After that, repeat the pedal toe down and heeling operation three or more times. (The maximum toe down position and maximum heeling position are saved at this time.)

When finished, always return the pedal to the neutral state, and then return to the normal mode.

Note

- To enter the [VCSET] state with mode call and then return to the normal mode, press down the [↓] and [↑] keys simultaneously. The lever unit's neutral, toe down and heeling positions are not adjusted in this case.
- The error "MA" will appear as shown on note 1, when the position data for the lever unit is faulty. The error "MA" is released by note 2, and confirm the neutral position of the pedal (lever unit), and then save the neutral, toe down and heeling positions again with the above steps.

1. The error "MA" appears as follows.

- When the neutral position is moved.
- When returning to the original lever unit from external variable speed pedal or the external switches operation.

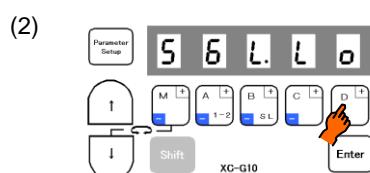
2. How to release the error "MA".

- It is released after 1 msec when the pedal return the neutral position.
- It is released by pressing [D] key.

19. To set the ON/OFF operation of the thread trimming protective signal (S6) Function setting [S6L.LO]

(1) Call out the program mode [P] function [S6L].

(This can be called with mode call or direct number call. Refer to pages 17 to 20.
(Direct call number = "0032")



*Press the [D] key and set to "LO" for the setting value.

(3) Entering the normal mode

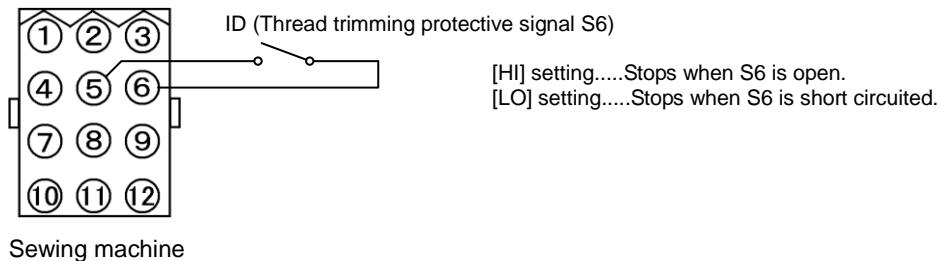
For mode call: [↓] + [↑]

For direct number call: Set with and then press .

Description

- A. The setting value will alternate between [HI] and [LO] with each press of the [D] key.
- B. If the logic changeover [S6L] of the thread trimming protective signal [S6] is set to [HI], the sewing machine will stop when the signal (S6) opens (S6 turns off). This includes the constant open state. (The speed display on the control switch panel will also stop when the sewing machine stops.)
- C. If the logic changeover [S6L] of the thread trimming protective signal [S6] is set to [LO], the sewing machine will stop when the signal (S6) is short circuited (S6 turns on). This includes the constant short circuit state. (The speed display on the control switch panel will also stop when the sewing machine stops.)

D. Connection example



- E. The simple setting value is [LO] during function settings [BR1], [RM1], [SRB1] and [JMH].
During the other function setting [YU2] ~ [YU5], [NO1] ~ [NO8],[NOC], [KA1] ~ [KA4], [UN1], [UN2], and [UN3] is [HI].

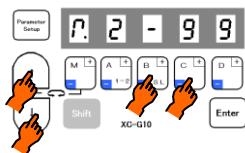
12 To save the setting data

1. How to use the program mode [I]

To save the setting data Function setting [SAVE*]

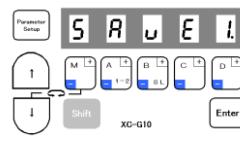
(Two types of data, [SAVE1] and [SAVE2] can be saved. The [SAVE1] data can be read out with [LOAD1], and the [SAVE2] data with [LOAD2].)

(1)



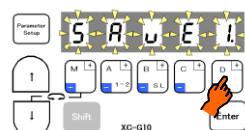
* Enter program mode [I]
([↓] + [↑] + [B] + [C] key)

(2)



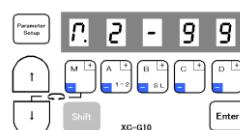
* Program mode [I] will be entered.

(3)



* When the [D] key is held down, [SAVE1.] will flicker, and the save process will be executed.

(4)



* Press [D] key over 2 seconds or more, and then the normal mode will be returned to. (Process is completed)

Description

- A. The current setting data can be saved as simple settings. Saving the data is completed when the [D] key is held down for two or more seconds while [SAVE*] is displayed and the display returns to the normal mode.
- B. To return to the normal mode from the [SAVE*] display without saving the data, press the [↑] key while holding down the [↓] key. The set data will not be saved.
- C. The saved setting data is saved in the program mode {1} simple setting [LOAD1] or [LOAD2], and can be read out by selecting [LOAD1] or [LOAD2] with program mode [1].
(As the factory setting, the [412B] data is saved in the simple settings [LOAD1] and the [280M] data is saved in the simple settings [LOAD2].)

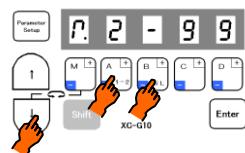
Caution

When this function setting [SAVE*] is used, the settings saved in the program mode [1] simple setting [LOAD*] before the new data was set will all be cleared. The current setting data will be newly saved in the simple setting [LOAD*]. Check the current setting data before starting operation.

D. Reading the setting data saved with the [SAVE*] function

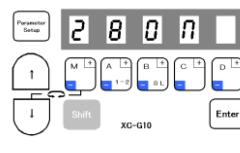
The setting data saved with the [SAVE*] function above can be read out with the following procedure (program mode [1]).

(1)



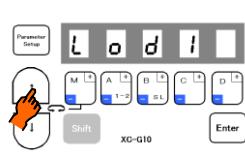
* Enter program mode [1]
([↓]+[A]+[B] key)

(2)

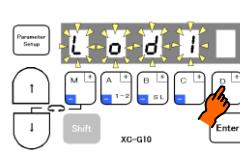


* Program mode [1] will be entered.

(3)



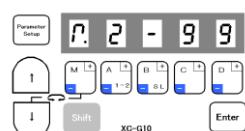
(4)



Press the [↑] key and set the function to [LOAD1].

* When the [D] key is held down, [LOAD1] will flicker, and the loading process will be executed.

(5)



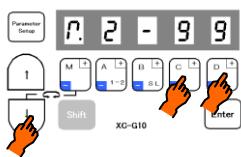
* Press [D] key (2 seconds or more) to return to the normal mode. (Process is completed)

13 How to use Simple setting of Program Mode [2] (for chain stitch trimming machine)

1. How to use the program mode [2]

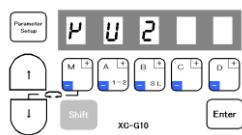
No.1 To set the functions for chain stitch sewing machine in simple setting
(Ex. to set for the VC2800, VC3800 class, "YAMATO").....Function setting [YU4]

(1)



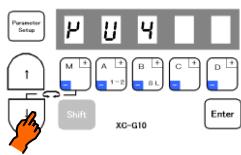
*Enter the program mode [2].
(↓) + [C] + [D] keys

(2)



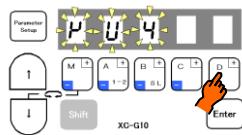
*The mode will change to the program mode [2].

(3)



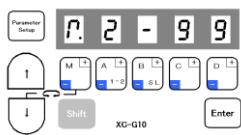
*Press the [↓] key or [↑] key to change the function to [YU4].

(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 43.
Holds down the [D] key over 2 seconds or more, and functions will be carried out automatically for that model.(Refer to the simple setting table for "YAMATO" on page 43.)
- 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].
- D. Refer to Fig.1 (page 46) for the connector input/output signals.
- E. Refer to Fig.5 (page 60) for the junction wiring.
- F. Set the solenoid voltage to 30V. Refer to page 14. (The factory setting is 24V.)
- G. Set the option A connector 5/12V setting to 12V. Refer to page 14. (The factory setting is 12V.)
- H. The thread trimming protection signal S6 will stop the sewing machine when the switch is turned OFF.

2. Simple setting table for chain stitch sewing machine

Function	Sewing machine maker	Model name of sewing machine and device	I/O signals of connectors	Junction wiring	Note 1 solenoid voltage	Note 2 DC5V or 12V setting in option A connector	Note 3 Logic of thread trimming protection signal S6	Note 4 Setting of switch to increase solenoid return speed	Start condensed speed N	Trimming speed T	Low speed L	High speed H	1/2 pos	End condensed speed V	
YU2	YAMATO	VC2600, VC2700 class Solenoid-operated under thread trimmer	Fig.1	Fig.50	30V	12V			2	6000	200	200	1400	1400	
YU3	YAMATO	VC2600, VC2700 class Air-operated under thread trimmer with air wiper	Fig.1	Fig.50	30V	12V			2	6000	200	200	1400	1400	
YU4	YAMATO	VC3845P, 2845P, 2840P class Air-operated under thread trimmer with air wiper	Fig.1	Fig.50	30V	12V			2	6000	200	200	1400	1400	
YU5	YAMATO	Solenoid-operated under thread trimmer with solenoid wiper	Fig.1	Fig.50	30V	12V		Sewing machine stops when switch:open	*Note 6	2	6000	200	200	1400	1400
NO1	PEGASUS	W(T) series /UT device Pneumatic under thread trimmer with pneumatic top cover thread trimmer electric under thread trimmer	Fig.2	Fig.51	24V	5V			1	6000	200	200	1400	1400	
NO1A	PEGASUS	W(T) series /UT device Pneumatic under thread trimmer with pneumatic top cover thread trimmer	Fig.2	Fig.51	24V	5V			1	6000	200	200	1400	1400	
NO2	PEGASUS	Do not use !!													
NO3	PEGASUS	FW series /UT device electric under thread trimmer	Fig.2	Fig.51	24V	5V			1	4500	200	200	1400	1400	
NO3A	PEGASUS	FW series /UT device Pneumatic under thread trimmer	Fig.2	Fig.51	24V	5V			1	4500	200	200	1400	1400	
NO4	PEGASUS	W674/UT device Super tack	Fig.2	Fig.52	24V	5V		Sewing machine stops when switch:open	*Note 6	1	4000	200	200	1400	1400
NO5	PEGASUS	W(T)562-82/UT device Angled stitch electric under thread trimmer with pneumatic top cover thread trimmer	Fig.3	Fig.51	24V	5V			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	Fig.3	Fig.51	24V	5V			1	6000	200	200	1400	1400	
NO6	PEGASUS	W(T)600,200 series /UT/MS device Condensed stitch electric under thread trimmer with pneumatic top cover thread trimmer	Fig.4	Fig.51	24V	5V		Sewing machine stops when switch:open	*Note 6	1	6000	200	200	1400	1400
NO7	PEGASUS	W(T)600,200 series /UT device Stitch lock pneumatic under thread trimmer with pneumatic top cover thread trimmer	Fig.4	Fig.5	----	24V	5V			1	6000	200	200	1400	1400
NO7A	PEGASUS	Condensed stitch Pneumatic under thread trimmer with pneumatic top cover thread trimmer	Fig.4	Fig.51	24V	5V				1	6000	200	200	1400	1400
NO8	PEGASUS	Do not use !!													
NOD	PEGASUS	W(T)600 series /UT device Stitch lock pneumatic under thread trimmer with pneumatic top cover thread trimmer	Fig.5	----	24V	5V		Sewing machine stops when switch:open	*Note 6	1	6000	200	200	1400	1400
NOF	PEGASUS	EX/BL500,600 series	Fig.6	----	24V	5V				1	6000	200	200	1400	1400

Function	Sewing machine maker	Model name of sewing machine and device	I/O signals of connectors	Junction wiring	Note 1 solenoid voltage	Note 2 DC5V or 12V setting in option A connector	Note 3 Logic of thread trimming protection S6	Note 4 Setting of switch to increase solenoid return speed	Start condensed speed N	Trimming speed T	Low speed L	High speed H	1/2 pos
KA1	KANSAI	M_RX series Automatic thread trimmer with solenoid wiper	Fig.7	Fig.53	30V	12V	Sewing machine stops when switch:short	*Note 6	2	6000	250	250	1400
KA2	KANSAI	D series Automatic thread trimmer with air wiper	Fig.7	Fig.53	30V	12V	Sewing machine stops when switch:short	*Note 6	2	6000	250	250	1400
KA3	KANSAI	F series Air-operated under thread trimmer with air wiper	Fig.8	Fig.53	30V	12V	Sewing machine stops when switch:short	*Note 6	2	6000	250	250	1400
KA4	KANSAI	DX series Air-operated under thread trimmer with air wiper	Fig.7	Fig.53	30V	12V	Sewing machine stops when switch:short	*Note 6	2	6000	250	250	1400
UN1	UNION SPECIAL	33700, 34500 class Solenoid-operated under thread trimmer	Fig.9	Fig.54	30V	12V	Sewing machine stops when switch:open	Always set JP6: FAST	2	4000	200	200	1400
UN2	UNION SPECIAL	34800skcc class Solenoid-operated under thread trimmer	Fig.10	Fig.54	30V	12V	Sewing machine stops when switch:open	Always set JP6: FAST	2	5500	200	200	1400
UN3	UNION SPECIAL	34700 class Push and Pull air-operated under thread trimmer with air wiper	Fig.10	Fig.55	30V	12V	Sewing machine stops when switch:open	Always set JP6: FAST	2	4000	200	200	1400
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													
BR1	BROTHER	FD3, FD4 series	Fig.11	---	24V	5V	Sewing machine stops when switch:short	*Note 6	2	6000	200	200	1400
RM1	RIMOLDI	---	Fig.12	---	24V	5V	Sewing machine stops when switch:short	*Note 6	1	6000	200	200	1400
SRB1	SIRUBA	---	Fig.13	---	24V	5V	Sewing machine stops when switch:short	*Note 6	2	6000	200	200	1700
JMH	JUKI	MH-481-4-4, MH-484-4-4 class	Fig.14	---	24V	5V	Sewing machine stops when switch:short	*Note 6	2	5500	200	200	1900

Note : The function name will display in the order of [YU2], [YU3], [YU4].....[NO1].....[KA1].....[UM1].....[JMH], [YU2] with each press of the [C] key.
The function name will display in the order of [YU2], [JMH].....[UN1].....[KA1].....[NO1].....[YU2] with each press of the [D] key.

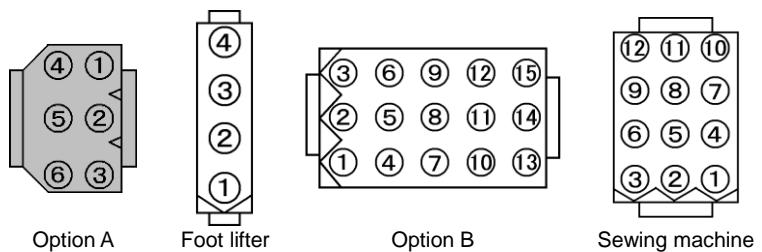
1. Refer to page 14 for how to change the solenoid voltage. The factory setting is 24V.
2. Refer to page 14 for how to change the option A connector DC5V/12V. The factory setting is 12V.

3. Refer to page 40 for how to change the logic of the thread trimming protection signal S6.
The factory setting is sewing machine stop at switch : short.
(The operation of the thread trimming protection device and thread trimming protection sensor switch ON and OFF will not always match. Consult with your dealer on any unclear points.)
4. Refer to page 15 for how to set the switch to increase the solenoid return speed. Always set JP6 to FAST when [UN1], [UN2] and [UN3] are set.
The factory settings is JP6 : SLOW.
5. The chain stitch sewing machine specifications may be changes in part by the sewing machine maker. Consult with your dealer before selecting the functions from the above table.
6. If the electromagnetic solenoid is connected to the trimming output, the JP6 switch should be set to "FAST".

3. I/O signals of connectors

Fig.1 "YAMATO"

Function setting [YU2],[YU3],[YU4] and [YU5]



Presser foot lifter

	0V	1	
IF	Presser foot lifting signal	2	F
OF	Presser foot lifting output +	3	(FU)
	Presser foot lifting output -	4	

Option A (Black connector)

	0V	1	
IA	Emergency stop signal	2	ES
	Power +12V	3	+12V max 40mA
IB	Needle DOWN position priority stop signal	4	PSD
O4	Needle UP position output	5	UPW 12V max 10mA
IC	One shot signal	6	SH

Refer to page 14.

Sewing machine

	Ground	1	Sewing machine body
OB	Wiper output	2	(W)
	+30V	3	
OA	Thread trimming output	4	(T)
	0V	5	
ID	Thread trimming protection signal	6	OP2
OD	Operation/thread trimming output	7	S6
	+30V	8	
IE	Needle lifting/presser foot lifting signal	9	UF
	0V	10	
	+30V	11	
OC	Operation output	12	(OP1)

Caution :
The rotation direction display of the control switch panel will stop when the sewing machine does not work.

Sewing machine stops when S6 : Open

Caution :
Always short circuit No.5 to 6 when the S6 signal is not being connected.

Option B

	0V	1	
I4	-----	2	
O1	Condensed stitch output	3	
VC2	Variable speed command	4	
I5	-----	5	
I1	Operation signal	6	S1
	+5V	7	
	+30V	8	
I2	Thread trimming signal	9	S2
	0V	10	
	+30V	11	
O2	Solenoid output No.2	12	B
O7	-----	13	
O6	-----	14	
O3	Needle DOWN position output	15	OT2

External variable resistor
10kΩ

This will be output if the start/end condensed stitch setting is ON in condensed stitch mode.

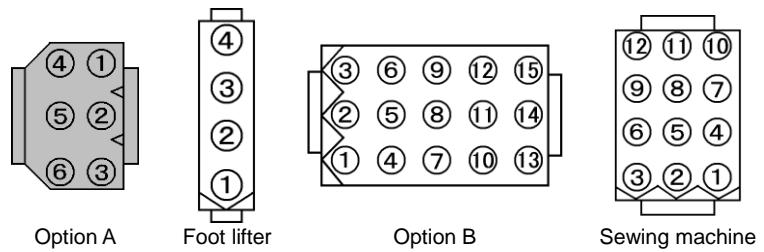
Note : Nothing is output.

Please refer to page 14.
How to change 24/30V of solenoid power source.

Note) The thread trimming (operation) will differ from the [YU2] to [YU5] simple settings, so select the setting value according to the sewing machine being used.

Fig.2 "PEGASUS"

Function setting
[NO1], [NO1A], [NO3], [NO3A] and [NO4]



Presser foot lifter

	0V	1	
IF	Presser foot lifting signal	2	○ ○ F
OF	Presser foot lifting output +	3	○ FU
	Presser foot lifting output -	4	

Option A (Black connector)

	0V	1	
IA	Solenoid input signal IO1	2	○ ○ IO1
	Power +5V (Change JP3 connector)	3	+5V max 40mA
IB	Output for the PS1 counting	4	○ ○ PS1
O4	Needle UP position output	5	○ ○ S0
IC	Run signal (Low speed)	6	○ ○

Refer to page 14.

Sewing machine

	Ground	1	
OB	Wiper output	2	○ W
	+24V	3	
OA	Thread trimming output	4	○ T
	0V	5	
ID	Thread trimming protection signal	6	○ ○ S6
OD	Thread release output	7	○ L
	+24V	8	
IE	Emergency stop signal	9	○ ○ ES
	0V	10	
	+24V	11	
OC	Needle cooler output	12	○ NCL

Caution :
The rotation direction display of the control switch panel will stop when the sewing machine does not work.

Sewing machine stops when S6 : Open

Caution :
Always short circuit No.5 to 6 when the S6 signal is not being connected.

Option B

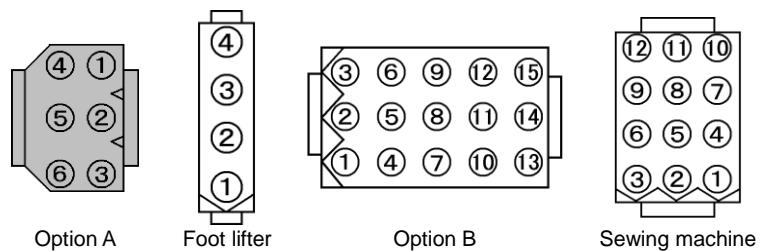
	0V	1	
I4	Needle DOWN position priority stop signal	2	
O1	Thread trimming output	3	
VC2	Variable speed command	4	
I5	Thread trimmer cancel signal	5	○ ○ TL
I1	Operation signal	6	○ ○ S1
	+12V (Change JP4 connector)	7	
	+24V	8	
I2	Thread trimming signal	9	○ ○ S2
	0V	10	
	+24V	11	
O2	Needle cooler output	12	○ NCL
O7	Output for the PS1 counting	13	
O6	Virtual output 1	14	
O3	Always ON output	15	○ UPW

External variable resistor 10kΩ

Note) The thread trimming (operation) will differ from the [NO1] to [NO4] simple settings,
so select the setting value according to the sewing machine being used.

Fig.3 "PEGASUS"

Function setting [NO5], [NO5A]



Presser foot lifter

	0V	1	
IF	Needle lift, presser foot signal	2	F
OF	Presser foot lifting output +	3	(FU)
	Presser foot lifting output -	4	

Option A (Black connector)

	0V	1	
IA	Solenoid input signal IO1	2	IO1
	Power +5V (Change JP3 connector)	3	+5V max 40mA
IB	Output for the PS1 counting	4	PS1
O4	Needle UP position output	5	UPW 5V max 10mA
IC	Run signal (Low speed)	6	S0

Refer to page 14.

Sewing machine

	Ground	1	
OB	Wiper output	2	(W)
	+24V	3	
OA	Thread trimming output	4	(T)
	0V	5	
ID	Thread trimming protection signal	6	
OD	Thread release output	7	(L)
	+24V	8	
IE	Emergency stop signal	9	(ES)
	0V	10	
	+24V	11	
OC	Output for slow start	12	(SL)

Caution :
The rotation direction display of the control switch panel will stop when the sewing machine does not work.

Sewing machine stops when S6 : Open

Caution :
Always short circuit No.5 to 6 when the S6 signal is not being connected.

SL output will be turned ON only for the No. of stitches set in the [P] mode SLN function.

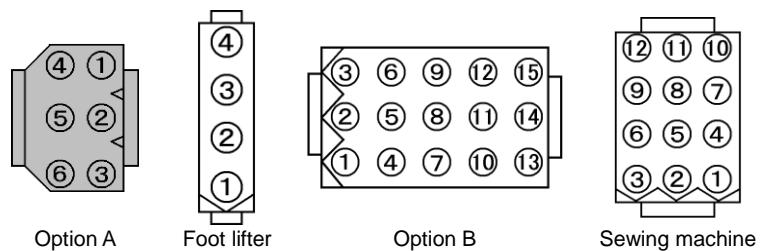
Option B

	0V	1	
I4	Needle DOWN position priority stop signal	2	
O1	Thread trimming output	3	
VC2	Variable speed command	4	
I5	Thread trimmer cancel signal	5	TL
I1	Operation signal	6	S1
	+12V (Change JP4 connector)	7	(T)
	+24V	8	
I2	Thread trimming signal	9	S2
	0V	10	
	+24V	11	
O2	Needle cooler output	12	(NCL)
O7	Output for the PS1 counting	13	
O6	Virtual output 1	14	
O3	Always ON output	15	UPW

Note) The thread trimming (operation) will differ from the [NO5], [NO5A] simple settings, so select the setting value according to the sewing machine being used.

Fig.4 "PEGASUS"

Function setting [NO7] and [NO7A]



Presser foot lifter

	0V	1	
IF	Presser foot lifting signal	2	○ F
OF	Presser foot lifting output +	3	(FU)
	Presser foot lifting output -	4	

Option A (Black connector)

	0V	1	
IA	Solenoid input signal IO1	2	○ IO1
	Power +5V (Change JP3 connector)	3	+5V max 40mA
IB	Output for the PS1 counting	4	○ PS1
O4	Needle UP position output	5	○ S0 UPW 5V max 10mA
IC	Run signal (Low speed)	6	

Refer to page 14.

Sewing machine

	Ground	1	
OB	Wiper output	2	○ W
	+24V	3	
OA	Thread trimming output	4	○ T
	0V	5	
ID	Thread trimming protection signal	6	○ S6
OD	Thread release output	7	○ L
	+24V	8	
IE	Emergency stop signal	9	○ ES
	0V	10	
	+24V	11	
OC	Condensed stitch output	12	○ SL

Caution :
The rotation direction display of the control switch panel will stop when the sewing machine does not work.

Sewing machine stops when S6 : Open

Caution :
Always short circuit No.5 to 6 when the S6 signal is not being connected.

SL output will be turned ON only for the No. of stitches set in the [P] mode SLN function.

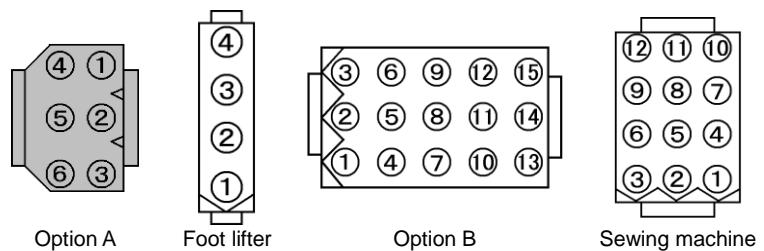
Option B

	0V	1	
I4	Needle DOWN position priority stop signal	2	
O1	Thread trimming output	3	
VC2	Variable speed command	4	
I5	Thread trimmer cancel signal	5	○ TL
I1	Operation signal	6	○ S1
	+12V (Change JP4 connector)	7	
	+24V	8	
I2	Thread trimming signal	9	○ S2
	0V	10	
	+24V	11	
O2	Needle cooler output	12	○ NCL
O7	Output for the PS1 counting	13	
O6	Virtual output 1	14	○ UPW
O3	Always ON output	15	

Note) The thread trimming (operation) will differ from the [NO7], [NO7A] simple settings, so select the setting value according to the sewing machine being used.

Fig.5 "PEGASUS"

Function setting [NOD]



Presser foot lifter

	0V	1	
IF	Presser foot lifting signal	2	
OF	Presser foot lifting output +	3	
	Presser foot lifting output -	4	

Option A (Black connector)

	0V	1	
IA	Solenoid input signal IO1	2	
	Power +5V (Change JP3 connector)	3	+5V max 40mA
IB	Output for the PS1 counting	4	
O4	Needle UP position output	5	UPW 5V max 10mA
IC	Run signal (Low speed)	6	

Refer to page 14.

Sewing machine

	Ground	1	
OB	[TF] output	2	
	+24V	3	
OA	Thread trimming output	4	
	0V	5	
ID	Thread trimming protection signal	6	
OD	[TF] output	7	
	+24V	8	
IE	Emergency stop signal	9	
	0V	10	
	+24V	11	
OC	Output for needle cooler	12	

Caution :
The rotation direction display of the control switch panel will stop when the sewing machine does not work.

Sewing machine stops when S6 : Open

Caution :
Always short circuit No.5 to 6 when the S6 signal is not being connected.

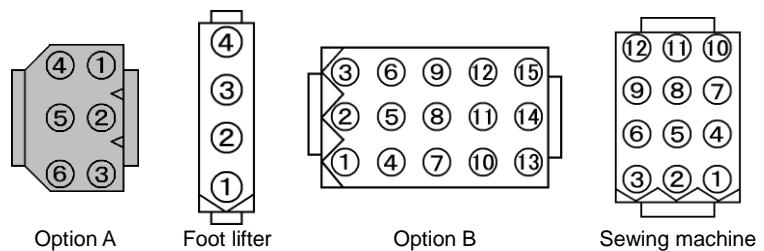
Option B

	0V	1	
I4	----	2	
O1	Thread trimming output	3	
VC2	Variable speed command	4	
I5	Thread trimmer cancel signal	5	
I1	Operation signal	6	
	+12V (Change JP4 connector)	7	
	+24V	8	
I2	Thread trimming signal	9	
	0V	10	
	+24V	11	
O2	Output for needle cooler	12	
O7	Output for the PS1 counting	13	
O6	Virtual output 1	14	
O3	Always ON output	15	

External variable resistor 10kΩ

Fig.6 "PEGASUS"

Function setting [NOF]



Presser foot lifter

	0V	1	
IF	Presser foot lifting signal	2	
OF	Presser foot lifting output +	3	
	Presser foot lifting output -	4	

Option A (Black connector)

	0V	1	
IA	Solenoid input signal IO1	2	
	Power +5V (Change JP3 connector)	3	+5V max 40mA
IB	Output for the PS1 counting	4	
O4	Needle UP position output	5	UPW 5V max 10mA
IC	Run signal (Low speed)	6	

Refer to page 14.

Sewing machine

	Ground	1	Sewing machine body
OB	Output for blower	2	
	+24V	3	
OA	Thread trimming output	4	
	0V	5	
ID	Thread trimming protection signal	6	
OD	Thread release output	7	
	+24V	8	
IE	Emergency stop signal	9	
	0V	10	
	+24V	11	
OC	Output for needle cooler	12	

Caution :
The rotation direction display of the control switch panel will stop when the sewing machine does not work.

Sewing machine stops when S6 : Open

Caution :
Always short circuit No.5 to 6 when the S6 signal is not being connected.

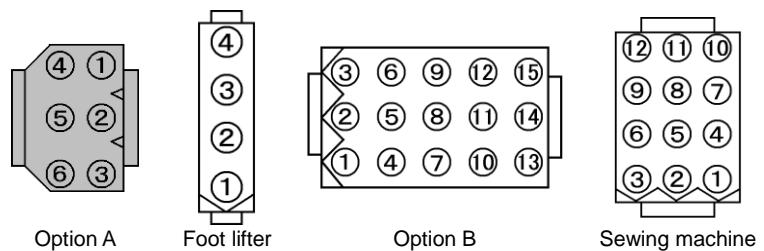
Option B

	0V	1	
I4	-----	2	
O1	Thread trimming output	3	
VC2	Variable speed command	4	
I5	Thread trimmer cancel signal	5	
I1	Operation signal	6	
	+12V (Change JP4 connector)	7	
	+24V	8	
I2	Thread trimming signal	9	
	0V	10	
	+24V	11	
O2	Output for needle cooler	12	
O7	Output for the PS1 counting	13	
O6	Virtual output 1	14	
O3	Always ON output	15	

External variable resistor 10kΩ

Fig.7 "KANSAI"

Function setting [KA1], [KA2] and [KA4]



Presser foot lifter

	0V	1	
IF	Presser foot lifting signal	2	F
OF	Puller output +	3	(PUL)
	Puller output -	4	

Option A (Black connector)

	0V	1	
IA	Needle UP position priority stop signal	2	PSU
	Power +12V	3	+12V max 40mA
IB	Needle DOWN position priority stop signal	4	PSD
O4	Needle UP position output	5	UPW 12V max 10mA
IC	One shot signal	6	SH

Refer to page 14.

Sewing machine

	Ground	1	
OB	Wiper output	2	(W)
	+30V	3	
OA	Thread trimming output	4	(T)
	0V	5	
ID	Thread trimming protection signal	6	
OD	Operation output	7	OP1
	+30V	8	
IE	Emergency stop signal	9	ES
	0V	10	
	+30V	11	
OC	Condensed stitch output	12	(B)

Caution :
The rotation direction display of the control switch panel will stop when the sewing machine does not work.

Sewing machine stops when S6 : Short

This will be output if the start/end condensed stitch setting is ON in condensed stitch mode.

Option B

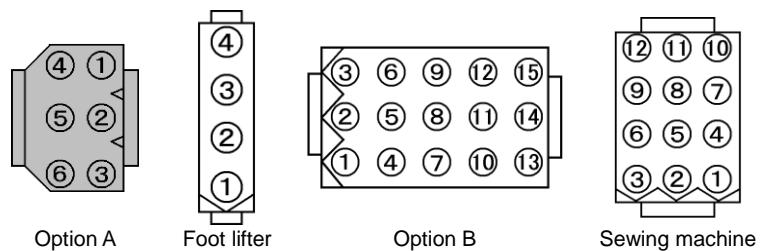
	0V	1	
I4	Virtual input IO7	2	IO7
O1	Virtual output OT2	3	
VC2	Variable speed command	4	
I5	----	5	
I1	Signal output to virtual output 3 when stopped	6	IS3
	+5V	7	
	+30V	8	
I2	Needle lifting signal	9	U
	0V	10	
	+30V	11	
O2	Presser foot lifting output	12	(FU)
O7	----	13	
O6	----	14	
O3	Thread tension output	15	(TF)

Please refer to page 14.
How to change 24/30V of solenoid power source.

Note) The thread trimming (operation) will differ from the [KA1], [KA2] and [KA4] simple settings, so select the setting value according to the sewing machine being used.

Fig.8 "KANSAI"

Function setting [KA3]



Presser foot lifter

	0V	1	
IF	Presser foot lifting signal	2	○ F
OF	Puller output +	3	○ PUL

	Puller output -	4	
--	-----------------	---	--

Option A (Black connector)

	0V	1	
IA	Needle UP position priority stop signal	2	○ PSU
	Power +12V	3	+12V max 40mA
IB	Needle DOWN position priority stop signal	4	○ PSD
O4	Needle UP position output	5	UPW 12V max 10mA
IC	One shot signal	6	○ SH

Refer to page 14.

Sewing machine

	Ground	1	
OB	Wiper output	2	○ W
	+30V	3	
OA	Thread trimming output	4	○ T
	0V	5	
ID	Thread trimming protection signal	6	○ PSD
OD	Thread release output	7	○ L
	+30V	8	
IE	Emergency stop signal	9	○ ES
	0V	10	
	+30V	11	
OC	Condensed stitch output	12	○ B

Caution :
The rotation direction display of the control switch panel will stop when the sewing machine does not work.

Sewing machine stops when S6 : Short

This will be output if the start/end condensed stitch setting is ON in condensed stitch mode.

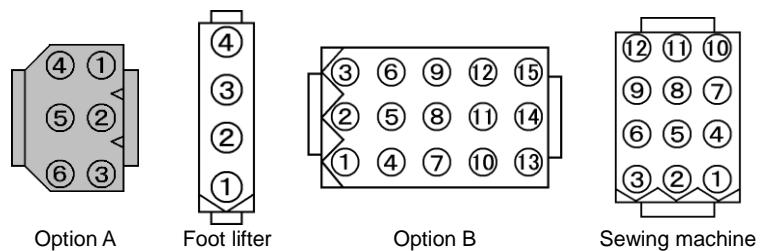
Option B

	0V	1	
I4	Virtual input IO7	2	○ IO7
O1	Virtual output OT2	3	
VC2	Variable speed command	4	
I5	----	5	
I1	Signal output to virtual output 3 when stopped	6	○ IS3
	+5V	7	
	+30V	8	
I2	Needle lifting signal	9	○ U
	0V	10	
	+30V	11	
O2	Presser foot lifting output	12	○ FU
O7	----	13	
O6	----	14	
O3	Thread tension output	15	○ TF

Please refer to page 14.
How to change 24/30V of solenoid power source.

Fig.9 "UNION SPECIAL"

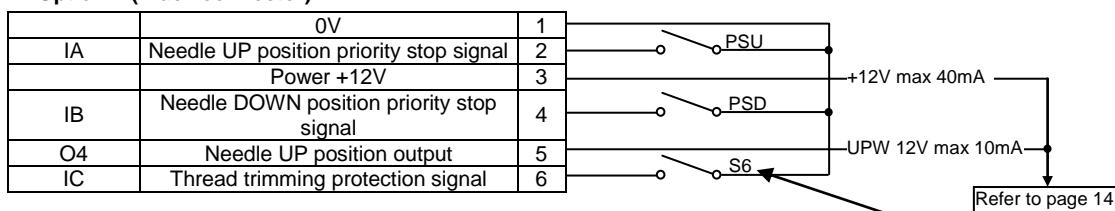
Function setting [UN1]



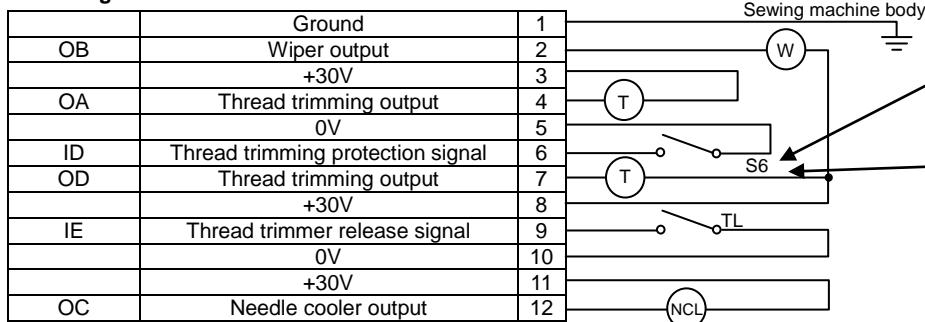
Presser foot lifter

	0V	1	
IF	Presser foot lifting signal	2	
OF	Presser foot lifting output +	3	
	Presser foot lifting output -	4	

Option A (Black connector)



Sewing machine



Caution :
The rotation direction display of the control switch panel will stop when the sewing machine does not work.

Sewing machine stops when S6 : Open

Caution :
Always short circuit No.5 to 6 when the S6 signal is not being connected.

Option B

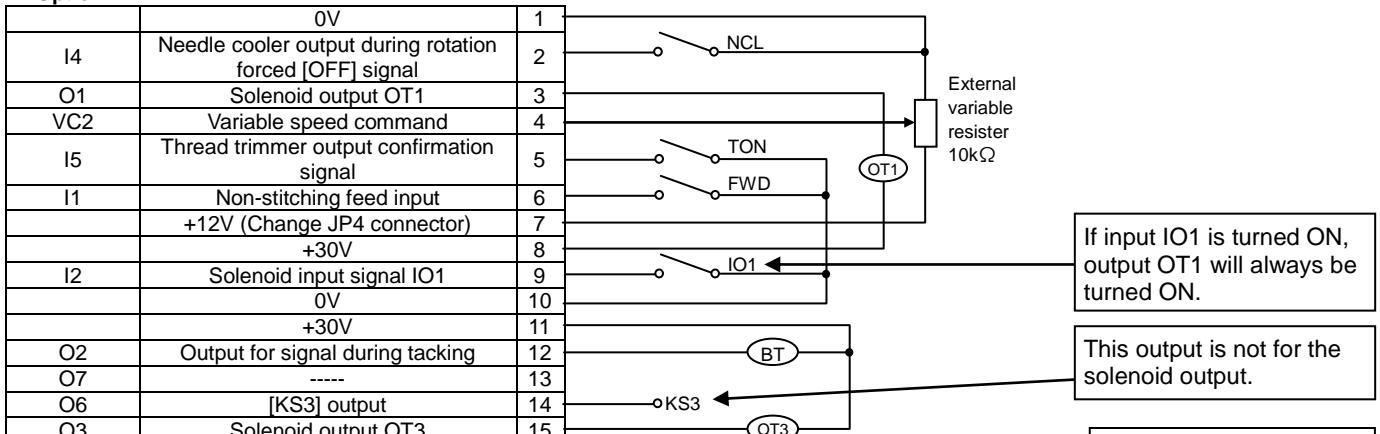
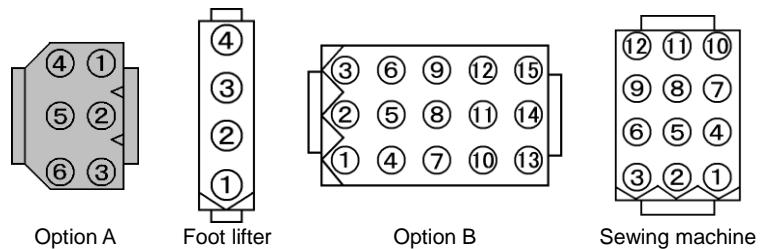


Fig.10 "UNION SPECIAL"

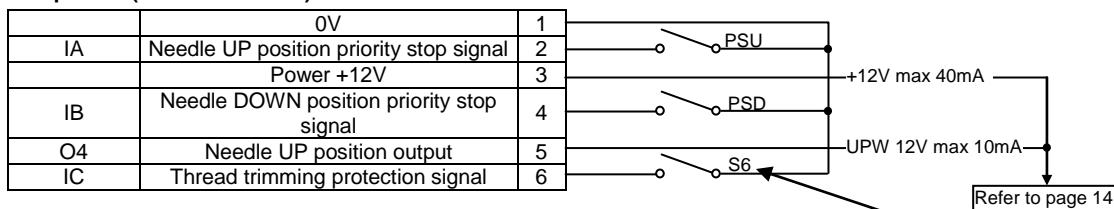
Function setting [UN2], [UN3]



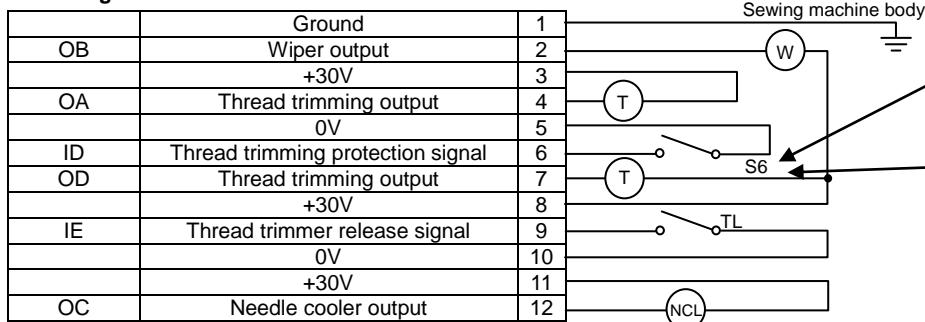
Presser foot lifter

	0V	1	
IF	Presser foot lifting signal	2	○ F
OF	Presser foot lifting output +	3	(FU)
	Presser foot lifting output -	4	

Option A (Black connector)



Sewing machine

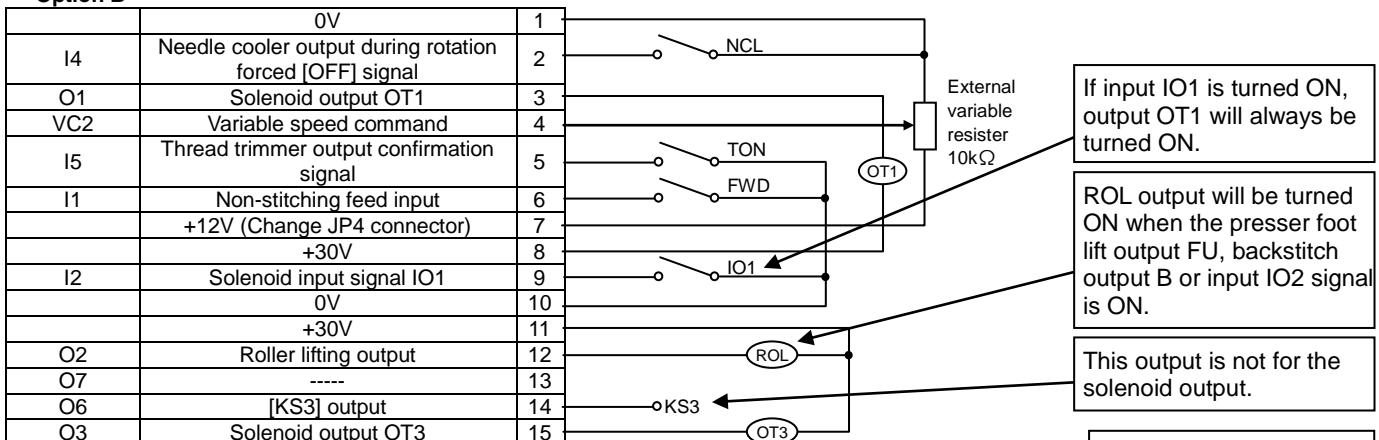


Caution :
The rotation direction display of the control switch panel will stop when the sewing machine does not work.

Sewing machine stops when S6 : Open

Caution :
Always short circuit No.5 to 6 when the S6 signal is not being connected.

Option B



If input IO1 is turned ON, output OT1 will always be turned ON.

ROL output will be turned ON when the presser foot lift output FU, backstitch output B or input IO2 signal is ON.

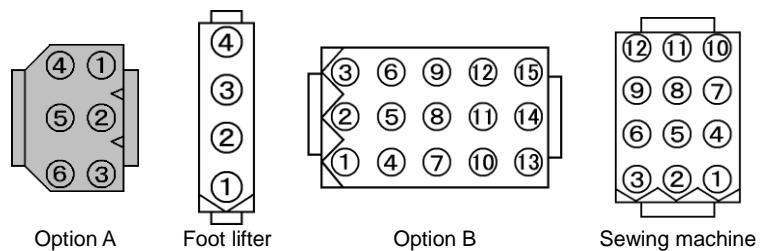
This output is not for the solenoid output.

Please refer to page 14.
How to change 24/30V of solenoid power source.

Note) The thread trimming (operation) will differ from the [UN2], [UN3] simple settings, so select the setting value according to the sewing machine being used.

Fig.11 "BROTHER"

Function setting [BR1]



Presser foot lifter

	0V	1	
IF	Presser foot lifting signal	2	
OF	Presser foot lifting output +	3	
	Presser foot lifting output -	4	

Option A (Black connector)

	0V	1	
IA	Needle UP position priority stop signal	2	
	Power +5V (Change JP3 connector)	3	+5V max 40mA
IB	Needle DOWN position priority stop signal	4	
O4	Needle UP position output	5	UPW 5V max 10mA
IC	One shot signal	6	

Refer to page 14.

Sewing machine

	Ground	1	
OB	Wiper output	2	
	+24V	3	
OA	Thread trimming output	4	
	0V	5	
ID	Thread trimming protection signal	6	
OD	Thread release output	7	
	+24V	8	
IE	Emergency stop signal	9	
	0V	10	
	+24V	11	
OC	Needle cooler output	12	

Caution :
The rotation direction display of the control switch panel will stop when the sewing machine does not work.

Sewing machine stops when S6 : Short

Option B

	0V	1	
I4	----	2	
O1	Solenoid output OT1	3	
VC2	Variable speed command	4	
I5	----	5	
I1	Solenoid input signal IO1	6	
	+5V	7	
	+24V	8	
I2	Needle lifting signal	9	
	0V	10	
	+24V	11	
O2	Operation output	12	
O7	----	13	
O6	----	14	
O3	Condensed stitch output	15	

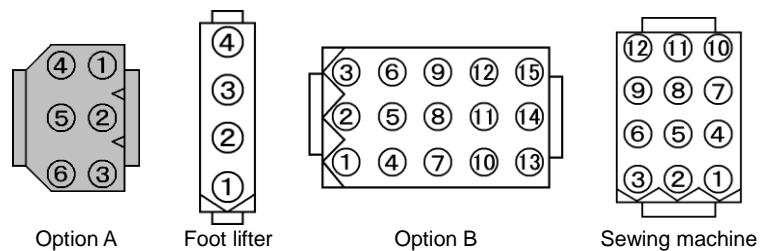
External variable resistor 10kΩ

If input IO1 is turned ON, output OT1 will always be turned ON.

This will be output if the start/end condensed stitch setting is ON in condensed stitch mode.

Fig.12 "RIMOLDI"

Function setting [RM1]



Presser foot lifter

	0V	1	
IF	Presser foot lifting signal	2	F
OF	Presser foot lifting output +	3	(FU)
	Presser foot lifting output -	4	

Option A (Black connector)

	0V	1	
IA	Needle UP position priority stop signal	2	PSU
	Power +5V (Change JP3 connector)	3	+5V max 40mA
IB	Needle DOWN position priority stop signal	4	PSD
O4	Needle UP position output	5	UPW 5V max 10mA
IC	One shot signal	6	SH

Refer to page 14.

Sewing machine

	Ground	1	
OB	Wiper output	2	
	+24V	3	
OA	Thread trimming output	4	T
	0V	5	
ID	Thread trimming protection signal	6	
OD	Thread release output	7	L
	+24V	8	
IE	Emergency stop signal	9	ES
	0V	10	
	+24V	11	
OC	Needle cooler output	12	NCL

Caution :
The rotation direction display of the control switch panel will stop when the sewing machine does not work.

Sewing machine stops when S6 : Short

Option B

	0V	1	
I4	----	2	
O1	Solenoid output OT1	3	
VC2	Variable speed command	4	
I5	----	5	
I1	Solenoid input signal IO1	6	IO1
	+5V	7	
	+24V	8	
I2	Needle lifting signal	9	U
	0V	10	
	+24V	11	
O2	Operation output	12	OPT
O7	----	13	
O6	----	14	B
O3	Condensed stitch output	15	

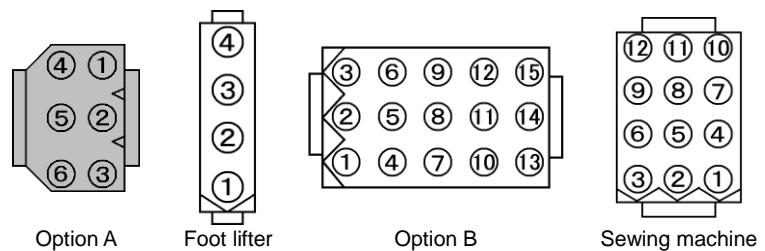
External variable resistor 10kΩ

If input IO1 is turned ON, output OT1 will always be turned ON.

This will be output if the start/end condensed stitch setting is ON in condensed stitch mode.

Fig.13 "SIRUBA"

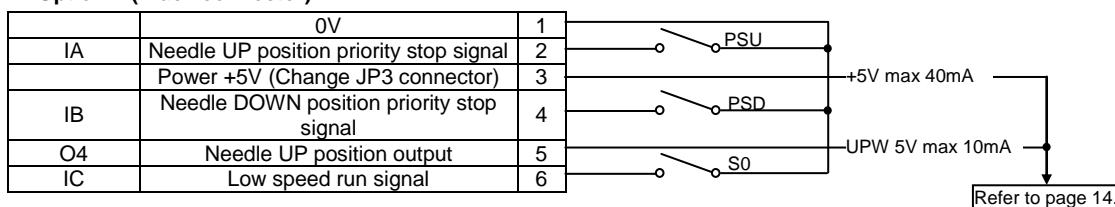
Function setting [SRB1]



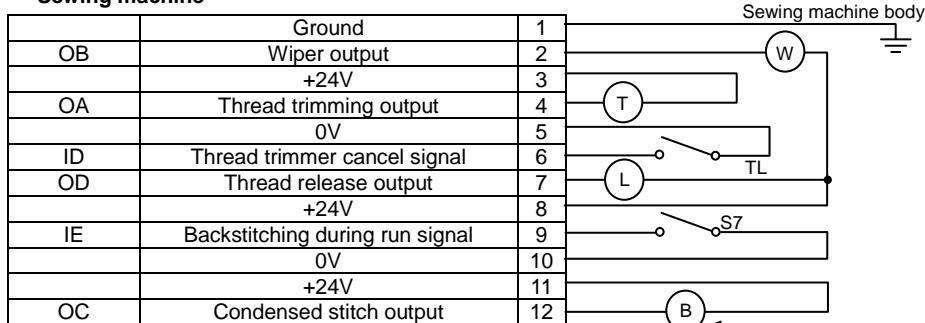
Presser foot lifter

	0V	1	
IF	Presser foot lifting signal	2	F
OF	Presser foot lifting output +	3	(FU)
	Presser foot lifting output -	4	

Option A (Black connector)



Sewing machine



This will be output if the start/end condensed stitch setting is ON in condensed stitch mode.

Option B

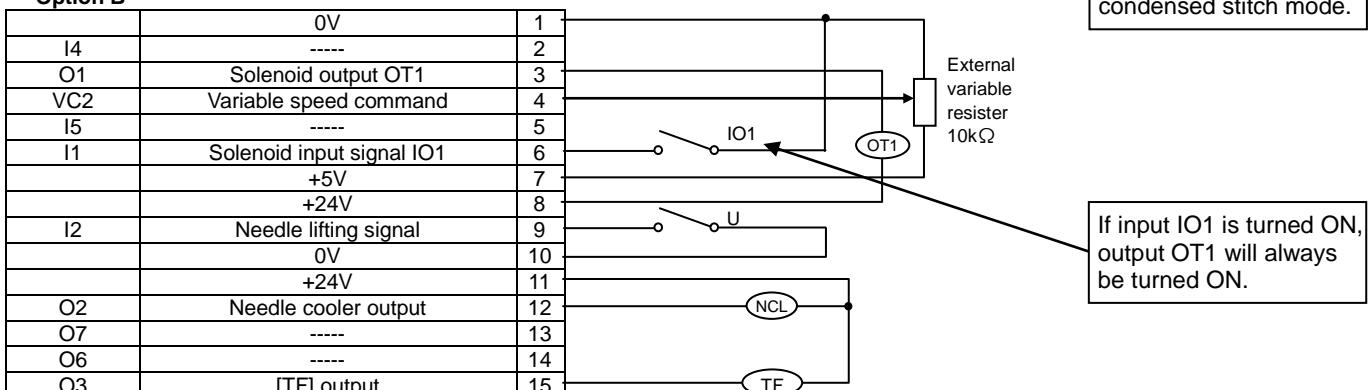
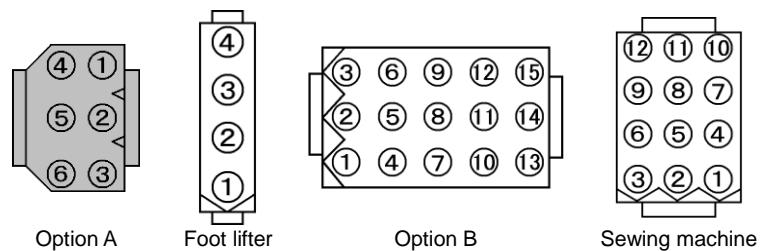


Fig.14 "JUKI"

Function setting [JMH]



Presser foot lifter

	0V	1	
IF	Presser foot lifting signal	2	F
OF	Presser foot lifting output +	3	(FU)

Presser foot lifting output - 4

Option A (Black connector)

	0V	1	
IA	Needle UP position priority stop signal	2	PSU
	Power +5V (Change JP3 connector)	3	+5V max 40mA
IB	Needle DOWN position priority stop signal	4	PSD
O4	Needle UP position output	5	S0
IC	Low speed run signal	6	UPW 5V max 10mA

Refer to page 14.

Sewing machine

	Ground	1	Sewing machine body
OB	Wiper output	2	(W)
	+24V	3	
OA	Thread trimming output	4	(T)
	0V	5	
ID	Thread trimmer cancel signal	6	TL
OD	Thread release output	7	(L)
	+24V	8	
IE	Backstitching during run signal	9	S7
	0V	10	
	+24V	11	
OC	Condensed stitch output	12	(B)

This will be output if the start/end condensed stitch setting is ON in condensed stitch mode.

Option B

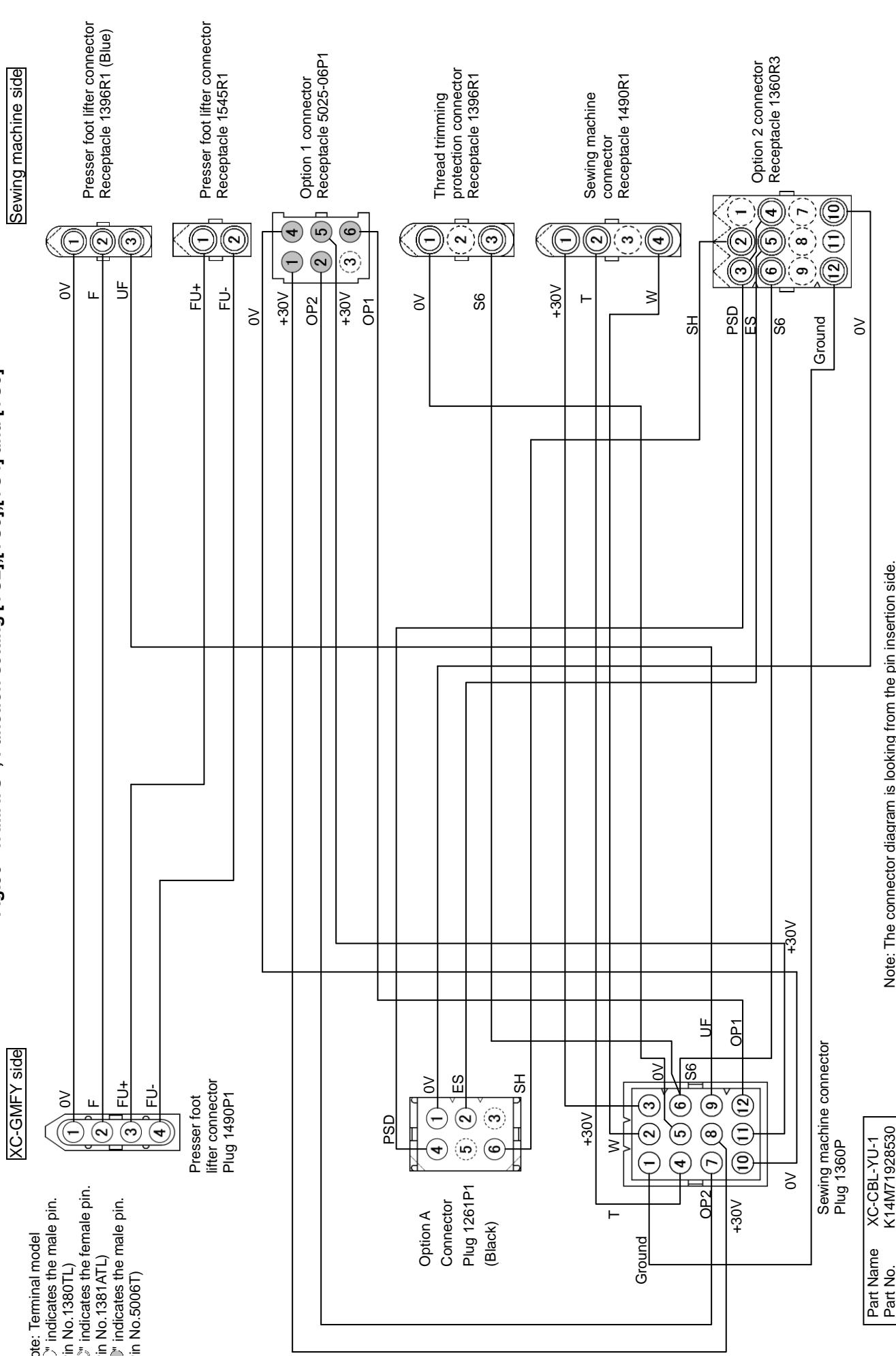
	0V	1	
I4	----	2	
O1	Solenoid output OT1	3	
VC2	Variable speed command	4	
I5	----	5	
I1	Solenoid input signal IO1	6	IO1
	+5V	7	
	+24V	8	
I2	Needle lifting signal	9	U
	0V	10	
	+24V	11	
O2	Needle cooler output	12	(NCL)
O7	----	13	
O6	----	14	
O3	[TF] output	15	(TF)

External variable resistor 10kΩ

If input IO1 is turned ON, output OT1 will always be turned ON.

4. Junction wiring

Fig.50 "YAMATO", Function setting [YU2],[YU3],[YU4] and [YU5]



XC-GMFY side

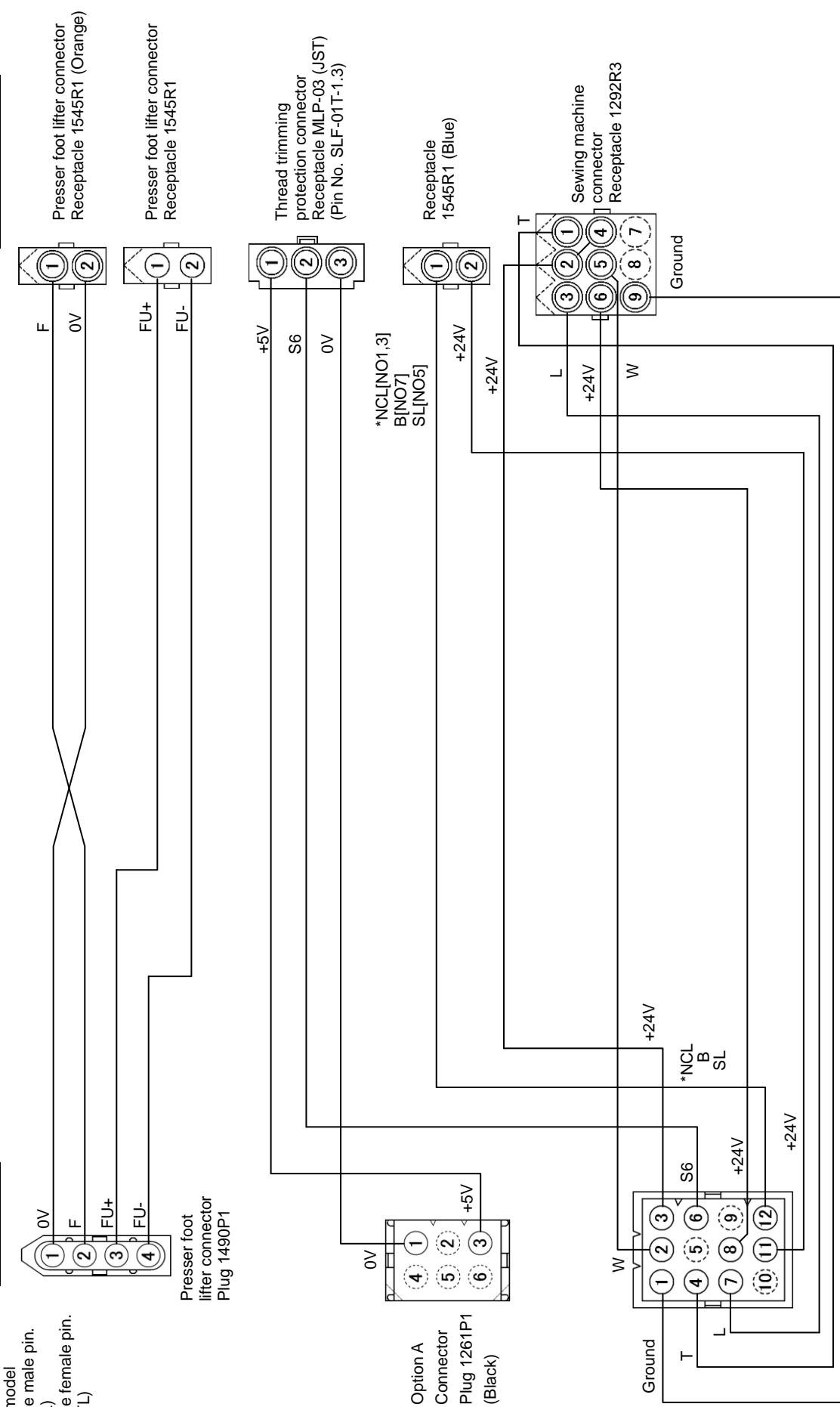


Fig51 "PEGASUS", Function setting [NO1],[NO1A],[NO3A],[NO5A],[NO7] and [NO7A]

Note: 1. The connector diagram is looking from the pin insertion side.
2. * The NCL output will be applied for function settings [NO1], [NO3].
The B output will be applied for function settings [NO7].
The SL output will be applied for function settings [NO5].

Part Name	XC-CBL-PP-1
Part No.	K14M71928730

Sewing machine connector
Plug 1360P

Note: Terminal model
 indicates the male pin.
 indicates the female pin.
(Pin No.1380TL)
(Pin No.1381ATL)

XC-GMFY side

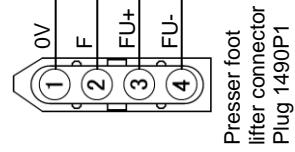
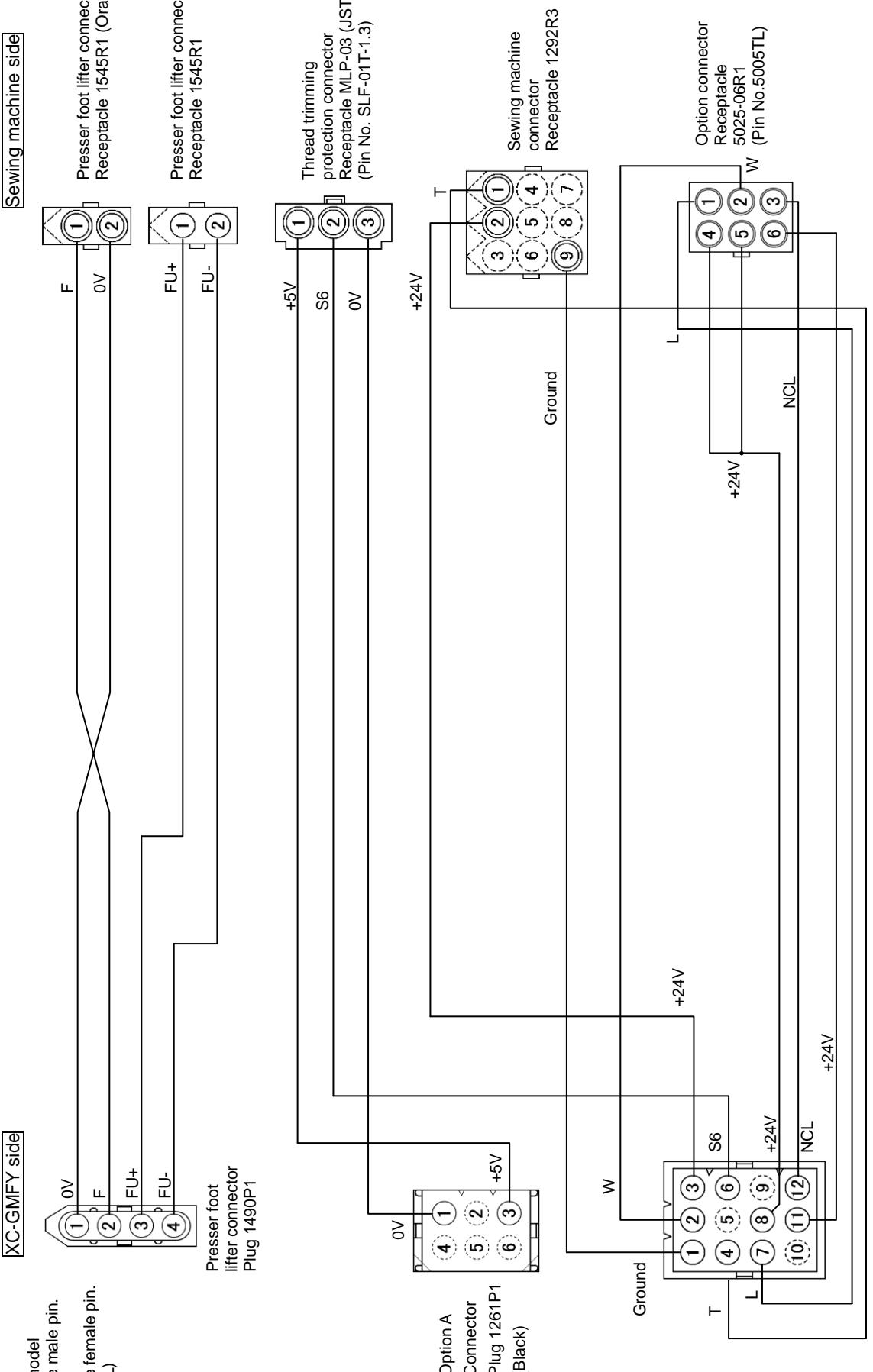


Fig.52 "PEGASUS", Function setting [NO4]

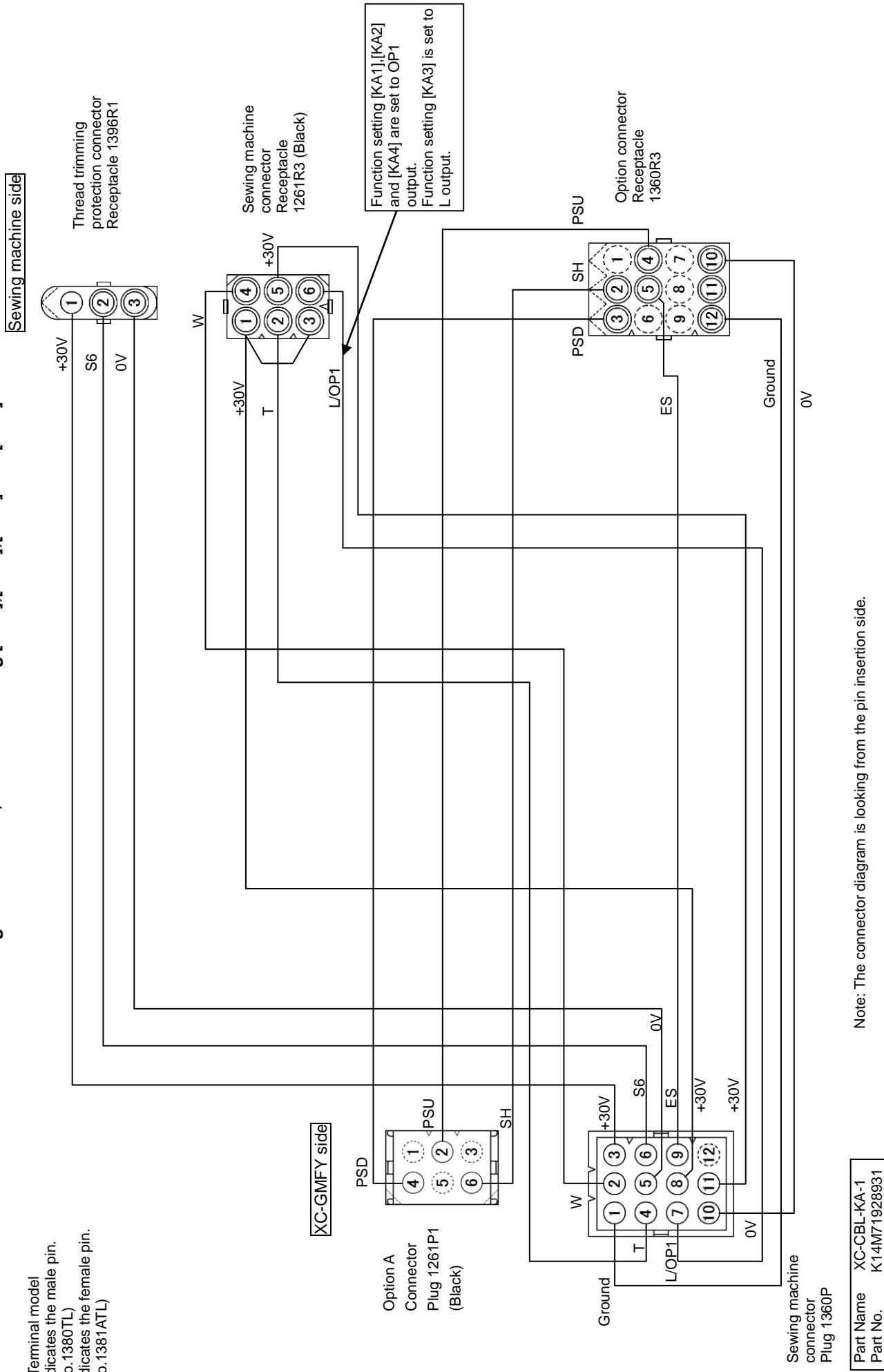


Part Name XC-CBL-PP-2
 Part No. K14M71928830

Note: The connector diagram is looking from the pin insertion side.

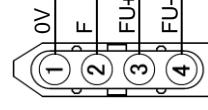
Sewing machine connector
 Plug 1360P

Fig.53 "KANSAI", Function setting [KA1],[KA2],[KA3] and [KA4]



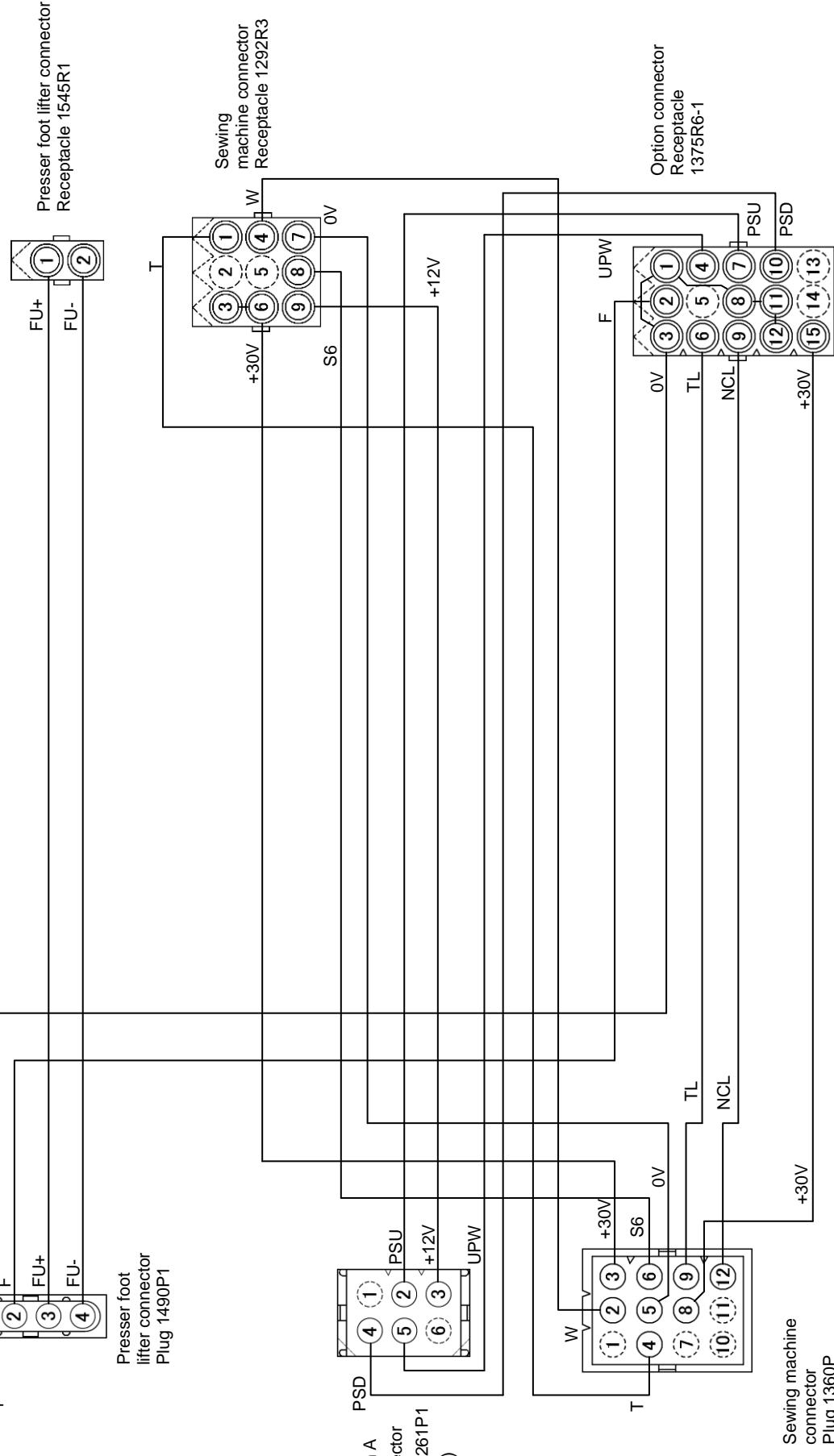
Note: Terminal model
 indicates the male pin.
 indicates the female pin.
(Pin No.1380TL)
(Pin No.1381ATL)

XC-GMFY side



Presser foot lifter connector
Plug 1490P1

Sewing machine side



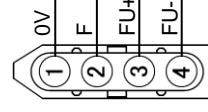
Part Name XC-CBL-UN-1
Part No. K14M71925030

Note: The connector diagram is looking from the pin insertion side.

Fig.54 "UNION", Function setting [UN1] and [UN2]

Note: Terminal model
Pin No.1380TL
Pin No.1381ATL
indicates the male pin.
indicates the female pin.

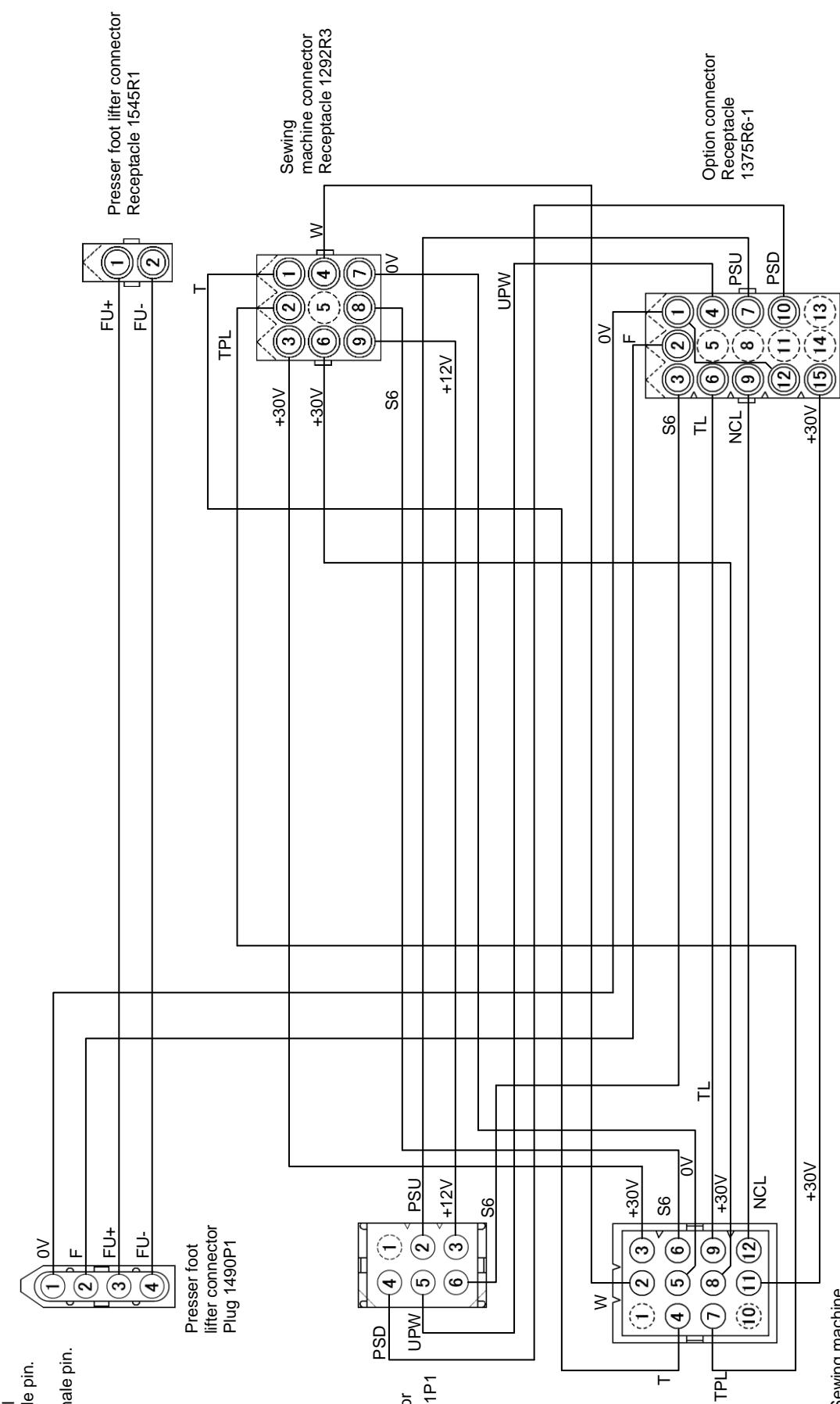
XC-GMFY side



Presser foot lifter connector
Plug 1490P1

Fig.55 "UNION", Function setting [UN3]

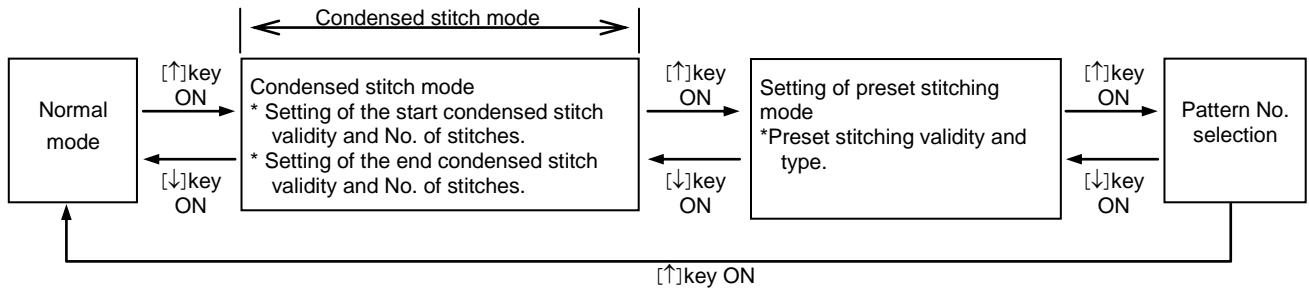
Sewing machine side



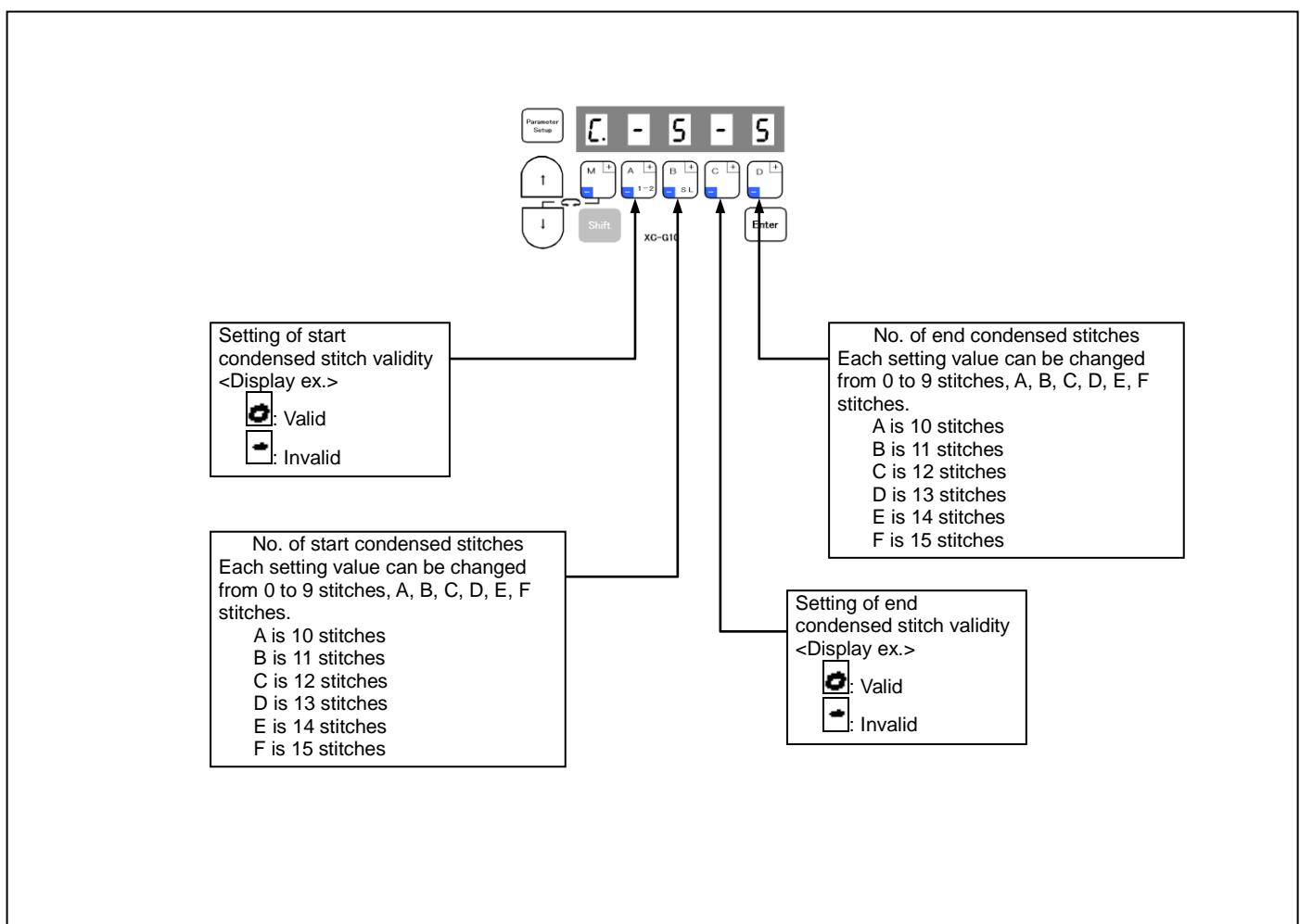
Part Name XC-CBL-UN-2
Part No. K14M7925130

Note: The connector diagram is looking from the pin insertion side.

5. Displays and function of each key in the condensed stitch mode



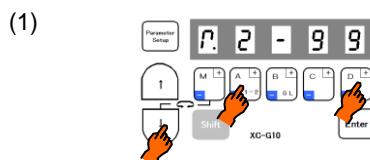
When the [↑] key is turned ON, will display above the [M] key, and the condensed stitch mode will be entered. The validity and No. of stitches of start and end condensed stitch can be set here.



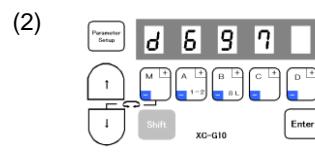
14 How to use Simple setting of Program Mode [3] (for lock stitch trimming machine)

1.How to use Simple setting of Program Mode [3] (for lock stitch trimming machine)

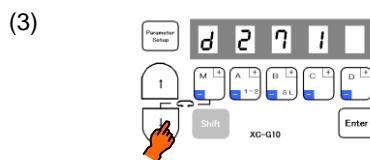
To set the functions for the DÜRKOPP ADLER thread trimming sewing machine in one step
(For example, to set for the 271 class, "DÜRKOPP ADLER").....Function setting [D271]



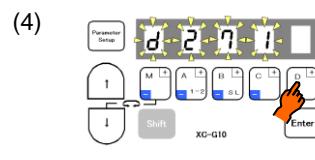
*Enter the program mode [3].
([↓] + [A] + [D] keys)



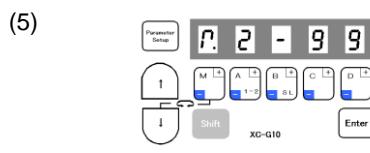
*The mode will change to the program mode [3].



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



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



*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

- 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.
- 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.
- 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.

2. Simple setting table for lock stitch sewing machine

Function	Digital display	Sewing machine maker	Model name of sewing machine and device	I/O signals of connectors	Junction wiring	Note 1 solenoid voltage	Note 2 DC5V or 12V setting in option A connector	1/2 pos	High speed H	Low speed L	Trimming speed T	Start condensed speed N	End condensed speed V
D697	d6g7	DÜRKOPP ADLER	697-15000 class	Fig.20	Fig.57	24V	12V	2	1500	250	150	700	700
D271	d271	DÜRKOPP ADLER	271-14000,272-14000 class	Fig.21	Fig.58	24V	12V	2	3000	170	250	1500	1500
D273	d273	DÜRKOPP ADLER	273-14000,274-14000 class	Fig.22	Fig.59	24V	12V	2	3000	170	250	1500	1500
B715	b715	BROTHER	DB2-B705,DB2-B707,DB2-B715 class	---	30V	5V	2	4300	215	215	1800	1800	
B716	b716	BROTHER	DB2-B716-?,DB2-B716-1,DB2-B716-?,DB2-B716-5 class	---	30V	5V	2	3500	215	215	1800	1800	
B737	b737	BROTHER	DB2-B737-1,DB2-B737-3,DB2-B737-5 class	---	30V	5V	2	4000	215	215	1800	1800	
B740	b740	BROTHER	DB2-B746-5,DB2-B746-7,DB2-B746-8,DB2-B746-9,DB2-B747-5,DB2-B748-5,DB2-B748-7 class	---	30V	5V	2	2000	215	215	1800	1800	
B757	b757	BROTHER	DB2-B757 class	---	30V	5V	2	5000	215	215	1800	1800	
B770	b770	BROTHER	DB2-B772,DB2-B774,DB2-B7740,DB2-B778 class	---	30V	5V	2	4500	215	215	1800	1800	
B790	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	---	30V	5V	2	3500	215	215	1800	1800	
B830	b830	BROTHER	DB2-B831,DB2-B833 class	---	30V	5V	2	3000	215	215	1800	1800	
BLT	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-B8	---	30V	5V	2	3000	185	185	1000	1000	
BLZ	blz	BROTHER	LZ2-B852,LZ2-B853,LZ2-B854,LZ2-B856,LZ2-B857 class	---	30V	5V	2	3000	185	185	1800	1800	
J500	j500	JUKI	DDL-500,DMN-5420NFA-6-WB class	---	30V	5V	2	5000	200	200	1700	1900	
J505	j505	JUKI	DDL-505,DDL-505A,DDL-506,DDL-506E,DDL-560-5,DDL-560-5,DDL-560-5,DLU-5494NBB-6-WB,PLW-1245-6,P,LW-1257-6,PLW-1266-6,PLW-1266-6 class	---	30V	5V	2	4000	200	200	1700	1900	
J555	j555	JUKI	DDL-555-2-2B,DDL-555-2-4B,DDL-555ON,DDL-5570,DDL-557	---	30V	5V	2	4000	200	200	1700	1900	
JDL	jdl	JUKI	1,DDL-5580 class	---	30V	5V	2	4200	200	200	1700	1900	
JDU	jdu	JUKI	DLD-432-5,DLD-436-5,DLW-5400N-6,DLW-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-5490ON-6,DMN-530-5,DMN-531-5 class	---	30V	5V	2	2000	200	200	1700	1900	
JLH	jlh	JUKI	DNU-241H-5,DNU-241H-6,DSC-244-6,DSC-244-6,DSC-245-5,DSC-245-6,DSC-246-6,DSC-246V-6,DSU-142-6,DSU-144-6,DSU-145-6,DSU-145-6,DU-141H-4,DU-141H-5,DU-141H-6,DU-161H-6 class	---	30V	5V	2	2300	200	200	1700	1900	
JLU1	jlu1	JUKI	DDL-5560NL-6,LU-1114-5,LU-1114-6,LZH-1290-6 class	---	30V	5V	2	2800	200	200	1700	1900	
JLU2	jlu2	JUKI	LU-2210-6-0B class	---	30V	5V	2	3500	200	200	1700	1900	

Refer to "5. HOW TO CONNECT BROTHER MACHINE".

Refer to "6. HOW TO CONNECT JUKI MACHINE".

Function	Digital display	Sewing machine maker	Model name of sewing machine and device	I/O signals of connectors	Junction wiring	Note 1 solenoid voltage	Note 2 DC5V or 12V setting in option A connector	1/2 pos	High speed H	Low speed L	Trimming speed T	Start condensed speed N	End condensed speed V	
T100	Γ 100	TOYOTA	AD1012,AD1012B,AD1012G,AD1013,AD1013A,AD1013G,AD1020,AD1102,AD1102B,AD1102G,AD1103,AD1103A,AD1103G,AD1202,A D1203,AD1204S,AD1205,AD1205S,AD1212G,AD1213,AD220 0,AD5010S class	---	30V	12V	2	3500	200	200	1700	1700		
T157	Γ 157	TOYOTA	AD157,AD157G class	---	30V	12V	2	4000	200	200	1700	1700		
T158	Γ 158	TOYOTA	AD158,AD158-2,AD158-22,AD158A-3,AD158A-32,AD158B-2, AD158B-22,AD158G-2,AD158G-22,AD158-3,AD158-32 class	---	30V	12V	2	3500	200	200	1700	1700		
T300	Γ 300	TOYOTA	AD3110,AD3110P,AD320-2,AD320-22,AD320-202,AD331,AD3 310,AD3310P,AD332,AD340-2,AD340-22,AD340-202,AD340B- 2,AD340B-22,AD340B-202,AD341-2,AD341-22,AD341-202,AD 345-2,AD345-22,AD345-202,AD352 class	---	30V	12V	2	1900	200	200	1700	1700		
U639	U639	UNION SPECIAL	Class 63900 Solenoid-operated needle feed under trimmer	Fig.23	---	30V	12V	2	4000	250	180	1700	1700	
SLH2	SLH2	SEIKO	SLH-2B	---	---	24V	12V	2	570	100	100	1700	1700	
457G	457G	SINGER	457 Wiper	Fig.24	Fig.60	24V	12V	2	4000	250	160	1500	1500	
457F	457F	SINGER	457 Thread pull	Fig.24	Fig.60	24V	12V	2	4000	250	160	1500	1500	
591	591	SINGER	591, 1591	Fig.24	Fig.60	24V	12V	2	4000	250	200	1500	1500	
211A	211A	SINGER	211A	Fig.24	Fig.60	24V	12V	2	2300	200	180	1000	1000	
212A	212A	SINGER	212A	Fig.24	Fig.60	24V	12V	2	3500	200	180	1000	1000	
411U	411U	SINGER	411U	Fig.24	Fig.60	24V	12V	2	4000	250	180	1500	1500	
412U	412U	SINGER	412U	Fig.24	Fig.60	24V	12V	2	4500	250	180	1500	1500	
591V	591V	SINGER	591V	Fig.24	Fig.60	24V	12V	2	4000	250	200	1500	1500	
691A	691A	SINGER	1691D250	Fig.24	Fig.60	24V	12V	2	4000	250	200	1500	1500	
691B	691B	SINGER	1691D210, 1691D200	Fig.24	Fig.60	24V	12V	2	4000	250	200	1500	1500	
750	750	SINGER	750	Fig.24	Fig.60	24V	12V	2	4500	250	215	1500	1500	

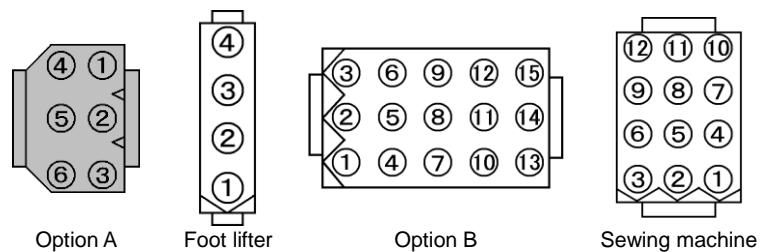
Note : 1. Refer to page 14 for how to change the solenoid voltage. The factory setting is 24V.

2. Refer to page 14 for how to change the option A connector DC5V/12V. The factory setting is 12V.

3. I/O signals of connectors

Fig.20 "DÜRKOPP ADLER"

Function setting [D697]



Presser foot lifter

	0V	1	
IF	Presser foot lifting signal	2	F
OF	Presser foot lifting output +	3	FU
	Presser foot lifting output -	4	

Option A (Black connector)

	0V	1	
IA	Needle UP position priority stop signal	2	PSU
	Power +12V	3	+12V max 40mA
IB	Needle DOWN position priority stop signal	4	PSD
O4	Needle UP position output	5	UPW 12V max 10mA
IC	One stitch signal	6	S01

Refer to page 14.

Sewing machine

	Ground	1	
OB	Wiper output	2	
	+24V	3	
OA	Thread trimming output	4	T
	0V	5	
ID	Thread trimmer protection signal	6	
OD	Thread release output	7	L
	+24V	8	
IE	Backstitching signal	9	UF
	0V	10	
	+24V	11	
OC	Backstitch output	12	B

Caution :
The rotation direction display of the control switch panel will stop when the sewing machine does not work.

Sewing machine stops when S6 : Short

This will be output if the start/end tacking stitch setting is ON in tacking mode.

Option B

	0V	1	
I4	Backstitching signal	2	S7
O1	Presser foot lifting output +	3	
VC2	Variable speed command	4	
I5	One stitch signal	5	
I1	Half-stitch signal	6	UD
	+5V	7	
	+24V	8	
I2	Tacking cancel signal	9	BTL
	0V	10	
	+24V	11	
O2	Needle cooler output	12	
O7	[KS3] output	13	NCL
O6	-----	14	KS3
O3	TF output	15	TF

External variable resistor 10kΩ

When input UD is turned ON, half-stitch sewing will start.

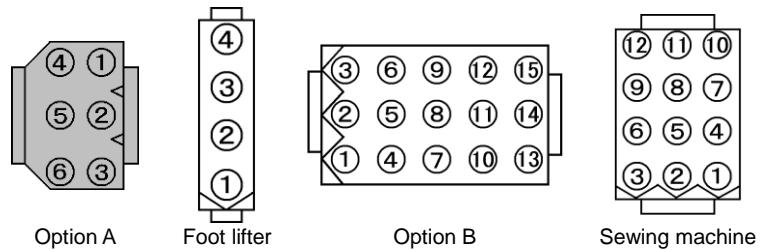
When input BTL is turned ON, start and end tacking will be prohibited.

This output is not for the solenoid output.

Refer to page 93.

Fig.21 "DÜRKOPP ADLER"

Function setting [D271]



Presser foot lifter

	0V	1	
IF	Presser foot lifting signal	2	○ F
OF	Presser foot lifting output +	3	○ FU

Presser foot lifting output - 4

Option A (Black connector)

	0V	1	
IA	Needle UP position priority stop signal	2	○ PSU
	Power +12V	3	+12V max 40mA
IB	Needle DOWN position priority stop signal	4	○ PSD
O4	Needle UP position output	5	UPW 12V max 10mA
IC	One stitch signal	6	○ S01

Refer to page 14.

Sewing machine

	Ground	1	Sewing machine body
OB	Wiper output	2	W
	+24V	3	
OA	Thread trimming output	4	T
	0V	5	
ID	Half-stitch signal	6	
OD	Thread release output	7	L
	+24V	8	
IE	Backstitching signal	9	
	0V	10	S7
	+24V	11	
OC	Backstitch output	12	B

When input UD is turned ON, half-stitch sewing will start.

This will be output if the start/end tacking stitch setting is ON in tacking mode.

Option B

	0V	1	
I4	----	2	
O1	Presser foot lifting output +	3	
VC2	Variable speed command	4	
I5	----	5	
I1	Thread trimmer cancel signal	6	○ TL
	+5V	7	
	+24V	8	
I2	Tacking cancel signal	9	○ BTL
	0V	10	
	+24V	11	
O2	Needle cooler output	12	
O7	[KS3] output	13	○ KS3
O6	----	14	
O3	TF output	15	○ TF

External variable resistor 10kΩ

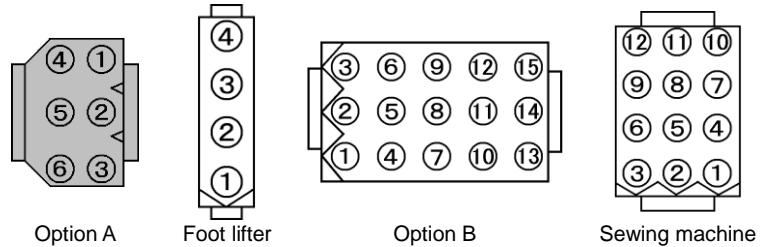
When input BTL is turned ON, start and end tacking will be prohibited.

This output is not for the solenoid output.

Refer to page 93.

Fig.22 "DÜRKOPP ADLER"

Function setting [D273]



Presser foot lifter

	0V	1	
IF	Presser foot lifting signal	2	○ F
OF	Presser foot lifting output +	3	○ FU
	Presser foot lifting output -	4	

Option A (Black connector)

	0V	1	
IA	Needle UP position priority stop signal	2	○ PSU
	Power +12V	3	+12V max 40mA
IB	Needle DOWN position priority stop signal	4	○ PSD
O4	Needle UP position output	5	○ S01
IC	One stitch signal	6	UPW 12V max 10mA

Refer to page 14.

Sewing machine

	Ground	1	Sewing machine body
OB	Wiper output	2	○ W
	+24V	3	
OA	Thread trimming output	4	○ T
	0V	5	
ID	Tacking cancel signal	6	○ BTL
OD	Roller lifting output	7	○ ROL
	+24V	8	
IE	Backstitching during run signal	9	○ UDS
	0V	10	
	+24V	11	
OC	Backstitch output	12	○ B

When input BTL is turned ON, start and end tacking will be prohibited.

This will be output if the start/end tacking stitch setting is ON in tacking mode.

Option B

	0V	1	
I4	----	2	
O1	Presser foot lifting output +	3	
VC2	Variable speed command	4	
I5	----	5	
I1	Solenoid input signal IO2	6	○ IO2
	+5V	7	
	+24V	8	
I2	One stitch signal	9	○ S01
	0V	10	
	+24V	11	
O2	Needle cooler output	12	○ NCL
O7	[KS3] output	13	○ KS3
O6	Virtual output OT2	14	○ OT2
O3	Thread tension output	15	○ TF

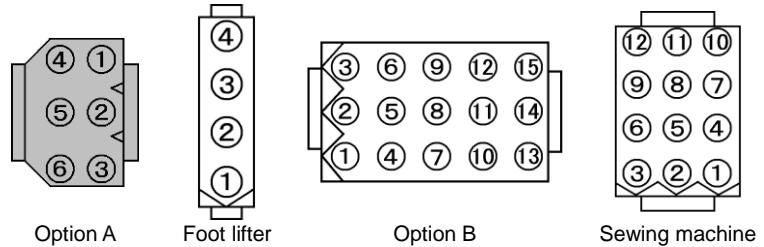
External variable resistor 10kΩ

This output is not for the solenoid output.

Refer to page 93.

Fig.23 "UNION SPECIAL"

Function setting [U639]



Presser foot lifter

	0V	1	
IF	Presser foot lifting signal	2	○ F
OF	Presser foot lifting output +	3	○ FU

Option A (Black connector)

	0V	1	
IA	Needle UP position priority stop signal	2	○ PSU
	Power +12V	3	+12V max 40mA
IB	Needle DOWN position priority stop signal	4	○ PSD
O4	Needle UP position output	5	○ S6
IC	Thread trimmer protection signal	6	UPW 12V max 10mA

Refer to page 14.

Sewing machine stops when S6 : Short

Sewing machine

	Ground	1	
OB	Wiper output	2	Sewing machine body
	+30V	3	W
OA	Thread trimming output	4	T
	0V	5	
ID	Thread trimmer protection signal	6	○ S6
OD	Thread release output	7	L
	+30V	8	
IE	Backstitching during run signal	9	○ TL
	0V	10	
	+30V	11	NCL
OC	Needle cooler output	12	

Caution :
The rotation direction display of the control switch panel will stop when the sewing machine does not work.

Sewing machine stops when S6 : Short

Option B

	0V	1	
I4	Needle cooler output during rotation forced [OFF] signal	2	○ NCL
O1	Solenoid output OT1	3	
VC2	Variable speed command	4	
I5	Thread trimmer output confirmation signal	5	○ TON
I1	Non-stitching feed input	6	○ FWD
	+12V (Change JP4 connector)	7	
	+30V	8	
I2	Solenoid input signal IO1	9	○ I01
	0V	10	
	+30V	11	
O2	Roller lift output	12	○ ROL
O7	-----	13	
O6	[KS3] output	14	○ KS3
O3	Solenoid output OT3	15	○ OT3

External variable resistor
10kΩ

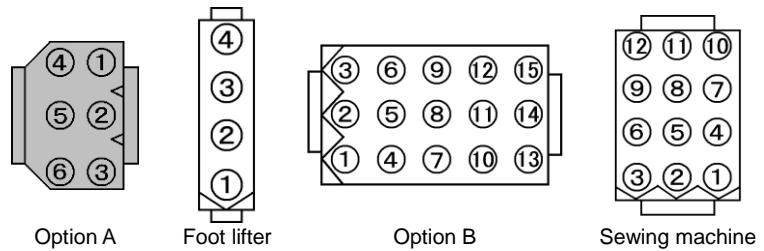
If input IO1 is turned ON, output OT1 will always be turned ON.

This output is not for the solenoid output.

Please refer to page 14.
How to change 24/30V of solenoid power source.

Fig.24 "SINGER"

Function setting [457G], [457F], [591], [211A], [212A], [411U], [412U], [591V], [691A], [691B] and [750]



Presser foot lifter

	0V	----	1	0V
IF	Presser foot lifting signal	----	2	F
OF	Presser foot lifting output +	----	3	FU
	Presser foot lifting output -	----	4	

Option A (Black connector)

	0V	----	1	0V
IA	Start tacking cancel signal	Except 750	2	When this input is turned ON, start tacking will be inhibited while the signal is ON.
	Thread trimmer protection signal	750		When input S6 is turned ON while the sewing machine is running, the sewing machine will stop. When input S6 is turned ON during thread trimming, the operation will be completed, and operation will not be possible until input S6 is turned OFF.
	Power +12V	----	3	DC12V (max 40mA) is output.
IB	End tacking cancel signal	----	4	When this input is turned ON, end tacking will be inhibited while the signal is ON.
O4	Needle UP position output	----	5	The needle UP position signal is output. The output voltage is DC12V.
IC	Thread trimmer cancel signal	----	6	When pedal full heeling is turned ON while this input is ON, the thread will not trimmed. After the thread trimmer interlock time passes, the presser foot lifting operation will start.

Sewing machine

	Ground	----	1	Ground
OB	Wiper solenoid output	457G, 457F, 750	2	It will be for wiper solenoid output.
	Thread release solenoid output	691A, 691B		It will be for thread release solenoid output.
	Option solenoid output	411U, 412U, 591, 211A, 212A, 591V		This output is always turned ON when option solenoid input signal is ON.
	+24V	----	3	+24V
OA	Thread trimming output	----	4	It will be for thread trimming solenoid output.
	0V	----	5	0V
ID	Needle up input	----	6	When this input is turned ON, the needle up input will function.
OD	Thread release solenoid output	457G, 457F, 750	7	It will be for thread release solenoid output.
	Wiper solenoid output	Except 457G, 457F, 750		It will be for wiper solenoid output.
	+24V	----	8	+24V
IE	Manual backtacking signal	----	9	When this input is turned ON, the backtacking operation will start.
	0V	----	10	0V
	+24V	----	11	+24V
OC	Backstitch output	----	12	It will be for Backstitch solenoid output.

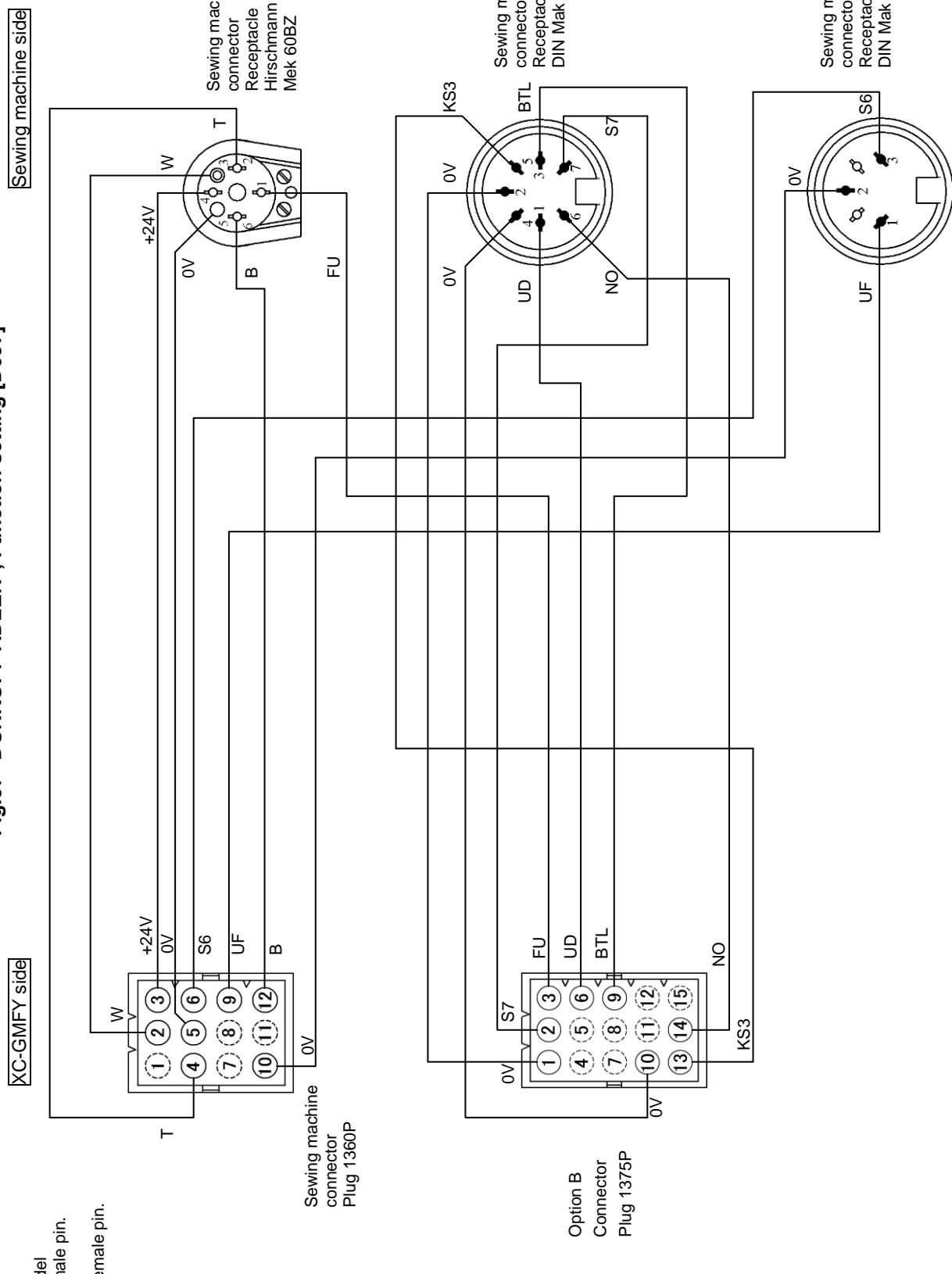
Option B

	0V	----	1	0V
I4	----	----	2	----
O1	----	Except 691A,691B, 750	3	Not output.
	ADD.BT solenoid output	691A,691B		It will be for ADD.BT solenoid output.
	Thread trimmer output	750		Thread trimming starts.
VC2	Variable speed command	----	4	This input is for external speed command. (If voltage is applied to this input, sewing machine will start.)
I5	----	----	5	----
I1	Needle UP position priority stop signal	----	6	When input PSU is turned ON while the sewing machine is running, the needle will stop at the UP position after swing PSU stitches and thread trimming.
	+5V	----	7	DC5V (max 10mA) is output.
	+24V	----	8	+24V
I2	Emergency stop signal	457G,457F, 691A,691B, 750	9	When this input is turned ON while the sewing machine is running, all running states will be canceled, and the sewing machine will stop with the brakes.
	Option solenoid input signal	591,211A, 212A,411U, 412U,591V		When this input is turned ON, the option solenoid output will start.
	0V	----	10	0V
	+24V	----	11	+24V
O2	----	Except 691A,750	12	Not output.
	Air blow output	691A		It will be for the air blow output.
	Wiper solenoid output	750		It will be for wiper solenoid output.
O7	----	----	13	----
O6	----	----	14	----
O3	Thread pull output	691A	15	It will be for the thread pull output.
	----	Except 691A		Not output.

Note) The thread trimming (operation) will differ with the [457G], [457F], [591], [211A], [212A],[411U], [412U], [591V], [691A], [691B] and [750] simple setting, so select the setting value according to the sewing machine being used.

4. Junction wiring

Fig.57 "DÜRKOPP ADLER", Function setting [D697]



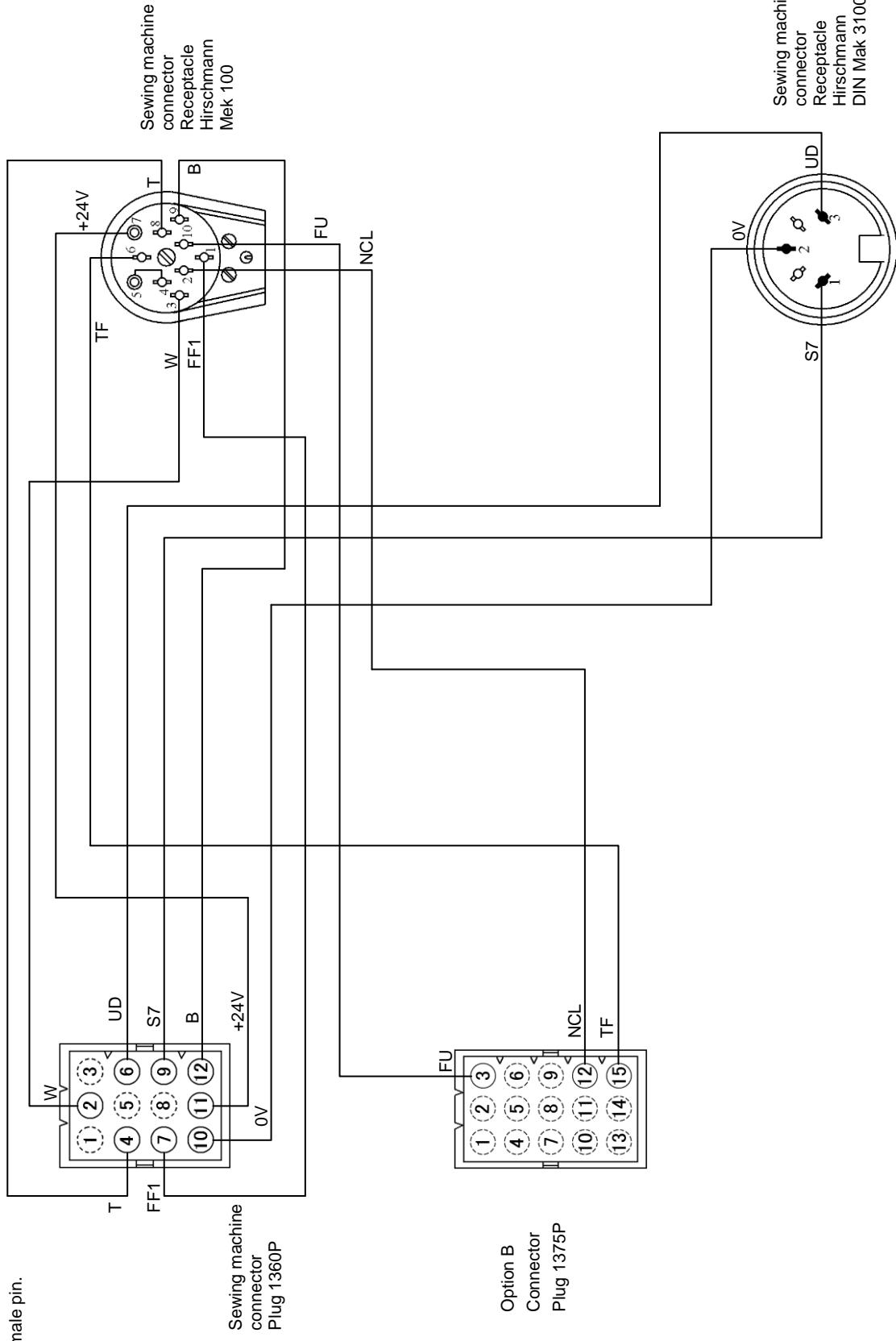
Part Name	XC-CBL-DA-1
Part No.	K14M7-924730

Note: The sewing machine connector and option B connector diagrams are looking from the pin insertion side.

Fig.58 "DÜRKOPP ADLER", Function setting [D271]

Sewing machine side

XC-GMFY side

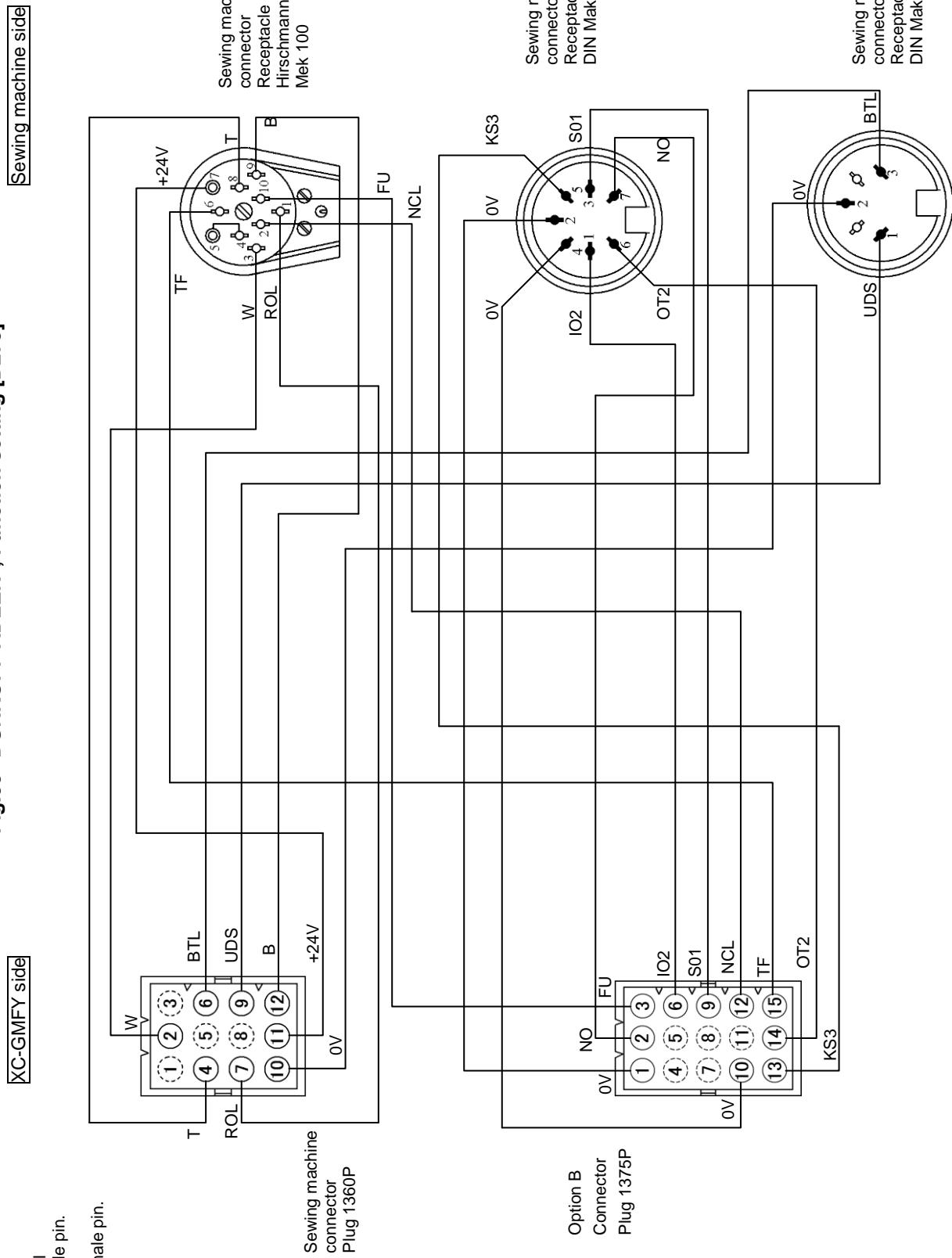


Part Name	XC-CBL-DA-2
Part No.	K14M7.924830

Note: The sewing machine connector and option B connector diagrams are looking from the pin insertion side.

Fig.59 "DÜRKOPP ADLER", Function setting [D273]

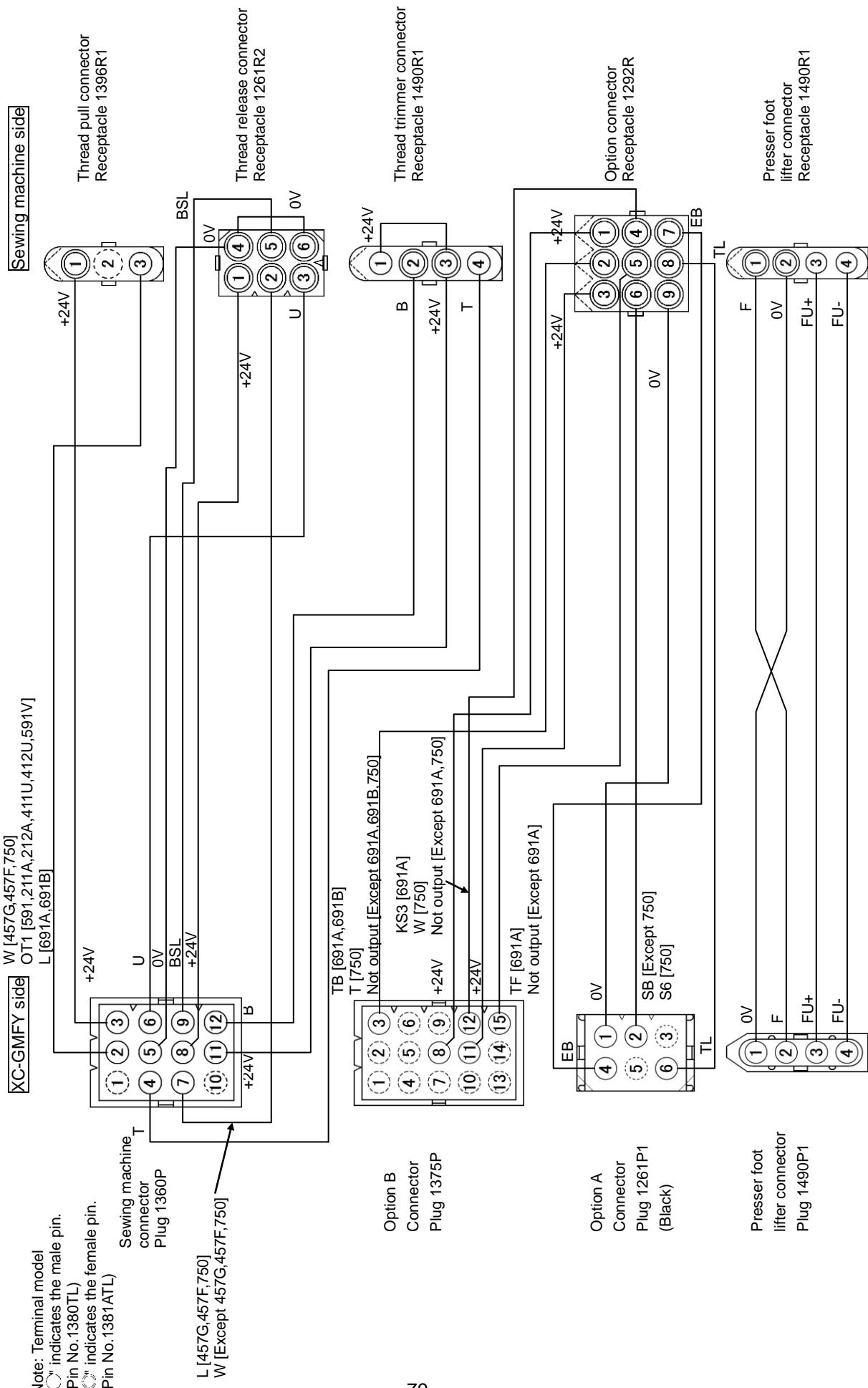
Note: Terminal model
 indicates the male pin.
(Pin No. 1:380TL)
 indicates the female pin.
(Pin No. 1:381ATL)



Part Name XC-CBL-DA-3
Part No. K14M71924930

Note: The sewing machine connector and option B connector diagrams are looking from the pin insertion side.

Fig.60 "SINGER", Function setting [457G],[457F],[591],[211A],[212A],[411U],[412U],[591V],[691A],[691B] and [750]



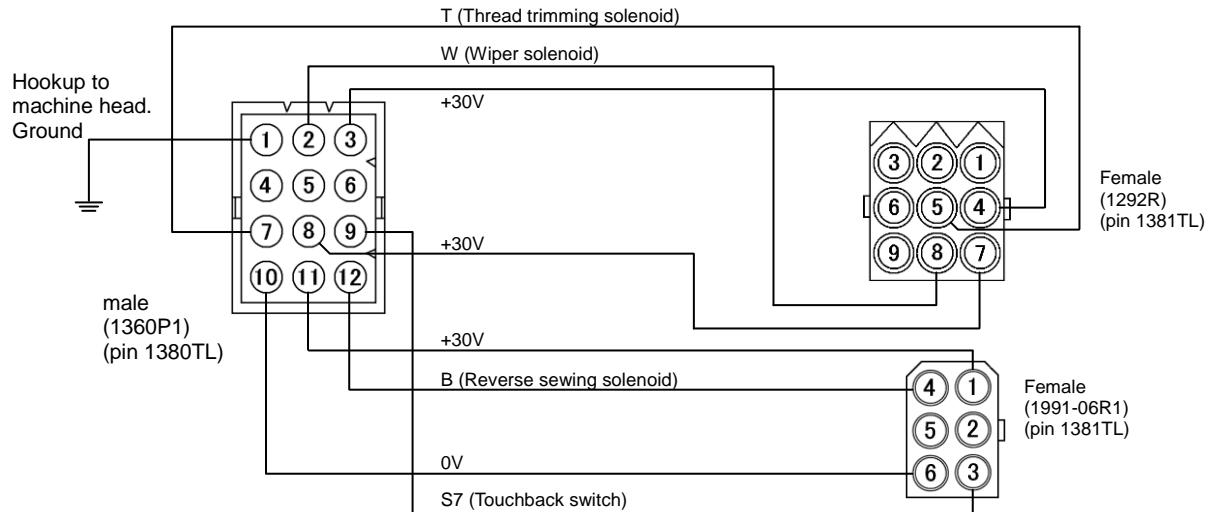
Note: Terminal model
 indicates the male pin.
 Pin No. 1380TL
 indicates the female pin
 Pin No.1381ATL

Part Name	XCCBL-SG-1
Part No.	K14M72022131

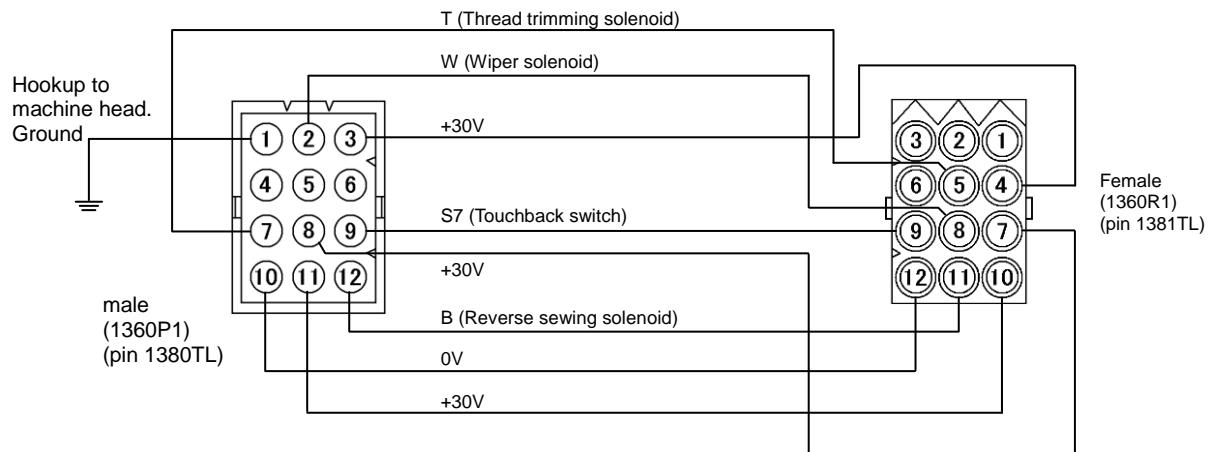
5. How to connect BROTHER machine

5.1 Junction wiring

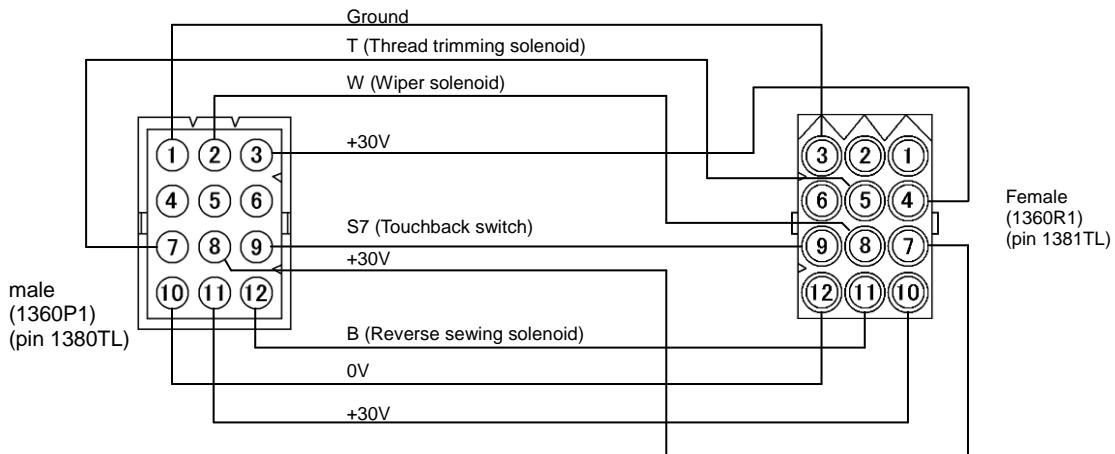
(1)DB2-715 (XC-CBL-BR-1)



(2)DB2-716 (XC-CBL-BR-2)



(3)DB2-B737, B737 MARK II, B748, B791, B7910, B793, B795, B798,
 LT2-B842, B845, B847, B848, B872, B875,
 LZ2-B852, B853, B854 (XC-CBL-BR-3)



5.2 How to use BROTHER'S built-in detector by LIMI-SERVO X

(1). MODEL

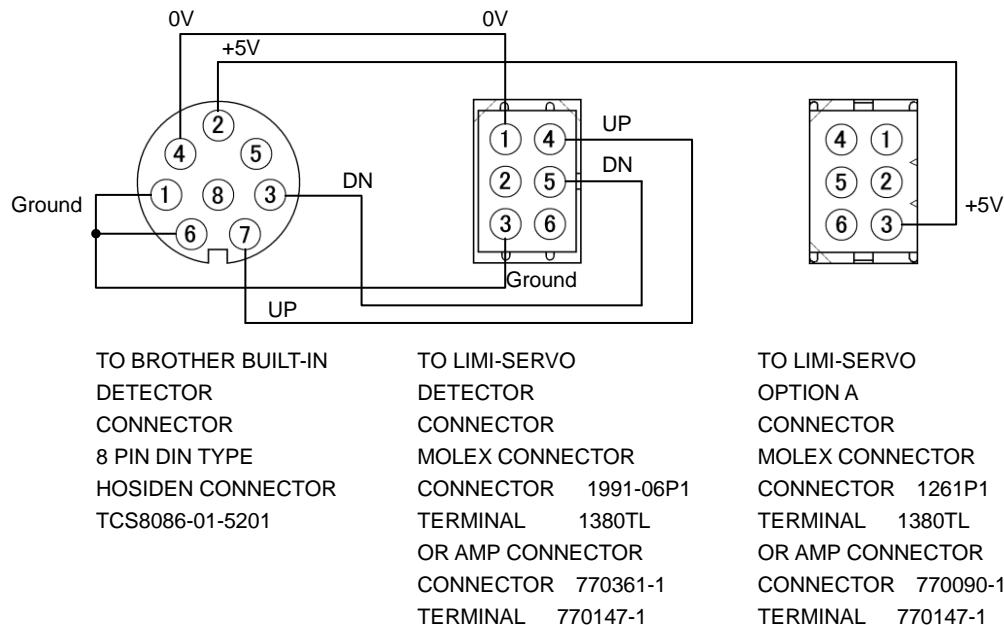
- (a) Applicable brother built-in type detector
brother control box: MODEL MD-803, MD-813
- (b) MITSUBISHI LIMI-SERVO MOTOR
LIMI-SERVO X MODEL XC-GMFY control box

(2). How to connect

- (a) Set up for over-change connector

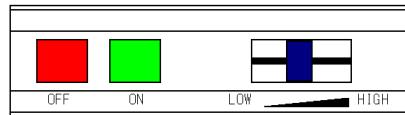
First, turn off the power. After 10 min. of turning off, screw down and remove the front cover. Power for brother's built-in detector is +5v, so open the cover of MITSUBISHI LIMI-SERVO control box, and change from +12v to +5v inside connector (JP3).

- (b) Connect by relay cable (XC-CBL-BR-4)



5.3 How to connect BROTHER'S built-in volume type push button switch

(1). Applicable brother push bottom switch
built-in volume type push bottom switch



(2). MITSUBISHI LIMI-SERVO MOTOR

(a) 100V, 1-phase use.

CONTROL BOX : XC-GMFY-10-05
MOTOR : XL-G554-10Y

(b) 200V, 3-phase use.

CONTROL BOX : XC-GMFY-20-05
MOTOR : XL-G554-20Y

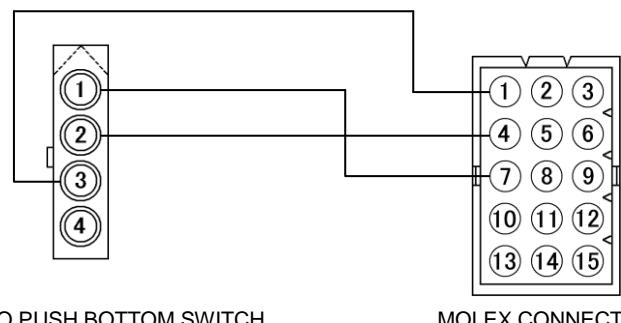
(3). How to connect

(a) Connect push bottom switch with LIMI-SERVO (XC-CBL-BR-6)

Using the junction wire of following indication, connect the control box and volume of push bottom switch.

(b) Turn off the power. After 10 min. of turning off, screw down and remove the front cover.

Power for brother's variable speed command is 12v, so open the cover of MITSUBISHI LIMI-SERVO control panel, and change from +5v to +12v inside connector (JP4).



TO PUSH BOTTOM SWITCH

MOLEX CONNECTOR

CONNECTOR 1991-04R1

TERMINAL 1381TL

OR AMP CONNECTOR

CONNECTOR 770337-1

TERMINAL 770146-1

MOLEX CONNECTOR

CONNECTOR 1375P3

TERMINAL 1380TL

OR AMP CONNECTOR

CONNECTOR 770107-1

TERMINAL 770147-1

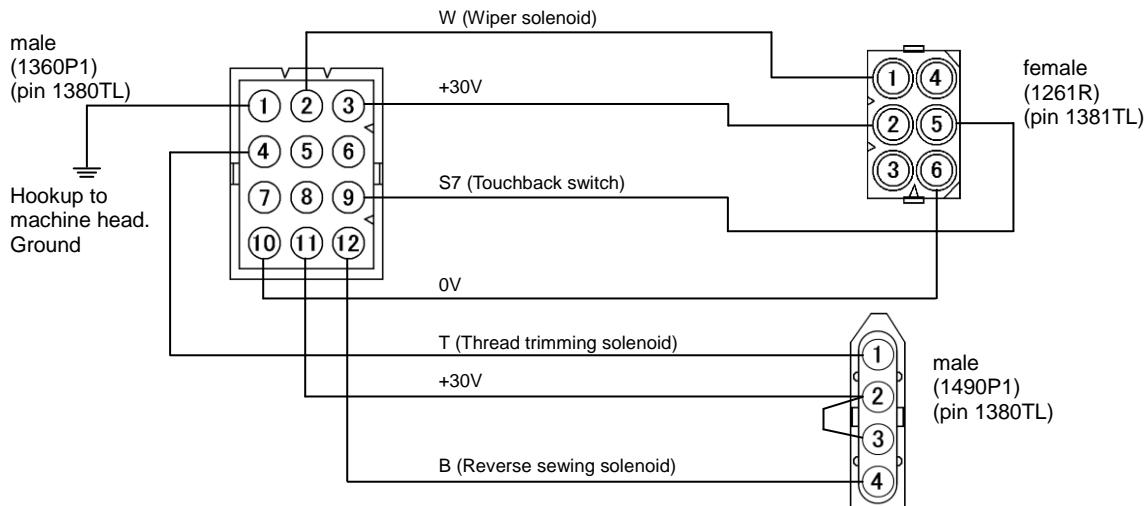
(4). Set up by control panel

- (a) Press the key [↓], [A] and [C] key simultaneously over 2 seconds at normal mode (indication is rotating) and set "Q" mode. Indicate the thread trimming time like [VCS.OF].
- (b) Press key [↓] few times, and find out VC2 (action mode VC2 for speed instructions). Indication become like [VC2.VC].
- (c) Press the key "D" few times, change the indication for [VC2.VR] (function of speed ordering input VC2 of connector option-b change into the function of speed volume of control panel).
- (d) Press key [↓] few times, and find out V25 (VC2 input 5V/12V changeover mode). Indication become like [V25.ON].
- (e) Press the key "D" once, change the indication for [V25.OF] (function of VC2 maximum input voltage change into 12v).
- (f) Press the key [↓] and [↑] simultaneously, return to the normal mode.

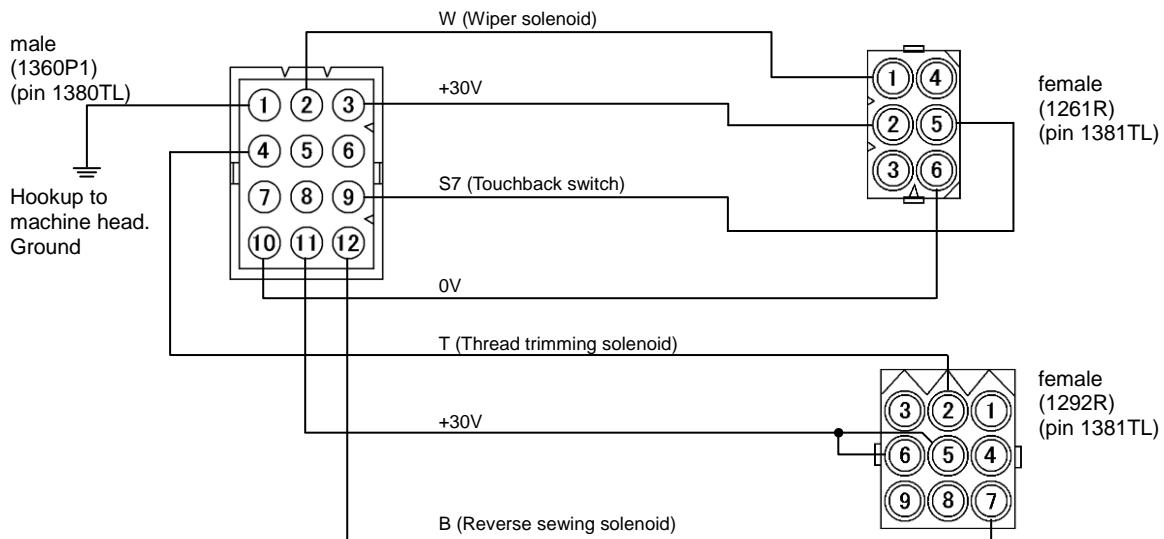
6. How to connect JUKI machine

6.1 Junction wiring

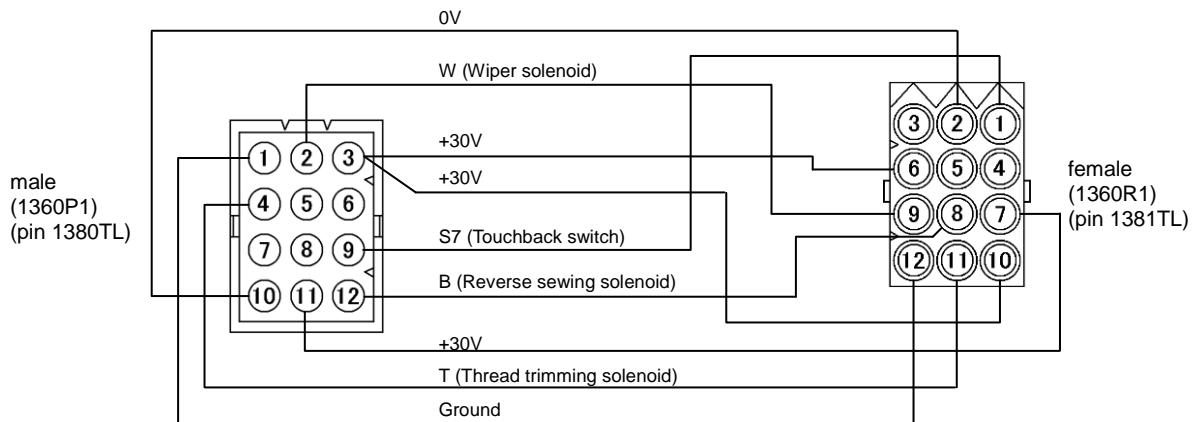
(1) For DDL-500 (XC-CBL-JK-1)



(2) For DDL-555-2-2B, 4B (XC-CBL-JK-2)



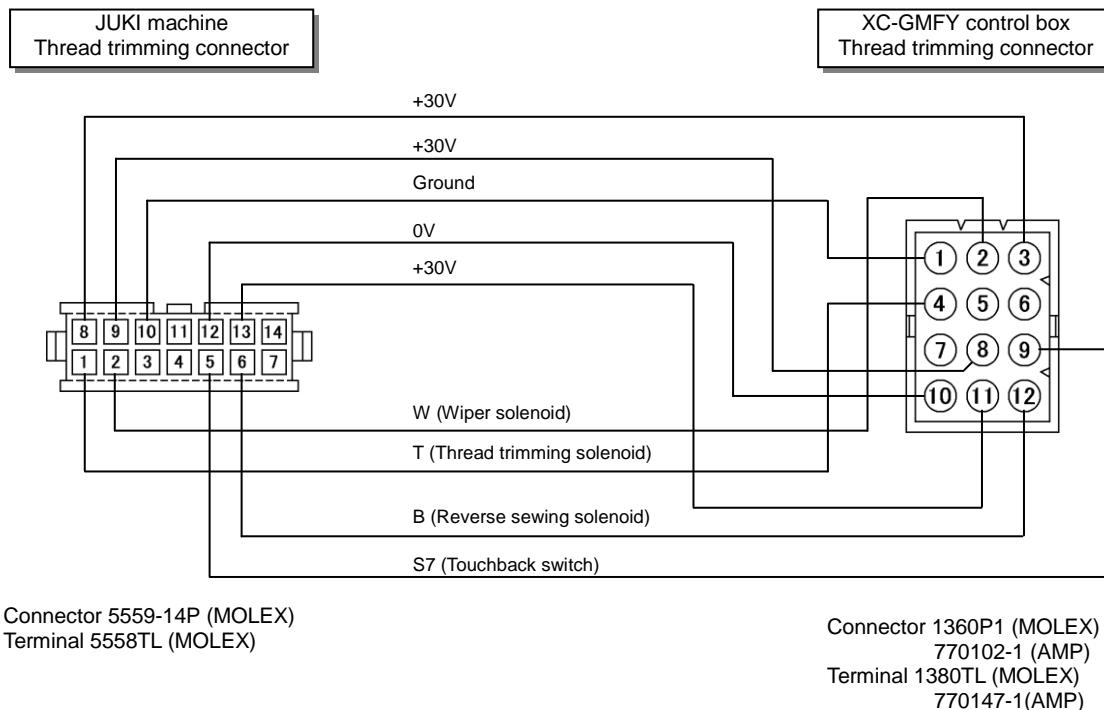
(3) For DDL-505, 506, 5570, 5580, DLU-5490 (XC-CBL-JK-3)



(4) For DDL-5571N, 5581N, 5550N-7, DLN-5410N-7, DLU-5490N-7, LZ-2281N-7

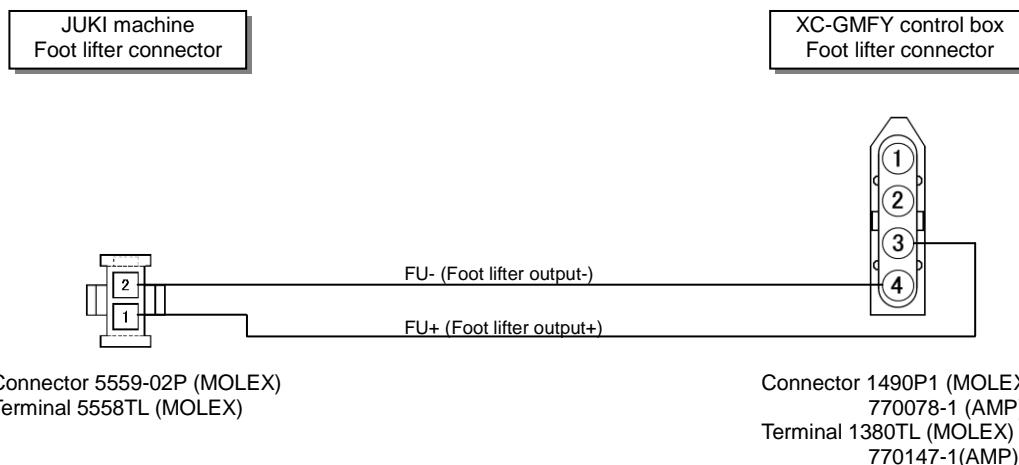
(a) For thread trimming

[Parts Name:XC-CBL-JK-5 (Parts No.:K14M72021130)]



(b) For foot lifter

[Parts Name:XC-CBL-JK-6 (Parts No.:K14M72021230)]



6.2 How to use JUKI'S built-in detector by LIMI-SERVO X

(1). MODEL

(a) JUKI'S built-in detector

THE models for JUKI'S control box j1aeas

(b) MITSUBISHI'S SERVO MOTOR

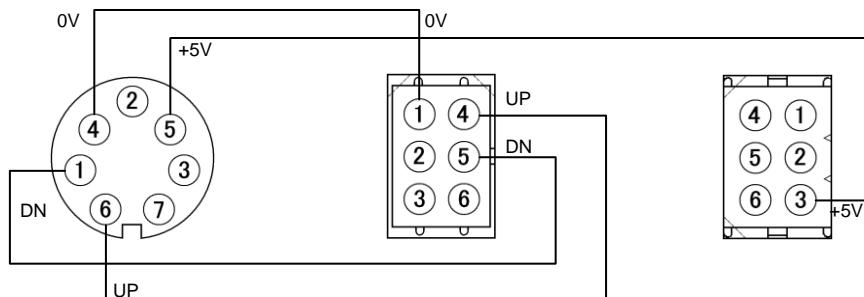
LIMI-SERVO X MODEL XC-FMFY control box

(2). How to connect

(a) Set up the dc5v/12v changeover switch

First, turn off the power. If turned off the power, the voltage is high, and please wait 10 more minutes after you turned off, please take off the front cover to screw down by plus driver. The power for JUKI'S built-in detector is +5v, open the control panel for MITSUBISHI LIMI-SERVO X, change over the inside connector (JP3) from side +12v to side +5v.

(b) Connection with junction wire (XC-CBL-JK-4)



TO JUKI BUILT-IN
DETECTOR
CONNECTOR
7 PIN DIN TYPE
HOSIDEN CONNECTOR
TCS8076-01-5201

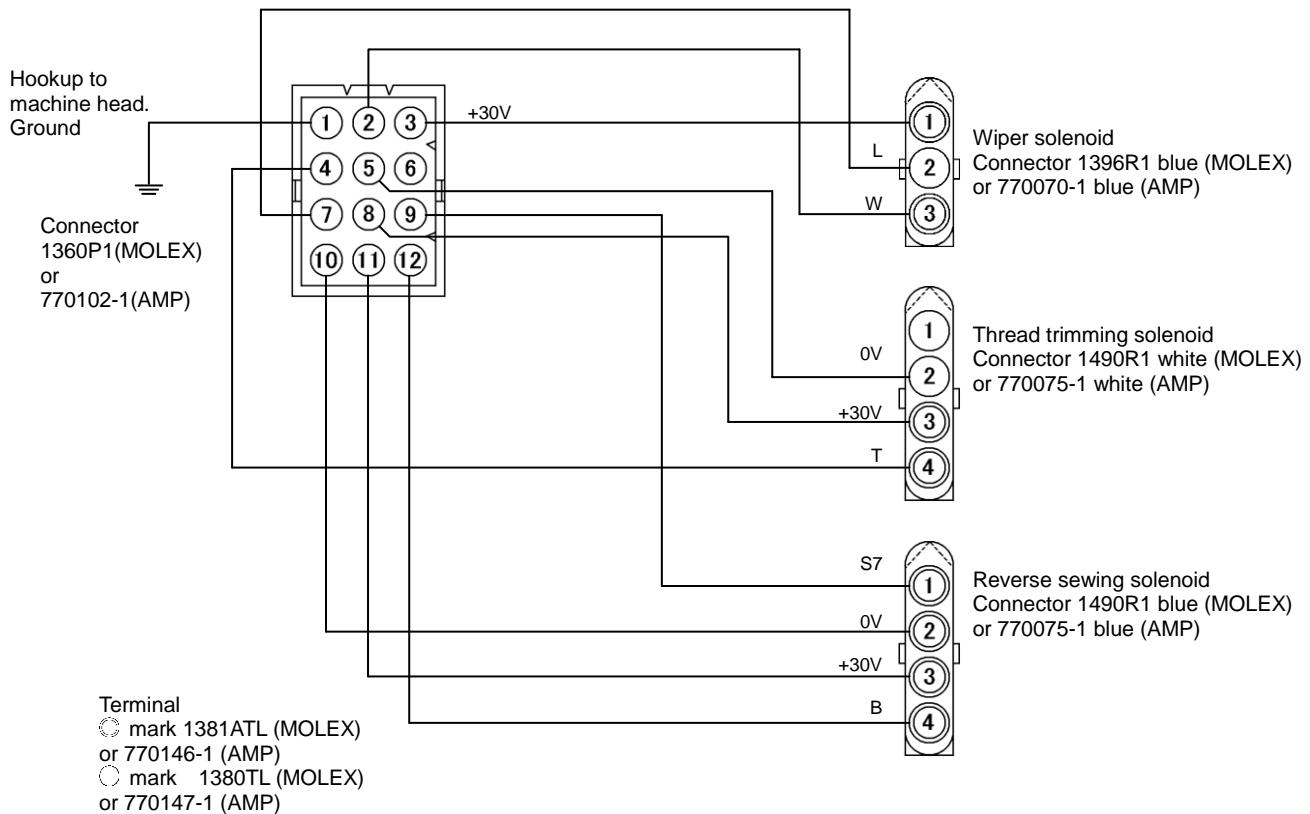
TO LIMI-SERVO
DETECTOR
CONNECTOR
MOLEX CONNECTOR
CONNECTOR 1991-06P1
TERMINAL 1380TL
OR AMP CONNECTOR
CONNECTOR 770361-1
TERMINAL 770147-1

TO LIMI-SERVO
OPTION A
CONNECTOR
MOLEX CONNECTOR
CONNECTOR 1261P1
TERMINAL 1380TL
OR AMP CONNECTOR
CONNECTOR 770090-1
TERMINAL 770147-1

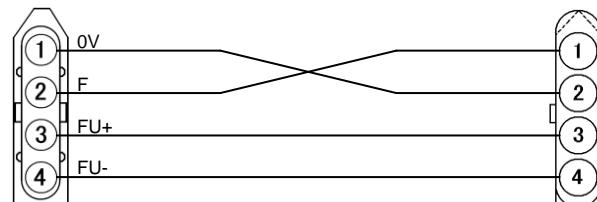
7. How to connect TOYOTA machine

7.1 Junction wiring

(1)XC-CBL-TY-1



(2)TOYOTA FOOT LIFTING DEVICE (XC-CBL-TY-2)

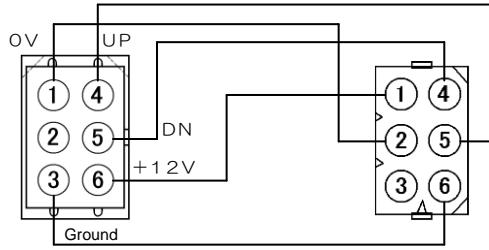


To LIMI-SERVO foot lifting connector
Connector 1490P1 white (MOLEX)
or 770078-1 white (AMP)
Terminal 1380TL male (MOLEX)
or 770147-1 (AMP)

To TOYOTA machine foot lifting Connector
1490R1 black (MOLEX)
or 770075-1 black (AMP)
Terminal 1380TL male (MOLEX)
or 770147-1 (AMP)

(3)TOYOTA BUILT-IN SYNCHRONIZER (XC-CBL-TY-3)

To LIMI-SERVO detector connector
Connector 1991-06P1 (MOLEX)
or 770361-1 (AMP)
Terminal 1380TL male (MOLEX)
or 770147-1 (AMP)

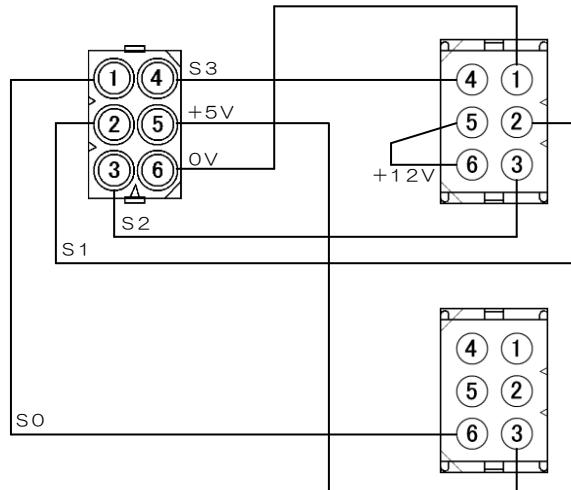


To TOYOTA built-in synchronizer
Connector 1261R1 white (MOLEX)
or 770086-1 white (AMP)
Terminal 1380TL male (MOLEX)
or 770147-1 (AMP)

(4)TOYOTA FOOT PEDAL MODEL RT-26, RT-27 (XC-CBL-TY-4)

To foot pedal model
Connector 1261R1 (MOLEX)
or 770086-1 (AMP)
Terminal
 mark 1381ATL (MOLEX)
or 770146-1 (AMP)
 mark 1380TL (MOLEX)
or 770147-1 (AMP)

Note: Change the output voltage
5VDC with the jumper JP3.
(Refer to page 14.)



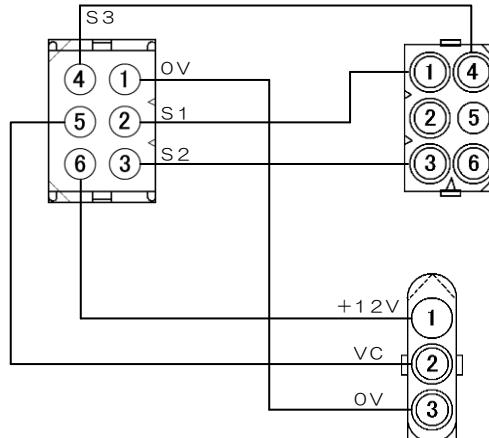
To LIMI-SERVO lever connector
Connector 1261P1 white (MOLEX)
or 770090-1 white (AMP)
Terminal 1380TL male (MOLEX)
or 770147-1 (AMP)

To LIMI-SERVO option A connector
Connector 1261P1 black (MOLEX)
or 770090-1 black (AMP)
Terminal 1380TL male (MOLEX)
or 770147-1 (AMP)

* Turn the program mode [C] function [PDS] ON. Refer to the page 210.

(5)TOYOTA VARIABLE SPEED PEDAL (XC-CBL-TY-5)

To LIMI-SERVO lever connector
Connector 1261P1 (MOLEX)
or 770090-1 (AMP)
Terminal
 mark 1381ATL (MOLEX)
or 770146-1 (AMP)
 mark 1380TL (MOLEX)
or 770147-1 (AMP)



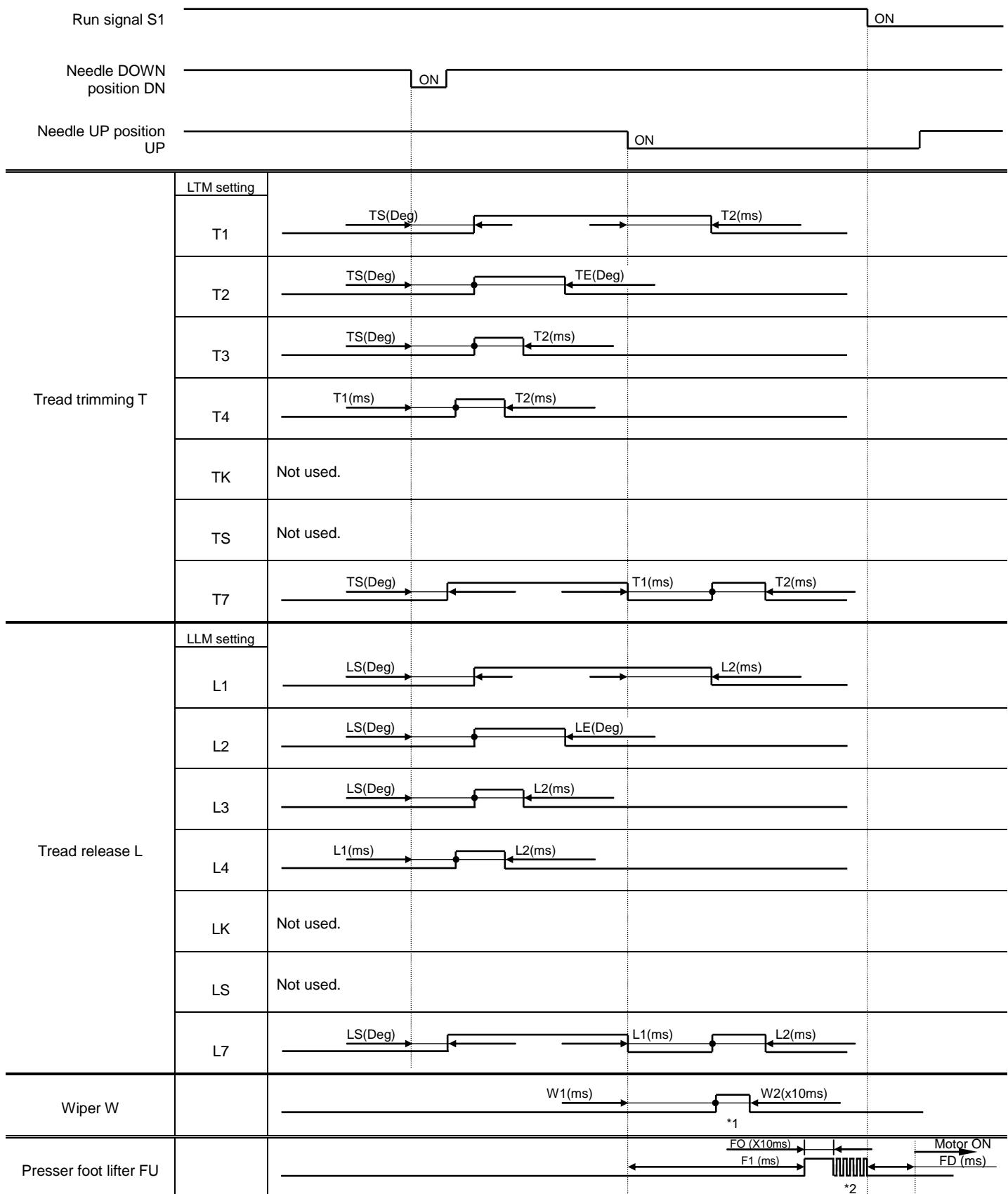
To TOYOTA variable speed pedal
Connector 1261R1 (MOLEX)
or 770086-1 (AMP)

To TOYOTA variable speed pedal
Connector 1396R1 black (MOLEX)
or 770070-1 black (AMP)

* Turn the program mode [C] function [PDS] ON. Refer to the page 210.

15 Setting in the thread trimming mode TR

1. Thread trimming timing when thread trimming mode TR setting is PRG

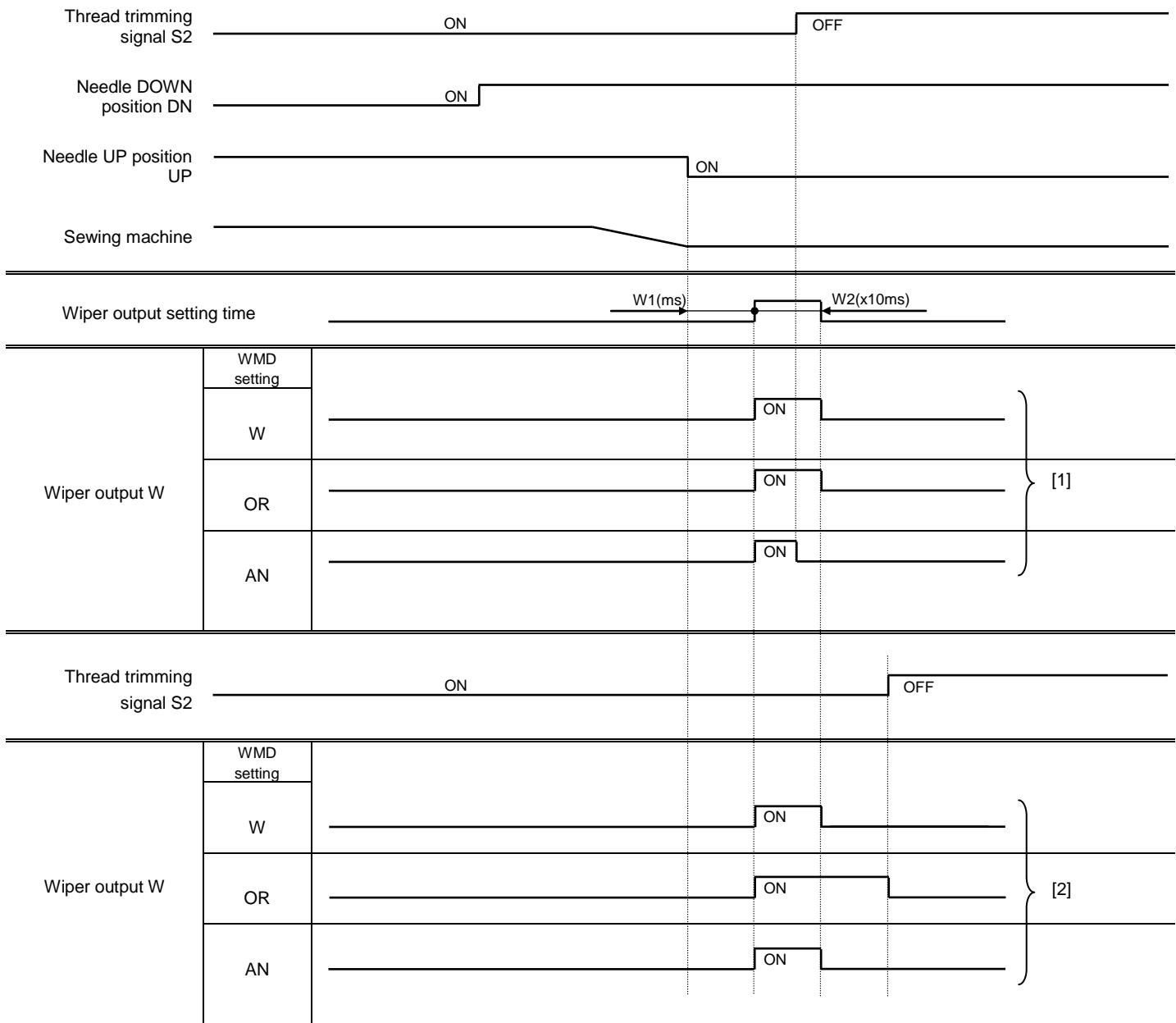


Notes: *1.The wiper output [W] becomes special operation according to the [G] mode WMD setting, as shown on page 89.

*2.The presser foot lifter [FU] chopping duty can be set with FUD in the [P] and [C] mode.

2. Wiper output timing

Wiper output OFF timing with (S2) signal by using WMD setting (in program mode G)



* Wiper output OFF timing is changed by S2 signal OFF timing like above chart [1] and [2].

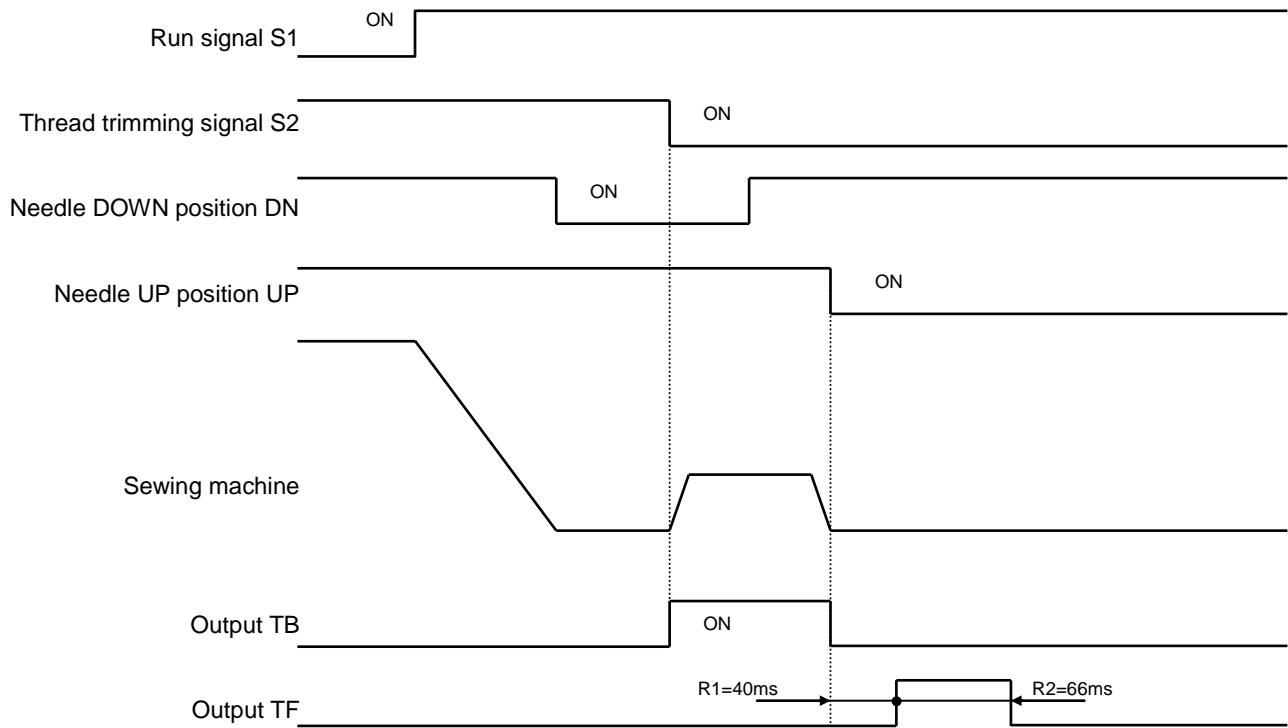
3. Thread trimming timing for each setting in the thread trimming mode TR

Thread trimming mode TR setting	Thread trimmer T	Thread release L	Wiper W	Presser foot lifting FU	Thread trimming signal S2 (msec.)	Applicable models
M1					80 140	Mitsubishi Brother (other than B1) Toyota Seiko Yakumo
B1					43 42 140	Brother B705 B707 B715 B716 B757 B790 B792
D1					80 140	DURKOPP ADLER
J1					20 20 44 30	Juki
J2					20 89 50 71 30	Juki

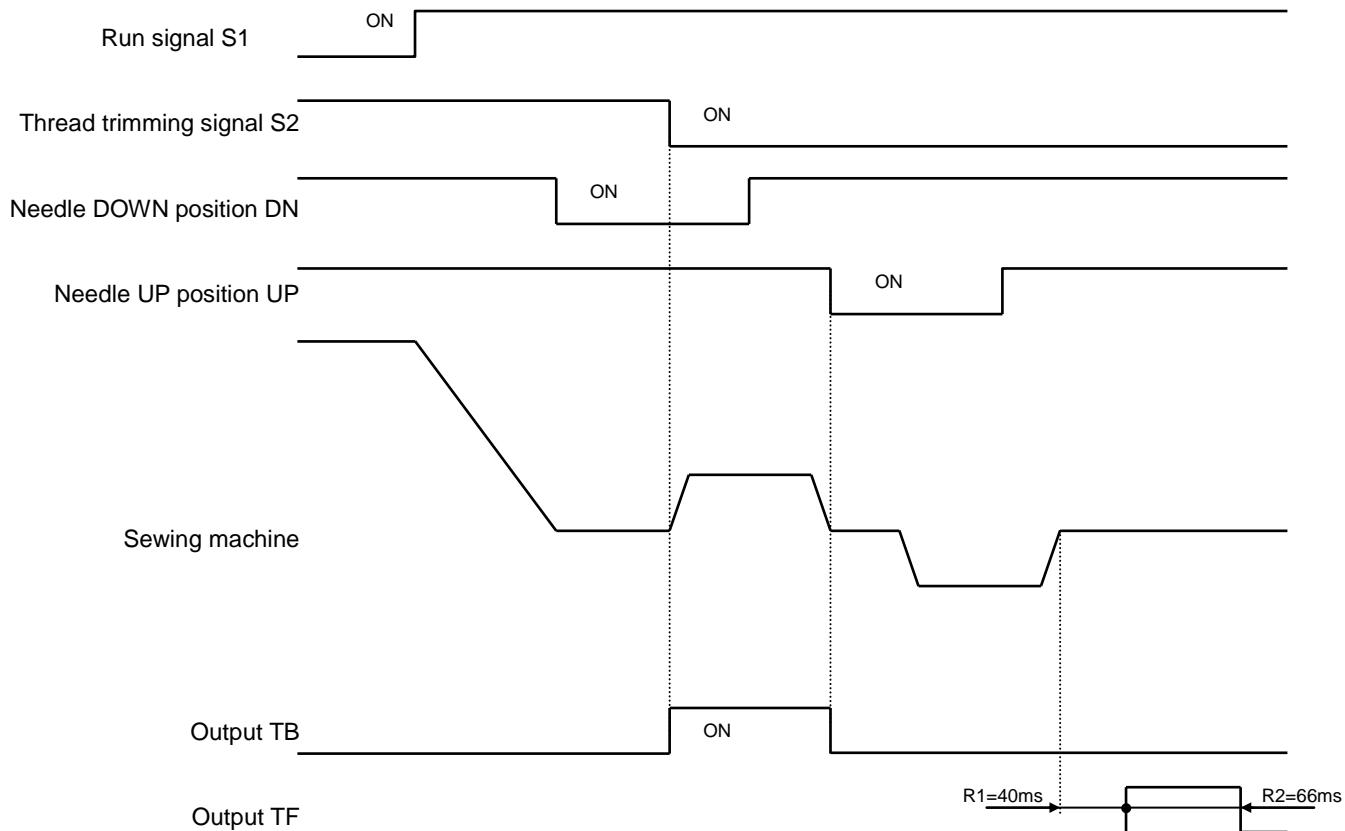
Thread trimming mode TR setting		Thread trimming signal S2 (msec.)		Applicable models
N1	Thread trimmer T		100 100	
	Thread release L		300 100	
	Wiper W		530	
	Presser foot lifting FU		530	
P1	Thread trimmer T	70		PFAFF (for solenoid) 463 900
	Thread release L			
	Wiper W		80	
	Presser foot lifting FU		140	
P2	Thread trimmer T			PFAFF (for air)
	Thread release L			
	Wiper W	40 40		
	Presser foot lifting FU		140	
P3	Thread trimmer T			PFAFF (for air)
	Thread release L			
	Wiper W	80		
	Presser foot lifting FU		140	

Thread trimming mode TR setting		Thread trimming signal S2 (msec.)		Applicable models
P4	Thread trimmer T			PFAFF (for air)
	Thread release L			
	Wiper W		80	
	Presser foot lifting FU		140	
T1	Thread trimmer T			Toyota AD158 157 340 341
	Thread release L			
	Wiper W		45	
	Presser foot lifting FU		70	
T2	Thread trimmer T			Toyota AD3110
	Thread release L			
	Wiper W		45	
	Presser foot lifting FU		70	
RK	Thread trimmer T			Reverse thread trimming Blind stitch sewing etc.
	Thread release L			
	Wiper W	Reverse	80	
	Presser foot lifting FU		140	
K	Thread trimmer T	20	90	
	Thread release L	40	70	
	Wiper W	40	70	
	Presser foot lifting FU		70	

(1) Output normal timing



(2) Function setting [RU [ON]] in program mode [P]

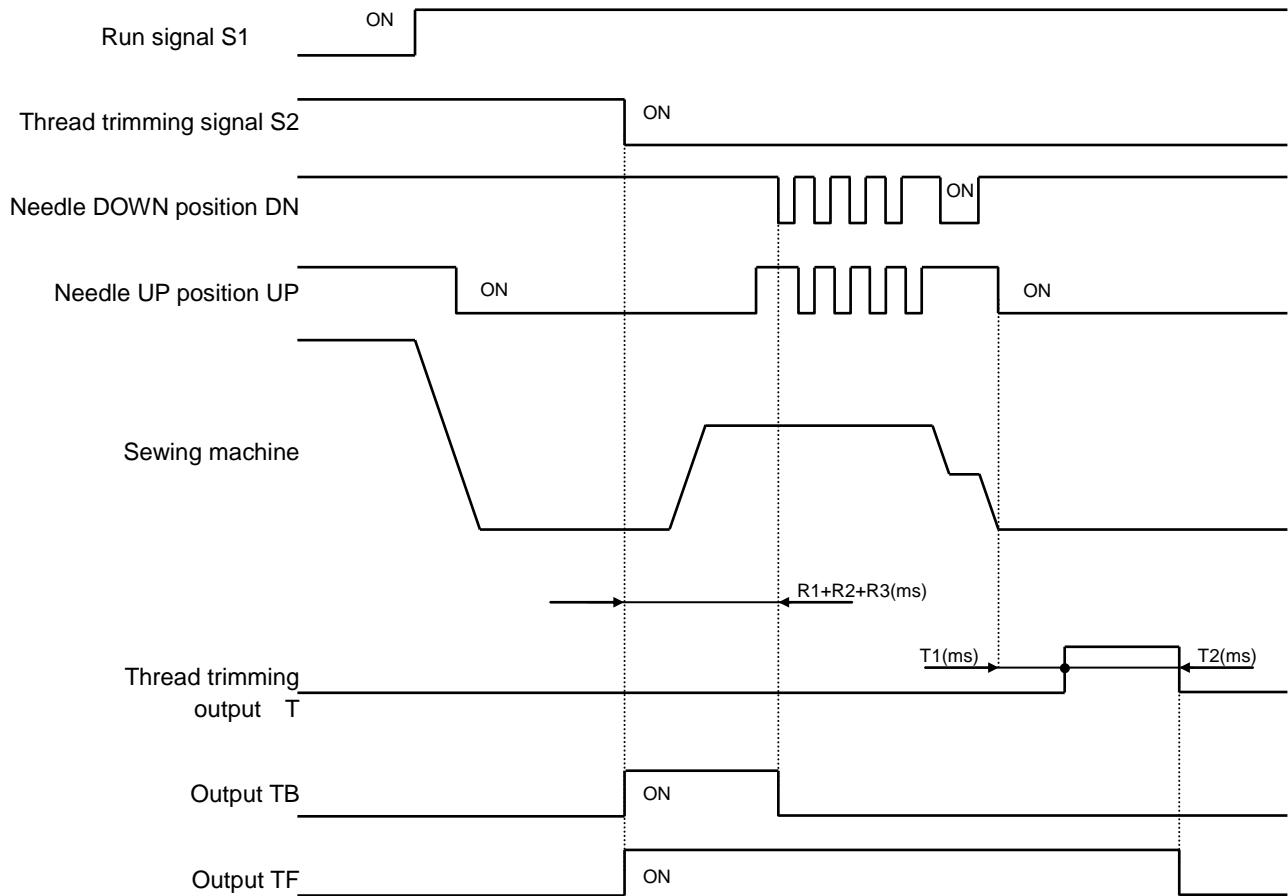


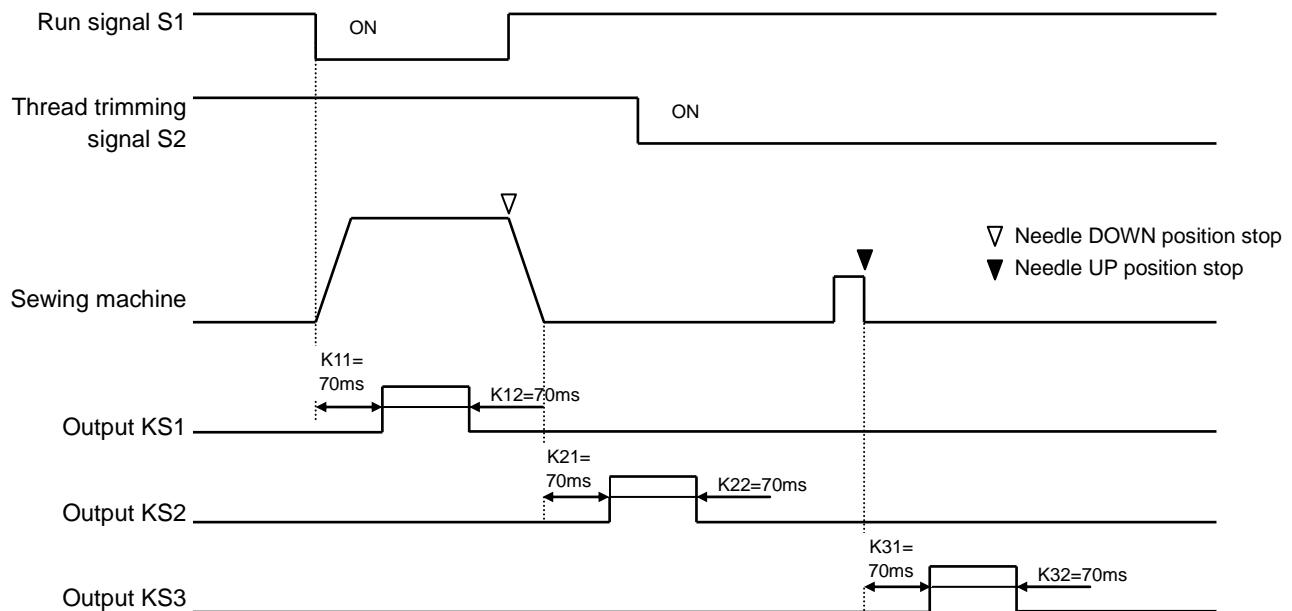
Note 1. The TF output start time can be set with R1 in the [G] mode.

The TF output time can be set with R2 in the [G] mode.

2. The above-mentioned timing is function setting [TRM [LK]] in program mode [G].

(3) Chain stitch sewing machine (Condensed stitch is valid.)





Note. The KS1 to KS3 output start time and output time can be set with K11 to K32 in the [S] mode.

Caution

This timing chart (sequence) is only available when [SQS] is set to [NO].
When [SQS] is not set to [NO], please refer to "[18] Simple sequence".

18 Simple Sequence

The function outputs [KS1], [KS2], [KS3] and [KS4] can be set as simple sequence outputs. To set the simple sequence output, the starting conditions [IN] [T][R][S][TR][SB][GO] are set in the simple sequence starting condition setting function [SQS] of the [S] mode. With this, function outputs [KS1], [KS2], [KS3] and [KS4] will be simple sequence outputs. (The default setting is the [NO] setting.)

1. Simple sequence starting conditions

The simple sequence starting condition setting function [SQS] is as follows.

- [NO] : The simple sequence is not started. (The default setting is the [NO] setting.)
(Refer to "[17] Output KS1, KS2, KS3 timings".)
- [IN] : When virtual input IO4 is turned ON.
- [T] : When thread trimming is completed.
- [R] : When operation is starting.
- [S] : When motor is stopped. (This also includes when single-stitch operation is stopped.)
- [TR] : When starting stitching after thread trimming.
- [SB] : When start tacking is completed. (If the start tacking setting is "NO", it is when starting stitching after thread trimming.)
- [GO] : Always start.

2. Simple sequence forced end conditions

The simple sequence forced end conditions can be set.

- [NO] : The simple sequence will not forced end. (The default setting is the [NO] setting.)
- [LV] : When virtual input IO5 is ON level.
- [IN] : When virtual input IO5 is turned ON.
- [T] : When thread trimming is completed.
- [R] : When operation is starting.
- [S] : When motor is stopped. (This also includes when single-stitch operation is stopped.)
- [TR] : When starting stitching after thread trimming.
- [SB] : When start tacking is completed. (If the start tacking setting is "NO", it is when starting stitching after thread trimming.)

3. Simple sequence output starting point setting

The simple sequence output starting point setting [S1S], [S2S], [S3S] and [S4S] can be set.

- [KS] : Linked output. (ON edge of the front output)
- [IN] : Virtual input ON point. (KS1:IO6, KS2:IO7, KS3:IO8, KS4:IO9)
- [T] : When thread trimming is completed.
- [R] : When operation is starting.
- [S] : When motor is stopped. (This also includes when single-stitch operation is stopped.)
- [TR] : When starting stitching after thread trimming.
- [SB] : When start tacking is completed. (If the start tacking setting is "NO", it is when starting stitching after thread trimming.)

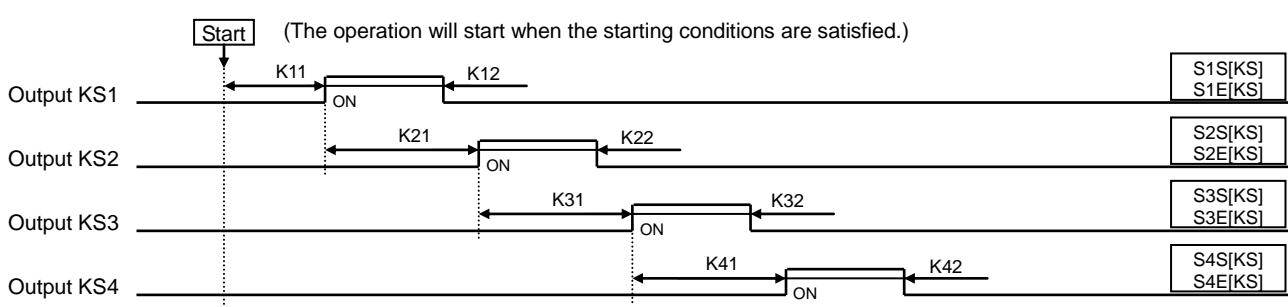
4. Simple sequence output end point setting

The simple sequence output end point setting [S1E], [S2E], [S3E] and [S4E] can be set.

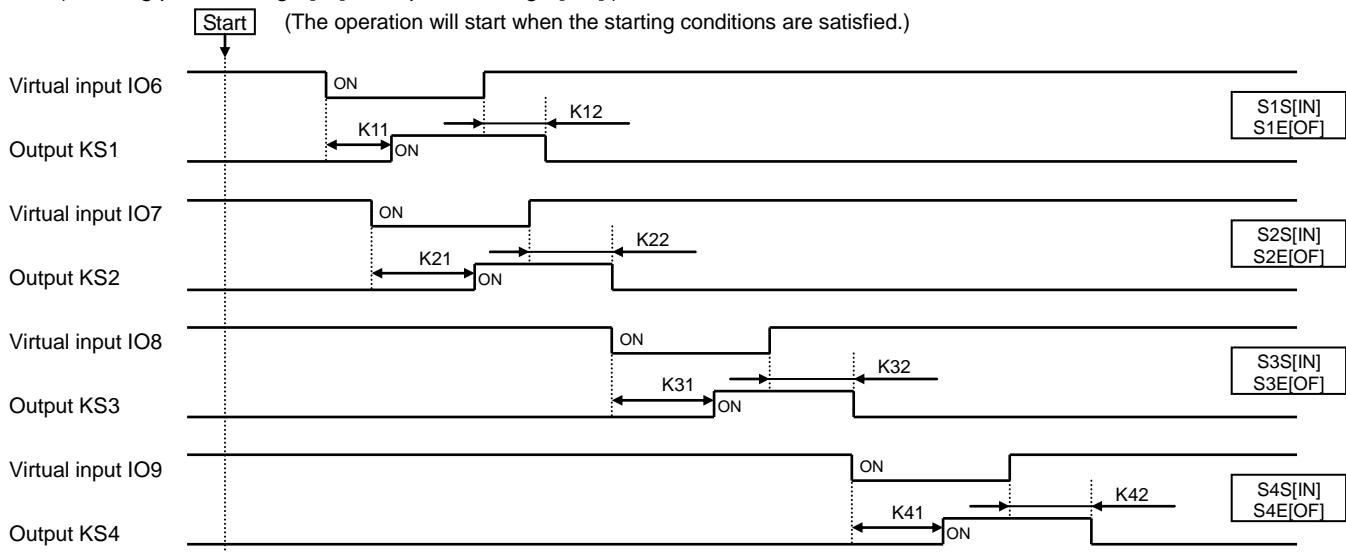
- [KS] : Linked output. (Each output starting point)
- [OF] : Virtual input OFF point. (KS1:IO6, KS2:IO7, KS3:IO8, KS4:IO9)
- [IN] : Virtual input ON point. (KS1:IOA, KS2:IOB, KS3:IOC, KS4:IOD)
- [T] : When thread trimming is completed.
- [R] : When operation is starting.
- [S] : When motor is stopped. (This also includes when single-stitch operation is stopped.)
- [TR] : When starting stitching after thread trimming.
- [SB] : When start tacking is completed. (If the start tacking setting is "NO", it is when starting stitching after thread trimming.)

5. Simple sequence output timing chart

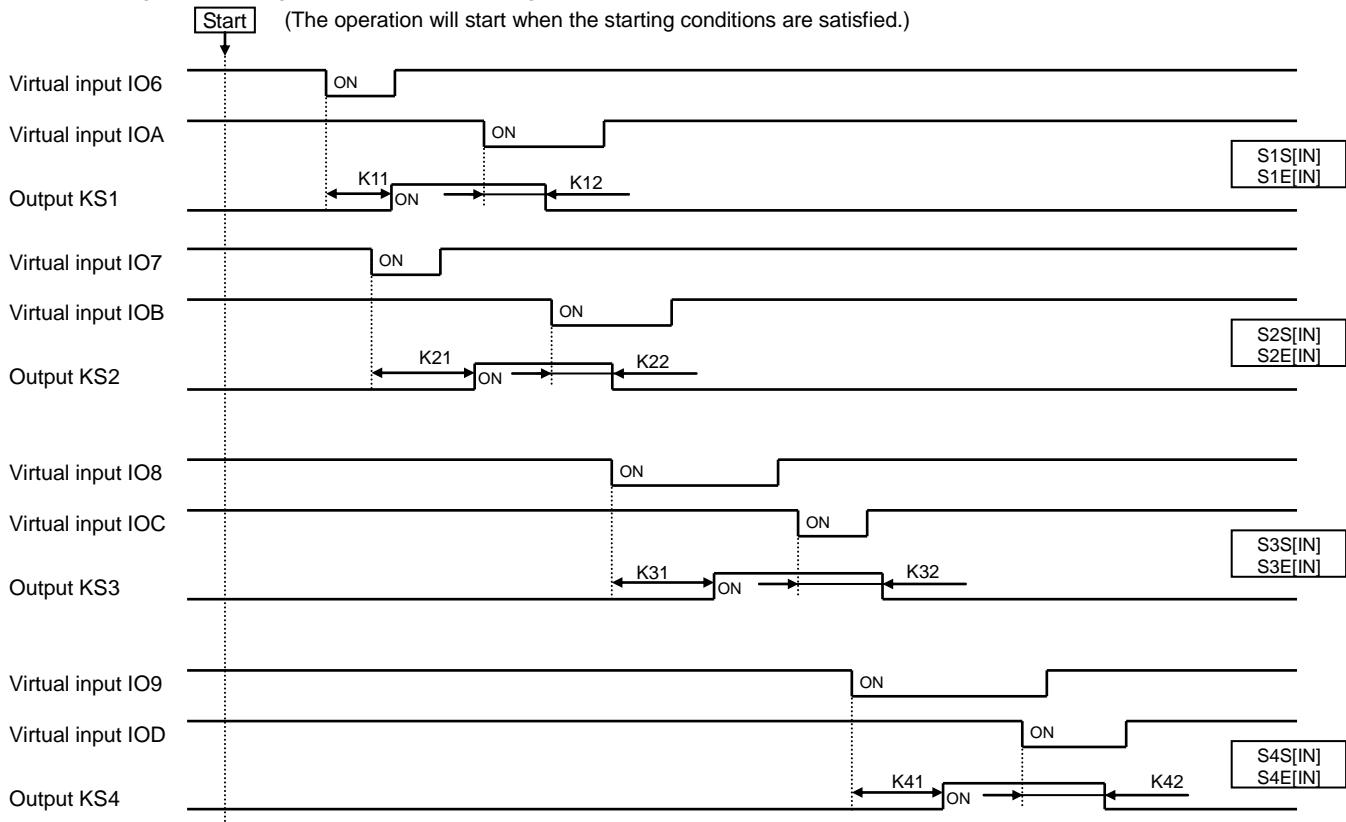
5-1. (Starting point setting : [KS], End point setting : [KS])



5-2. (Starting point setting : [IN], End point setting : [OF])



5-3. (Starting point setting : [IN], End point setting : [IN])



Explanation of setting functions

- (a) Sequence output [KS1] [KS2] [KS3] [KS4] output start time/No. of stitch setting changeover [NS1] [NS2] [NS3] [NS4]
 - [OF] setting : Time setting ([K11] [K21] [K31] [K41] : 10 msec unit)
 - [ON] setting : No. of stitch setting ([K11] [K21] [K31] [K41])
- (b) Sequence output [KS1] [KS2] [KS3] [KS4] output time/No. of stitch setting changeover [NE1] [NE2] [NE3] [NE4]
 - [OF] setting : Time setting ([K12] [K22] [K32] [K42] : 10 msec unit)
 - [ON] setting : No. of stitch setting ([K12] [K22] [K32] [K42])
- (c) Sequence output [KS1] [KS2] [KS3] [KS4] time setting/No. of stitch setting each by ten times setting [KL1] [KL2] [KL3] [KL4]
 - [OF] setting : Time setting/No. of stitch setting ([K11][K12], [K21][K22], [K31][K32], [K41][K42])
 - [ON] setting : Time setting/No. of stitch setting by ten times ([K11][K12]x10, [K21][K22]x10, [K31][K32]x10, [K41][K42]x10)
- (d) Sequence output [KS1] [KS2] [KS3] [KS4] time setting by ten times setting [KSL]
 - [OF] setting : Time setting ([K11][K12][K21][K22][K31][K32][K41][K42])
 - [ON] setting : Time setting by ten times ([K11][K12][K21][K22][K31][K32][K41][K42]x10)

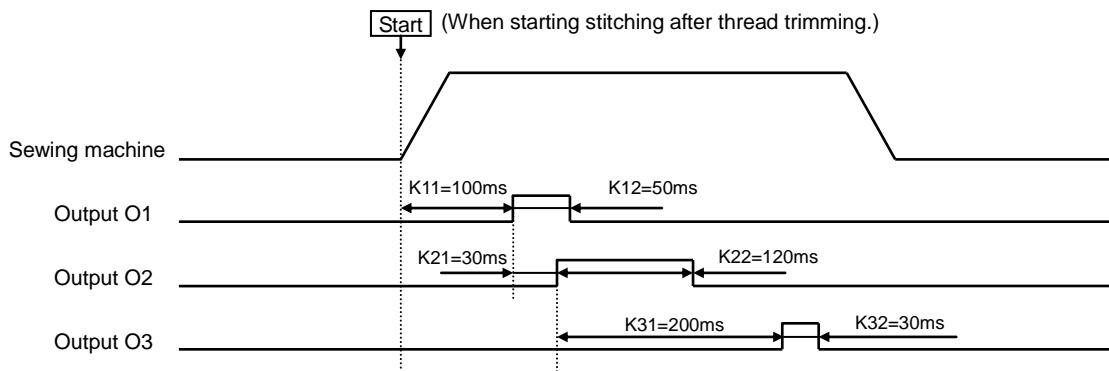
Note 1. When using the simple sequence, make each simple sequence related setting shown above, and assign the function output [KS1] [KS2]

[KS3] [KS4] to the output setting of the output pin being used by setting the [C] mode output function.

2. If the starting conditions are not set in the simple sequence setting starting condition setting [SQS] above (when [NO] is set), the function output [KS1] [KS2] [KS3] will have the output timing shown on the next page.

1.Example 1

When the following timing output is to be output to the option B connector's No.3 pin, No.12 pin and No.15 pin. ([O1],[O2],[O3])



[Setting]

C Mode ([↓]+[C] key)

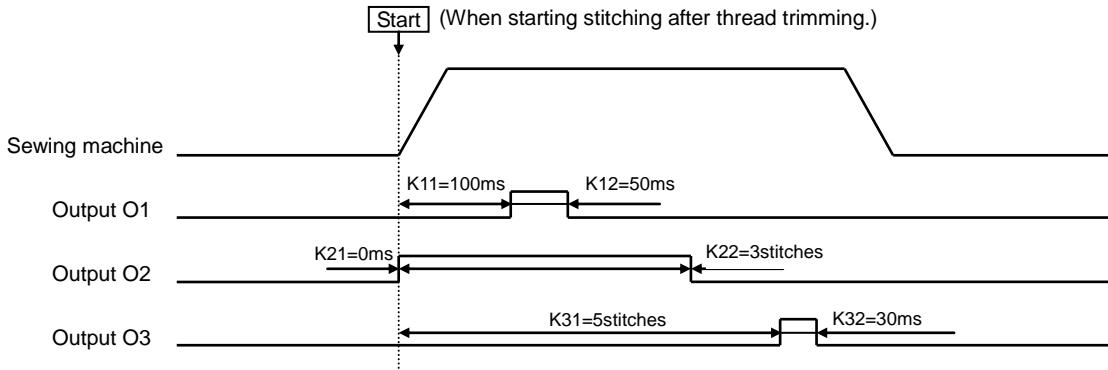
Function	Standard	Setting	Description
O1	OT1	KS1	Selection of output signal function
O2	NCL	KS2	Selection of output signal function
O3	TF	KS3	Selection of output signal function

S Mode ([↓]+[B]+[D] key)

Function	Standard	Setting	Description
SQS	NO	TR	Simple sequence start condition (When starting stitching after thread trimming)
SQE	NO	T	Simple sequence forced end condition (When thread trimming is completed)
S1S	KS	KS	KS1 output starting point setting (Linked output. (ON edge of the front output))
S1E	KS	KS	KS1 output end point setting (Linked output. (Each output starting point))
S2S	KS	KS	KS2 output starting point setting (Linked output. (ON edge of the front output))
S2E	KS	KS	KS2 output end point setting (Linked output. (Each output starting point))
S3S	KS	KS	KS3 output starting point setting (Linked output. (ON edge of the front output))
S3E	KS	KS	KS3 output end point setting (Linked output. (Each output starting point))
K11	7	10	KS1 output start [Time] setting (10x10ms=100ms)
K12	7	5	KS1 output [Time] setting (5x10ms=50ms)
K21	7	3	KS2 output start [Time] setting (3x10ms=30ms)
K22	7	12	KS2 output [Time] setting (12x10ms=120ms)
K31	7	20	KS3 output start [Time] setting (20x10ms=200ms)
K32	7	3	KS3 output [Time] setting (3x10ms=30ms)

2.Example 2

When the following timing output is to be output to the option B connector's No.3 pin, No.12 pin and No.15 pin. ([O1],[O2],[O3])



[Setting]

C Mode ([↓]+[C] key)

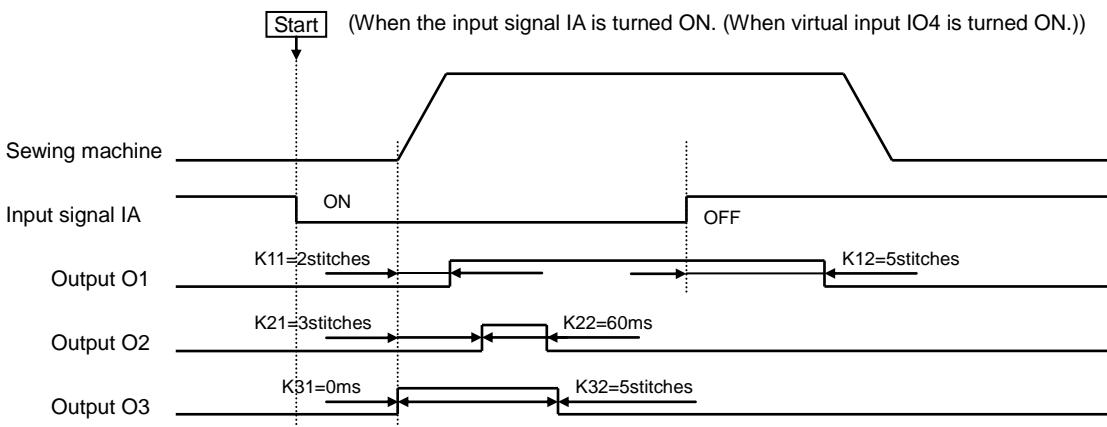
Function	Standard	Setting	Description
O1	OT1	KS1	Selection of output signal function
O2	NCL	KS2	Selection of output signal function
O3	TF	KS3	Selection of output signal function

S Mode ([↓]+[B]+[D] key)

Function	Standard	Setting	Description
SQS	NO	TR	Simple sequence start condition (When starting stitching after thread trimming)
SQE	NO	T	Simple sequence forced end condition (When thread trimming is completed)
NS1	OF	OF	KS1 output start time/No. of stitch setting changeover (Time count setting)
NE1	OF	OF	KS1 output time/No. of stitch setting changeover (Time count setting)
S1S	KS	TR	KS1 output starting point setting (Linked output. (ON edge of the front output))
S1E	KS	KS	KS1 output end point setting (Linked output. (Each output starting point))
NS2	OF	OF	KS2 output start time/No. of stitch setting changeover (Time count setting)
NE2	OF	ON	KS2 output time/No. of stitch setting changeover (Stitch count setting)
S2S	KS	TR	KS2 output starting point setting (Linked output. (ON edge of the front output))
S2E	KS	KS	KS2 output end point setting (Linked output. (Each output starting point))
NS3	OF	ON	KS3 output start time/No. of stitch setting changeover (Stitch count setting)
NE3	OF	OF	KS3 output time/No. of stitch setting changeover (Time count setting)
S3S	KS	TR	KS3 output starting point setting (Linked output. (ON edge of the front output))
S3E	KS	KS	KS3 output end point setting (Linked output. (Each output starting point))
K11	7	10	KS1 output start [Time] setting (10x10ms=100ms)
K12	7	5	KS1 output [Time] setting (5x10ms=50ms)
K21	7	0	KS2 output start [Time] setting (0ms)
K22	7	3	KS2 output [No. of stitches] setting (3stitches)
K31	7	5	KS3 output start [No. of stitches] setting (5stitches)
K32	7	3	KS3 output [Time] setting (3x10ms=30ms)

3.Example 3

By input signal of the option A connector's No.2 pin ([IA]), When the following timing output is to be output to the option B connector's No.3 pin, No.12 pin and No.15 pin. ([O1],[O2],[O3])



[Setting]

C Mode ([↓]+[C] key)

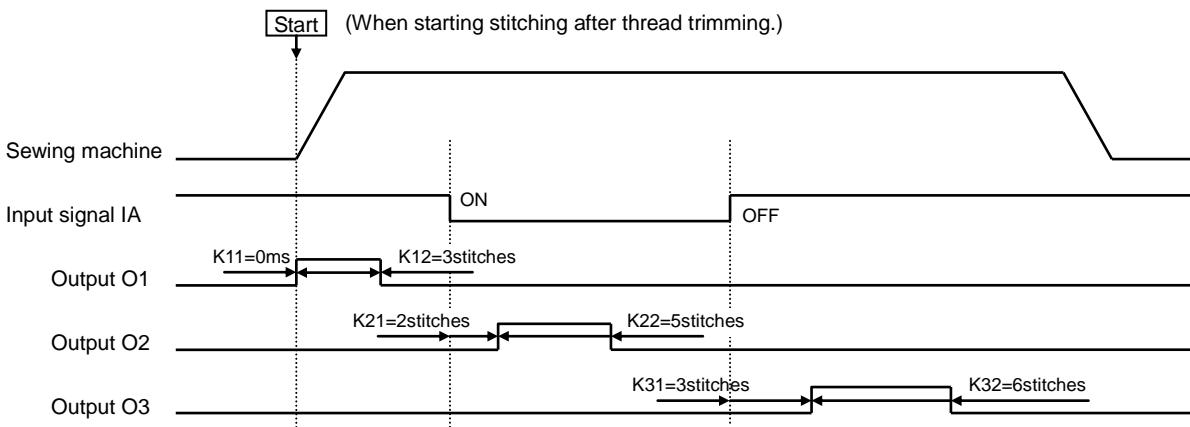
Function	Standard	Setting	Description
IA	PSU	IO4	Selection of input signal function
IM	NO	IO6	Selection of input signal function
O1	OT1	KS1	Selection of output signal function
O2	NCL	KS2	Selection of output signal function
O3	TF	KS3	Selection of output signal function
OM	NO	OT4	Selection of output signal function

S Mode ([↓]+[B]+[D] key)

Function	Standard	Setting	Description
SQS	NO	IN	Simple sequence start condition (When virtual input IO4 is turned ON.)
SQE	NO	T	Simple sequence forced end condition (When thread trimming is completed)
NS1	OF	ON	KS1 output start time/No. of stitch setting changeover (Stitch count setting)
NE1	OF	ON	KS1 output time/No. of stitch setting changeover (Stitch count setting)
S1S	KS	TR	KS1 output starting point setting (When starting stitching after thread trimming)
S1E	KS	OF	KS1 output end point setting (Virtual input OFF point. (KS1:IO6))
NS2	OF	ON	KS2 output start time/No. of stitch setting changeover (Stitch count setting)
NE2	OF	OF	KS2 output time/No. of stitch setting changeover (Time count setting)
S2S	KS	TR	KS2 output starting point setting (When starting stitching after thread trimming)
S2E	KS	KS	KS2 output end point setting (Linked output. (Each output starting point))
NS3	OF	OF	KS3 output start time/No. of stitch setting changeover (Time count setting)
NE3	OF	ON	KS3 output time/No. of stitch setting changeover (Stitch count setting)
S3S	KS	TR	KS3 output starting point setting (When starting stitching after thread trimming)
S3E	KS	KS	KS3 output end point setting (Linked output. (Each output starting point))
K11	7	2	KS1 output start [No. of stitches] setting (2stitches)
K12	7	5	KS1 output [No. of stitches] setting (5stitches)
K21	7	3	KS2 output start [No. of stitches] setting (3stitches)
K22	7	6	KS2 output [Time] setting (6x10ms=60ms)
K31	7	0	KS3 output start [Time] setting (0ms)
K32	7	5	KS3 output [No. of stitches] setting (5stitches)

4.Example 4

By input signal of the option A connector's No.2 pin ([IA]), When the following timing output is to be output to the option B connector's No.3 pin, No.12 pin and No.15 pin. ([O1],[O2],[O3])



[Setting]

C Mode ([↓]+[C] key)

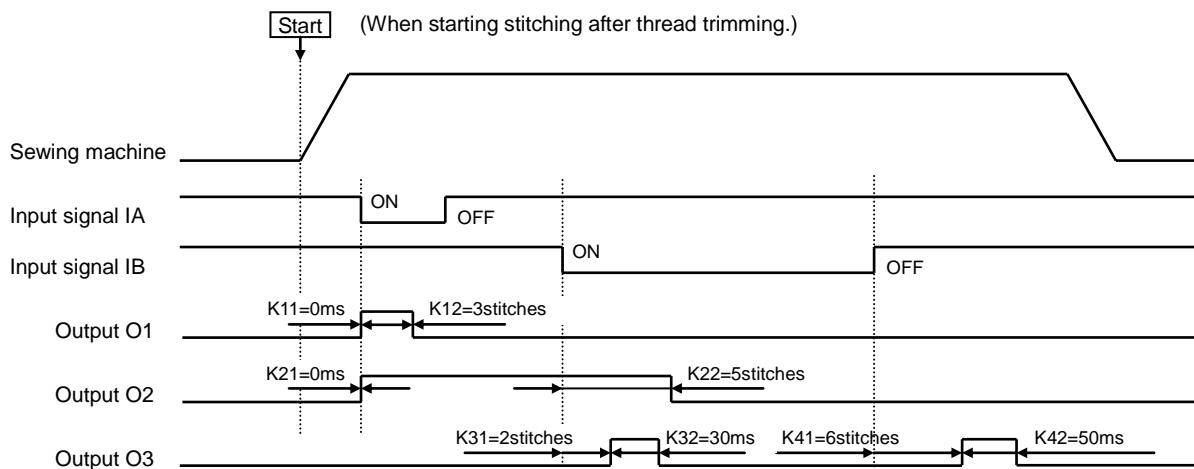
Function	Standard	Setting	Description
IA	PSU	IO7	Selection of input signal function
IM	NO	IO8	Selection of input signal function
O1	OT1	KS1	Selection of output signal function
O2	NCL	KS2	Selection of output signal function
O3	TF	KS3	Selection of output signal function
OM	NO	OT7	Selection of output signal function
OML	OF	ON	Output signal logical changeover

S Mode ([↓]+[B]+[D] key)

Function	Standard	Setting	Description
SQS	NO	TR	Simple sequence start condition (When starting stitching after thread trimming)
SQE	NO	T	Simple sequence forced end condition (When thread trimming is completed)
NS1	OF	OF	KS1 output start time/No. of stitch setting changeover (Time count setting)
NE1	OF	ON	KS1 output time/No. of stitch setting changeover (Stitch count setting)
S1S	KS	TR	KS1 output starting point setting (When starting stitching after thread trimming)
S1E	KS	KS	KS1 output end point setting (Linked output. (Each output starting point))
NS2	OF	ON	KS2 output start time/No. of stitch setting changeover (Stitch count setting)
NE2	OF	ON	KS2 output time/No. of stitch setting changeover (Stitch count setting)
S2S	KS	IN	KS2 output starting point setting (Virtual input ON point. (KS2:IO7))
S2E	KS	KS	KS2 output end point setting (Linked output. (Each output starting point))
NS3	OF	ON	KS3 output start time/No. of stitch setting changeover (Stitch count setting)
NE3	OF	ON	KS3 output time/No. of stitch setting changeover (Stitch count setting)
S3S	KS	IN	KS3 output starting point setting (Virtual input ON point. (KS3:IO8))
S3E	KS	KS	KS3 output end point setting (Linked output. (Each output starting point))
K11	7	O	KS1 output start [Time] setting (0ms)
K12	7	3	KS1 output [No. of stitches] setting (3stitches)
K21	7	2	KS2 output start [No. of stitches] setting (2stitches)
K22	7	5	KS2 output [No. of stitches] setting (5stitches)
K31	7	3	KS3 output start [No. of stitches] setting (3stitches)
K32	7	6	KS3 output [No. of stitches] setting (6stitches)

5.Example 5

By input signal of the option A connector's No.2 pin ([IA]) and No.4pin ([IB]), When the following timing output is to be output to the option B connector's No.3 pin, No.12 pin and No.15 pin. ([O1],[O2],[O3])



[Setting]

C Mode ([↓]+[C] key)

Function	Standard	Setting	Description
IA	PSU	IO6	Selection of input signal function
IB	PSD	IO8	Selection of input signal function
IM	NO	IO7	Selection of input signal function
IN	NO	IOB	Selection of input signal function
IO	NO	IO9	Selection of input signal function
O1	OT1	KS1	Selection of output signal function
O2	NCL	KS2	Selection of output signal function
O3	TF	OT3	Selection of output signal function
OM	NO	OT6	Selection of output signal function
ON	NO	OT8	Selection of output signal function
OO	NO	OT8	Selection of output signal function
OOL	OF	ON	Output signal logical changeover
OR	NO	IO3	Logic [OR] module input function selection
R1	NO	KS3	Logic [OR] module output function selection
R2	NO	KS4	Logic [OR] module output function selection

S Mode ([↓]+[B]+[D] key)

Function	Standard	Setting	Description
SQS	NO	TR	Simple sequence start condition (When starting stitching after thread trimming)
SQE	NO	T	Simple sequence forced end condition (When thread trimming is completed)
NS1	OF	OF	KS1 output start time/No. of stitch setting changeover (Time count setting)
NE1	OF	ON	KS1 output time/No. of stitch setting changeover (Stitch count setting)
S1S	KS	IN	KS1 output starting point setting (Virtual input ON point. (KS1:IO6))
S1E	KS	KS	KS1 output end point setting (Linked output. (Each output starting point))
NS2	OF	OF	KS2 output start time/No. of stitch setting changeover (Time count setting)
NE2	OF	ON	KS2 output time/No. of stitch setting changeover (Stitch count setting)
S2S	KS	IN	KS2 output starting point setting (Virtual input ON point. (KS2:IO7))
S2E	KS	IN	KS2 output end point setting (Virtual input ON point. (KS2:IOB))
NS3	OF	ON	KS3 output start time/No. of stitch setting changeover (Stitch count setting)
NE3	OF	OF	KS3 output time/No. of stitch setting changeover (Time count setting)
S3S	KS	IN	KS3 output starting point setting (Virtual input ON point. (KS3:IO8))
S3E	KS	KS	KS3 output end point setting (Linked output. (Each output starting point))
NS4	OF	ON	KS4 output start time/No. of stitch setting changeover (Stitch count setting)
NE4	OF	OF	KS4 output time/No. of stitch setting changeover (Time count setting)
S4S	KS	IN	KS4 output starting point setting (Virtual input ON point. (KS4:IO9))
S4E	KS	KS	KS4 output end point setting (Linked output. (Each output starting point))
K11	7	0	KS1 output start [Time] setting (0ms)
K12	7	3	KS1 output [No. of stitches] setting (3stitches)
K21	7	0	KS2 output start [Time] setting (0ms)
K22	7	5	KS2 output start [No. of stitches] setting (5stitches)
K31	7	2	KS3 output start [No. of stitches] setting (2stitches)
K32	7	3	KS3 output start [Time] setting (3x10ms=30ms)
K41	7	6	KS4 output start [No. of stitches] setting (6stitches)
K42	7	5	KS4 output start [Time] setting (5x10ms=50ms)

20 How to set Thread break detector

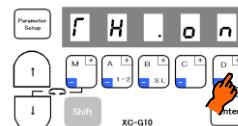
1. Setting Thread break detector function

(1) Call out the program mode [Q] function [TH].

(This can be called with mode call or direct number call. Refer to pages 17 to 20.
(Direct call number = "1416"))

* Enter program mode [Q]
([↓] + [A] + [C] keys)

(2)



* Press the [D] key and set the value to "ON".

(3) Set the function [TH].

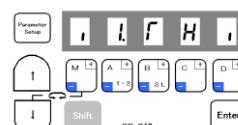
For mode call: [↓] + [↑]

For direct number call: Set with

(4) Call out the program mode [C] function [I1].

(This can be called with mode call or direct number call. Refer to pages 17 to 20.
(Direct call number = "357"))

(5)



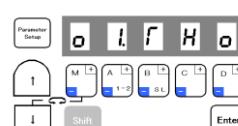
* Press the [D] key and set the value to "THI".

(6) Call out the program mode [C] function [O1].

For mode call: [↓]

For direct number call: Set with , select number [416], and
then press .

(7)



* Press the [D] key and set the value to "THO".

(8) Entering the normal mode

For mode call: [↓] + [↑]

For direct number call: Set with and then press



Description

Selection the function on program mode [Q].

[TH.ON] : To use upper thread break detector function, set to "ON"

[TH.OF] : Upper thread break detector function is invalid.

Selection the function on program mode [Q].

[TST.] : Setting the action, after thread was broken.

[NO] : "THO" output function become on and continue to sew.

[TR] : "THO" output function become on and trimming thread.

[ST] : "THO" output function become on and sewing machine will be stooped.

* When the sewing machine run again, "THO" output will be clear.

[B.] : To set the speed neglect thread break function.

When sewing machine rotation speed become under this speed, it neglect thread break function.

[THS.] : To set the stitch numbers to neglect thread break function, after sewing machine speed becomes over "B" speed.

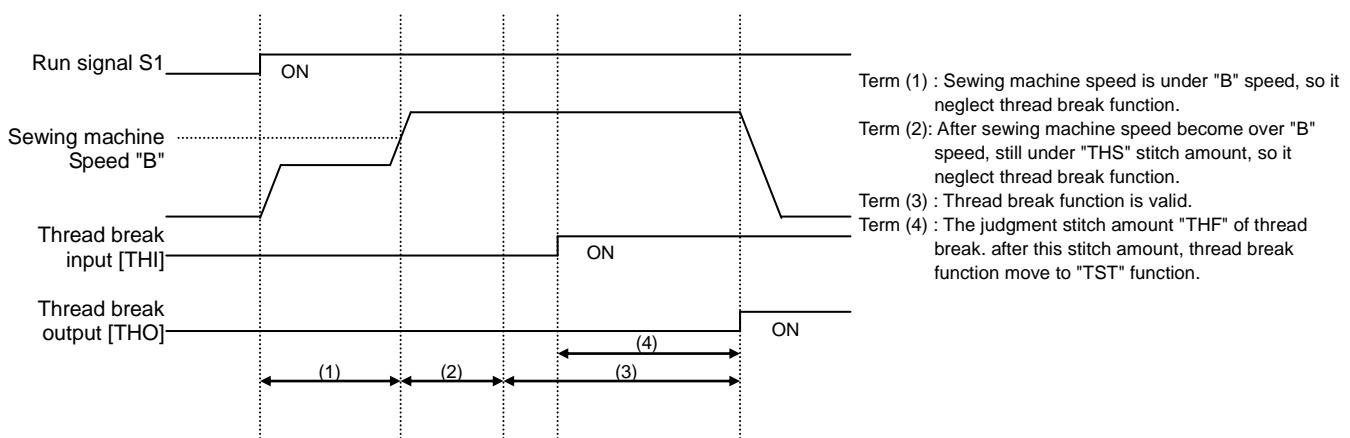
[THF.] : Setting the judgment stitch amount of thread break.

Selection the function on program mode [C].

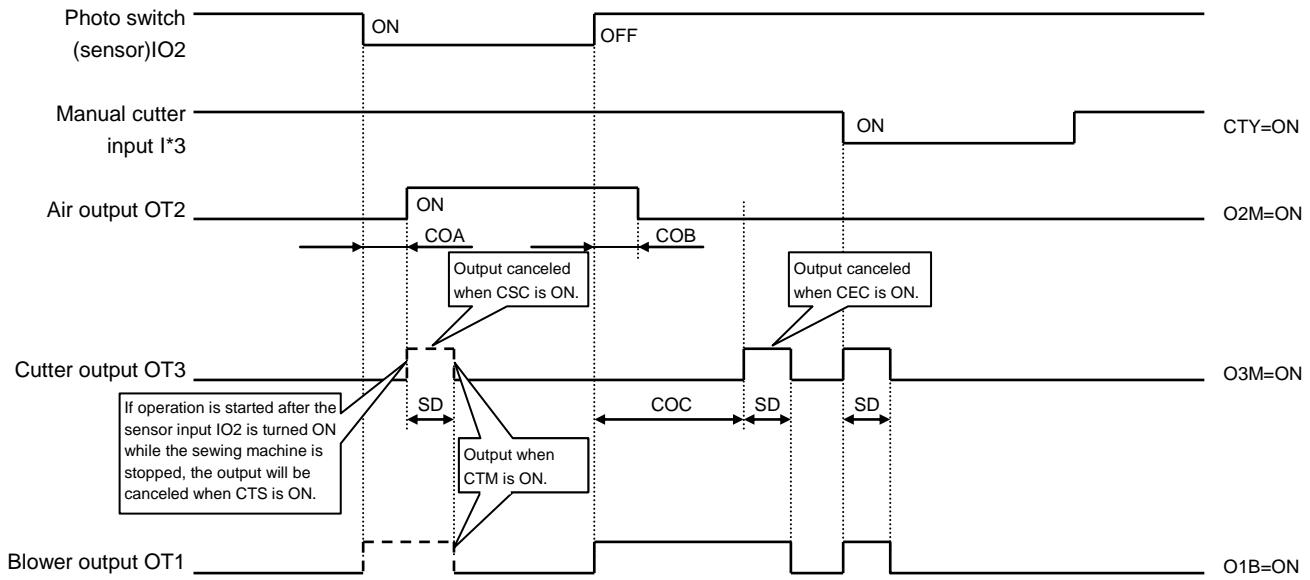
[I1.THI] : No. 6 pin of option connector B will be set to thread break input function.

[O1.THO] : No. 3 pin of option connector B will be set to thread break output function.

2. Timing chart of thread break input and output.



1. Cutter output function



(Note) Use of the I*1 input is prohibited when using the blower output.

F mode setting

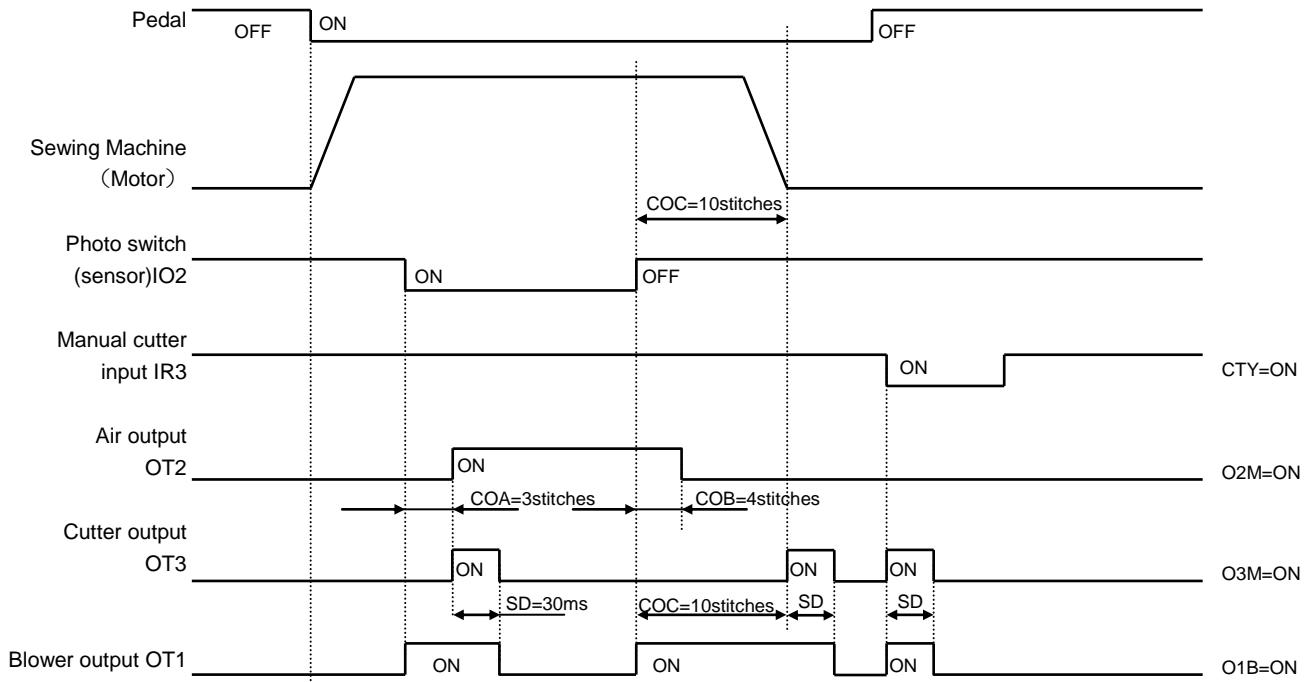
Function name	Specification
O1B	Set OT1 output to blower output.
O2M	Set OT2 output to air output.
O3M	Set OT3 output to cutter output.
I2M	Add mesh judgment control to IO2 input. (If output stays ON or OFF for longer than the mesh judgment time set with ED, the IO2 input will not be fixed.)
CTY	Set I*3 input to manual cutter input.
CTM	Set OT3 cutter output to both OFF→ON and ON→OFF of IO2 photo switch.
COA	No. of stitches A
COB	No. of stitches B
COC	No. of stitches C
SD	Cutter ON time
ED	Mesh judgment time
CSC	The output of the automatic cutter output is prohibited while the sensor is ON.
CEC	The output of the automatic cutter output is prohibited while the sensor is OFF.
CTS	The output of the automatic cutter output is prohibited when the sensor input is ON while the sewing machine is stopped.

Note 1. Always set O2M to ON even when not using the air output.

2. Customize the option connectors I1, I2 and O1 to O3 to the required functions using the program mode beforehand.

2. Setting example of the Cutter output function

1). Timing



2). Setting

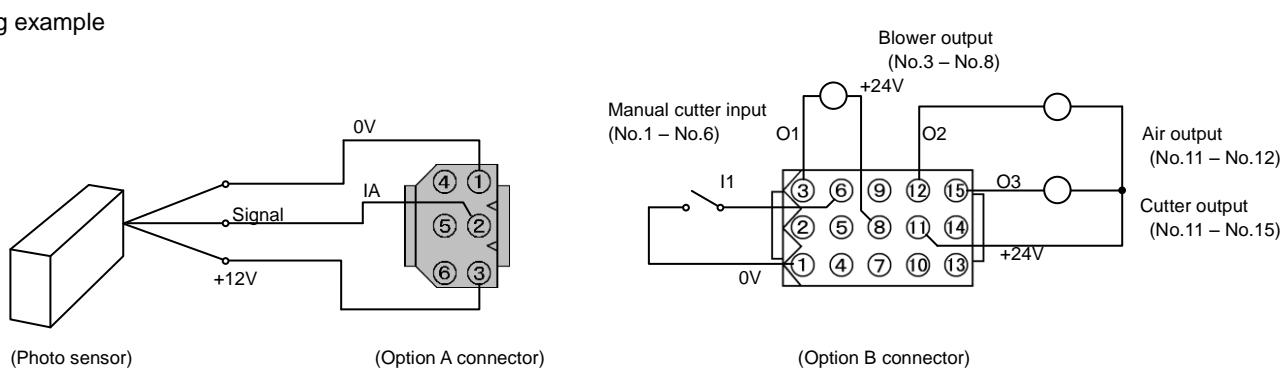
C Mode ([↓]+[C] key)

Function	Standard	Setting	Description
IA	PSU	IO2	Input signal select (Sensor signal)
I1	IO1	IR3	Input signal select (Manual cutter input)
O1	OT1	OT1	Output signal select (Blower output)
O2	NCL	OT2	Output signal select (Air output)
O3	TF	OT3	Output signal select (Cutter output)

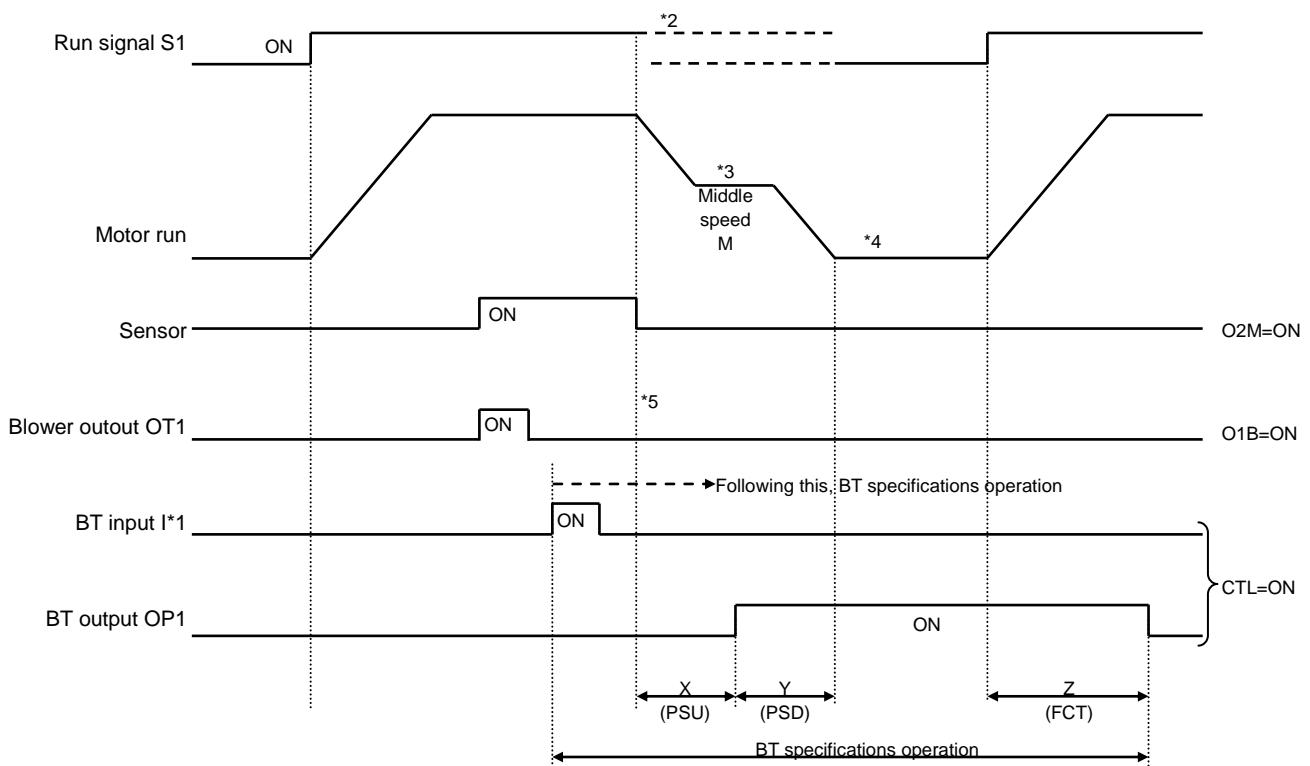
F Mode ([↓]+[↑]+[B] key)

Function	Standard	Setting	Description
O1B	OF	ON	Set OT1 output to blower output.
O2M	OF	ON	Set OT2 output to air output.
O3M	OF	ON	Set OT3 output to cutter output.
CTY	OF	ON	Set I*3 input to manual cutter input.
CTM	OF	ON	Set OT3 cutter output to both OFF→ON and ON→OFF of IO2 photo switch.
CTS	OF	ON	Cutter output prohibit when sensor is ON while stopped
CAT	OF	ON	Automatic thread trim setting after cutter sensor is turned off
COA	0	3	No. of stitches (0~99 stitches)
COB	0	4	No. of stitches (0~99 stitches)
COC	0	10	No. of stitches (0~99 stitches)
SD	0	30	Cutter ON time (0~508msec)

3). Wiring example



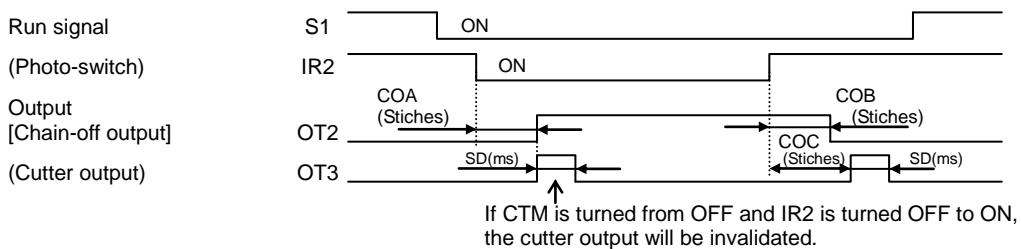
3. BT specifications (*1) operation chart and required settings



- *1 : When CTL is set to ON, the BT specifications operation will be applied after the I*1 input turns ON. (If the BT output is turned OFF after I*1 turns OFF, the BT specifications will be canceled.)
- *2 : S1 is invalidated after the photo sensor detection. Operation will restart after stopping and then turning S1 OFF and ON.
- *3 : Medium speed preset stitching when photo sensor turns OFF after BT input.
- *4 : Up position stop after thread trimming.
- *5 : Not output when photo sensor is OFF after BT input.

- Note
1. Always set O2M to ON even when not using the air output.
 2. Customize the option connectors I1, I2 and O1 to O3 to the required functions using the program mode beforehand.
 3. The No. of stitch settings PSU, PSD and FCT are common with the other settings. Thus, when using as the BT specifications, the PSU/PSD input and the function that automatically lowers the presser with a timer cannot be used.

4. How to set the tape cutter operation 1



(1) Function setting of the program mode [C]

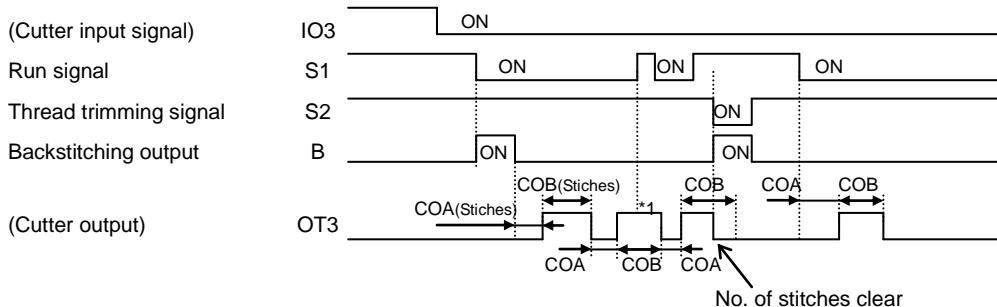
Ex. function setting [I1. IR2] + [O1. OT2] + [O2. OT3]

(2) Function setting of the program mode [F]

- | | |
|-------------------------------|---------------------------------|
| 1) Function setting [CTM. ON] | : Cutter output mode |
| 2) Function setting [O2M. ON] | : Operation mode of output OT2 |
| 3) Function setting [O3M. ON] | : Operation mode of output OT3 |
| 4) Function setting [COA. **] | : No. of stitches COA setting |
| 5) Function setting [COB. **] | : No. of stitches COB setting |
| 6) Function setting [COC. **] | : No. of stitches COC setting |
| 7) Function setting [SD. ***] | : Cutter output time SD setting |

Note 1. Always set the F mode function CTR to OFF when using this operation.

5. How to set the tape cutter operation 2



(1) Function setting of the program mode [C]

Ex. function setting [I1. IO3] + [O1. OT3]

(2) Function setting of the program mode [F]

- | | |
|-------------------------------|-------------------------------|
| 1) Function setting [CTR. ON] | : Cutter output mode |
| 2) Function setting [COA. **] | : No. of stitches COA setting |
| 3) Function setting [COB. **] | : No. of stitches COB setting |

Note 1. Function setting [IO3] : When the cutter input signal is set to IO3, the cutter output will not turn OFF even if the sewing machine is stopped during No. of stitches [COB] counting. (*1)

2. Function setting [IR3] : When the cutter input signal is set to IR3, the cutter output will turn OFF when the sewing machine is stopped during No. of stitches [COB] counting.

3. Always set the F mode functions CTY, CTM, O2M, O3M to OFF when using this operation.

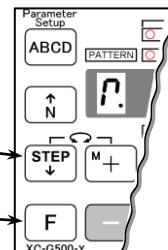
1. Examples of using control switch panel

SELECTION OF MODE

There are 2 kinds of modes in the control panel

- 1) G10 mode : Display of setting data for control box like sewing machine direction, sewing machine speed and so on.
(The same display as the XC-G10 control panel)
- 2) Control panel mode : Display of back tacking data, program input data, teaching input data and so on.
(The specific display of the XC-G500 control panel)

Please select them for your purpose.
(Factory setting is G10 mode)

**How to change mode**

Press the **F** key while pressing the **STEP** key. The previous mode is returned at the same operation.

Note: Mode is not changed while the **INPUT** is lighted on control panel mode.

Press the **OUTPUT** key and after the **INPUT** is turned OFF the light, it is possible to change mode.

Settings Data Copy Function

The control panel can be used to read the machine control box settings data and write to another control box.

Reading Settings Data (Control Box → Control Panel)

(1) Turn ON the power while pressing the **ABCD** key. The display will indicate **B R E A D**.

(2) Turn the **F** key ON to copy the settings data from the control box to the control panel.

(3) Copying is completed successfully if the normal display appears after several tens of seconds. If M5 (**75**) displays, an error has occurred. Use the following procedure to perform the operation again.

- 1) Turn the power OFF. → 2) Turn OFF the M5 display.
→ 3) Inspect the connector connection. → 4) Repeat the operation from step 1.

Writing Settings Data (Control Panel → Control Box)

(1) Turn ON the power while pressing the **N** key. The display will indicate **B R , F E**.

(2) Turn the **F** key ON to copy the settings data from the control panel to the control box.

(3) Copying is completed successfully if the normal display appears after ten seconds. If M5 (**75**) displays, an error has occurred. Use the following procedure to perform the operation again.

- 1) Turn the power OFF. → 2) Turn OFF the M5 display. → 3) Check the control box voltage/model.
→ 4) Inspect the connector connection. → 5) Repeat the operation from step 1.

Notes: 1. The settings data cannot be written if the voltage and model (control box model name) do not match.

(M5 (**75**) displays.)

2. Never disconnect the control panel while reading or writing settings data. Control box operation after disconnection cannot be guaranteed.

Speed limit limiter changeover

2. Changing the speed limit limiter for the maximum speed using the switches

- Applicable control box : XC-GMF
- Working specifications : The high-speed speed limit limiter is changed with the switch.
(Variable-speed operation is carried out with the variable-speed pedal XC-CVS-2.)

[Setting] (For example, to change the high-speed speed limit between 2000 rotations and 600 rotations.)

- (1). For example, set the Mitsubishi sewing machine simple setting (Direct call number = "1423")
LU2-4410 or LU2-4430 for the model setting.

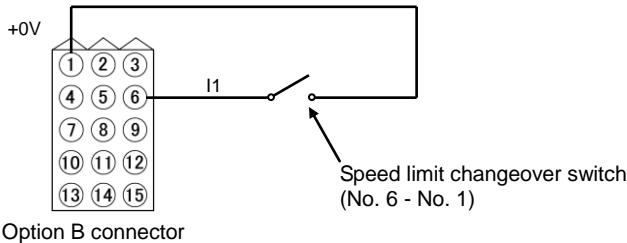
- (2) Q mode ([↓] + [A] + [C] key)

Function [LIM. OF] → [LIM.ON] (Set the speed limit during OT1 output ON to medium speed M.)

- (3) P mode ([↓] + [↑] key)

Set the medium speed setting to 600 rotations. [M. 800] → [M. 600] (Direct call number = "0005")

[Connection]



Caution 1 : When the switch is OFF, the normal speed limit (2000 rotations) will be applied. When the switch is ON, the speed will be limited to the medium speed M setting value (600 rotations).

Caution 2 : Do not use the 01 (OT1) output. (Do not connect.)

Caution 3 : When using only 2 pin with the option B connector, the connector could dislocate easily with vibration. Thus, insert an empty pin into the pins that are not being used.

Variable-speed pedal + separate switch operation

3. Special operation using option B connector variable-speed command VC2

(The speed can be adjusted with the digital potentiometer on the setting panel.)

- Applicable control box : XC-GMF

- Working specifications : High-speed operation using variable-speed pedal (XC-CVS-2) and separate switch
(Digital keys C and D on the control panel is valid)

[Setting]

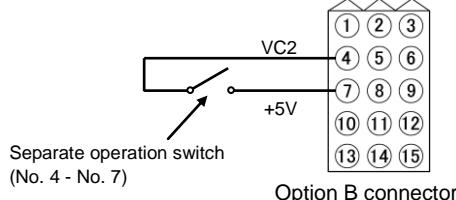
Q mode setting ([↓] + [A] + [C] keys)



- VC2=VC → VC2=VS

(Direct call number = "1405")

[Connection]



4. Example of down counter function application settings

• Operation

Number of count stitches: 900 stitches.

The number of stitches is displayed on the control box or control switch panel.

Thread trimming (pedal heeling operation) is carried out while stitching (while counting).

After 900 stitches are counted, the needle stops at the DOWN position, and further stitching is prohibited. The thread is trimmed with pedal heeling, and then the automatic counter is cleared.

[Setting]

B mode ([↓]+[B] key)

N=900	(Direct call number = "0201")
D=900	(Direct call number = "0202")
CDN=ST	(Direct call number = "0210")
DSC=ST	(Direct call number = "0211")
DNC=ON	(Direct call number = "0213")
CNU=1	(Direct call number = "0217")

C mode ([↓]+[C] key)

CNF=DN (For XC-G500Y type control box display)	(Direct call number = "0529")
IM=PSD	(Direct call number = "0339")
IN=CCD	(Direct call number = "0342")
OM=CDE	(Direct call number = "0449")
ON=OT2	(Direct call number = "0453")
A1=IO2	(Direct call number = "0477")
N1=CDE	(Direct call number = "0480")
N2=T(or, N2 = KS3 : when counter clearing is mistaken with pedal heeling)	(Direct call number = "0482")

P mode ([↓] + [↑] key)

PSD = 0 stitches (default value)

Note that when stitching at a high speed, the needle will stop at the DOWN position after stitching the number of stitches instead of following the counter setting value. (After the set number of stitches are counted, PSD stop will take place with the count end signal, so the needle will not stop immediately.) Thus, set the number of stitches for the down counter setting value as a value obtained by subtracting several stitches (number of stitches exceeded to the DOWN position) in respect to the number of stitches to be actually stitched. (In this case, the excessive number of stitches will be displayed as a minus value.)

Add the following setting when a minus count is not to be displayed.

B mode ([↓]+[B] key)

NXD = ON (Direct call number = "0214")

Note that in this case, the display will stop at "0". However, the down counter setting value and the number of excessive stitches during actual stitching will differ in the same manner as above.

In the above setting example,

B mode ([↓]+[B] key)

If the B mode is set to CNU = 10 (stitches), set N = 90 and D = 90 (For 900 stitches)

B mode ([↓]+[B] key)

In this case, the B mode NXD = ON does not need to be set. (Set NXD to OFF)

One count will consist of 10 stitches, and 90 will be counted (900 stitches to 909 stitches).

In other words, the actual number of stitches will be between 900 stitches and 909 stitches.

(The number of excessive stitches when stopping at the DOWN position (PSD stop) will be within these ten stitches.)

5. Example of using the counter function (turning on a lamp using a relay when the count is completed)

- Use the down counter as a bobbin thread level counter (end count at 10,000 stitches), and after ending count turn on lamp using a relay.

[Setting]

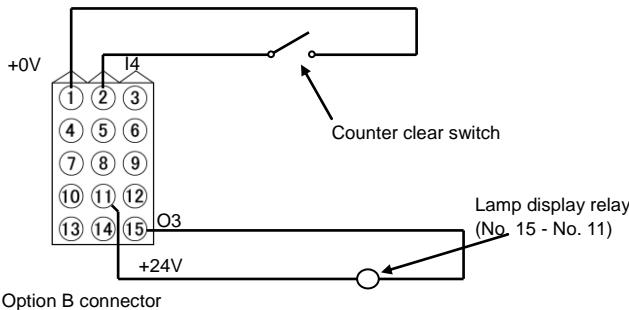
C Mode ([↓]+[C] key)

Function	Standard	Setting	Description
I4 (Direct call number = "0378")	NO	CCD	Input signal function selection
O3 (Direct call number = "0426")	TF	CDE	Output signal function selection

B mode ([↓]+[B] key)

Function	Standard	Setting	Description
N (Direct call number = "0201")	99	1000	Down counter value setting
CDN (Direct call number = "0210")	CU	ST	Count by number of stitches setting
DSC (Direct call number = "0211")	ST	ST	Operation at end of down counter count selection
DNC (Direct call number = "0213")	OF	ON	Down counter validity setting
CNU (Direct call number = "0217")	1	10	Number of stitches per counter setting

[Connection example]



- Cautions)
- 1 : Prepare the lamp (display lamp) and lamp power supply separately. (Power (current capacity) sufficient to turn the lamp on cannot be supplied from the control box.)
 - 2 : Use a 24V compatible relay. Contact Mitsubishi when using a 12V relay.
 - 3 : When using the control box (XC-G500-Y), a buzzer will sound with the above setting. (In addition, the counter can be displayed on the control box, and the counter can be cleared with the P key on the control box, etc.)

6. Example of setting two counters (Using the up counter and down counter simultaneously)

[Setting example] 1) Down counter setting (Example: Count 10,000 stitches)

B mode ([↓]+[B] key)

Function	Standard	Setting	Description
N (Direct call number = "0201")	99	1000	Down counter setting
D (Direct call number = "0202")	99	1000	Current down counter value
CDN (Direct call number = "0210")	CU	ST	Down counter count conditions (Count with number of stitches)
DSC (Direct call number = "0211")	ST	ST	Operation at end of down counter count selection
DNC (Direct call number = "0213")	OF	ON	Down counter validity
CNU (Direct call number = "0217")	1	10	Number of stitches per count setting

C Mode ([↓]+[C] key)

Function	Standard	Setting	Description
I1 (Direct call number = "0357")	IO1	CCD	Input signal selection (down counter clear signal) (Option B connector pin No. 6)

[Setting example] 2) Up counter setting (Example: Count 12,000 stitches)

B mode ([↓]+[B] key)

Function	Standard	Setting	Description
P (Direct call number = "0203")	99	1200	Up counter setting
U (Direct call number = "0204")	0	0	Current up counter value
CUP (Direct call number = "0205")	CU	ST	Up counter count conditions (Count with number of stitches)
USC (Direct call number = "0206")	ST	ST	Operation at end of up counter count selection
UPC (Direct call number = "0208")	OF	ON	Up counter validity

C Mode ([↓]+[C] key)

Function	Standard	Setting	Description
I2 (Direct call number = "0370")	U	CCU	Input signal selection (up counter clear signal) (Option B connector pin No. 9)

7. Setting points for post-type sewing machine

1. Sewing machine model : Post-type sewing machine

2. Applicable control box : XC-GMF type

3. Details of fault : Stop position inconsistency, overrunning, etc.

4. Setting points (In respect to standard setting value or ultra-thick material setting value)

(1) If the sewing machine has a belt longer than a normal sewing machine, the [GA. LL] setting is valid for the gain setting [GA.]. If the belt is not long, or if the sewing machine pulley is not large, the [GA.L] or [GA.H] setting is more effective. If the torque or power at the start of stitching is a problem, the [GA.H] setting is more effective.

(2) When using the sewing machine for ultra-thick material or the post-type sewing machine, the pulley may be larger than the normal sewing machine. Set the size of the pulley on the sewing machine being used, and the size of the pulley on the motor.

A mode : **[PL.ON]** (Direct call number = "0109")

(Pulley ratio manual setting)

[MR.*]** (Direct call number = "0110")

(Motor side pulley diameter setting)

[SR.*]** (Direct call number = "0111")

(Sewing machine side pulley diameter setting)

(3) Speed setting

If the stop position is inconsistent or if overrunning occurs when stopping from high-speed operation, lower the high-speed setting value.

P mode : **[H.2000]** (Direct call number = "0000")

(For example, even if the sewing machine specification is 3000 rotations, lower the setting value.)

If the stop position is inconsistent when stopping from low-speed operation or inching, lower the low-speed setting value.

P mode : **[L. 150]** (Direct call number = "0001")

(For example, 150 rotations, etc.)

If the stop position is inconsistent when stopping with pedal healing needle lift (thread trimming), lower the needle lifting speed setting.

P mode : **[T. 150]** (Direct call number = "0002")

(For example, 150 rotations, etc.)

(4) Set the deceleration time for stopping to a large value. (Note that this will delay the time for stopping.) Set the deceleration time in [DC.-]. Set the deceleration time to a value larger than the [DCT.16] setting value.

A mode : **[DC. -]** (Direct call number = "0104")

[DCT. 30] (Direct call number = "0105")

(For example, 30, etc.)

(5) Braking time at sewing machine stop (Use the original setting value if this does not need to be improved.)

In addition to changing the deceleration time in item (4) above, increase the braking time setting value for stopping the sewing machine.

A mode : **[BKT. 30]** (Direct call number = "0115")

(For example, 30 (30 x 10msec = 300msec), etc.)

(6) When the stop position deviates during DOWN position stop (2-position) Do not set the needle DOWN stop position angle (coasting angle) setting [D8.] to less than the default setting [28].

Set [D8.] to a value larger than [28].

(This is effective when the sewing machine does not stop at the DOWN position.)

P mode : **[D8. 50]** (Direct call number = "0054")

(For example, 50 degrees, etc.)

(7) When the stop position deviates during UP position stop (1-position or needle lifting (thread trimming)) Do not set the needle UP stop position angle (coasting angle) setting [U8.] to less than the default value [14].

Set [U8.] to a value larger than [14].

(This is effective when the sewing machine does not stop at the UP position.)

P mode : **[U8. 50]** (Direct call number = "0055")

(For example, 50 degrees, etc.)

Caution) Adjust the DOWN and UP stop positions with the detector.

(When changing the [U8.] setting value, always adjust the detector's coupler.)

(When changing the [D8.] setting value, always adjust the detector's DOWN position disk.)

(8) If the A mode speed loop stop setting [STM.] does not pose a problem with normal starting or stopping, set [STM. OF].

(This may be effective for ultra-thick material sewing machines, but is not very effective for the post-type sewing machine.)

(9) The effectiveness of the following settings for the post-type sewing machine is not cleared, but can be tried.

(9-1) K mode function setting [NAN. ON] (Deceleration immediately when operation signal turns OFF.)

(9-2) K mode function setting [HWG. ON] (Large inertia sewing machine operation gain valid)

(K mode : ([↓] + [↑] + [A] + [C] key))

(10) When degree of pedal pressing does not feel correct during 1-stitch sewing with pedal or inching

A mode : **[SC. ON]** (Direct call number = "0106")

(S-pattern cushion valid at start)

[SCT. 7] (Direct call number = "0107")

(S-pattern cushion time setting. Increase this value slightly as required.)

* For 1-stitch sewing, the K mode function setting [NAN.ON] in item (9-1) above is also effective.

Set and adjust the sewing machine referring to the above points.

8. Examples of application for zigzag sewing machine

Methods of fixing needle stop position to left and right sides using zigzag sewing machine

Setting example 1. Using the K mode function [ZNC.]

With the zigzag sewing machine, the number of zigzag stitches (shifting width) can be set.

- (1) K mode: Press the four keys \downarrow + \uparrow + [A] + [C], and enter the K mode.
- (2) Next, press the \uparrow or \downarrow key several times, and display the function [ZNC.]. (Direct call number = "1240")

The following display will appear.



- (3) Press the [D] key, and set the number of zigzag stitches (shifting width). For example, to stop at either the left or right side after zigzagging for four points, set the number of stitches to 3. The following display will appear.



- (4) To always stop at the left side or at the right side, set the number of stitches to 6. The following display will appear.



Caution: With the K mode function [ZNC.], the sewing machine will stop at each of the set number of stitches.

When using the zigzag sewing machine with automatic thread trimmer, or when using 2-position setting (needle DOWN stop setting) etc, the stop position could deviate and may not stop at the end depending on the stitching start position. In this case, carry out the settings given in example 2 below.

Setting example 2. Using the back tacking function

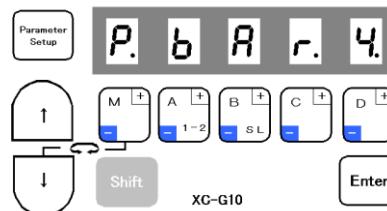
(Note that when using the back tacking function, start/end tacking (automatic repeat sewing) cannot be used.) An example for 4-point zigzag sewing is given below. For other cases, change the number of stitches. (Note: When setting example 1 above has been set, always return the function [ZNC.] setting to [ZNC.0].)

1 Using the control box (without control switch panel)

- (1) Select the pattern sewing mode with the setting panel on the control box.

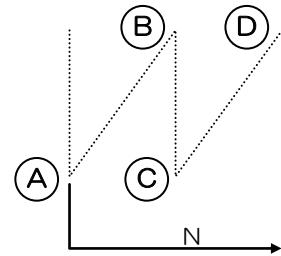
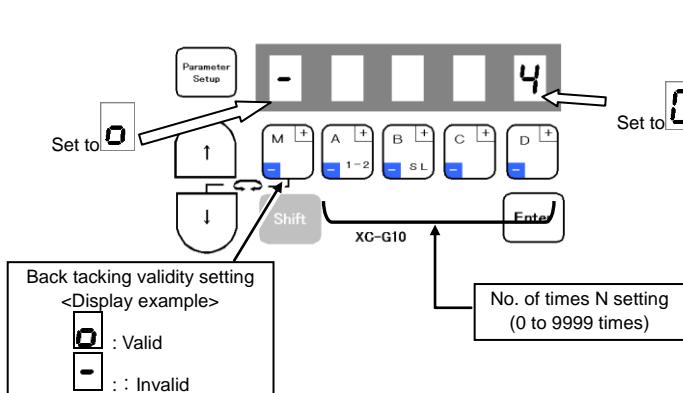
Key operation	Display
Press key four times from normal mode.	* The pattern No. selection mode will appear.

- (2) In the pattern sewing mode, set the back tacking mode (pattern 4). Press the [D] key and set the pattern No. to 4. (Back tacking mode) The following display will appear.



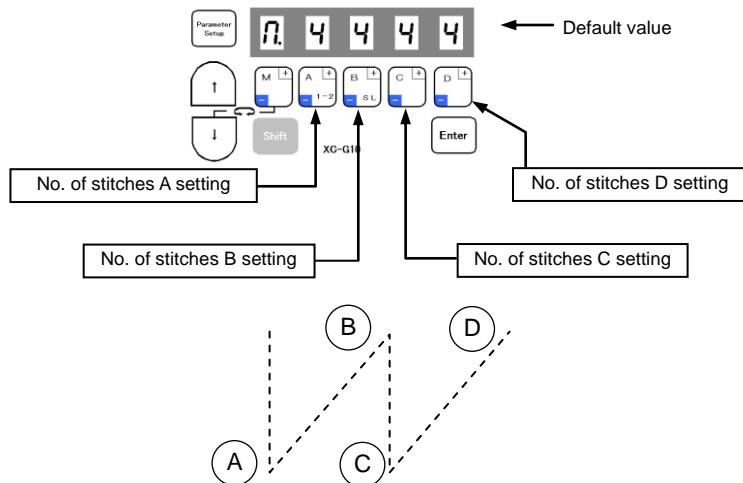
- (3) Next, press the \downarrow key, and set the back tacking validity and the number of times.

- Set the back tacking validity setting to [Valid].
- Set the number of back tacking times N to "0".



If the number of times N is set to 3, stitching will take place in the order of A, B, C.
If N is set to 5, the order will be A, B, C, D, C.
If N is set to 6 or higher, the order will be A, B, C, D, C, D...
(When N is set to 0, the tacking operation will be continued in the order of A, B, C, D, C, D ... while the pedal is pressed down.)

(4) Next, press the [↓] key, and enter the number of back tacking stitch setting mode, and set the number of stitches for A, B, C and D.



With this setting, the following can be determined:

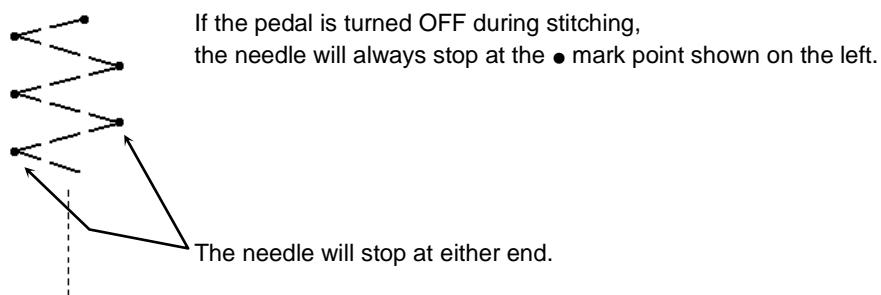
A: Stop needle at either left end or right end.

B: Fix needle stop position to left end or right end.

the following can be determined:

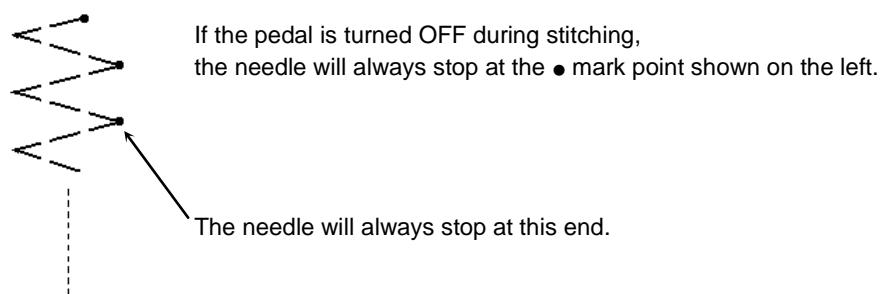
(4-1) A: Stop needle at left end or right end.

Set the number of stitches to A = 2 (or 3), and B = C = D = 3 (stitches).



(4-2) B: Fix needle stop position to left end or right end.

Set the number of stitches to A = 5 (or 6), and B = C = D = 6 (stitches).



Caution : 1. N is set to 0, so while the pedal is pressed down,

the stitches will be repeatedly stitched in the order of A, B, C, D, C, D, C, D

C and D are repeated.

To eliminate the A and B stitches, set A and B to 0 stitches.

2. This explanation is for 4-point zigzag, so change the number of stitches for other types of zigzag.

3. The back tacking mode is used, so the automatic tacking (start/end tacking) and touch back output cannot be used.

2 Using the control switch panel (XC-G500-Y)

When using the control switch panel, refer to the respective manual, and set the number of times and stitches in the same manner in the back tacking settings.

3 Set the various settings for the program mode.

(1) Set the stitching speed for back tacking to variable-speed.

- In the normal mode, hold down the [↓] key, and press the [D] key for two or more seconds to enter the program D mode.
- When in the D mode, press the [D] key several times, and display the function [D1.D]. (Direct call number = "0600") The following display will appear.

- Next, press the [↓] several times, and display the tacking alignment function [BM]. (Direct call number = "0603") Press the [D] key, and set the function [BM.ON]. The following display will appear.

- After making the above setting, press the [↓] and [↑] keys simultaneously to return to the normal mode.

(2) Change the speed setting limiter for the back tacking speed.

- In the normal mode, hold down the [↓] key, and press the [D] key for two or more seconds to enter the program H mode.
- Next, press the [↓] key several times, and display the tacking speed limiter function [LNH.]. (Direct call number = "1006") Press the [C] key several times, and set [LNH.90]. The following display will appear.

- After making the above setting, press the [↓] and [↑] keys simultaneously to return to the normal mode.

(3) Change the backtacking speed.

- In the normal mode, hold down the [↓] key, and press the [↑] key for two or more seconds to enter the program P mode.
- First, confirm the maximum speed setting [H.]. (Direct call number = "0000") (If the value must be changed, press the key below the value, and set the required speed.)
- Next, press the [↓] key several times, and display the start tacking speed setting [N.]. (Direct call number = "0003") Press the [A] key and [B] key to set the same value as that set for the maximum speed above.
- Next, press the [↓] key, and display the end tacking speed setting [V.]. (Direct call number = "0004") In the same manner, press the [A] and [B] keys to set the same value as that set for the maximum speed above. (Set the start tacking speed and end tacking speed values to the same value.)
- After making the above setting, press the [↓] and [↑] keys simultaneously to return to the normal mode.

(4) To trim thread at an angle when heeling while sewing with a zigzag machine with thread trimmer.

- In the normal mode, hold down the [↓] key, and press the [↑] + [A] + [C] key for two or more seconds to enter the program K mode.
- Next, press the [↓] key several times, and display the special setting function [CDR. ON]. (Direct call number = "1239") Press the [D] key, and set the function [CDR. ON]. The following display will appear.

- After making the above setting, press the [↓] and [↑] keys simultaneously to return to the normal mode.

(5) To carry out manual touch back when using a zigzag machine with touch back switch.

(Note that automatic repeat sewing such as start/end tacking cannot be used.)

- Connect the touch back switch between the sewing machine connectors No. 9 and No. 10. Connect the repeat sewing output solenoid between the sewing machine connectors No. 11 and No. 12.
- In the normal mode, hold down the [↓] key, and press the [C] key for two or more seconds to enter the program C mode.
- Next, press the [↓] key several times and display the input signal selection function [IE.]. (Direct call number = "0312") Press the [D] key several times, and set either [IE.IO3] or [IE.IR3]. The following display will appear.

When [IE.IO3] is set, the touch back solenoid can be driven even when the sewing machine is stopped.

or

When [IE.IR3] is set, the touch back solenoid can be driven only when the sewing machine is running.

- Next, press the [↓] key several times, and set the output signal selection function [OC.]. (Direct call number = "0400") Press the [D] key several times, and set [OC.OT3].
- After making the above setting, press the [↓] and [↑] keys simultaneously to return to the normal mode.

Order of signal priority

9. Order of signal priority

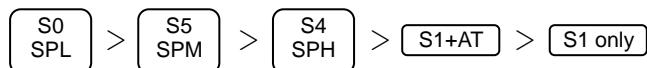
(1) Order of lever unit's (lever connector) S1 (run), S2 (thread trimmer) and S3 (presser foot lifter) signals

S1 (run) > S2 (thread trimmer) > S3 (presser foot lifter)

- (Note 1) : For the (run) signal, an interlock is applied when the power is turned ON, thus, this will be invalid even if the S signal is ON when the power is turned ON. (The signal must be turned ON again.) * If the pedal is not at the neutral position or if the S1 signal is ON when the power is turned ON, the error message "MA" will appear.
- (Note 2) : The S2 (thread trimmer) signal will be validated only after operation has been carried out once. (This signal is validated when the S1 signals turns OFF after operating once.)
- (Note 3) : The S3 (presser foot lifter) signal is valid only when the S1 and S2 signals are invalid (when the motor is stopped.) (In other words, the S3 signal is invalid when the motor is running, including when the thread trimmer is operating.)

(2) Order of speed command signal priority

The order of priority for the S1 (variable-speed run signal), S0 (low-speed run signal), S4 (high-speed run signal), S5 (medium-speed run signal), SPL (speed low-speed signal), SPM (speed medium-speed signal) and SPH (speed high-speed signal) is as follows.



Note 1) S1 + AT: Indicates the S1 signal and P mode automatic operation function [AT.ON]

(3) Supplements (Operation in S2 signal and S3 signal short-circuit state)

For example, operation when only the S1 (run) signal is turned ON and OFF while the S2 (thread trimmer) and S3 (presser foot lifter) signals are always ON in the normal setting state. (Lever connector pins No. 5 and 6 are short-circuited.)

[Operation]

When the power is turned ON, the presser foot lifter will turn ON, when the S1 signal turns ON, the presser foot lifter will turn OFF.

Operation (high-speed operation) will start.

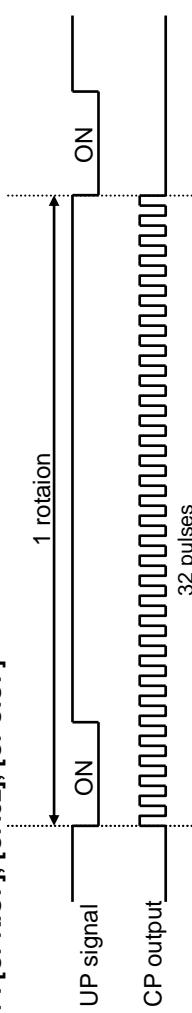
→ When the S1 signal is then turned OFF, the thread trimmer will operate, the machine will stop, and then the presser foot lifter will operate.

10. CP output

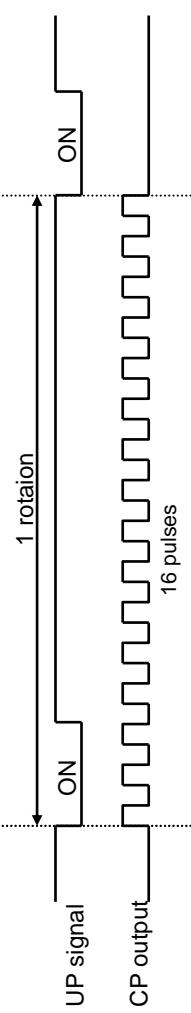
Mode name	Function name	Direct call number	Factory setting	Unit	Setting range	Function name	Setting	Specification
	Operability		GMFY		Digital display			
C mode	Feed pulse output (CP) cancel function	0520	O	ON	-	[CP].	OF	Feed pulse [CP] is invalid. When feed pulse will be used, set this function to "OF". This signal output is from the same pin of "O6".
	Setting CP pulse amount	0521	O	32	-	[P.]	**	Setting the number of pulse [CP]. After changing this number, turn on power switch again.
	Prohibited angle of output CP pulse	0522	O	OF	-	[PC].	OF	The prohibited angle section of pulse generated can be set from UP position. The start prohibited angle can be set with [TS] (G mode). The end prohibited angle can be set with [TE] (G mode).

[CP output] (CP output : No. 14 pin of Option B connector. (Note: CP output is not for solenoid output.))

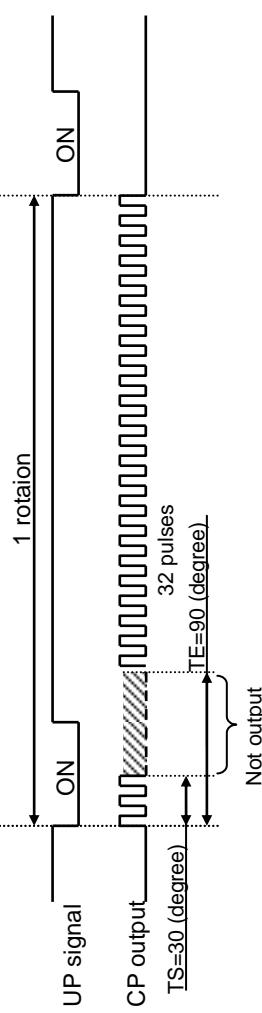
Example 1 : [CPK.OF], [CP.32], [CPC.OF]



Example 2 : [CPK.OF], [CP.16], [CPC.OF]



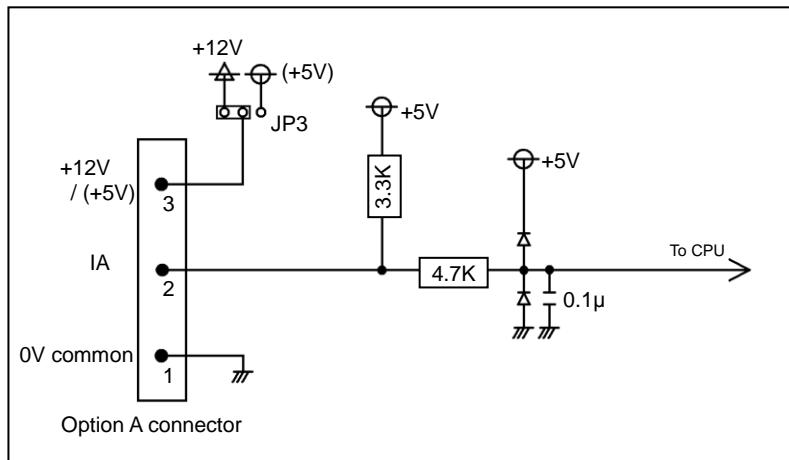
Example 3 : [CPK.OF], [CP.32], [CPC.ON], [TS.30], [TE.90]



CP output

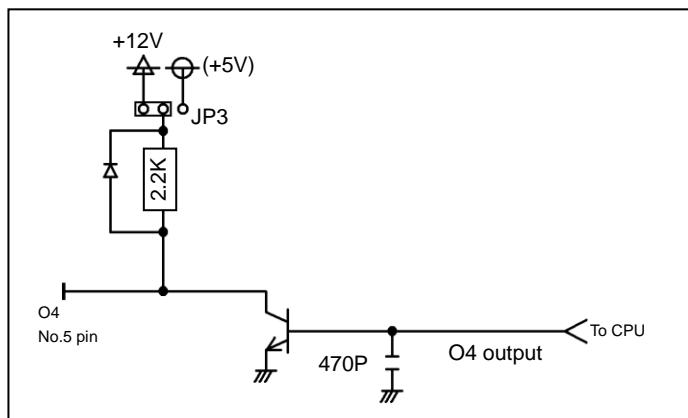
11. Main input/output circuits

(1) Input circuit for option A connector No. 2 pin (IA)



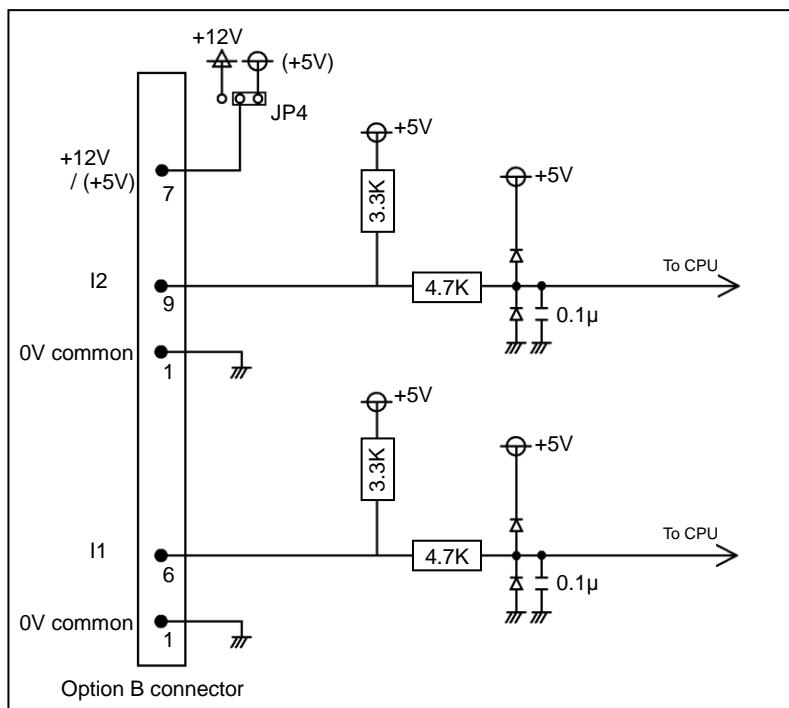
Caution)
The input circuit for the option A connector's No. 4 pin (IB) and No. 6 pin (IC) is the same as that shown on the left.

(2) Output circuit for option A connector No. 5 pin (O4)



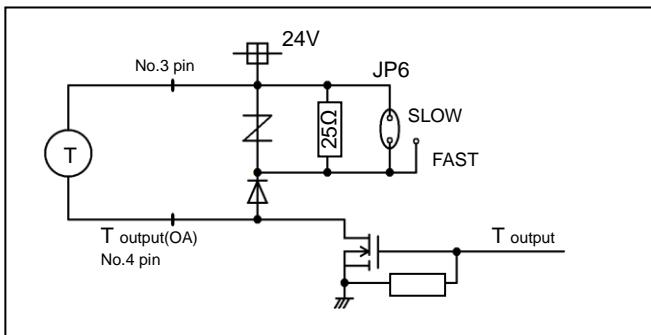
Caution)
As the default, the O4 output is set to the needle UP position output (UPW).
The needle UP position signal is output.
The output will be 12V output (default).
The output can be selected with the C mode settings.

(3) Input circuit for option B connector pin No. 6 (I1) and pin No. 9 (I2)

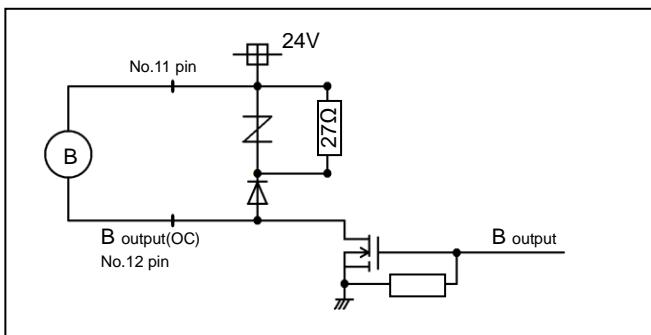


Caution)
The input circuit for the option B connector No. 2 pin (I4) and No. 5 pin (I5) is the same as that shown on the left.

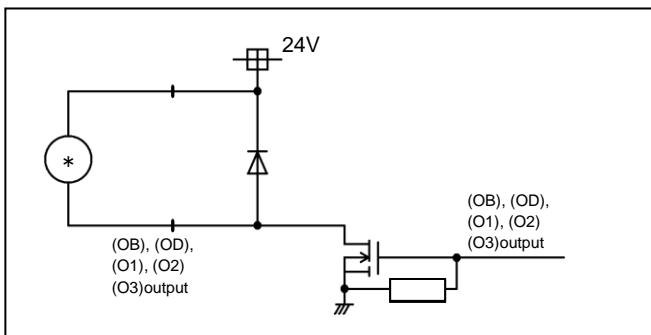
(4) Output circuit for sewing machine connector T output (OA)



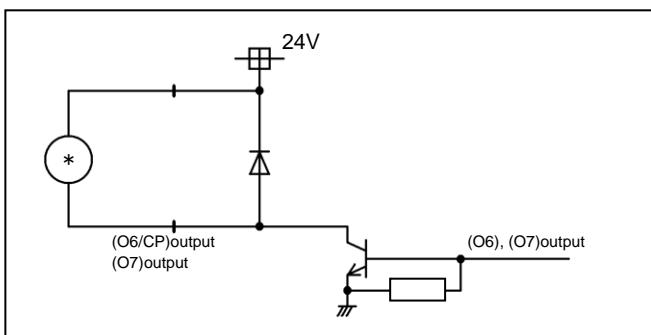
(5) Output circuit for sewing machine connector B output (OC)



(6) Output circuit for other solenoids [(OB), (OD), (O1), (O2), (O3) outputs]



(7) Output circuit for option B connector No. 13 pin (O7), pin No. 14 (O6/CP)



Caution 1)

The option B connector pin No. 13 (O7) and pin No. 14 (O6) are output terminals for the solenoid valve. The solenoid cannot be driven.

Caution 2)

When using the option B connector pin No. 14 (O6/CP) as the pulse output (CP), several settings are required including the CPK function and CP function (cycle division ratio) in the C mode. These are not set as the default.

12. Detector compatibility <Matrix list>

"◎" mark: original (enclosed), "○" mark: Connection possible, "△" mark: Caution required, "×" mark: Connection not possible

Control box series		XC-G Series	XC-F Series	XC-E Series	XC-B Series	XC-A Series	XC Series	ZK-A Series	LF-A Series	ZK Series	LF Series
Detector type \ Control box type	XC-GMF	XC-FMF	XC-EMF	XC-EN	XC-BMF	XC-BML	XC-AMF	XC-M	ZK-AMB	ZK-MBL	LF-MDF
					XC-AFL	XC-BFL	XC-AM	XC-FL		ZK-FL	(DIP switch 64P side)
XC-KE-01P	◎	◎	◎	◎	○ Note1	×	×	×	×	×	×
XC-KB-12P	○	○	○	○	○	○	○	○	○	○	○
XC-KB-12	○	○	○	○	○	○	○	○	○	○	△ Note3
XC-KB-22	×	×	×	×	○	○	○	○	○	○	×
XC-K-12P	○	○	○	○	○	○	○	○	○	○	○
XC-K-22	×	×	×	×	○	○	○	○	○	○	○
XC-K-12	○	○	○	○	○	○	○	○	○	○	○
LA-K-22	×	×	×	×	○	○	○	○	○	○	○
LA-K-12	○	○	○	○	○	○	○	○	○	○	○
XC-K-2000	○	○	○	○	○	○	○	○	○	○	○
XC-K-1002	○	○	○	○	○	○	○	○	○	○	○
XC-K-1000	○	○	○	○	○	○	○	○	○	○	○
XC-K-1001	○	○	○	○	○	○	○	○	○	○	○
XC-K-230-E	○	○	○	○	○	○	○	○	○	○	○
XC-K-230-F	○	○	○	○	○	○	○	○	○	○	○
XC-K-180	○	○	○	○	○	○	○	○	○	○	○
XC-K-230-C	○	○	○	○	○	○	○	○	○	○	○
XC-K-230-D	○	○	○	○	○	○	○	○	○	○	○
LA-K-180	○	○	○	○	○	○	○	○	○	○	○
XA-K-230-C	○	○	○	○	○	○	○	○	○	○	○
XA-K-230-D	○	○	○	○	○	○	○	○	○	○	○
LA-K-190	○	○	○	○	○	○	○	○	○	○	○

Note1 : The detector does not have a PG signal, so when using a pulse output (CP output) with the XC-BFL or XC-BMF, the pulse output cannot be output.

Note2 : The ground from the sewing machine is connected to the control box's TM signal (thread trimming position), so this cannot be connected.

However, this can be used if the detector's ground wire is cut off (pin removed), etc., and the ground is not connected.

Note3 : The detector does not have a TM signal (thread trimming position), so this cannot be used with a sewing machine that uses the thread trimming position TM signal.

Note4 : When using the pulse output (CP output) with the XC-BFL or XC-BMF, the pulse output will be double at 64 pulses.

Detector compatibility

23 Function List

Refer to "24 Table of Program Mode Function" 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
	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
B mode (For counter/speed display) : [↓]+[B] key	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
	PMG.	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.
Program mode [I] (Save mode of the setting data) : [↓]+[↑]+[B]+[C] key	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.
Program mode [R] (Reset) : [↓]+[B]+[C] key	RESET.	Reset	-

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

	name	Function	No.
Program mode [1] (Mitsubishi sewing machine) : [↓]+[A]+[B] key	280M	LS2-1280-M1T(W)	-
	:	:	-
Program mode [1] (Mitsubishi sewing machine) : [↓]+[A]+[B] key	LOAD1	Load of the saved setting data1	-

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

	name	Function	No.
Program mode [2] (Chain stitch sewing machine) : [↓]+[C]+[D] key	YU2	YAMATO VC2600,VC2700 class	-
	:	:	-
	JMH	JUKI	-

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

	name	Function	No.
Program mode [3] (other lock stitch sewing machine) : [↓]+[A]+[D] key	D697	DÜRKOPP ADLER 697-15000 class	-
	:	:	-
	750	SINGER	-

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

name	Function	No.
I.A.	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
III.	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
QIA.	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
IAL.	I4 input logic changeover	0379
IAA.	I4 input alternating operation	0380
I5.	I5 input function selection	0381
15L.	I5 input logic changeover	0382
15A.	I5 input alternating operation	0383
I6.	I6 input function selection	0384
16L.	I6 input logic changeover	0385
16A.	I6 input alternating operation	0386
I7.	I7 input function selection	0387
17L.	I7 input logic changeover	0388
17A.	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

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

name	Function	No.
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.
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.
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.
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

E mode (For H/W checking mode): [↓]+[↑]+[A] key

name	Function	No.
COA.	Set No. of stitches A for cutter output (Setting the delay time during chain-off output ON)	0800
COB.	Set No. of stitches B for cutter output (Setting the delay time during chain-off output OFF)	0801
COC.	Set No. of stitches C for cutter output	0802
X .	No. of stitches for BT output ON after sensor OFF setting	0803
Y .	No. of stitches for sewing machine stop after BT output ON setting	0804
Z .	No. of stitches for BT output OFF after start of stitching setting	0805
SD.	Delay time to when SL output turns from OFF to ON	0806
ED.	Delay time to when SL output turns from ON to OFF	0807
SLH.	No. of set stitches during SL output ON selection mode	0808
SLK.	SL output start position setting	0809
SLT.	SL output start position during SLS function ON setting	0810
SLL.	Speed limit M except tacking and SL on	0811
SLS.	SL output operation during motor stop	0812
O1B.	OT1 output blower output setting	0813
O2M.	OT2 output chain-off output setting	0814
O3M.	OT3 output cutter output setting	0815
I2M.	Mesh judgment control with I*2 input	0816
CTY.	Setting I*3 signal for manual cutter output	0817
CTM.	Status of cutter output photo switch (I*2) signal according to OT3 output	0818
CTR.	Turn OT3 output ON/OFF per set No. of stitches when I*3 signal is ON	0819
CSC.	Automatic cutter output prohibit during sensor ON	0820
CEC.	Automatic cutter output prohibit during sensor OFF	0821
CTS.	Cutter output prohibit when sensor is ON while stopped	0822
CAT.	Automatic thread trim setting after cutter sensor is turned off	0823
CTL.	Set I*1 input, OP1 output to cutter BT specifications input/output	0824
NMD.	Preset stitching operation after operation signal OFF	0825
RLM.	ROL output mode	0826
RLN.	No. of stitches setting for auxiliary feeding rear roller	0827
CTG.	Not used.	0828
CGD.	Not used.	0829
EDT.	Not used.	0830
EDS.	Not used.	0831
CAS.	Not used.	0832
ESC.	Not used.	0833

F mode (Cutter setting mode): [↓]+[↑]+[B] key

	name	Function	No.		name	Function	No.
G mode (Thread trimming timing setting mode): [↓]+[↑]+[C] key	TR.	Thread trimming mode	0900	H mode (Setting speed limit setting mode): [↓]+[↑]+[D] key	LHH.	Upper limit of maximum speed [H]	1000
	TRM.	Motor operation mode during thread trimming	0901		LHL.	Lower limit of maximum speed [H]	1001
	LTM.	Thread trimming output (T) output mode	0902		LLH.	Upper limit of low speed [L]	1002
	LLM.	Thread release output (L) output mode	0903		LLL.	Lower limit of low speed [L]	1003
	TS.	Thread trimming output start angle	0904		LTH.	Upper limit of thread trimming speed [T]	1004
	TE.	Thread trimming output angle	0905		LTL.	Lower limit of thread trimming speed [T]	1005
	LS.	Thread release output start angle	0906		LNH.	Upper limit of start/end tacking (condensed stitching) speed	1006
	LE.	Thread release output angle	0907		LNL.	Lower limit of start/end tacking (condensed stitching) speed	1007
	T1.	Thread trimming output start time	0908		LMH.	Upper limit of medium speed [M]	1008
	T2.	Thread trimming output time	0909		LML.	Lower limit of medium speed [M]	1009
	L1.	Thread release output start time	0910		LSH.	Upper limit of slow start speed [S]	1010
	L2.	Thread release output time	0911		LSL.	Lower limit of slow start speed [S]	1011
	R1.	Thread release output start time (Output TF start time)	0912				
	R2.	Thread release output time (TF output time)	0913				
	R3.	Condensed stitching start time (Stop time before thread trimming)	0914				
	W1.	Wiper output start time	0915				
	W2.	Wiper output time	0916				
	WMD.	Wiper output operation mode	0917				
	F1.	Presser foot lifting output start time	0918				
	FD.	Time to motor drive after presser foot lifter bring down	0919				
	IL.	Interlock time during thread trimming	0920				
	IT.	Interlock time during no thread trimming	0921				
	TDS.	Motor rotation after motor stop before thread trimming	0922				
	TD.	Motor stop time during lockstitch and R output time during chain stitch	0923				
	RUS.	Delay setting before reverse run during RU setting	0924				
	RT.	Delay time before reverse run during RU setting	0925				
	RUM.	Reverse run needle lifting [RU] after output T, L and W	0926				
	WS1.	Wiper output OFF trimming with (S1) signal	0927				
	S2T.	Operation mode with thread trimming signal to shift the needle stop position and return to the original needle stop position before the thread trimming signal	0928				
	S2P.	Operation mode with thread trimming signal when shifting the needle stop position before the thread trimming signal	0929				
	MAN.	Solenoid output OT1 manual/automatic change	0930				
	HOF.	Setting of no. of stitches during MAN [OFF] setting	0931				
	WB.	Weak brake ON simultaneously with wiper output (W)	0932				
	TDT.	Motor rotation operation when LTM function is set to T1, T2 or T3	0933				
	C1.	Not used	0934				
	C2.	Not used	0935				
	C3.	Not used	0936				
	T3.	Not used	0937				
	T4.	Not used	0938				
	T5.	Not used	0939				
	PET.	Not used	0940				
	P9U.	Not used	0941				
	HHC.	Not used	0942				
	PAA.	Not used	0943				
	STL.	Not used	0944				
	L8.	Not used	0945				
	PEK.	Not used	0946				
	PPA.	Setting A which can be used by step sequence	0947				
	PPB.	Setting B which can be used by step sequence	0948				
	PPC.	Setting C which can be used by step sequence	0949				
	PPD.	Setting D which can be used by step sequence	0950				
	PPE.	Setting E which can be used by step sequence	0951				
	PPF.	Setting F which can be used by step sequence	0952				
	PPG.	Setting G which can be used by step sequence	0953				
	PPH.	Setting H which can be used by step sequence	0954				

	name	Function	No.
K mode (Various setting mode): [↓]+[↑]+[A]+[C] key	P21.	Operation during 2 - 1 position changeover	1200
	IO1.	Sewing machine speed during solenoid input signal [IO1] setting	1201
	COR.	Speed specification when COR input is ON	1202
	RND.	Speed specification when RND input is ON	1203
	NTL.	Setting the thread trimming key of control switch panel (mark of scissors) valid or invalid, when the preset stitching is active.	1204
	CNM.	Decelerate per step when Continuous is set with control panel XC-G500-Y	1205
	KD2.	DN signal is valid during the virtual DOWN control	1206
	IOD.	Validity of operation delay when IO1 signal is input	1207
	S7B.	Delay to motor drive after B output ON	1208
	UFD.	Delay when S2 signal is U or UF	1209
	E8R.	Not used	1210
	MRA.	Not used	1211
	PAP.	UP position needle lifting at the power is turned ON	1212
	ST1.	One stitch operation mode during UCR setting	1213
	IT1.	Setting one stitch operation, when "S01" signal is set	1214
	S6M.	Operation mode during thread trimming protection signal (S6) input/release	1215
	S6A.	Thread trimming protection signal (S6) operation mode	1216
	KTM.	End tacking mode when TR function is set to chain stitch	1217
	KDM.	Lock stitch tacking menu display	1218
	UFP.	U, UF signal needle lift prohibit at position other than set position	1219
	UPB.	Weak brake validity when UP signal is ON	1220
	ESB.	Weak brake forced OFF when stopped with ES signal	1221
	UPS.	UP position detection stop	1222
	UP2.	Stop status after low speed detection	1223
	K.	Low speed detection speed	1224
	NAN.	Deceleration mode	1225
	ESF.	Presser foot lifter operation during emergency stop	1226
	PRC.	OP output and OP1 output prohibit at restart	1227
	TS6.	S2 signal validity when S6 signal is ON.	1228
	PNC.	Speed loop stopping control when the machine is overrun with the preset stitching	1229
	MFN.	Input port IL, I1 and I2 software noise filter validity	1230
	PFN.	All input port software noise filter validity	1231
	SEF.	No. of stitches for noise removal during sensor input setting	1232
	PSM.	Deceleration state during PSU, PSD signal ON	1233
	2ST.	Low stitching speed validity when the preset stitching is two stitches	1234
	PSS.	No. of set stitch stitching speed when PSU, PSD, SEN signal is ON	1235
	PSK.	Speed at PSU, PSD, SEN signal is ON	1236
	PUF.	No. of stitches for removing noise when PSU signal is ON	1237
	PDF.	No. of stitches for removing noise when PSD signal is ON	1238
	CDR.	Zigzag during continuous tacking	1239
	ZNC .	No. of stitches of zigzag stitch (sway width) setting	1240
	BRC.	BCR operation after thread trimming	1241
	USN.	Actual No. of USR operations	1242
	2RW.	W output mode during S2R=OFF setting	1243
	BTC.	O1 output prohibit during tacking and thread trimming	1244
	PR .	OP output prohibit/permit changeover with input I1 during operation	1245
	P1R.	OP1 output prohibit/permit changeover with input I1 during operation	1246
	TBC.	B output OFF prohibit mode during thread trimming	1247
	KTL.	KS3 output and TF output prohibit during TL input ON	1248
K mode (Various setting mode): [↓]+[↑]+[A]+[C] key	FLC.	Presser foot operation of F, S2, S3 signal is OFF when FUM function is ON, FU function is M or C.	1249
	SPT.	T output, L output protection function	1250
	FW .	Wiper output W ON simultaneously with presser foot lifting output FU	1251
	PS1.	Input signal check function when power is turned on	1252
	B2O.	Setting program stitch of the control switch panel	1253
	TOB.	Setting "OT1" output while "B" output is ON	1254
	2SL.	Special specification setting of limit control	1255
	NCK.	Setting output at FWD input ON	1256
	UDN.	Needle lift function is invalidated, excluding the needle down position.	1257
	FSL.	The set value of full speed	1258
	UPR.	Not used	1259
	HWG.	Operation gain for the big inertia sewing machine	1260
	PPS.	Stop by pedal neutrality under operation PSU, PSD, PS1, PS2	1261
	PCB.	Not used	1262
	TQT.	Not used	1263
	E8T.	Not used	1264
	WBO.	Not used	1265
	R3D.	Not used	1266
	MEA.	Not used	1267
	OCS.	Not used	1268
	STP.	Step ON/OFF	1269
	STS.	Number of step execution lines.	1270
	HDS.	Not used	1271
	1ST.	Not used	1272
	TMI.	The unit of the display time is selected.	1273

	name	Function	No.
O mode (Extended I/O function): [↓]+[↑]+[B]+[D] key	I.A.	Function selection of making IA two input signal functions	1300
	IAL.	Logical conversion function to make IA two input signal functions	1301
	IAA.	Not used	1302
	IB.	Function selection of making IB two input signal functions	1303
	IBL.	Logical conversion function to make IB two input signal functions	1304
	IBA.	Not used	1305
	IC.	Function selection of making IC two input signal functions	1306
	ICL.	Logical conversion function to make IC two input signal functions	1307
	ICA.	Not used	1308
	ID.	Function selection of making ID two input signal functions	1309
	IDL.	Logical conversion function to make ID two input signal functions	1310
	IDA.	Not used	1311
	IE.	Function selection of making IE two input signal functions	1312
	IEL.	Logical conversion function to make IE two input signal functions	1313
	IEA.	Not used	1314
	IF.	Function selection of making IF two input signal functions	1315
	IFL.	Logical conversion function to make IF two input signal functions	1316
	IFM.	Operation selection of making IF two input signal functions	1317
	RFS.	Not used	1318
	RFR.	Not used	1319
	RFN.	Not used	1320
	IG.	Function selection of making IG two input signal functions	1321
	IGL.	Logical conversion function to make IG two input signal functions	1322
	IGA.	Not used	1323
	IH.	Function selection of making IH two input signal functions	1324
	IHL.	Logical conversion function to make IH two input signal functions	1325
	IHA.	Not used	1326
	II.	Function selection of making II two input signal functions	1327
	III.	Logical conversion function to make II two input signal functions	1328
	IIA.	Not used	1329
	IJ.	Not used	1330
	IJL.	Not used	1331
	IJA.	Not used	1332
	IK.	Not used	1333
	IKL.	Not used	1334
	IKA.	Not used	1335
	IL.	Not used	1336
	ILL.	Not used	1337
	ILA.	Not used	1338
	I1.	Function selection of making I1 two input signal functions	1339
	I1L.	Logical conversion function to make I1 two input signal functions	1340
	I1M.	Operation selection of making I1 two input signal functions	1341
	I1O.	Not used	1342
	I1F.	Not used	1343
	I1C.	Not used	1344
	1CT.	Not used	1345
	F1P.	Not used	1346
	F1C.	Not used	1347
	F1S.	Not used	1348
	R1S.	Not used	1349
	R1R.	Not used	1350
	R1N.	Not used	1351
	I2.	Function selection of making I2 two input signal functions	1352
	I2L.	Logical conversion function to make I2 two input signal functions	1353
O mode: [↓]+[↑]+[B]+[D] key	I2M.	Operation selection of making I2 two input signal functions	1354
	I2C.	Not used	1355
	2CT.	Not used	1356
	R2S.	Not used	1357
	R2R.	Not used	1358
	R2N.	Not used	1359
	I4.	Function selection of making I4 two input signal functions	1360
	I4L.	Logical conversion function to make I4 two input signal functions	1361
	I4A.	Not used	1362
	I5.	Function selection of making I5 two input signal functions	1363
	I5L.	Logical conversion function to make I5 two input signal functions	1364
	I5A.	Not used	1365

	name	Function	No.
Q mode (Speed command, Speed limit, Thread break detector setting mode): [↓]+[A]+[C] key	VCS.	Virtual S1 operation with VC levels	1400
	VCL.	Setting of VC1 and VC2 where virtual S1 turns ON	1401
	VCD.	Input voltage hysteresis during virtual S1 signal ON/OFF by VC and VC2 level	1402
	V1R.	VC curve reversal mode	1403
	V15.	VC input 5V/12V changeover mode	1404
	VC2.	VC2 operation mode	1405
	V2R.	VC2 curve reversal mode	1406
	V25.	VC2 input 5V/12V changeover mode	1407
	VL1.	Speed limiter curve inflection point 1 percentage	1408
	VP1.	Speed limiter curve inflection point 1 point	1409
	VP2.	Speed limiter curve inflection point 2 point	1410
	FLM.	Operation speed limit specification mode 1	1411
	2LM.	Operation speed limit specification mode 2	1412
	LMD.	Speed command value correctly by middle speed digital during speed limit process	1413
	HMD.	Speed limit with digital speed setting on control switch panel	1414
	E8C.	Ignore detector error	1415
	TH .	Thread break sensor valid	1416
	TST.	Operation after thread break sensor detection	1417
	B.	Speed to ignore thread break sensor	1418
	THS .	No. of stitches to ignore thread break sensor after starting stitching	1419
	THF .	Number of stitches for judgment of thread break.	1420
	RFU.	Operation mode with F input during sewing machine operation	1421
	S7C.	Output of backtacking output (B) during OT1 output ON inhibited	1422
	LIM.	Medium speed (M) limit mode during OT1 output ON	1423
	O1P.	Simultaneously ON of OP1 output during OT1 output ON	1424
	LVB.	Disregard of S3 signal of Lever Unit	1425
	PD1.	1 step heeling setting for the internal lever unit	1426
	VCSET	Adjustment mode for the internal lever unit	1427
S mode (Simple sequence mode): [↓]+[B]+[D] key	MTJ.	Not used.	1428
	MOA.	Not used.	1429
	MOB.	Not used.	1430
	MOC.	Not used.	1431
	VCA.	VC assistance ON/OFF	1432
	VCP.	Strength of VC assistance	1433
	KSM.	KS1, KS2 output run mode	1500
	SQS.	Simple sequence start conditions	1501
	SQE.	Simple sequence forced end conditions	1502
	NS1.	Simple sequence output KS1 output beginning is time or the number of stitch is selected	1503
	NE1.	Simple sequence output KS1 output is time or the number of stitch is selected	1504
	S1S.	Output beginning standard of simple sequence output KS1	1505
	S1E.	Output end standard of simple sequence output KS1	1506
	NS2.	Simple sequence output KS2 output beginning is time or the number of stitch is selected	1507
	NE2.	Simple sequence output KS2 output is time or the number of stitch is selected	1508
	S2S.	Output beginning standard of simple sequence output KS2	1509
	S2E.	Output end standard of simple sequence output KS2	1510
	NS3.	Simple sequence output KS3 output beginning is time or the number of stitch is selected	1511
	NE3.	Simple sequence output KS3 output is time or the number of stitch is selected	1512
	S3S.	Output beginning standard of simple sequence output KS3	1513
	S3E.	Output end standard of simple sequence output KS3	1514
	NS4.	Simple sequence output KS4 output beginning is time or the number of stitch is selected	1515
	NE4.	Simple sequence output KS4 output is time or the number of stitch is selected	1516
	S4S.	Output beginning standard of simple sequence output KS4	1517
	S4E.	Output end standard of simple sequence output KS4	1518
	K11.	KS1 output start [Time]/[No. of Stitches] setting	1519
	K12.	KS1 output [Time]/[No. of Stitches] setting	1520
	K21.	KS2 output start [Time]/[No. of Stitches] setting	1521
	K22.	KS2 output [Time]/[No. of Stitches] setting	1522
	K31.	KS3 output start [Time]/[No. of Stitches] setting	1523
	K32.	KS3 output [Time]/[No. of Stitches] setting	1524
	K41.	KS4 output start [Time]/[No. of Stitches] setting	1525
	K42.	KS4 output [Time]/[No. of Stitches] setting	1526
	K1M.	KS1 output run mode	1527
	K1D.	Run prohibit during KS1 output ON	1528
	K1C.	K11, K12 time clear during KS1 output ON	1529
	K2C.	K21, K22 time clear during KS2 output ON	1530
	K3C.	K31, K32 time clear during KS3 output ON	1531
	KSL.	Increase the number of K11 through K42 by ten	1532
	KL1.	Sequence output time setting/No. of stitch setting each by ten times setting	1533
	KL2.	Sequence output time setting/No. of stitch setting each by ten times setting	1534
	KL3.	Sequence output time setting/No. of stitch setting each by ten times setting	1535
	KL4.	Sequence output time setting/No. of stitch setting each by ten times setting	1536

24 Table of Program Mode Function

Caution

Operation validity

O mark: The sewing machine can be operated in the function setting state.

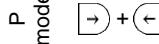
X mark: The sewing machine cannot be operated in the function setting state.

Operate the sewing machine after returning to the normal mode.

Mode name	Function name	Factory setting GMFY	Unit	Setting range	Function name Digital display	Setting	Specification
Direct call number							
Operability	H.	0000 O	4000 rpm	0 ~ 8999	H.	****	The maximum speed can be set.
	L.	0001 O	250 rpm	0 ~ 499	L.	***	The low speed can be set.
Thread trimming speed	T.	0002 O	200 rpm	0 ~ 499	T.	***	The thread trimming speed to reach the needle UP position stop from the needle DOWN position during full heeling or when thread trimmer signal (S2) is turned ON can be set.
Start tacking speed	N.	0003 O	1700 rpm	0 ~ 2999	N.	****	The speed of start tacking can be set.
End tacking speed	V.	0004 O	1700 rpm	0 ~ 2999	V.	****	The speed of end tacking can be set.
Medium speed	M.	0005 O	1700 rpm	0 ~ 8999	M.	****	The medium speed can be set.
Slow start speed	S.	0006 O	250 rpm	0 ~ 2999	S.	****	The slow start speed can be set.
No. of slow start stitches	SLN.	0007 O	2 stitche	1 ~ 5 s	SLN.	*	The No. of slow start stitches can be set. This is valid when the [B, SL] key is ON in the normal mode.
Slow start operation mode	SLM.	0008 O	T	-	SLM.		The slow start operation mode is selected. This is valid when the [B, SL] key is ON in the normal mode.
P mode							Slow start operation will begin when the power is turned ON or when the first toe down after thread trimming, or the first external run signal (S0, S1) is turned ON.
Slow start when power is turned ON	SLP.	0009 O	OF	-	SLP.	A	Slow start operation will begin when the pedal is tied down or when the external run signal (S0, S1) is turned ON.
One shot	SH.	0010 O	OF	-	SH.	OF	Slow start operation will begin when the power ON, or when the first external run signal (S0, S1) is turned ON even if the [B, SL] key is turned OFF in the normal mode.
One shot operation mode	SHM.	0011 O	SH	-	SHM.	OF	The one shot function can be selected. One shot operation (automatic operation) will begin when the external run signals (S0, S1, S4) is turned ON.
							The one shot SH operation mode is selected. This is valid when one shot SH is [ON].
							When one of the external run signals (S0, S1, S4) is turned ON the sewing machine will rotate at the commanded speed while ON, and will continue operating even when the signal is turned OFF. However, the speed will be that commanded with the speed setting key ([C, <==], [D, ==>] key) while OFF. Stops with PSD, PSU, ES or SEN signal.
							When one of the external run signals (S0, S1, S4) is turned ON, the sewing machine will rotate at the speed commanded with each signal even if the signal is turned OFF.
							The same operation as when [SS] is set is included. When one of the external run signals (S0, S1, S4) is turned (1)OFF=>ON=>(2)OFF=>ON, the sewing machine will stop at (1) and will restart at (2). (Alternate operation).
							CONTINUED ON THE NEXT PAGE

Mode name	Function name	Factory setting GMFY	Unit	Setting range	Function name	Setting	Specification
	Direct call number	Operability	Factory setting GMFY	Unit	Setting range	Digital display	
	CONTINUED FROM PREVIOUS PAGE						
One shot operation mode	SHM.	0011	O	SH	-	SH	
P mode							
No. of stitches after PSU input	PSU.	0012	O	0	stitches 0 ~ 99	PSU. **	After the UP position priority stop signal PSU is input, the no. of stitches until stopping can be set.
No. of stitches after PSD input	PSD.	0013	O	0	stitches 0 ~ 99	PSD. **	After the DOWN position priority stop signal PSD is input, the no. of stitches until stopping can be set.
Sensor input signal PS1 operation mode	PS1.	0014	O	T	-	PS1. **	The operation of the sensor input signal PS1 can be set.
No. of stitches after PS1 input	1.	0015	O	0	stitches 0 ~ 9999	t ****	The needle will stop at the UP position. The thread trimming operation is not done. However, after stopping, the thread trimming operation is done when the pedal is heeling or when the thread trimming signal (S2) is turned ON.
							After thread trimming, the needle will stop at the DOWN position. This setting is the same operation as the DOWN position priority stop signal PSD.
							After thread trimming, the needle will stop at the UP position. This setting is the same operation as the UP position priority stop signal PSD.
							After the sensor input signal PS1 is input, the no. of stitches until stopping can be set.

Mode name	Function name	Factory setting GMFY	Unit	Setting range	Function name	Setting	Specification	
							Digital display	
Sensor input signal PS2 operation mode	PS2.	0016	O D	- -	P52.	U	U	The operation of the sensor input signal PS2 can be set.
						d	D	The needle will stop at the UP position. The thread trimming operation is not done. However, after stopping, the thread trimming operation is done when the pedal is heelng or when the thread trimming signal (S2) is turned ON.
No. of stitches after PS2 input	2.	0017	O 0	0 stitche s	0 ~ 9999	2.	****	After thread trimming, the needle will stop at the DOWN position. This setting is the same operation as the DOWN position priority stop signal PSD.
Restart after PSD,SEN input PSN	PSN.	0018	O OF	- -	P5n.	OF	ON OF	After thread trimming, the needle will stop at the UP position. This setting is the same operation as the UP position priority stop signal PSD.
Input sensor function valid / invalid	SEN.	0019	O OF	- -	SEN.	OF	ON OF	Sensor input function "SEN" is valid. [SEN] have to be set on C mode. (as same as the sensor key on control panel)
Setting stitch amount to stop by "SEN"	SE.	0020	O 0	0 stitche s	0 ~ 99	SE.	**	The number of stitch to stop, after the input function "SEN" ON. ("SEN" have to be set "ON")
Presser foot lift momentary	FUM.	0021	O OF	- -	FUn.	OF	ON OF	This is the momentary function of the presser foot lifting.
FUM operation mode	FU.	0022	O M	- -	FU.			The operation mode of the presser foot lift momentary mode is selected. This is valid when the presser foot lift momentary FUM is set to [ON].
						f	M	After thread trimming with full heelng or the external thread trimmer signal S2, the presser foot lifting operation is continued.
						C	C	After thread trimming with full heelng or the external thread trimmer signal S2, the presser foot lifting operation is continued while the timer is on, and then the presser foot will lower. The timer time is set with the timer setting FCT.
						R	A	The presser foot lifting operation is activated with full heelng, light heelng, or the external control signal (S2, F) ON. Then, when the full heelng, light heelng or external control signal (S2, F) is turned ON, the presser foot will bring down, and when turned ON again, the presser foot will lift. (Alternate operation.)
Time setting for FUM operation mode (FU is set to [C,T])						f	T	The timer operates in the same manner as the [C] setting. However, after the presser foot bring down, the same alternate operation as the [A] setting will occur.
Time to motor drive after presser foot lifter bring down	FCT.	0023	O 12	sec	1 ~ 99	F[C f.	**	The timer time for the presser foot output to turn ON and then turn OFF when the mode P FUM operation mode FU is set to [C, T] can be set.
						fd.	***	The time for the motor to start driving after the presser foot output FU is turned OFF when pedal toe down or external run signal (S0, S1) ON during presser foot lifting can be set in 2 millisecond units.

Mode name	Function name	Factory setting GMFY	Unit	Setting range	Function name	Setting	Specification	
							Digital display	
	Full wave time of presser foot lifter output F0.	0025	O	50	X10 msec	-	F0.	
							20	20
							25	Full wave time 200mS
							30	Full wave time 250mS
							30	Full wave time 300mS
							40	Full wave time 400mS
							50	Full wave time 500mS
							60	Full wave time 600mS
							80	Full wave time 800mS
							100	Full wave time 1 sec.
	Delay time of presser foot signal S3 input S3D.	0026	O	10	X10 msec	1 ~ 99	53d.	**
								The delay time for the presser foot output FU to turn ON when the light heeling (lever signal presser foot lifting signal S3) is input before thread trimming can be set.
	Presser foot lifting output chopping duty FUD.	0027	O	MF	-	-	FUD.	
							75	MS
							75	4ms ON/OFF, 50% duty
							MF	2ms ON/OFF, 50% duty
							H1	4ms ON,2ms OFF,66% duty
							26	2ms ON,6ms OFF,25% duty
							62	6ms ON,2ms OFF,75% duty
							84	8ms ON,4ms OFF,66% duty
							FL	100% (full wave)
							LO	2ms ON, 4ms OFF, 33% duty
P mode 	Presser foot lifting output when power is turned ON PFU.	0028	O	ON	-	-	PFU.	OF
							OF	ON OF
	Cancel the presser foot lifting with full heeling FL.	0029	O	OF	-	-	FL.	OF
							OF	ON OF
	Cancel presser foot lifting with light heeling S3L.	0030	O	OF	-	-	S3L.	OF
							OF	ON OF
	Cancel of thread trimming operation S2L.	0031	O	OF	-	-	S2L.	OF
							OF	ON OF

Mode name	Function name	Setting				Specification
		Function name	Setting range	Digital display		
P mode	Direct call number	Factory setting GMFY	Unit LO	-	56L.	The operation can be changed when the thread trimming protection signal (S6) is turned Short/Open.
	Thread trimming protection signal (S6) logical changeover	S6L.	X	-	H1 L0	The sewing machine will stop when the input signal (S6) is Open. The sewing machine will stop when the input signal (S6) is Short.
	Automatic operation	AT.	O OF	-	Rf. rf	ON OF
	Thread trimmer cancel	TL.	O OF	-	rl. rl	ON OF
	Auto-stop of preset stitch sewing before trim	TLS.	O OF	-	rl5. rl	ON OF
	Reverse run needle lifting after thread trimming	RU.	O OF	-	ru. rf	ON OF
	RU reverse run angle	R8.	O 30 degree	0 ~ 500	r8. ***	***
	Thread trimming with reverse feed	TB.	O OF	-	rb. rb	ON OF
	Not used	TBJ.	O OF	-	rb'.	Not used.
	Full heeling, S2 signal operation mode	S2R.	O ON	-	s2r.	The operation mode of full heeling or external thread trimmer signal S2 is selected. This is valid when cancel of thread trimming operation S2L is set to [OF].
↓ + ↑						With full heeling or the external thread trimmer signal S2 after the needle UP position stop, the motor will rotate once to trim the thread. Then the presser foot will lift. When stopped at the needle DOWN position, the motor will make a half-rotation and then the presser foot will lift.
					on of	The needle will remain at the UP position even when full heeling or external thread trimmer signal S2 is turned ON after stopping at the UP position. Only the presser foot lifting operation will operate after this. When full heeling or external thread trimming signal S2 is input after the needle DOWN position stop, motor will make a half-rotation and trim the thread. Only the presser foot lifting operation will operate after this. This releases the restart operation prohibit command during thread trimming.
Cancel of interlock after full pedal heeling	IL.	0041	O OF	-	l.	[ON]: Restart is possible for a designated time after the pedal toe down or external operation signal (S0, S1) is turned ON immediately after full pedal heeling. This is used with a sewing machine that does not have thread trimming. [OF]: Restart is not possible.
						[ON] is turned ON again after a set time is passed.

Mode name	Function name	Specification				
		Factory setting	Unit	Setting range	Function name	Setting
Operability	GMFY		Digital display			
Operation when power is turned ON during 1 position setting.	P1P.	0	OF	-	P 1P. OF	ON OF
Operation when power is turned ON during 2 position setting.	P2P.	0	OF	-	P 2P. OF	ON OF
Needle stop position before fabric	C8.	0	60	degree	0 ~ 360 C8.	***
Reverse run angle from DOWN position to UP position	K8.	0	180	degree	0 ~ 360 L8.	***
ON angle of virtual TM	E8.	0	90	degree	0 ~ 360 E8.	***
ON start angle of virtual TM	S8.	0	50	degree	0 ~ 360 S8.	***
Setting sensor "SEN" input function	SNM.	0	ON	-	S n!. OF	ON OF
Virtual down Setting	KD.	0	OF	-	L d. OF	ON OF
Virtual width of up and down signal	KDU.	0	OF	-	L dU. OF	ON OF
Not used	PSJ.	0	OF	-	P Sj. OF	ON OF
Needle DOWN position stop angle	D8.	0	28	degree	10 ~ 180 d8.	***
Needle UP position stop angle	U8.	0	14	degree	10 ~ 180 u8.	***

Mode name	Function name	Factory setting GMFY	Unit	Setting range	Function name	Setting	Specification
Direct call number	Gain high/low selection GA.	0100	O	L	-	G.R.	Digital display
Pedal curve	PDC.	0101	O	30	-	PdC.	**
Acceleration time simple setting	AC.	0102	O	M	-	AC.	H
Acceleration time	ACT.	0103	O	14	X10 msec	ACT.	H M L
Deceleration time simple setting	DC.	0104	O	M	-	dC.	H M L
Deceleration time	DCT.	0105	O	16	X10 msec	dCT.	**

A mode
 +

The high/low gain can be set. Set with the following

Sewing machine with large inertia.
Sewing machine with small inertia.
This is used when there is a slight vibration when stopping even when the gain is set to [L].

The size of the curve of the speed changes for the pedal toe down amount can be set. The speed change curve will change from small to large according to the small => large of the set value.

The time for the sewing machine to reach the high speed after the pedal toe down or external run signal (S1) is input can be set easily.

H 100mS
M 140mS
L 240mS

- - - The time set in the next acceleration time ACT is used.

The acceleration time for the sewing machine to reach the high speed after pedal toe down or external run signal (S1) ON can be set. This is valid when the acceleration time simple setting AC is set to [-].

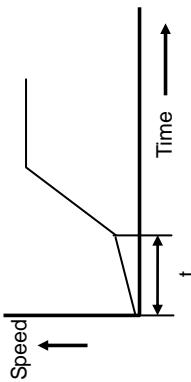
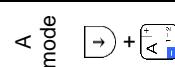
H 90mS
M 160mS
L 230mS

- - - The time set in the next deceleration time DCT is used.

The deceleration time for the sewing machine to stop after returning to neutral from pedal toe down or when the external run signal (S1) is turned OFF can be set easily.

H 90mS
M 160mS
L 230mS

- - - The deceleration time for the sewing machine to stop after returning to neutral from pedal toe down or when the external run signal (S1) is turned OFF can be set. This is valid when the deceleration time simple setting DC is set to [-]. Normally use this at 350 milliseconds or less.

Mode name	Function name	Factory setting GMFY	Unit	Setting range	Function name	Setting	Specification
					Digital display		
S-character cushion	SC.	0106	O	OF	-	-	 <p>The speed change curve is accelerated slowly for the t time after pedal toe down or the external run signal (S1) is turned ON, and then the sewing machine accelerates rapidly and enters the high speed operation. This is effective when carrying out one stitch sewing with the external run signal (S1) when automatic operation function is set in the P mode.</p>
S-character cushion time setting	SCT.	0107	O	7	X10 msec	0 ~ 99	5[rf. **
Full heeling S2 signal operation mode when power is turned on or after thread trimming	S2M.	0108	O	FU	-	-	52n FU FU U U NO NO UF UF
A mode							FU The presser foot lifting operation is entered. U The needle lifting operation is entered. NO No operation. UF The presser foot lifting operation after needle lifting is entered.
Setting motor pulley diameter	MR.	0110	O	OF	-	-	P_L. 00 0F ON OF
Setting sewing machine pulley diameter	SR.	0111	O	70	mm	20 ~ 349	flr. ***
No detector mode	NOS.	0112	O	OF	-	-	n05. 00 0F ON OF
First priority stop => speed control	STM.	0114	O	OF	-	-	5rn. 00 0F ON OF
Brake time	BKT.	0115	O	14	X10 msec	0 ~ 99	btf. **
Weak brake angle	B8.	0116	O	14	X0.1 degree	4 ~ 500	b8. **
							Setting the angle to clear weak break. Minimum setting angle is 0.2 degree.

Mode name	Function name	Specification			
		Function name	Setting range	Digital display	Setting
A mode [+]	Reduction of weak brake BNR.	Factory setting GMFY	Unit ON	-	bnr. OF
	Weak brake force BKS.	0118	O 99 %	1 ~ 99	bts. **
	Weak brake mode BKM.	0119	O E -	-	btl. E
					H
	Weak brake BK.	0120	O OF -	-	btk. OF

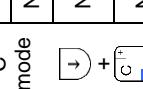
Mode name	Function name	Factory setting GMFY	Operability	Unit	Setting range	Function name	Setting	Specification	
								Digital display	
B mode  + 	Display sewing speed S.	0200	O	0	rpm	0 ~ 9999	5.	****	Display the round per minute of running sewing machine.
	Down counter setting count N.	0201	O	99	-	0 ~ 9999	n.	****	Setting the number of down counter.
	Down counter display count amount	0202	O	99	-	0 ~ 9999	d.	****	Display the number of current down counter.
	Up counter setting count P.	0203	O	99	-	0 ~ 9999	P.	****	Setting the number of up counter.
	Up counter display count amount	0204	O	0	-	0 ~ 9999	U.	****	Display the number of current up counter.
	Up counter the selection of setting mode	0205	O	CU	-	-	CUP.		Selection of count up condition.
							CU	CU	After thread trimming is finished
							ST	ST	After thread trimming is finished
							PR	PR	The number of trimming times become "N" ("N" have to be set at "PRN")
							IN	IN	When input function "OI" become ON. ("OI" have to be set to input signal on the program mode C.)
Up counter the selection of counter operation 	Up counter the selection of USC.	0206	O	ST	-	-	USC.		When output signal "OI" become ON. ("OI" have to be set to output function on "O1" of the program mode C.)
							OU	OU	Selection of operation count over. (Up counter)
							ST	ST	Control panel buzzes and running is prohibited after trimming with buzzer sound. And then when Up counter clear key "CCU" is pressed, sewing become possible. (Buzzer will stop after a while.) (Factory setting of Up counter clear key is "P" key on control panel.)
							OF	OF	Sewing is possible to continue without buzzer sound.
							BZ	BZ	Sewing is possible to continue with buzzer sound. (Buzzer will stop after a while.)
							UEN.	OF	[ON]:When sewing pattern is changed, it clear "up counter".
							UPC.	OF	[ON]:The up counter is valid.
							NXU.	ON	The Up counter operation, after counting over.
							ON	ON	The display shows the setting number and the counting is stopped.
							OF	OF	The display shows the setting number and the counting is continued.

Mode name	Function name	Setting				Specification
		Factory setting	Unit	Setting range	Function name	
	Down counter the selection CDN. of setting mode	0210	O	CU	-	C d n.
						Selection of count down condition.
					C U	CU After thread trimming is finished
					S r	ST The number of sewing stitch become "N" ("N" have to be set at "CNU")
					P r	PR The number of trimming times become "N" ("N" have to be set at "PRN")
					I n	IN When input function "(OI)" become ON. ("OI" have to be set to input signal on the program mode C.)
					O U	OU When output signal "O1" become ON. ("O1" have to be set to output function on "O1" of the program mode C.)
						Selection of operation at count over. (Down counter)
						Control panel buzzes and running is prohibited after thread trimming with buzzer sound. And then when Down counter clear key "CCD" is pressed, buzzer and sewing become possible. (Buzzer will stop after a while.) (Factory setting of Up counter clear key is "P" key on control panel.)
					O F	OF Sewing is possible to continue without buzzer sound.
					B -	BZ Sewing is possible to continue with buzzer sound. (Buzzer will stop after a while.)
	Down counter changing DCM. sewing pattern	0211	O	ST	-	d S L.
						S r ST
					O F	OF
					B -	BZ
						[ON]:When sewing pattern is changed, it clear "down counter".
						[ON]:The down counter is valid.
	Down counter valid / invalid DNC.	0212	O	OF	-	d C R.
						O F ON
						OFF
						[ON]:The down counter is valid.
	Down counter operation after counting over NXD.	0213	O	OF	-	d n L.
						O F ON
						OFF
						[ON]:The down counter action, after counting over. (It is valid, when [DSC] is set to "OF", "BZ".)
						The display shows "0" and the counting is stopped.
					O N	ON
						The display shows "-" and the counting is continued.
	Counter condition turning on power switch PCM.	0214	O	OF	-	n l i d.
						O F ON
						OFF
						[ON]:When power switch is turned on.
						Up counter is clear (zero) and down counter is set the setting number.
					O N	ON
					O F	OFF
						Both counter keep previous amount.
	Setting Thread trimming times "N" PRN.	0215	O	OF	-	P C R.
						O F **
						OFF
						[ON]:When "CUP" and "CDN" are PR, trimming times "N" is set.
	Setting Number of stitches "N" CNU.	0216	O	0	times	P r n.
						O N **
						OFF
						[ON]:When "CUP" and "CDN" are ST, number of stitch "N" is set.
					E n U.	S **
						OFF

Mode name	Function name	Factory setting	Unit	Setting range	Function name	Setting	Specification	
							GMFY	Digital display
	Count modification (to use CCI. IO1, IO2)	O	OF	-	EE.			Modification of count amount.
B	Display condition turning on power switch	O	OF	-	PMD.			When input function "IO1" is turned on, it becomes count up. When input function "IO2" is turned on, it becomes count down. (Input function can set input signal on program mode "C".)
	Reset for Up / Down counter during operation	O	OF	-	CCR.			Modification is prohibited.
					EE.			Selection display mode, when power switch is turned on.
					ON.			When power switch turned on, display shows previous condition. (Keep previous condition)
					OF.			When power switch turned on, display shows normal mode.
					EE.			Reset for Up / Down counter during operation.
					ON.			Reset for Up / Down counter is valid.
					OF.			Reset for Up / Down counter is invalid.

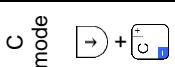
Mode name	Function name	Factory setting GMFY	Unit	Setting range	Function name	Setting	Specification	
							Digital display	
C mode  + 	Function selection of input signal IA.	0300	X	PSU	-	-	<i>I.R.</i>	*** The input functions of each input signal IA can be selected from 80 types of functions. (*1)
	Logical conversion function of input signal IA.	0301	X	OF	-	-	<i>I.RL.</i>	ON OFF ON OFF The input logic of each input signal IA is reversed.
	Alternating operation of input signal IA.	0302	X	OF	-	-	<i>I.RR.</i>	ON OFF ON OFF If each input signal IA performs OFF => (1)ON => OFF => (2)ON => OFF => (3)ON => OFF the signal will stay ON at (1), stops (turn OFF) at (2), and will turn ON again at (3). (This is hereafter referred to alternate operation.) (*2)
	Function selection of input signal IB.	0303	X	PSD	-	-	<i>I.B.</i>	*** The input functions of each input signal IB can be selected from 80 types of functions. (*1)
	Logical conversion function of input signal IB.	0304	X	OF	-	-	<i>I.BL.</i>	ON OFF ON OFF The input logic of each input signal IB is reversed.
	Alternating operation of input signal IB.	0305	X	OF	-	-	<i>I.BR.</i>	ON OFF ON OFF If each input signal IB performs OFF => (1)ON => OFF => (2)ON => OFF => (3)ON => OFF the signal will stay ON at (1), stops (turn OFF) at (2), and will turn ON again at (3). (This is hereafter referred to alternate operation.) (*2)
	Function selection of input signal IC.	0306	X	S0	-	-	<i>I.E.</i>	*** The input functions of each input signal IC can be selected from 80 types of functions. (*1)
	Logical conversion function of input signal IC.	0307	X	OF	-	-	<i>I.EL.</i>	ON OFF ON OFF The input logic of each input signal IC is reversed.
	Alternating operation of input signal IC.	0308	X	OF	-	-	<i>I.ER.</i>	ON OFF ON OFF If each input signal IC performs OFF => (1)ON => OFF => (2)ON => OFF => (3)ON => OFF the signal will stay ON at (1), stops (turn OFF) at (2), and will turn ON again at (3). (This is hereafter referred to alternate operation.) (*2)
	Function selection of input signal ID.	0309	X	TL	-	-	<i>I.D.</i>	*** The input functions of each input signal ID can be selected from 80 types of functions. (*1)
Logical conversion function of input signal ID.	0310	X	OF	-	-	<i>I.DL.</i>	ON OFF ON OFF The input logic of each input signal ID is reversed.	
	Alternating operation of input signal ID.	0311	X	OF	-	-	<i>I.DR.</i>	ON OFF ON OFF If each input signal ID performs OFF => (1)ON => OFF => (2)ON => OFF => (3)ON => OFF the signal will stay ON at (1), stops (turn OFF) at (2), and will turn ON again at (3). (This is hereafter referred to alternate operation.) (*2)
	Function selection of input signal IE.	0312	X	S7	-	-	<i>I.E.</i>	*** The input functions of each input signal IE can be selected from 80 types of functions. (*1)
	Logical conversion function of input signal IE.	0313	X	OF	-	-	<i>I.EL.</i>	ON OFF ON OFF The input logic of each input signal IE is reversed.
	Alternating operation of input signal IE.	0314	X	OF	-	-	<i>I.ER.</i>	ON OFF ON OFF If each input signal IE performs OFF => (1)ON => OFF => (2)ON => OFF => (3)ON => OFF the signal will stay ON at (1), stops (turn OFF) at (2), and will turn ON again at (3). (This is hereafter referred to alternate operation.) (*2)
	Function selection of input signal IF.	0315	X	F	-	-	<i>I.F.</i>	*** The input functions of each input signal IF can be selected from 80 types of functions. (*1)

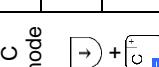
Mode name	Function name	Factory setting GMFY	Unit	Setting range	Function name <i>I</i> _F _L	Digital display <i>O</i> _F	Setting ON OF	Specification
Operability	Logical conversion function of input signal IF IFL.	0316 X OF	-	-	<i>I</i> _F _R			The input logic of each input signal IF is reversed.
Operation selection of input signal IF	Operation selection of input signal IF IFM.	0317 X NO	-	-	<i>I</i> _F _R			The operation mode of each input signal IF can be selected.
C mode 	Set condition of RS F/F operation of input signal IF	0318 X IN	-	-	<i>r</i> _F _S			Set condition RS F/F of IF When [IFM] is set to [RS], it is valid.
	Reset condition of RS F/F operation of input signal IF RFR.	0319 X IN	-	-	<i>r</i> _F _r			Reset condition RS F/F of IF When [IFM] is set to [RS], it is valid.
	Number of reset needles of RS F/F operation of input IF RFN.	0320 X 3	stitche s	0 ~ 99	<i>r</i> _F _n	**	IN T R S TR SB	RS F/F of IF is reset by IOG. After thread trimming is done (stop to up position.) When motor start, RS F/F will be set. When motor stops, RS F/F will be set. When sewing start, after thread trimming. When start tacking or condensed stitch was finished.
	Function selection of input IG signal IG	0321 X S1	-	-	<i>I</i> _G	***	IN T R S TR SB	RS F/F of IF is reset by IOG. When thread trimming is done (stop to up position.) When motor start, RS F/F will be reset. When motor stops, RS F/F will be reset. When sewing start, after trimming. When start condensed stitch was finished.
	Logical conversion function IG of input signal G	0322 X OF	-	-	<i>I</i> _G _L	***	NC	When sewing machine sew the setting stitch after set RS F/F, it will be reset. (R1N, R2N)
	Alternating operation of input IG	0323 X OF	-	-	<i>I</i> _G _R	***	**	When [RFR] set [NC], the number of stitch is set by this counter.
	Function selection of input IH signal IH	0324 X S2	-	-	<i>I</i> _H	***	***	The input functions of each input signal IG can be selected from 80 types of functions. (*1)
								The input logic of each input signal IG is reversed.
								If each input signal IG performs OFF => (1)ON => OFF => (2)ON => OFF => (3)ON => OFF the signal will stay ON at (1), stops (turn OFF) at (2), and will turn ON again at (3). (This is hereafter referred to alternate operation.) (*2)
								The input functions of each input signal IH can be selected from 80 types of functions. (*1)

Mode name	Function name	Factory setting GMFY	Unit	Setting range	Function name	Setting	Specification	
							Digital display	
	Logical conversion function of input signal IH.	IHL.	0325	X OF	-	<i>IHL.</i> 	ON OF	The input logic of each input signal IH is reversed.
	Alternating operation of input signal IH	IHA.	0326	X OF	-	<i>IHR.</i> 	ON OF	If each input signal IH performs OFF => (1)ON => OFF => (2)ON => OFF => (3)ON => OFF the signal will stay ON at (1), stops (turn OFF) at (2), and will turn ON again at (3). (This is hereafter referred to alternate operation.) (*2)
	Function selection of input signal II	II.	0327	X S3	-	<i>IIL.</i> 	***	The input functions of each input signal II can be selected from 80 types of functions. (*1)
	Logical conversion function of input signal II	III.	0328	X OF	-	<i>IIR.</i> 	ON OF	The input logic of each input signal II is reversed.
	Alternating operation of input signal II	IIA.	0329	X OF	-	<i>IIL.</i> 	ON OF	If each input signal II performs OFF => (1)ON => OFF => (2)ON => OFF => (3)ON => OFF the signal will stay ON at (1), stops (turn OFF) at (2), and will turn ON again at (3). (This is hereafter referred to alternate operation.) (*2)
	Not used	IJ.	0330	X NO	-	<i>IUL.</i> 	***	Not used.
	Not used	IJL.	0331	X OF	-	<i>IUL.</i> 	ON OF	Not used.
	Not used	IJA.	0332	X OF	-	<i>IUR.</i> 	ON OF	Not used.
	Not used	IK.	0333	X NO	-	<i>IT.</i> 	***	Not used.
	Not used	IKL.	0334	X OF	-	<i>ITL.</i> 	ON OF	Not used.
	Not used	IKA.	0335	X OF	-	<i>ITR.</i> 	ON OF	Not used.
	Not used	IL.	0336	X NO	-	<i>IL.</i> 	***	Not used.
	Not used	ILL.	0337	X OF	-	<i>ILL.</i> 	ON OF	Not used.
	Not used	ILA.	0338	X OF	-	<i>ILR.</i>	ON OF	Not used.
	Function selection of input signal IM	IM.	0339	X NO	-	<i>ILR.</i>	***	The input functions of each input signal IM can be selected from 80 types of functions. (*1)
	Logical conversion function of input signal IM	IML.	0340	X OF	-	<i>ILR.</i>	ON OF	The input logic of each input signal IM is reversed.
	Alternating operation of input signal IM	IMA.	0341	X OF	-	<i>ILR.</i>	ON OF	If each input signal IM performs OFF => (1)ON => OFF => (2)ON => OFF => (3)ON => OFF the signal will stay ON at (1), stops (turn OFF) at (2), and will turn ON again at (3). (This is hereafter referred to alternate operation.) (*2)
	Function selection of input signal IN	IN.	0342	X NO	-	<i>IN.</i>	***	The input functions of each input signal IN can be selected from 76 types of functions. (*1)

Mode name	Function name	Factory setting	Unit	Setting range	Function name	Setting	Specification
Direct call number	Logical conversion function of input signal INL.	0343	X OF	-	<i>inL.</i> $\frac{OF}{OF}$	ON OF	The input logic of each input signal IN is reversed.
C mode ↓ + C ↵	Alternating operation of input signal IN	0344	X OF	-	<i>inR.</i> $\frac{OF}{OF}$	ON OF	If each input signal IN performs OFF => (1)ON => OFF => (2)ON => OFF => (3)ON => OFF the signal will stay ON at (1), stops (turn OFF) at (2), and will turn ON again at (3). (This is hereafter referred to alternate operation.) (**2)
	Function selection of input signal IO	0345	X NO	-	<i>IO.</i>	***	The input functions of each input signal IO can be selected from 80 types of functions. (*1)
	Logical conversion function of input signal IO	0346	X OF	-	<i>oL.</i> $\frac{OF}{OF}$	ON OF	The input logic of each input signal IO is reversed.
	Alternating operation of input signal IOA	0347	X OF	-	<i>oR.</i> $\frac{OF}{OF}$	ON OF	If each input signal IO performs OFF => (1)ON => OFF => (2)ON => OFF => (3)ON => OFF the signal will stay ON at (1), stops (turn OFF) at (2), and will turn ON again at (3). (This is hereafter referred to alternate operation.) (**2)
	Function selection of input signal IP	0348	X CCU	-	<i>IP.</i>	***	The input functions of each input signal IP can be selected from 80 types of functions. (*1)
	Logical conversion function of input signal IP	0349	X OF	-	<i>PL.</i> $\frac{OF}{OF}$	ON OF	The input logic of each input signal IP is reversed.
	Alternating operation of input signal IPA	0350	X OF	-	<i>PR.</i> $\frac{OF}{OF}$	ON OF	If each input signal IP performs OFF => (1)ON => OFF => (2)ON => OFF => (3)ON => OFF the signal will stay ON at (1), stops (turn OFF) at (2), and will turn ON again at (3). (This is hereafter referred to alternate operation.) (**2)
	Function selection of input signal IQ	0351	X NO	-	<i>Q.</i>	***	The input functions of each input signal IQ can be selected from 80 types of functions. (*1)
	Logical conversion function of input signal IQ	0352	X OF	-	<i>QL.</i> $\frac{OF}{OF}$	ON OF	The input logic of each input signal IQ is reversed.
	Alternating operation of input signal IQA	0353	X OF	-	<i>QR.</i> $\frac{OF}{OF}$	ON OF	If each input signal IQ performs OFF => (1)ON => OFF => (2)ON => OFF => (3)ON => OFF the signal will stay ON at (1), stops (turn OFF) at (2), and will turn ON again at (3). (This is hereafter referred to alternate operation.) (**2)
	Function selection of input signal IR	0354	X NO	-	<i>IR.</i>	***	The input functions of each input signal IR can be selected from 80 types of functions. (*1)
	Logical conversion function of input signal IR	0355	X OF	-	<i>RL.</i> $\frac{OF}{OF}$	ON OF	The input logic of each input signal IR is reversed.
	Alternating operation of input signal IRA	0356	X OF	-	<i>RR.</i> $\frac{OF}{OF}$	ON OF	If each input signal IR performs OFF => (1)ON => OFF => (2)ON => OFF => (3)ON => OFF the signal will stay ON at (1), stops (turn OFF) at (2), and will turn ON again at (3). (This is hereafter referred to alternate operation.) (**2)
	Function selection of input signal I1	0357	X IO1	-	<i>I.</i> $\frac{I}{I}$	***	The input functions of each input signal I1 can be selected from 80 types of functions. (*1)
	Logical conversion function of input signal I1L	0358	X OF	-	<i>IL.</i> $\frac{OF}{OF}$	ON OF	The input logic of each input signal I1 is reversed.

Mode name	Function name	Factory setting	Unit	Setting range	Function name	Setting	Specification	
	Operation selection of input signal I1	I1M.	0359	X	NO	-	I1.	The operation mode of each input signal I1 can be selected.
							I1.	
							RS	Normal operation.
							AL	Alternating operation.
							RS F/F (Flip-Flop)	RS F/F (Flip-Flop) operation.
	Special setting for input signal "I1" (Neglecting of signal)	I1O.	0360	O	OF	-	I1.	When sewing machine is running, input signal [I1] is not accepted. This function is valid, only [I1M] set [AL] or [RS].
	Special setting for input signal "I1" is ON	I1F.	0361	X	OF	-	I1.	When [I1M] set [AL] on program mode "C", the alternate operation of input[1] sets virtual output [O13] to alternative output.
	AL operation clearness of input signal I1	I1C.	0362	X	OF	-	I1.	When above setting I1C is valid, these delay timer is set.
	Delay time of AL operation of input signal I1	I1CT.	0363	O	0	X100 msec	0 ~ 99 I1C.	When above setting I1C is valid, these delay timer is set.
	Input signal I1 virtual F/F circuit operation 1	F1P.	0364	X	OF	-	F1P.	The input signal [I1 virtual F/F (flip-flop)] operation is turned ON when power is turned ON.
	Input signal I1 virtual F/F circuit operation 2	F1C.	0365	X	OF	-	F1C.	It is only valid, when [I1M] function is set to "AL" or "RS".
	Input signal I1 virtual F/F circuit operation 3	F1S.	0366	X	OF	-	F1S.	The input signal [I1 virtual F/F (flip-flop)] operation is turned OFF when the sewing start No. of stitches RLN setting is completed.
C mode mode  + 	Set condition of RS F/F for I1	R1S.	0367	X	IN	-	I15.	The input signal [I1 virtual F/F (flip-flop)] operation is turned ON when the tacking starts or after thread trimming.
							I15.	Set condition RS F/F of I1. When [I1M] is set to [RS], it is valid.
							IN	RS F/F of I1 is set by I1.
							T	After thread trimming operation (stop to up position.)
							R	When motor start, RS F/F will be set.
							S	When motor stops, RS F/F will be set.
							TR	When sewing start, after thread trimming.
							SB	When start tacking or condensed stitch was finished.
	Reset condition of RS F/F for I1	R1R.	0368	X	IN	-	I1R.	Reset condition RS F/F of I1. When [I1M] is set to [RS], it is valid.
							I1R.	RS F/F of I1 is reset by IOE.
							T	When thread trimming is done (stop to up position.)
							R	When motor start, RS F/F will be reset.
							S	When motor stops, RS F/F will be reset.
							TR	When sewing start, after trimming.
							SB	When start condensed stitch was finished.
							NC	When sewing machine sew the setting stitch after set RS F/F, it will be reset. (R1N, R2N)

Mode name	Function name	Setting				Specification
		Function name	Setting range	Digital display	Setting	
C mode 	RS F/F reset stitch amount R1N.	0369	O 3 stitche s	0 ~ 99	r in.	** When [R1R] set [NC], the number of stitch is set by this counter.
	Function selection of input I2.	0370	X U	-	i2.	*** The input functions of each input signal I2 can be selected from 80 types of functions. (*1)
	I2 input logic changeover I2L.	0371	X OF	-	i2L.	ON OF The input logic of each Input signal I2 is reversed.
	Operation selection of input signal I2M.	0372	X NO	-	i2M.	The operation mode of each input signal I2 can be selected.
					no	NO Normal operation.
					AL	AL Alternating operation.
					rS	RS F/F (Flip-Flop) operation.
	AL operation clearness of input signal I2C.	0373	X OF	-	i2C.	ON OF AL operation of input signal I2 is cleared by thread trimming operation.
	Delay time of AL operation of input signal I2	0374	O 0 X100 msec	0 ~ 99	2Cf.	** When above setting I2C is valid, these delay timer is set.
	Set condition of RS F/F for I2 R2S.	0375	X IN	-	r2S.	Set condition RS F/F of I2 When [I2M] is set to [RS], it is valid.
					in	IN RS F/F of I1 is set by I2
					f	T After thread trimming operation (stop to up position.)
					r	R When motor start, RS F/F will be set.
					S	S When motor stops, RS F/F will be set.
					rr	TR When sewing start, after thread trimming.
					5b	SB When start tacking or condensed stitch was finished.

Mode name	Function name	Factory setting GMFY	Unit	Setting range	Function name Digital display	Setting	Specification	
							IN	RS F/F of I2 is reset by IOF.
	Reset condition of RS F/F for I2	R2R.	0376	X	-	<i>r2r.</i>	<i>i1</i>	Reset condition RS F/F of F When [I2M] is set to [RS], it is valid.
	Function selection of input I4. signal I4	I4L.	0377	O	3	stitche s	0 ~ 99	<i>r2n.</i> **
	Logical conversion function of input signal I2	I4L.	0378	X	NO	-	-	<i>i4.</i> ***
	Function selection of input I4. signal I4	I4L.	0379	X	OF	-	-	<i>i4L.</i> <i>oF</i> ON OF
	14 input alternating operation I4A.	I4A.	0380	X	OF	-	-	<i>i4A.</i> <i>oF</i> ON OF
	Function selection of input I5. signal I5	I5L.	0381	X	NO	-	-	<i>i5.</i> ***
	Logical conversion function of input signal I5	I5L.	0382	X	OF	-	-	<i>i5L.</i> <i>oF</i> ON OF
	Alternating operation of input signal I5	I5A.	0383	X	OF	-	-	<i>i5A.</i> <i>oF</i> ON OF
	Function selection of input I6. signal I6	I6L.	0384	X	NO	-	-	<i>i6.</i> ***
	Logical conversion function of input signal I6	I6L.	0385	X	OF	-	-	<i>i6L.</i> <i>oF</i> ON OF
	Alternating operation of input signal I6	I6A.	0386	X	OF	-	-	<i>i6A.</i> <i>oF</i> ON OF
	Function selection of input I7. signal I7	I7.	0387	X	NO	-	-	<i>i7.</i> ***
								The input functions of each input signal I7 can be selected from 80 types of functions. (*1)
								The input logic of each input signal I4 is reversed.
								If each input signal I4 performs OFF => (1)ON => OFF => (2)ON => OFF => (3)ON => OFF the signal will stay ON at (1), stops (turn OFF) at (2), and will turn ON again at (3). (This is hereafter referred to alternate operation.) (*2)
								The input functions of each input signal I5 can be selected from 80 types of functions. (*1)
								The input logic of each input signal I5 is reversed.
								If each input signal I5 performs OFF => (1)ON => OFF => (2)ON => OFF => (3)ON => OFF the signal will stay ON at (1), stops (turn OFF) at (2), and will turn ON again at (3). (This is hereafter referred to alternate operation.) (*2)
								The input functions of each input signal I6 can be selected from 80 types of functions. (*1)
								The input logic of each input signal I6 is reversed.
								If each input signal I6 performs OFF => (1)ON => OFF => (2)ON => OFF => (3)ON => OFF the signal will stay ON at (1), stops (turn OFF) at (2), and will turn ON again at (3). (This is hereafter referred to alternate operation.) (*2)
								The input functions of each input signal I7 can be selected from 80 types of functions. (*1)

Mode name	Function name	Factory setting	Unit	Setting range	Function name	Setting	Specification	
	Logical conversion function of input signal 17	GMFY	OF	-	I7L.	OF	ON OFF	The input logic of each input signal 17 is reversed.
	Alternating operation of input signal 17	X	OF	-	I7A.	OF	ON OFF	If each input signal 17 performs OFF => (1)ON => OFF => (2)ON => OFF => (3)ON => OFF the signal will stay ON at (1), stops (turn OFF) at (2), and will turn ON again at (3). (This is hereafter referred to alternate operation.) (**2)

(*) Refer to [25. Table of input/output function for signal on C model]
 *Refer to [26. The composition figure of input and output customization]

C mode

Input signals (I1-I4) connect to logic gates. The outputs of these gates feed into a connector labeled C. The connector C has pins 1 through 15. Pin 1 is connected to I1, pin 2 to I2, pin 3 to I3, pin 4 to I4, pin 5 to I5, pin 6 to I6, pin 7 to I7, pin 8 to I8, pin 9 to I9, pin 10 to I10, pin 11 to I11, pin 12 to I12, pin 13 to I13, pin 14 to I14, and pin 15 to I15.

Output signals (OA, OAL, OF) are generated from the connector C based on the logic of the input signals.

Caution
 Input signal [I6,I7] are coupling port of input and output by the Software. So these input signal are not at connector.

(*) If each input signal performs OFF => (1)ON => OFF => (2)ON => OFF => (3)ON => OFF the signal will stay ON at (1), stops (turn OFF) at (2), and will turn ON again at (3). (This is hereafter referred to alternate operation.)

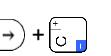
Function selection of output signal OA.	0390	X	T	-	OF	***	***	The output functions of each output signal OA can be selected from 58 types of functions. (**3)
Logical conversion function OAL. of output signal OA	0391	X	OF	-	OAL.	OF	ON OFF	The output logic of each output signal OA is reversed.

Mode name	Function name	Factory setting GMFY	Unit	Setting range	Function name	Setting	Specification	
							Digital display	
Operability	Chopping operation of output signal OA OAC.	0392	X OF	-	oR<u>L.</u> oF	ON OF	Each output is output with full wave immediately after output starts, and then is reduced to half-wave output for each output signal OA. (Chopping control) The full wave output time can be set with the full wave time [PO] function for each output.	
	Output signal OA compulsion OAT.	0393	X OF	-	oR<u>F.</u> oF	ON OF	In each output signal OA, each output is forcibly turned OFF after the time set in the OFF timer is passed. The OFF timer set time can be set with each output's forced OFF timer [OTT] function.	
	Delay time of output signal OA DA.	0394	X 0 msec.	0 ~ 510 msec.	dR<u>I.</u> ***	***	In each output signal OA the delay time to when each output is started can be set. Each delay time can be set in 2msec intervals.	
	Function selection of output signal OB OB.	0395	X W	-	ob<u>b.</u> ***	***	The output functions of each output signal OB can be selected from 58 types of functions. (*3)	
	Logical conversion function of output signal OB OBL.	0396	X OF	-	ob<u>L.</u> oF	ON OF	The output logic of each output signal OB is reversed.	
	Chopping operation of output signal OB OBC.	0397	X OF	-	ob<u>E.</u> oF	ON OF	Each output is output with full wave immediately after output starts, and then is reduced to half-wave output for each output signal OB. (Chopping control) The full wave output time can be set with the full wave time [PO] function for each output.	
	Output signal OB compulsion OFF OB OBT.	0398	X OF	-	ob<u>F.</u> oF	ON OF	In each output signal OB, each output is forcibly turned OFF after the time set in the OFF timer is passed. The OFF timer set time can be set with each output's forced OFF timer [OTT] function.	
	Delay time of output signal OB DB.	0399	X 0 msec.	0 ~ 510 msec.	db<u>I.</u> ***	***	In each output signal OB the delay time to when each output is started can be set. Each delay time can be set in 2msec intervals.	
	Function selection of output signal OC OC.	0400	X B	-	o<u>C.</u> ***	***	The output functions of each output signal OC can be selected from 58 types of functions. (*3)	
	Logical conversion function of output signal OC OCL.	0401	X OF	-	o<u>L.</u> oF	ON OF	The output logic of each output signal OC is reversed.	
C mode	Chopping operation of output signal OC occ.	0402	X OF	-	o<u>E.</u> oF	ON OF	Each output is output with full wave immediately after output starts, and then is reduced to half-wave output for each output signal OC. (Chopping control) The full wave output time can be set with the full wave time [PO] function for each output.	
	Output signal OC compulsion OFF OC OCT.	0403	X OF	-	o<u>F.</u> oF	ON OF	In each output signal OC, each output is forcibly turned OFF after the time set in the OFF timer is passed. The OFF timer set time can be set with each output's forced OFF timer [OTT] function.	
	Delay time of output signal DC DC.	0404	X 0 msec.	0 ~ 510 msec.	d<u>C.</u> ***	***	In each output signal OC the delay time to when each output is started can be set. Each delay time can be set in 2msec intervals.	
	Function selection of output signal OD OD.	0405	X L	-	od<u>d.</u> ***	***	The output functions of each output signal OD can be selected from 58 types of functions. (*3)	
	Logical conversion function of output signal OD ODL.	0406	X OF	-	od<u>L.</u> oF	ON OF	The output logic of each output signal OD is reversed.	
	Chopping operation of output signal OD ODC.	0407	X OF	-	od<u>E.</u> oF	ON OF	Each output is output with full wave immediately after output starts, and then is reduced to half-wave output for each output signal OD. (Chopping control) The full wave output time can be set with the full wave time [PO] function for each output.	

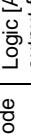
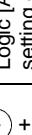
Mode name	Function name	Factory setting GMFY	Unit	Setting range	Function name	Setting	Specification	
							Digital display	
C mode 	Output signal OD compulsion OFF ODT.	0408	X	OF	-	OF.	OF.	ON OF
	Delay time of output signal OD DD.	0409	X	0 msec.	0 ~ 510	dd.	***	***
	Function selection of output signal OF OFL.	0410	X	FU	-	OF.	***	***
	Logical conversion function of output signal OF OFL.	0411	X	OF	-	OF.	ON OF	The output logic of each output signal OF can be set.
	Presser foot lifter output chopping duty FUD.	0412	X	MF	-	FUD.	The chopping output duty during holding after the presser foot lifter output FU lifting operation can be set.	The output functions of each output signal OF can be selected from 58 types of functions. (*3)
	C mode 	C mode 	C mode 	C mode 	C mode 	C mode 	C mode 	C mode 
						f5	MS	4ms ON/OFF 50% duty
						f6	MF	2ms ON/OFF 50% duty
						f7	HI	4ms ON, 2ms OFF, 66% duty
						f8	26	2ms ON, 6ms OFF, 25% duty
						f9	62	6ms ON, 2ms OFF, 75% duty
						f10	84	8ms ON, 4ms OFF, 66% duty
						f11	FL	100% (full wave)
						f12	LO	2ms ON, 4ms OFF 33% duty
						The full wave output time of the presser foot lifter output FU can be set.		
	Presser foot lifter FU full wave output time FO.	0413	X	50	X10 msec	FO.	20	200ms
	P mode 	P mode 	P mode 	P mode 	P mode 	P mode 	P mode 	P mode 
						f13	25	250ms
						f14	30	300ms
						f15	40	400ms
						f16	50	500ms
						f17	60	600ms
						f18	80	800ms
						f19	100	1000ms
						The operation mode of presser foot lifter momentary FUM is set. This is valid when presser foot lifter momentary FUM is set to [ON] in the P mode.		
						The presser foot lifter operation is continued after full heeling or after thread trimmer with external thread trimmer signal S2.		
						The presser foot lifter operation is continued during the timer time after full heeling or after thread trimming with external thread trimmer signal S2. Then the presser foot lifter is lowered. The timer can be adjusted with full heeling, light heeling, or the external control signal (S2, F) ON. Then, when the full heeling, light heeling or external control signal (S2, F) is turned ON, the presser foot will bring down, and when turned ON again, the presser foot will lift. (Alternate operation.)		
						The timer operates in the same manner as the [C] setting. However, after the presser foot bring down, the same alternate operation as the [A] setting will occur.		

Mode name	Function name	Factory setting GMFY	Unit	Setting range	Function name	Setting	Specification	
							Digital display	
C mode	Delay time of output signal OF	DF.	X	0 msec.	0 ~ 510	dF.	***	In each output signal OF the delay time to when each output is started can be set. Each delay time can be set in 2msec intervals.
	Function selection of output signal O1	O1.	X	OT1	-	o_l	***	The output functions of each output signal O1 can be selected from 58 types of functions. (*3)
	Logical conversion function of output signal O1	O1L.	X	OF	-	o_lL.	o_F²	The output logic of each output signal O1 is reversed.
	Chopping operation of output signal O1C.	O1C.	X	OF	-	o_lC.	o_F²	Each output is output with full wave immediately after output starts, and then is reduced to half-wave output for each output signal O1. (Chopping control) The full wave output time can be set with the full wave time [PO]
	Output signal O1 compulsion OFF	O1T.	X	OF	-	o_lT.	o_F²	In each output signal O1, each output is forcibly turned OFF after the time set in the OFF timer is passed. The OFF timer set time can be set with each output's forced OFF timer [OTT] function.
	Delay time of output signal O1	D1.	X	0 msec.	0 ~ 510	d_l	***	In each output signal O1 the delay time to when each output is started can be set. Each delay time can be set in 2msec intervals.
	Function selection of output signal O2	O2.	X	NCL	-	o₂	***	The output functions of each output signal O2 can be selected from 58 types of functions. (*3)
	Logical conversion function of output signal O2	O2L.	X	OF	-	o₂L.	o_F²	The output logic of each output signal O2 is reversed.
	Chopping operation of output signal O2C.	O2C.	X	OF	-	o₂C.	o_F²	Each output is output with full wave immediately after output starts, and then is reduced to half-wave output for each output signal O2. (Chopping control) The full wave output time can be set with the full wave time [PO]
	Output signal O2 compulsion OFF	O2T.	X	OF	-	o₂T.	o_F²	In each output signal O2, each output is forcibly turned OFF after the time set in the OFF timer is passed. The OFF timer set time can be set with each output's forced OFF timer [OTT] function.
D mode	Delay time of output signal O2	D2.	X	0 msec.	0 ~ 510	d₂	***	In each output signal O2 the delay time to when each output is started can be set. Each delay time can be set in 2msec intervals.
	Function selection of output signal O3	O3.	X	TF	-	o₃	***	The output functions of each output signal O3 can be selected from 58 types of functions. (*3)
	Logical conversion function of output signal O3	O3L.	X	OF	-	o₃L.	o_F²	The output logic of each output signal O3 is reversed.
	Chopping operation of output signal O3C.	O3C.	X	OF	-	o₃C.	o_F²	Each output is output with full wave immediately after output starts, and then is reduced to half-wave output for each output signal O3. (Chopping control) The full wave output time can be set with the full wave time [PO]
	Output signal O3 compulsion OFF	O3T.	X	OF	-	o₃T.	o_F²	In each output signal O3, each output is forcibly turned OFF after the time set in the OFF timer is passed. The OFF timer set time can be set with each output's forced OFF timer [OTT] function.
	Delay time of output signal O3	D3.	X	0 msec.	0 ~ 510	d₃	***	In each output signal O3 the delay time to when each output is started can be set. Each delay time can be set in 2msec intervals.
	Function selection of output signal O4	O4.	X	UP/N	-	o₄	***	The output functions of each output signal O4 can be selected from 58 types of functions. (*3)
	Logical conversion function of output signal O4	O4L.	X	OF	-	o₄L.	o_F²	The output logic of each output signal O4 is reversed.

Mode name	Function name	Factory setting GMFY	Unit	Setting range	Function name O4F.	Setting ON OF	Specification	
							Digital display	Setting ON OF
	Output signal O4 compulsion OFF O4T.	0433	X	OF	-	O4F.	O4F	ON OF
	Delay time of output signal O4 D4.	0434	X	0 msec.	0 ~ 510	d4.	***	***
	Function selection of output signal O5 O5.	0435	X	DNW	-	o5.	***	In each output signal O4 the delay time to when each output is started can be set. Each delay time can be set in 2msec intervals.
	Logical conversion function of output signal O5 O5L.	0436	X	OF	-	o5L.	O5F	The output functions of each output signal O5 can be selected from 58 types of functions. (*3)
	Output signal O5 compulsion OFF O5T.	0437	X	OF	-	o5F.	O5F	The output logic of each output signal O5 is reversed.
	Delay time of output signal O5 D5.	0438	X	0 msec.	0 ~ 510	d5.	***	In each output signal O5, each output is forcibly turned OFF after the time set in the OFF timer is passed. The OFF timer set time can be set with each output's forced OFF timer [OTT] function.
	Function selection of output signal O6 O6.	0439	X	NO	-	o6.	***	In each output signal O5 the delay time to when each output is started can be set. Each delay time can be set in 2msec intervals.
C mode	Logical conversion function of output signal O6 O6L.	0440	X	OF	-	o6L.	O6F	The output functions of each output signal O6 can be selected from 58 types of functions. (*3)
 + 	Chopping operation of output signal O6 O6C.	0441	X	OF	-	o6C.	O6F	The output logic of each output signal O6 is reversed.
	Output signal O6 compulsion OFF O6T.	0442	X	OF	-	o6F.	O6F	ON OF
	Delay time of output signal O6 D6.	0443	X	0 msec.	0 ~ 510	d6.	***	In each output signal O6, each output is reduced to half-wave output for each output signal O6. (Chopping control) The full wave output time can be set with the full wave time [PO] function for each output.
	Function selection of output signal O7 O7.	0444	X	NO	-	o7.	***	In each output signal O6, each output is forcibly turned OFF after the time set in the OFF timer is passed. The OFF timer set time can be set with each output's forced OFF timer [OTT] function.
	Logical conversion function of output signal O7 O7L.	0445	X	OF	-	o7L.	O7F	In each output signal O6 the delay time to when each output is started can be set. Each delay time can be set in 2msec intervals.
	Chopping operation of output signal O7 O7C.	0446	X	OF	-	o7C.	O7F	The output functions of each output signal O7 can be selected from 58 types of functions. (*3)
	Output signal O7 compulsion OFF O7T.	0447	X	OF	-	o7F.	O7F	ON OF
	Delay time of output signal O7 D7.	0448	X	0 msec.	0 ~ 510	d7.	***	In each output signal O7 the delay time to when each output is started can be set. Each delay time can be set in 2msec intervals.
	Function selection of output signal OM OM.	0449	X	NO	-	o7.	***	The output functions of each output signal OM can be selected from 58 types of functions. (*3)
	Logical conversion function of output signal OM OML.	0450	X	OF	-	o7L.	O7F	The output logic of each output signal OM is reversed.

Mode name	Function name	Factory setting GMFY	Unit	Setting range	Function name	Setting	Specification	
							Digital display	
	Output signal OM compulsion OFF	OMT.	0451	X OF	-	oMf.	oF	ON ON OFF OFF
	Delay time of output signal OM	DM.	0452	X 0 msec.	0 ~ 510	dM.	***	***
	Function selection of output signal ON	ON.	0453	X NO	-	oN.	***	In each output signal ON the delay time to when each output is started can be set. Each delay time can be set in 2msec intervals. (*3)
	Logical conversion function of output signal ON	ONL.	0454	X OF	-	onL.	oF	The output functions of each output signal ON can be selected from 58 types of functions. (*3)
	Output signal ON compulsion OFF	ONT.	0455	X OF	-	onf.	oF	The output logic of each output signal ON is reversed.
	Delay time of output signal ON	DN.	0456	X 0 msec.	0 ~ 510	dN.	***	In each output signal ON, each output is forcibly turned OFF after the time set in the OFF timer is passed. The OFF timer set time can be set with each output's forced OFF timer [OTT] function.
	Function selection of output signal OO	OO.	0457	X NO	-	oo.	***	In each output signal ON the delay time to when each output is started can be set. Each delay time can be set in 2msec intervals. (*3)
	Logical conversion function of output signal OO	OOL.	0458	X OF	-	ooL.	oF	The output functions of each output signal OO can be selected from 58 types of functions. (*3)
	Output signal OO compulsion OFF	OOT.	0459	X OF	-	oof.	oF	The output logic of each output signal OO is reversed.
	Delay time of output signal OO	DO.	0460	X 0 msec.	0 ~ 510	do.	***	In each output signal OO, each output is forcibly turned OFF after the time set in the OFF timer is passed. The OFF timer set time can be set with each output's forced OFF timer [OTT] function.
	Function selection of output signal OP	OP.	0461	X NO	-	oP.	oF	In each output signal OO the delay time to when each output is started can be set. Each delay time can be set in 2msec intervals. (*3)
	Logical conversion function of output signal OP	OPL.	0462	X OF	-	opL.	oF	The output functions of each output signal OP can be selected from 58 types of functions. (*3)
	Output signal OP compulsion OFF	OPT.	0463	X OF	-	opf.	oF	ON ON OFF OFF
	Delay time of output signal OP	DP.	0464	X 0 msec.	0 ~ 510	dp.	***	***
	Function selection of output signal OQ	OQ.	0465	X NO	-	oq.	***	In each output signal OP the delay time to when each output is started can be set. Each delay time can be set in 2msec intervals. (*3)
	Logical conversion function of output signal OQ	OQL.	0466	X OF	-	oql.	oF	The output logic of each output signal OQ is reversed.
	Output signal OQ compulsion OFF	OQT.	0467	X OF	-	oqf.	oF	In each output signal OQ, each output is forcibly turned OFF after the time set in the OFF timer is passed. The OFF timer set time can be set with each output's forced OFF timer [OTT] function.

Mode name	Function name	Factory setting GMFY	Unit	Setting range	Function name Digital display	Setting	Specification	
							***	***
 C mode	Delay time of output signal OQ	D.Q.	0468	X 0 msec.	0 ~ 510	dQ.	***	In each output signal OQ the delay time to when each output is started can be set. Each delay time can be set in 2msec intervals.
	Function selection of output signal OR	O.R.	0469	X NO	-	or.	***	The output functions of each output signal OR can be selected from 58 types of functions. (*3)
	Logical conversion function of output signal OR	O.RL.	0470	X OF	-	orL.	OF	ON OF
	Output signal OR compulsion OFF	O.RT.	0471	X OF	-	orT.	OF	ON OF
	Delay time of output signal OR	DR.	0472	X 0 msec.	0 ~ 510	dr.	***	The output logic of each output signal OR is reversed.
	Full wave output time for each output	PO.	0473	O 50 msec	X10 msec	pQ.		In each output signal OR the delay time to when each output is started can be set. Each delay time can be set in 2msec intervals.
	 FU output					20	20	The full wave output time of each output signal OA~OD, O1~O7 can be set.
						25	25	Set to [20] : 200ms
						30	30	Set to [25] : 250ms
						40	40	Set to [30] : 300ms
						50	50	Set to [40] : 400ms
						60	60	Set to [50] : 500ms
						80	80	Set to [60] : 600ms
						100	100	Set to [80] : 800ms
								Set to [100] : 1000ms
 FU output	Output chopping duty except of FU output	POD.	0474	O MF	-	pod.		Setting output chopping duty, except FU output
					f5	MS	Set to [MS] : 2ms ON/OFF 50% duty	
					fF	MF	Set to [MF] : 4ms ON/OFF 50% duty	
					H.	HI	Set to [H] : 4ms ON, 2ms OFF, 66% duty	
					LO	LO	Set to [LO] : 2ms ON, 4ms OFF 33% duty	
 FUM operation mode timer setting function	Forced OFF timer setting function for each output	OTT.	0475	O 12 sec	1 ~ 24	otT.	**	The timer that forcibly turns off output signals OA to OD, O1 to O7 and OM to OR can be set.
	FCT.	0476	O 12 sec	1 ~ 99	FCT.	**	The timer from the time when the presser foot lifter output is turned ON to the time when it is turned OFF. (When FUM operation mode FU [C] or [T] is set can be set.)	

Mode name	Function name	Factory setting	Unit	Setting range	Function name	Setting	Specification	
							Digital display	
C mode  + 	Logic [AND] module A2 Alternate	A2A.	0486	X OF	-	R2R. OF	ON OF	[A2] of the [AND] module is set to alternative.
	Logic [AND] module N3 output function selection	N3.	0487	X NO	-	n3. OF	***	Output function selection of the [N3] of the logic [AND] module.
	Logic [AND] module N3 setting of Hi /Low logic	N3L.	0488	X OF	-	n3L. OF	ON OF	[N3] logic of the [AND] module is set to opposite.
	Logic [AND] module N4 output function selection	N4.	0489	X NO	-	n4. OF	***	Output function selection of the [N4] of the logic [AND] module.
	Logic [AND] module N4 setting of Hi /Low logic	N4L.	0490	X OF	-	n4L. OF	ON OF	[N4] logic of the [AND] module is set to opposite.
	Logic [AND] module A3 input function selection	A3.	0491	X NO	-	R3. OF	***	Input function selection of the [A3] of the logic [AND] module.
	Logic [AND] module A3 setting of Hi /Low logic	A3L.	0492	X OF	-	R3L. OF	ON OF	[A3] logic of the [AND] module is set to opposite.
	Logic [AND] module A3 Alternate	A3A.	0493	X OF	-	R3R. OF	ON OF	[A3] of the [AND] module is set to alternative.
	Logic [AND] module N5 output function selection	N5.	0494	X NO	-	n5. OF	***	Output function selection of the [N5] of the logic [AND] module.
	Logic [AND] module N5 setting of Hi /Low logic	N5L.	0495	X OF	-	n5L. OF	ON OF	[N5] logic of the [AND] module is set to opposite.
	Logic [AND] module N6 output function selection	N6.	0496	X NO	-	n6. OF	***	Output function selection of the [N6] of the logic [AND] module.
	Logic [AND] module N6 setting of Hi /Low logic	N6L.	0497	X OF	-	n6L. OF	ON OF	[N6] logic of the [AND] module is set to opposite.
	Logic [OR] module input function selection	OR.	0498	X NO	-	or. OF	***	Input function selection of the [OR] of the logic [OR] module.
	Logic [OR] module setting of Hi /Low logic	ORL.	0499	X OF	-	orL. OF	ON OF	[OR] logic of the [OR] module is set to opposite.
	Logic [OR] module Alternate ORA.	0500	X OF	-	orR. OF	ON OF	[OR] of the [OR] module is set to alternative.	
	Logic [OR] module R1 output function selection	R1.	0501	X NO	-	r! OF	***	Output function selection of the [R1] of the logic [OR] module.
	Logic [OR] module R1 setting of Hi /Low logic	R1L.	0502	X OF	-	r'!L. OF	ON OF	[R1] logic of the [AND] module is set to opposite.
	Logic [OR] module R2 output function selection	R2.	0503	X NO	-	r?2. OF	***	Output function selection of the [R2] of the logic [OR] module.
	Logic [OR] module R2 setting of Hi /Low logic	R2L.	0504	X OF	-	r?2L. OF	ON OF	[R2] logic of the [AND] module is set to opposite.
	Variable speed command for digital input	CSP.	0505	X OF	-	CSPL. OF	ON OF	Set variable speed command for digital input "(OC, IOE, IOF) High speed is set to [H] on program mode "P". (CSP=ON, CSG=OFF)

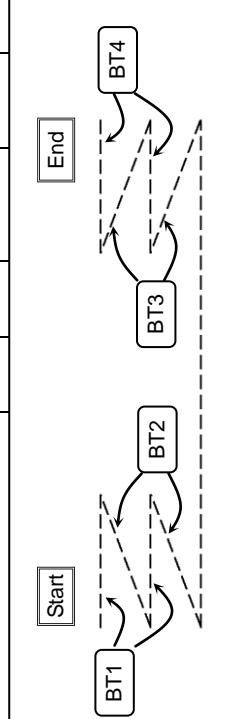
Mode name	Function name	Factory setting	Unit	Setting range	Function name	Setting	Specification								
							Digital display			Set variable speed command for digital input. (IOC, IOD, IOE, IOF) High speed is set to [H] on program mode "P" To use gray code. (3,2,1,0) = (16, 17, 12, 11). (CSP=ON, CSG=ON)			CSG setting (Gray code) (CSP=ON, CSG=ON)		
	Variable speed command for digital input	CSG.	0506	X OF	-	-	FF	FF	ON	ON	IOC	IOD	IOE		
		GMFY					FF	FF	OF	OF	OF	OF	OF		
	Code table of speed command input				Hexadecim numbaer	CSP setting (CSP=ON, CSG=OF)									
					0	IOF OF 0	IOE OF 0	IOD OF 0	IOC OF 0	IOF OF 0	IOE OF 0	IOD OF 0	IOC OF 0	1	VC2= [Small]
					1	OF 0	OF 0	OF 0	ON 1	OF 0	OF 0	OF 0	ON 1	1	2
					2	OF 0	OF 0	ON 1	OF 0	OF 0	OF 0	ON 1	ON 1	3	
					3	OF 0	OF 0	ON 1	ON 1	OF 0	OF 0	ON 1	OF 0	4	
					4	OF 0	ON 1	OF 0	OF 0	OF 0	ON 1	ON 1	OF 0	5	
					5	OF 0	ON 1	OF 0	ON 1	OF 0	ON 1	ON 1	ON 1	6	
					6	OF 0	ON 1	ON 1	OF 0	OF 0	ON 1	OF 0	ON 1	7	
					7	OF 0	ON 1	ON 1	OF 0	ON 1	ON 1	OF 0	OF 0	8	
					8	ON 1	OF 0	OF 0	ON 1	ON 1	ON 1	OF 0	OF 0	9	
					9	ON 1	OF 0	ON 1	ON 1	ON 1	ON 1	ON 1	ON 1	10	
					A	ON 1	OF 0	ON 1	ON 1	ON 1	ON 1	ON 1	ON 1	11	
					B	ON 1	OF 0	ON 1	ON 1	ON 1	ON 1	ON 1	OF 0	12	
					C	ON 1	OF 0	ON 1	ON 1	ON 1	ON 1	ON 1	OF 0	1	
					D	ON 1	ON 1	ON 1	ON 1	ON 1	ON 1	ON 1	ON 1	3	
					E	ON 1	ON 1	ON 1	ON 1	ON 1	ON 1	ON 1	ON 1	14	
					F	ON 1	ON 1	ON 1	ON 1	ON 1	ON 1	ON 1	ON 1	15	

C mode 

Mode name	Function name	Specification					
		Factory setting	Unit	Setting range	Function name	Setting	
C mode [+]	Thread release + backstitch output	LB.	0507	O OF	-	L b. OF	ON OF
	Virtual output OT1 forced OFF function	T1C.	0508	O OF	-	F !E. OF	ON OF
	Forced OFF timer setting function for virtual output OT1	T1T.	0509	O 99	X10 msec	F !!F.	**
	Virtual output OT2 forced OFF function	T2C.	0510	O OF	-	F 2E. OF	ON OF
	Forced OFF timer setting function for virtual output OT2	T2T.	0511	O 99	X10 msec	F 2F.	**
	Virtual output OT3 forced OFF function	T3C.	0512	O OF	-	F 3E. OF	ON OF
	Forced OFF timer setting function for virtual output OT3	T3T.	0513	O 99	X10 msec	F 3F.	**
	ON delay time setting function for virtual output OT1	D11.	0514	X 0	X10 msec	d !I.	**
	OFF delay time setting function for virtual output OT1	D12.	0515	X 0	X10 msec	d !2.	**
	ON delay time setting function for virtual output OT2	D21.	0516	X 0	X10 msec	d 2 !.	**
	OFF delay time setting function for virtual output OT2	D22.	0517	X 0	X10 msec	d 2 2.	**
ON delay time setting function for virtual output OT3	ON delay time setting function for virtual output OT3	D31.	0518	X 0	X10 msec	d 3 !.	**
	OFF delay time setting function for virtual output OT3	D32.	0519	X 0	X10 msec	d 3 2.	**
	Feed pulse output (CP) cancel function	CPK.	0520	O ON	-	E P E. OF	ON OF
	Setting CP pulse amount	CP.	0521	O 32	-	E P.	**

Mode name	Function name	Setting				Specification	
		Factory setting	Unit	Setting range	Function name	Digital display	
	Prohibited angle of output CP pulse	CPC.	0522	O OF	-	[Pf. OF]	ON OFF
	Panel switch operation prohibit	PSW.	0523	O OF	-	[PSH. OF]	ON OFF
	O4, O5 output cancel during back tack term	CKB.	0524	O OF	-	[tb. OF]	ON OFF
	CP output cancel during back tack term	CPB.	0525	O OF	-	[Pb. OF]	ON OFF
	Speed setting for the [SPC] output	C.	0526	X 1000	rpm	0 ~ 8999	[. ****]
	Speed setting for the [SPD] output	D.	0527	X 2000	rpm	0 ~ 8999	[d. ****]
	Speed setting for the [SPE] output	E.	0528	X 3000	rpm	0 ~ 8999	[E. ****]
C mode F key function on control panel	CNF.	0529	O SE	-	-	[nf.]	UP DN SE SP SP
							UP DN SE SP SP
							Display Up counter amount Display Down counter amount Display stitch amount of sensor Display routine speed of sewing machine
	Variable speed pedal changeover	PDS.	0530	O OF	-	[pdS. OF]	ON OFF
	Speed instruction VC2 cancellation	V2C.	0531	X OF	-	[vc2. OF]	ON OFF
							Speed instruction VC2 is canceled.

Mode name	Function name	Factory setting GMFY	Unit	Setting range	Function name	Setting	Specification
	Direct call number	Operability	Setting range	Digital display			
	Operation mode during tacking	D1.	0600	O M	-	-	
					d !	d !	
					n	M	
					d	D	
					n	N	
					C5f	CST	
					C5u	CSU	
					C5d	CSD	
	Operation mode during start tack completion	D2.	0601	O CON	-	-	d2.
							d2.
					Cn	CON	
					Sfp	STP	
					r n	TRM	
	Stop time at each corner during start and backtacking	CT.	0602	O 5	X10 msec	0 ~ 99	Cf.
	Tack alignment	BM.	0603	O OF	-	-	b n
							On
							Of
	No. of stitch compensation for start tacking alignment	BT1.	0604	O 0	-	0 ~ F	b f
							*

Mode name	Function name	Factory setting GMFY	Unit	Setting range	Function name	Setting	Specification																																					
							Digital display																																					
D mode	No. of stitch compensation for start tacking alignment	BT2.	0605	0 0 -	0 ~ F	b72.	*	*																																				
	No. of stitch compensation for end tacking alignment	BT3.	0606	0 0 -	0 ~ F	b73.	*	*																																				
	No. of stitch compensation for end tacking alignment	BT4.	0607	0 0 -	0 ~ F	b74.	*	*																																				
<p style="text-align: center;">Relation of no. of compensated stitches and setting value</p> <table border="1" style="margin-left: auto; margin-right: auto;"> <tr> <td>Setting value</td> <td>9</td> <td>8</td> <td>7</td> <td>6</td> <td>5</td> <td>4</td> <td>3</td> <td>2</td> </tr> <tr> <td>Compensated stitches</td> <td>-2 1/4</td> <td>-2</td> <td>-1 3/4</td> <td>-1 2/4</td> <td>-1 1/4</td> <td>-1</td> <td>-3/4</td> <td>-2 1/4</td> </tr> <tr> <td>Setting value</td> <td>1</td> <td>0</td> <td>A</td> <td>B</td> <td>C</td> <td>D</td> <td>E</td> <td>F</td> </tr> <tr> <td>Compensated stitches</td> <td>-1/4</td> <td>0</td> <td>+1/4</td> <td>+2/4</td> <td>+3/4</td> <td>+1</td> <td>+1 1/4</td> <td>+1 2/4</td> </tr> </table>									Setting value	9	8	7	6	5	4	3	2	Compensated stitches	-2 1/4	-2	-1 3/4	-1 2/4	-1 1/4	-1	-3/4	-2 1/4	Setting value	1	0	A	B	C	D	E	F	Compensated stitches	-1/4	0	+1/4	+2/4	+3/4	+1	+1 1/4	+1 2/4
Setting value	9	8	7	6	5	4	3	2																																				
Compensated stitches	-2 1/4	-2	-1 3/4	-1 2/4	-1 1/4	-1	-3/4	-2 1/4																																				
Setting value	1	0	A	B	C	D	E	F																																				
Compensated stitches	-1/4	0	+1/4	+2/4	+3/4	+1	+1 1/4	+1 2/4																																				
																																												
<p>No. of tacking stitches (+) 15 BTP.</p> <p>No. of tacking stitches function BTO.</p> <p>Full heeling function immediately after start tacking stop BTT.</p> <p>Not used. CSJ.</p> <p>The speed operation mode when both the medium speed signal and S5V signal is ON</p>																																												
<p>0608 O OF -</p> <p>0609 O 0 -</p> <p>0610 O ON -</p> <p>0611 O OF -</p> <p>0612 O OF -</p>																																												
<p>b7P. OF</p> <p>b7o. **</p> <p>b7f. OF</p> <p>b7u. OF</p> <p>SPn.</p>																																												
<p>ON OF</p> <p>**</p> <p>ON OF</p> <p>ON OF</p> <p>When both the medium speed signal (medium speed run signal S5, medium speed command signal SPM) and the end tacking speed run signal S5V is ON, the speed operation mode can be set.</p>																																												
<p>on ON</p> <p>of OF</p>																																												
<p>If both the medium speed signal (S5, SPM) and the end tacking speed run signal (S5V) is ON, the speed will be the start tacking speed N.</p> <p>If both the medium speed signal (S5, SPM) and the end tacking speed run signal (S5V) is ON, the speed will be the end tacking speed V.</p>																																												

Mode name	Function name	Factory setting GMFY	Unit	Setting range	Function name b7f7.	Setting Digital display	Specification
Operability	Set table types of tacking BTM.	0613	O	6	-	1 ~ 7	Determine the type of tacking that can be set with the front and end tacking type ([B], [D] keys) in the tacking setting mode with setting values 1 to 7
							1 Once tacking (V tacking) 2 Double tacking (N tacking) 3 Triple tacking (M tacking) 4 4 repeat tacking (W tacking) 5 5 repeat tacking 6 6 repeat tacking 7 7 repeat tacking
	Input signal S7 operation mode during preset stitching S7M.	0614	O	OF	-	-	57f7. 0F ON OFF
	Manual backstitch ON timing S7U.	0615	O	OF	-	-	57U. 0F ON OFF
	Manual backstitch ON timing S7D.	0616	O	OF	-	-	57d. 0F ON OFF
D mode The OFF timing setting of output B when the backstitching signal (S7) is OFF setting. The maximum tacking stitches (maximum stitches is 99 stitches)	The OFF timing setting of output B when the backstitching signal (S7) is OFF setting.	0617	O	OF	-	-	7bd. 0F ON OFF
	The maximum tacking stitches (maximum stitches is 99 stitches)	0618	O	OF	-	-	b7f7. ON
	No. of end tacking stitches during direct heeling BCC.	0619	O	OF	-	-	b7L. 0F ON OFF
	Operation mode during thread trimmer cancel signal [TL] setting	0620	O	OF	-	-	7L5. 0F ON OFF
	Input signal BTL quick pressing operation	0621	O	ON	-	-	b7S. 0F ON OFF

Mode name	Function name	Factory setting GMFY	Unit	Setting range	Function name Digital display	Setting		Specification
						ON	OFF	
D mode 	Input signal SB and EB quick pressing operation	BS.	O	OF	-	b5.	OF	The start and end tacking cancel signals SE and EB operations are set. [ON] The start tacking operation is prohibited once after one pushing (OFF-ON-OFF) of the start tacking signal SE. (Same for end tacking cancel signal EB.) [OF] The start tacking operation is prohibited while the start tacking cancel signal SE is ON. (Same for end tacking cancel signal EB.)
	Operation when input signal BTL is ON	BTD.	O	OF	-	bf.d.	OF	When the tacking is set to OFF, if tacking cancel signal (BTL) turns ON, the tacking will be permitted. (When this function is set to OFF, the tacking will be prohibited.)
	Operation when input signal SB and EB tacking OFF are set	BD.	O	OF	-	bd.	OF	If the start tacking validity ([A key]) is set to OFF (-) in the tacking setting mode, start tacking can be validated by turning the start tacking cancel signal SE ON. (Same for end tacking cancel signal EB.)
	End tacking cancel mode with input signal PSU	PNE.	O	OF	-	PnE.	OF	When end tacking is set, if the needle UP position priority stop signal PSU turns ON during operation, the end tacking will not be executed after stopping at the needle UP position. After thread trimming, the presser foot will lift.
	The buzzer of control panel validity	BZ.	O	ON	-	b..	OF	The buzzer of control panel will be validated.

Mode name	Function name	Factory setting GMFY	Unit	Setting range	Function name	Setting	Specification
					Digital display		
E  + 	Error code (The last error code)	1.	0700 O	E--	-	<i>E</i> --	E-- The last error code is displayed.
	Error code (The second to last code)	2.	0701 O	E--	-	<i>E</i> --	E-- The second to last code is displayed.
	Error code (The third to last code)	3.	0702 O	E--	-	<i>E</i> --	E-- The third to last code is displayed.
	Error code (The fourth to last code)	4.	0703 O	E--	-	<i>E</i> --	E-- The fourth to last code is displayed.
	Total integration time of power on	P.	0704 O	0	X10 hours	<i>P.</i> ****	**** Display total integration time of power on
	Total integration time of motor run	M.	0705 O	0	X10 hours	<i>M.</i> ****	**** Display total integration time of motor run
	Input signal IA display	IA.	0706 O	-	-	<i>IA.</i> 	ON The input status (ON/OFF) of the input signal IA.
	Input signal IB display	IB.	0707 O	-	-	<i>IB.</i> 	ON The input status (ON/OFF) of the input signal IB.
	Input signal IC display	IC.	0708 O	-	-	<i>IC.</i> 	ON The input status (ON/OFF) of the input signal IC.
	Input signal ID display	ID.	0709 O	-	-	<i>ID.</i> 	ON The input status (ON/OFF) of the input signal ID.
I 	Input signal IE display	IE.	0710 O	-	-	<i>IE.</i> 	ON The input status (ON/OFF) of the input signal IE.
	Input signal IF display	IF.	0711 O	-	-	<i>IF.</i> 	ON The input status (ON/OFF) of the input signal IF.
	Input signal IG display	IG.	0712 O	-	-	<i>IG.</i> 	ON The input status (ON/OFF) of the input signal IG.
	Input signal IH display	IH.	0713 O	-	-	<i>IH.</i> 	ON The input status (ON/OFF) of the input signal IH.
	Input signal II display	II.	0714 O	-	-	<i>II.</i> 	ON The input status (ON/OFF) of the input signal II.
	Input signal IJ display	IJ.	0715 O	-	-	<i>IJ.</i> 	ON The input status (ON/OFF) of the input signal IJ.
	Input signal IK display	IK.	0716 O	-	-	<i>IK.</i> 	ON The input status (ON/OFF) of the input signal IK.
	Input signal IL display	IL.	0717 O	-	-	<i>IL.</i> 	ON The input status (ON/OFF) of the input signal IL.
	Input signal IP display	IP.	0718 O	-	-	<i>IP.</i> 	ON The input status (ON/OFF) of the input signal IP.

Mode name	Function name	Factory setting	Unit	Setting range	Function name	Setting	Specification	
							Digital display	
E mode ↓ + [↑] A 1~2	Input signal IQ display IQ.	0719	O	-	-	1q.	0F	ON OF
	Input signal IR display IR.	0720	O	-	-	1r.	0F	ON OF
	Input signal I1 display I1.	0721	O	-	-	1l.	0F	ON OF
	Input signal I2 display I2.	0722	O	-	-	12.	0F	ON OF
	Input signal I4 display I4.	0723	O	-	-	14.	0F	ON OF
	Input signal I5 display I5.	0724	O	-	-	15.	0F	ON OF
	Encoder signal display (A phase)	0725	O	-	-	ECA.	0F	ON OF
	Encoder signal display (B phase)	0726	O	-	-	ECB.	0F	ON OF
	Detector signal display (UP signal)	0731	O	-	-	UP.	0F	ON OF
	Detector signal display (DN signal)	0732	O	-	-	DN.	0F	ON OF
	Display the angle from down position	0733	O	-	X2 degree	dr.	***	*** Display the angle of current position from down position.
	Display the voltage of VC	0734	O	-	-	vc.	***	*** The numerical value that is equivalent to the variable speed voltage VC with the option B connector is displayed. Display range: 000 ~ 3FF
	Display the voltage of VC2	0736	O	-	-	v2.	***	*** The numerical value that is equivalent to the variable speed voltage VC2 with the option B connector is displayed. Display range: 000 ~ 3FF
	Output signal OA display OAD.	0737	O	-	-	ord.	0F	ON OF
	Output signal OB display OBD.	0738	O			obd.	0F	ON OF
	Output signal OC display OCD.	0739	O			ocd.	0F	ON OF
	Output signal OD display ODD.	0740	O			odd.	0F	ON OF
	Output signal OF display OFD.	0741	O			ofd.	0F	ON OF
	Output signal O1 display O1D.	0742	O			o1d.	0F	ON OF

Mode name	Function name	Factory setting GMFY	Unit	Setting range	Function name Digital display	Setting	Specification	
							ON	OFF
Operability	Output signal O2 display	O2D.	O		o2d. oF	ON OFF	The output status (ON/OFF) of the output signal O2.	
	Output signal O3 display	O3D.	O		o3d. oF	ON OFF	The output status (ON/OFF) of the output signal O3.	
	Output signal O4 display	O4D.	O		o4d. oF	ON OFF	The output status (ON/OFF) of the output signal O4.	
	Output signal O5 display	O5D.	O		o5d. oF	ON OFF	The output status (ON/OFF) of the output signal O5.	
	Output signal O6 display	O6D.	O		o6d. oF	ON OFF	The output status (ON/OFF) of the output signal O6.	
	Output signal O7 display	O7D.	O		o7d. oF	ON OFF	The output status (ON/OFF) of the output signal O7.	
	Output signal OP display	OPD.	O		opd. oF	ON OFF	The output status (ON/OFF) of the output signal OP.	
	Output signal OQ display	OQD.	O		oqd. oF	ON OFF	The output status (ON/OFF) of the output signal OQ.	
	Output signal OR display	ORD.	O		ord. oF	ON OFF	The output status (ON/OFF) of the output signal OR.	
	Solenoid output of output signal OA	OAO.	X	-	oRq. oF	ON OFF	The output status (ON/OFF) of the solenoid output OA with the [D, ==>] key ON/OFF is changed. Do not turn the O4 to O7 outputs ON/OFF with the [D, ==>] key.	
E mode	Solenoid output of output signal OB	OBO.	X	-	obo. oF	ON OFF	The output status (ON/OFF) of the solenoid output OB with the [D, ==>] key ON/OFF is changed. Do not turn the O4 to O7 outputs ON/OFF with the [D, ==>] key.	
	Solenoid output of output signal OC	OCO.	X	-	oCq. oF	ON OFF	The output status (ON/OFF) of the solenoid output OC with the [D, ==>] key ON/OFF is changed. Do not turn the O4 to O7 outputs ON/OFF with the [D, ==>] key.	
	Solenoid output of output signal OD	ODO.	X	-	odo. oF	ON OFF	The output status (ON/OFF) of the solenoid output OD with the [D, ==>] key ON/OFF is changed. Do not turn the O4 to O7 outputs ON/OFF with the [D, ==>] key.	
	Solenoid output of output signal OF	OFO.	X	-	ofq. oF	ON OFF	The output status (ON/OFF) of the solenoid output OF with the [D, ==>] key ON/OFF is changed. Do not turn the O4 to O7 outputs ON/OFF with the [D, ==>] key.	
	Solenoid output of output signal O1	O10.	X	-	o1q. oF	ON OFF	The output status (ON/OFF) of the solenoid output O1 with the [D, ==>] key ON/OFF is changed. Do not turn the O4 to O7 outputs ON/OFF with the [D, ==>] key.	
	Solenoid output of output signal O2	O20.	X	-	o2q. oF	ON OFF	The output status (ON/OFF) of the solenoid output O2 with the [D, ==>] key ON/OFF is changed. Do not turn the O4 to O7 outputs ON/OFF with the [D, ==>] key.	
	Solenoid output of output signal O3	O30.	X	-	o3q. oF	ON OFF	The output status (ON/OFF) of the solenoid output O3 with the [D, ==>] key ON/OFF is changed. Do not turn the O4 to O7 outputs ON/OFF with the [D, ==>] key.	

+ + ^z

Mode name	Function name	Factory setting	Unit	Setting range	Function name	Setting	Specification
	Direct call number	GMFY		Digital display			
	Output for small signal of output signal O4.	040.	X	-	04.0. 0F	ON OF	The output status (ON/OFF) of the solenoid output O4 with the [D, ==>] key ON/OFF is changed. Do not turn the O4 to O7 outputs ON/OFF with the [D, ==>] key.
	Solenoid output of output signal O5	050.	X	-	05.0. 0F	ON OF	The output status (ON/OFF) of the solenoid output O5 with the [D, ==>] key ON/OFF is changed. Do not turn the O4 to O7 outputs ON/OFF with the [D, ==>] key.
	Electromagnetic value output of output signal O6	060.	X	-	06.0. 0F	ON OF	The output status (ON/OFF) of the solenoid output O6 with the [D, ==>] key ON/OFF is changed. Do not turn the O4 to O7 outputs ON/OFF with the [D, ==>] key.
	Electromagnetic value output of output signal O7	070.	X	-	07.0. 0F	ON OF	The output status (ON/OFF) of the solenoid output O7 with the [D, ==>] key ON/OFF is changed. Do not turn the O4 to O7 outputs ON/OFF with the [D, ==>] key.
	LED output for G500 type control panel	OPO.	X	-	OP.0. 0F	ON OF	The output status (ON/OFF) of the solenoid output OP with the [D, ==>] key ON/OFF is changed. Do not turn the O4 to O7 outputs ON/OFF with the [D, ==>] key.
	LED output for G500 type control panel	OQO.	X	-	OQ.0. 0F	ON OF	The output status (ON/OFF) of the solenoid output OQ with the [D, ==>] key ON/OFF is changed. Do not turn the O4 to O7 outputs ON/OFF with the [D, ==>] key.
	LED output for G500 type control panel	ORO.	X	-	OR.0. 0F	ON OF	The output status (ON/OFF) of the solenoid output OR with the [D, ==>] key ON/OFF is changed. Do not turn the O4 to O7 outputs ON/OFF with the [D, ==>] key.
E mode  +  + 	Rated output display WT.	0767	O	**	watt	-	 75 Refers to 750W.
	Voltage display VL.	0768	O	***	volt	-	 55 Refers to 550W.
	Model display TP.	0769	O	-	-	 100 Refers to 100V class.	The rated input voltage value in the control box is displayed.
	Data version No.	DV.	0770	O	***	-	 200 Refers to 200V class.
	Software version No.	RV.	0771	O	***	-	 XC-GMFY The data version No. (3-digit alpha-numeral) of the EEPROM is displayed.
	Display previous simple setting selected.	T.	0772	O	-	-	 *** The version No. (3-digit alpha-numeral) of the software is displayed.
					 *** Display previous simple setting selected.		

Mode name	Function name	Factory setting	Unit	Setting range	Function name	Setting	Specification	
							Digital display	
	Set No. of stitches A for cutter output (Setting the delay time during chain-off output ON)	0800	O	stitche s	0 ~ 99	C O R.	**	The No. of stitches A (delay during chain-off output operation can be set. When CTR = ON, the No. of stitches for cutter output OFF can be set.)
	Set No. of stitches B for cutter output (Setting the delay time during chain-off output OFF)	0801	O	stitche s	0 ~ 99	C O B.	**	The No. of stitches B (delay during chain-off output operation can be set. When CTR = ON, the No. of stitches for cutter output ON can be set.)
F  +  + 	Set No. of stitches C for cutter output No. of stitches for BT output ON after sensor OFF setting No. of stitches for sewing machine stops after BT output ON setting No. of stitches for BT output OFF after start of stitching setting Delay time to when SL output turns from OFF to ON	0802 0803 0804 0805 0806	O O O O O	stitche s stitche s stitche s stitche s msec	0 ~ 99 0 ~ 99 0 ~ 99 1 ~ 99 0 ~ 508	C O L. I I . P . E . S d.	** ** ** ** ***	The No. of stitches C (delay during cutter output ON) during cutter output operation can be set. The No. of stitches to be stitched before the output BT for the in-tacking signal is turned ON after the sensor turns OFF can be set. The No. of stitches to be stitched before the sewing machine stops after the output BT for the in-tacking signal turns ON can be set. The No. of stitches to be stitched before the output BT for in-tacking signal is turned OFF after stitching is started can be set. The delay time for the output SL to turn from OFF to ON can be set in 2msec intervals. The cutter output time setting is also possible.
	Delay time to when SL output turns from ON to OFF	0807	O	msec	0 ~ 508	E d.	***	The delay time for the output SL to turn from ON to OFF can be set in 2msec intervals. The chain-off output mesh judgment time setting is also possible.
	No. of set stitches during SL output ON selection mode	0808	O	OF	-	SL H.		The No. of set stitches for the output SL can be selected from HOF set No. of stitches (during ON setting) or SLN set No. of stitches (during OFF setting).
	SL output start position setting	0809	O	OF	-	SL L.	OF	Setting HOF function in G mode.
	SL output start position during SLS function ON setting	0810	O	OF	-	SL F.	OF	The output of SL for thread dislocation prevention starts when the needle lift operation (US, U, UF) is completed.
	Speed limit M except tacking and SL on	0811	O	OF	-	SL L.	OF	When the SL output operation mode SLS is ON while the motor is stopped, the output of SL for thread dislocation prevention will start after the thread is trimmed.
	SL output operation during motor stopping	0812	O	OF	-	SL S.	OF	If the output SL turns ON during an operation other than tacking, the speed is limited to that set in the medium speed M.
								The output SL is ON even when the motor is stopped.

Mode name	Function name	Factory setting GMFY	Unit	Setting range	Function name Digital display	Setting		Specification
						Setting	Range	
F mode	Set I*1 input, OP1 output to cutter BT specifications input/output	CTL.	0824	O OF	-	<i>EfrL.</i> <i>OF</i>	ON OFF	The IO1, IR1 and IS1 signals and the run output OP1 are set to the cutter BT specifications input/output signals. Refer to the section for details on the IO1, IR1 and IS1 signal function.
	Preset stitching operation after operation signal OFF	NMD.	0825	O OF	-	<i>nfd.</i> <i>OF</i>	ON OFF	Only the preset No. of stitches is stitched after the operation signal (S1) is turned OFF.
	ROL output mode	RLM.	0826	O OF	-	<i>rlf.</i> <i>OF</i>	ON OFF	The roller lift output ROL will turn ON when presser foot lifting output FU, back tacking output B, virtual output OT2 are ON, and during tacking and thread trimming.
	No. of stitches setting for auxiliary feeding rear roller	RLN.	0827	O 0 stitche s	0 ~ 99	<i>rln.</i>	**	The roller lower No. of stitches is set for the auxiliary feeding rear roller.
	Not used.	CTG.	0828	OF	-	<i>EfrL.</i> <i>OF</i>	ON OFF	Not used.
	Not used.	CGD.	0829	OF	-	<i>Efd.</i> <i>OF</i>	ON OFF	Not used.
	Not used.	EDT.	0830	OF	-	<i>Edr.</i> <i>OF</i>	ON OFF	Not used.
	Not used.	EDS.	0831	0 stitche s	0 ~ 99	<i>Eds.</i>	**	Not used.
	Not used.	CAS.	0832	OF	-	<i>ER5.</i> <i>OF</i>	ON OFF	Not used.
	Not used.	ESC.	0833	OF	-	<i>ESL.</i> <i>OF</i>	ON OFF	Not used.

Mode name	Function name	Factory setting GMFY	Unit	Setting range	Function name <i>r r.</i>	Digital display <i>r r n.</i>	Setting ***	Specification
	Thread trimming mode	TR.	0900	O	M1	-	-	The thread trimming timing for each manufacturer's thread trimming sewing machine can be set. Same function as the P mode thread trimming mode [TR]. When [PRG] is set, the sewing machine operation and thread trimming timing can be set when combined with the functions [TRM], [LTM] or [LLM].
	Motor operation mode during thread trimming	TRM.	0901	O	LK	-	-	The motor operation mode during thread trimming can be set when thread trimming mode TR is set to [PRG].
								The motor will run for the lockstitch thread trimming sewing machine.
								The motor will run for reverse thread trimming.
								KA Not used.
								KB Not used.
								UP Not used.
								DN Not used.
	Thread trimming output (T) output mode	LTM.	0902	O	T1	-	-	The output timing mode of the thread trimming output (T) can be set when thread trimming mode TR is set to [PRG]. The output timing of the thread trimming output (T) can be set. (Lock stitch setting) It becomes effective when the thread trimming mode [TR] sets [PRG]. Refer to "15 1 Thread trimming timing when thread trimming mode TR setting is PRG" for details of output timing.
G mode								Please refer to the LTM setting of string swithing off output T which has been described to the technical information.
								Please refer to the LTM setting of string swithing off output T which has been described to the technical information.
								Please refer to the LTM setting of string swithing off output T which has been described to the technical information.
								Please refer to the LTM setting of string swithing off output T which has been described to the technical information.
								Please refer to the LTM setting of string swithing off output T which has been described to the technical information.
								Please refer to the LTM setting of string swithing off output T which has been described to the technical information.
								Please refer to the LTM setting of string swithing off output T which has been described to the technical information.
								Please refer to the LLM setting of string loosening output L which has been described to the technical information.
	Thread release output (L) output mode	LLM.	0903	O	L1	-	-	The output timing mode of the thread release output (L) can be set when thread trimming mode TR is set to [PRG]. The output timing of the thread release output [L] can be set. (Lock stitch setting) It becomes effective when the thread trimming mode [TR] sets [PRG]. Refer to "15 1 Thread trimming timing when thread trimming mode TR setting is PRG" for details of output timing.
								Please refer to the LLM setting of string loosening output L which has been described to the technical information.
								Please refer to the LLM setting of string loosening output L which has been described to the technical information.
								Please refer to the LLM setting of string loosening output L which has been described to the technical information.

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NEXT PAGE

Mode name	Function name	Factory setting GMFY	Unit	Setting range	Function name Digital display	Setting	Specification
	CONTINUED FROM PREVIOUS PAGE				L4	L4	Please refer to the LLM setting of string loosening output L which has been described to the technical information.
Operability					L5	LK	Not used.
					L5	LS	Not used.
					L7	L7	Please refer to the LLM setting of string loosening output L which has been described to the technical information.
Thread trimming output start angle	TS.	0904	0	0 degree	0 ~ 360	F5.	***
Thread trimming output angle	TE.	0905	0	90 degree	0 ~ 360	F6.	***
Thread release output start angle	LS.	0906	0	0 degree	0 ~ 360	L5.	***
G mode Thread release output angle	LE.	0907	0	90 degree	0 ~ 360	L6.	***
T1. +  +  + 	0908	0	20 msec	0 ~ 998	F1.	***	***
Thread trimming output start time	T2.	0909	0	90 msec	0 ~ 998	F2.	***
Thread trimming output time	L1.	0910	0	150 msec	0 ~ 998	L1.	***
Thread release output start time	L2.	0911	0	70 msec	0 ~ 998	L2.	***
							The output time of the thread trimmer output (L) for chain stitching sewing machine can be set. When the thread trimming mode TR is set to [PRG], the output start time of the thread trimmer A during chain stitching thread trimmer timing B is invalid at this time. When the thread trimming mode TR is set to [PRG], the output start time of the thread trimmer A for lock stitch sewing machine can be set. Set according to the thread trimmer output (L) timing chart.
							The output time of the thread trimmer output (L) for chain stitching sewing machine can be set. When the thread trimmer output (L) for lock stitch sewing machine can be set. Set according to the thread trimmer output (L) timing chart.
							The output time of the thread trimmer output (L) for chain stitching sewing machine can be set. The output time of the thread trimmer A for lock stitch sewing machine can be set. Set according to the thread trimmer output (L) timing chart.
							The output time of the thread trimmer output (L) for chain stitching sewing machine can be set. The output time of the thread trimmer A for lock stitch sewing machine can be set. Set according to the thread trimmer output (L) timing chart.

Mode name	Function name	Factory setting GMFY	Unit	Setting range	Function name	Setting	Specification	
							Digital display	
	Thread release output start time (Output TF start time) R1.	0912	O	40 msec	0 ~ 508	r 1 ***	The output start time of the thread release output (L) during chain stitching thread trimming timing B can be set. The chain stitching thread trimming timing A is invalid at this time. The output start time of the output (TF) can be set. Set according to teach output's timing chart.	
	Thread release output time (TF output time) R2.	0913	O	66 msec	0 ~ 508	r 2. ***	The output time of the thread release output (L) during chain stitching thread trimming timing B can be set. The chain stitching thread trimming timing A is invalid at this time. The output time of the output (TF) can be set. Set according to teach output's timing chart.	
	Condensed stitching start time (Stop time before thread trimming) R3.	0914	O	50 msec	0 ~ 508	r 3. ***	The time to when the sewing machine begins condensed stitching after the condensed stitching(CH) turn ON during start/end condensed stitching in the chain stitching thread trimming timing B, this time [R3] will be the time for end condensed stitching after the thread release output (L) turns OFF. (If end condensed stitching is not set, the time will be that for the needle to rise from the DOWN to UP position after the thread release output (L) is turned OFF.)	
G mode ↓ + ↑ + C +	Wiper output start time W1.	0915	O	10 msec	0 ~ 998	g 1. ***	When the thread trimming mode TR is set to [PRG], the output start time of the wiper output (W) can be set. Set according to the wiper output (W) timing chart.	
	Wiper output time W2.	0916	O	8 X10 msec	0 ~ 999	g2. ***	When the thread trimming mode TR is set to [PRG], the output time of the wiper output (W) can be set. Set according to the wiper output (W) timing chart.	
	Wiper output operation mode WMD.	0917	O	W	-	gnd.	The output timing mode of the wiper output (W) can be set. The timing that the wiper output W is turned OFF can be set with the thread trimming signal S2. Refer to "[15] 2. Wiper output timing." for details on setting the OFF timing. If the S2 signal turns OFF within the wiper output W set time, the W output will turn OFF after the set time has passed. If the S2 signal turns OFF after the wiper output W set time has passed, the W output will turn OFF after the set time has passed.	
					g	W	If the S2 signal turns OFF after the set time has passed. If the S2 signal turns OFF after the wiper output W set time has passed, the W output will turn OFF after the set time has passed.	
					or	OR	If the S2 signal turns OFF when the S2 signal turns OFF. If the S2 signal turns OFF after the wiper output W set time passes, the W output will turn OFF after the set time has passed.	
					R	AN	If the S2 signal turns OFF within the wiper output W set time, the W output will turn OFF when the S2 signal turns OFF. If the S2 signal turns OFF after the wiper output W set time passes, the W output will turn OFF after the set time has passed.	
					rU	RU	This setting is valid when the reverse run needle setting after thread trimming RU is ON. When the reverse run needle lifting is completed after the thread is trimmed, the W output will turn ON. If the S2 signal turns OFF within the wiper output W set time, the W output will turn OFF after the set time has passed. If the S2 signal turns OFF after the wiper output W set time has passed, the W output will turn OFF after the set time has passed.	
					C	CH	Not used.	
					F	FW	Not used.	

Mode name	Function name	Factory setting GMFY	Unit	Setting range	Function name Digital display	Setting	Specification	
							***	***
Operability	Presser foot lifting output start time	F1.	0918	O	140 msec	0 ~ 998	F  	***
	Time to motor drive after presser foot lifter bring down	FD.	0919	O	176 msec	0 ~ 998	F 	***
	Interlock time during thread trimming	IL.	0920	O	140 msec	0 ~ 998	 	***
	Interlock time during no thread trimming	IT.	0921	O	0 msec	0 ~ 510	 	***
	Motor rotation after motor stop before thread trimming	TDS.	0922	O	OF	-	 	ON OF
	Motor stop time during lockstitch and R output time during chain stitch	TD.	0923	O	50 msec	0 ~ 508	 	***
	Delay setting before reverse run during RU setting	RUS.	0924	O	OF	-	 	ON OF
	Delay time before reverse run during RU setting	RT.	0925	O	76 msec	0 ~ 508	 	ON OF
	Reverse run needle lifting [RU] after output T, L and W	RUM.	0926	O	OF	-	 	ON OF
	Wiper output OFF trimming with (S1) signal	WS1.	0927	O	OF	-	 	ON OF
G mode	 +  + 							
	Operation mode with thread trimming signal to shift the needle stop position and return to the original needle stop position before the thread trimming signal	S2T.	0928	O	OF	-	 	ON OF

Mode name	Function name	Factory setting GMFY	Unit	Setting range	Function name Digital display	Setting	Specification
Operability	Operation mode with thread trimming signal when shifting the needle stop position before the thread trimming signal	S2P.	O	TR	-	52P.	The operation mode started with the full pedal heeling or thread trimming signal (S2) ON when rotating the sewing machine pulley, etc., manually, and leaving the UP position when in 1 position, and leaving the DOWN position when in 2 position. When [KA1] to [KA4] of the thread trimming mode [TR] are set, the thread trimming operation will be performed according to the settings after the needle is lifted. When [KB1] to [KB4] are set, the thread trimming operation will be performed according to the settings after the needle is lowered. The presser foot lifting operation will be executed after the needle is lifted. The thread trimming operation will not be executed. The sewing machine does not rotate or perform thread trimming, and only the presser foot lifting operation is executed.
Direct call number	Solenoid output OT1 manual/automatic change	MAN.	O	ON	-	rrn.	ON OF
G mode + +	Setting of no. of stitches during MAN [OF] setting	HOF.	O	7	stitche s	0 ~ 99	HoF. **
	Weak brake ON simultaneously with wiper output (W)	WB.	O	OF	-	bb.	ON OF
	Motor rotation operation when LTM function is set to T1, T2 or T3	TDT.	O	OF	-	r df.	ON OF
		C1.	O	0	-	l l	**
		C2.	O	0	-	l 2	**
		C3.	O	0	-	l 3	**
		T3.	O	0	-	l 3	***
		T4.	O	0	-	l 4	***
		T5.	O	0	-	l 5	***
		PET.	O	OF	-	PEf.	ON OF
		P9U.	O	OF	-	p9u.	ON OF
		HHC.	O	OF	-	HHL.	ON OF

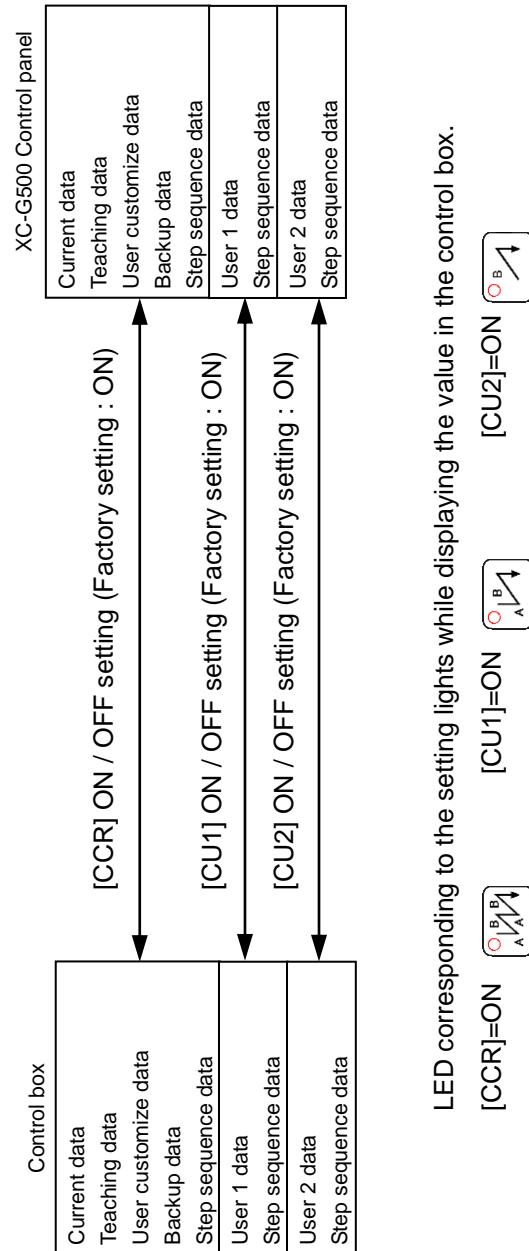
Mode name	Function name	Factory setting GMFY	Unit	Setting range	Function name	Setting		Specification
						Digital display		
G mode + + +	Not used	PAA.	0	OF	-	PRR.		ON OFF
	Not used	STL.	0	OF	-	SL.		ON OFF
	Not used	L8.	0	0	-	L8.		***
	Not used	PEK.	0	OF	-	PEK.		ON OFF
	Setting A which can be used by step sequence	PPA.	0	OF	-	PPR.		ON OFF
	Setting B which can be used by step sequence	PPB.	0	OF	-	PPB.		ON OFF
	Setting C which can be used by step sequence	PPC.	0	OF	-	PPC.		ON OFF
	Setting D which can be used by step sequence	PPD.	0	OF	-	PPD.		ON OFF
	Setting E which can be used by step sequence	PPE.	0	OF	-	PP E.		ON OFF
	Setting F which can be used by step sequence	PPF.	0	OF	-	PP F.		ON OFF
	Setting G which can be used by step sequence	PPG.	0	OF	-	PP G.		ON OFF
	Setting H which can be used by step sequence	PPH.	0	OF	-	PP H.		ON OFF

Mode name	Function name	Factory setting GMFY	Unit	Setting range	Function name Digital display	Setting	Specification
Direct call number	Operability						
	Upper limit of maximum speed [H]	LHH.	1000	O 90	X100 rpm	0 ~ 99 L HH. **	The upper limit value of the maximum speed [H] in P mode is set. A value that exceeds the value set in this limiter cannot be set for the maximum speed [H].
	Lower limit of maximum speed [H]	LHL.	1001	O 0	X100 rpm	0 ~ 99 L HL. **	The lower limit value of the maximum speed [H] in P mode is set. A value that is lower than the value set in this limiter cannot be set for the maximum speed [H].
	Upper limit of low speed [L]	LLH.	1002	O 5	X100 rpm	0 ~ 99 L LH. **	The upper limit value of the low speed [L] in P mode is set. A value that exceeds the value set in this limiter cannot be set for the low speed [L].
	Lower limit of low speed [L]	LLL.	1003	O 0	X100 rpm	0 ~ 99 L LL. **	The lower limit value of the low speed [L] in P mode is set. A value that is lower than the value set in this limiter cannot be set for the low speed [L].
H mode	Upper limit of thread trimming speed [T]	LTH.	1004	O 5	X100 rpm	0 ~ 99 L TH. **	The upper limit value of the thread trimming speed [T] in P mode is set. A value that exceeds the value set in this limiter cannot be set for the thread trimming speed [T].
	Lower limit of thread trimming speed [T]	LTL.	1005	O 0	X100 rpm	0 ~ 99 L TL. **	The lower limit value of the thread trimming speed [T] in P mode is set. A value that is lower than the value set in this limiter cannot be set for the thread trimming speed [T].
	Upper limit of start/end tacking (condensed stitching) speed	LNH.	1006	O 30	X100 rpm	0 ~ 99 L nH. **	The upper limit value of the start/end tacking (condensed stitching) speed in P mode is set. A value that exceeds the value set in this limiter cannot be set for the start/end tacking (condensed stitching) speed.
	Lower limit of start/end tacking (condensed stitching) speed	LNL.	1007	O 0	X100 rpm	0 ~ 99 L nl. **	The lower limit value of the start/end tacking (condensed stitching) speed in P mode is set. A value that is lower than the value set in this limiter cannot be set for the start/end tacking (condensed stitching) speed.
	Upper limit of medium speed [M]	LMH.	1008	O 90	X100 rpm	0 ~ 99 L nH. **	The upper limit value of the medium speed [M] in P mode is set. A value that exceeds the value set in this limiter cannot be set for the medium speed [M].
	Lower limit of medium speed [M]	LML.	1009	O 0	X100 rpm	0 ~ 99 L nl. **	The lower limit value of the medium speed [M] in P mode is set. A value that is lower than the value set in this limiter cannot be set for the medium speed [M].
	Upper limit of slow start speed [S]	LSH.	1010	O 30	X100 rpm	0 ~ 99 L SH. **	The upper limit value of the slow start speed [S] in P mode is set. A value that exceeds the value set in this limiter cannot be set for the slow start speed [S].
	Lower limit of slow start speed [S]	LSL.	1011	O 0	X100 rpm	0 ~ 99 L SL. **	The lower limit value of the slow start speed [S] in P mode is set. A value that is lower than the value set in this limiter cannot be set for the slow start speed [S].

Mode name	Function name	Factory setting GMF Y	Unit	Setting range	Function name	Setting	Specification
	Operability	- X	-	-	S_RuE 1.	-	
	Direct call number	-	-	-	S_RuE 2.	-	
Save function 1 of the setting data	SAVE1.						It is possible to save the present data into the "Simple setting table". When this [SAVE] function is set, the setting data will be saved into the [LOAD1] on the program mode [1]. It is possible to load the saved data by the selection of [LOAD1] in the program mode [1].
Save function 2 of the setting data	SAVE2.						It is possible to save the present data into the "Simple setting table". When this [SAVE] function is set, the setting data will be saved into the [LOAD2] on the program mode [1]. It is possible to load the saved data by the selection of [LOAD2] in the program mode [1].
Current data is copied	CCR.	O	ON	-	C_Ur.	OF	ON [ON] : All data but user 1 and 2 are copied.
User 1 data is copied	CU1.	O	ON	-	C_U 1.	OF	ON [ON] : User 1 data is copied.
User 2 data is copied	CU2.	O	ON	-	C_U2.	OF	ON [ON] : User 2 data is copied.

The explanation of [CCR], [CU1], and [CU2].

mode
↓ + ↑ + B↑ + C↑



LED corresponding to the setting lights while displaying the value in the control box.



Mode name	Function name	Factory setting GMFY	Unit	Setting range	Function name	Setting	Specification	
							Digital display	
	Simple setting mode for [1],[2],[3] prohibit	MAC.	1100	O OF	-	-	<i>MR[C.]</i>	<i>OF</i>
	[P],[G] mode thread trimmer mode TR prohibit	TRC.	1101	O OF	-	-	<i>Fr[C.]</i>	<i>OF</i>
	Rotation direction changeover prohibit	CWC.	1102	O OF	-	-	<i>CW[C.]</i>	<i>OF</i>
	1-2 position changeover prohibit	12C.	1103	O OF	-	-	<i>I2[C.]</i>	<i>OF</i>
	Slow start changeover prohibit	SLC.	1104	O OF	-	-	<i>SL[C.]</i>	<i>OF</i>
	Speed setting key changeover prohibit	SPC.	1105	O OF	-	-	<i>SP[C.]</i>	<i>OF</i>
	Not used	JKC.	1106	O OF	-	-	<i>Jt[C.]</i>	<i>OF</i>
J mode +	Start tacking validity changeover prohibit	SBC.	1107	O OF	-	-	<i>Sb[C.]</i>	<i>OF</i>
	No. of start tacking stitches changeover prohibit	SNC.	1108	O OF	-	-	<i>Sn[C.]</i>	<i>OF</i>
A + +	End tacking validity changeover prohibit	EBC.	1109	O OF	-	-	<i>Eb[C.]</i>	<i>OF</i>
	No. of end tacking stitches changeover prohibit	ENC.	1110	O OF	-	-	<i>En[C.]</i>	<i>OF</i>
B + +	Start tacking type changeover prohibit	SKC.	1111	O OF	-	-	<i>St[C.]</i>	<i>OF</i>
	End tacking type changeover prohibit	EKC.	1112	O OF	-	-	<i>Et[C.]</i>	<i>OF</i>
	Pattern stitching validity changeover prohibit	TSC.	1113	O OF	-	-	<i>TS[C.]</i>	<i>OF</i>
	Pattern stitching No. of stitches and times changeover prohibit	TNC.	1114	O OF	-	-	<i>Tn[C.]</i>	<i>OF</i>
	Pattern mode pattern changeover prohibit	MDC.	1115	O OF	-	-	<i>Md[C.]</i>	<i>OF</i>
	Prohibit the all of key switches on control switch panel	BAC.	1116	O OF	-	-	<i>Br[C.]</i>	<i>OF</i>
	Prohibit the teaching mode key switches on control switch panel	BPC.	1117	O OF	-	-	<i>BP[C.]</i>	<i>OF</i>

Mode name	Function name	Factory setting GMFY	Unit	Setting range	Function name	Setting	Specification	
	Prohibit the following key switches on control switch panel	BSC.	O	OF	-	-	b5[. OF	ON OF
	Operation prohibition of set value change key	PSW.	O	OF	-	-	p58. OF	ON OF
J mode	Prohibit the key switches on the control switch panel before thread trimming	BKC.	O	OF	-	-	bt[. OF	ON OF
	Prohibit the key switches on the control switch panel before thread trimming	NSV.	O	OF	-	-	n5u. OF	ON OF
	It blinks compared with a set value.	CMP.	O	ON	-	-	cnP. OF	ON OF
	At the comparison when it compares and it blinks destination.	CMS.	O	BK	-	-	cn5.	It compares it with the shipment setting value.
							bt	BK
							s1	S1
							s2	S2
	Prohibit "parameter setup (ABCD) key" during the normal mode	PKC.	O	OF	-	-	pt[. OF	ON OF
	Not used	NTM.	O	OF			nri. OF	ON OF
	Not used	UDC.	O	OF			ud[. OF	ON OF

Mode name	Function name	Factory setting GMFY	Unit	Setting range	Function name	Setting	Specification
					Digital display		
	Operation during 2 - 1 position changeover	P21.	O	OF	-	P21	ON OFF
	Sewing machine speed during solenoid input signal [IO1] setting	1201	X	NO	-	101	
K mode  +  +  +  + 							When changeover from the 2 position to the 1 position with the [A1] key during the normal mode, the needle will rise to the UP position when not in the UP position, when turned ON.
							The speed for when the signal IO1 output to the virtual output 1 can be selected.
	Speed specification when COR input is ON	COR.	O	L	-	COR.	

Mode name	Function name	Factory setting	Unit	Setting range	Function name	Setting	Specification
		GMFY		Digital display			
	Speed specification when RND input is ON	RND.	O	L	-	rnd.	The sewing machine speed for when the input signal RND is ON.
							The speed will be approximately proportional to the variable speed command VC or VC2 voltage of the lever connector.
							The speed will be at the speed set in low speed [L].
							V
							The speed will be at the speed set in condensed stitching speed [V].
							M
							The speed will be at the speed set in medium speed [M].
							H
							The speed will be at the speed set in high speed [H].
	Setting the thread trimming key of control switch panel (mark of scissors) valid or invalid, when the preset stitching is active.	NTL.	1203	O	OF	-	The thread trimming by the control panel scissors switch when preset stitching is ON will be validated (enabled).
	Decelerate per step when Continuous is set with control panel XC-G500-Y	CNM.	1204	O	OF	-	The speed will decelerate at each step when Continuous is set with the control panel XC-G500-Y.
K mode	DN signal is valid during the virtual DOWN control	KD2.	1205	O	OF	-	The speed will decelerate at each step when Continuous is set with the control panel XC-G500-Y.
	Validity of operation delay when IO1 signal is input	IOD.	1206	O	OF	-	During operation control (virtual DOWN) by only the needle UP position signal UP, the DOWN position signal DN will also be valid. The value set for the reverse run angle K8 from the DOWN position to the UP position in the [B] mode, must be smaller than the angle at which the DN signal turns ON.
	Delay to motor drive after B output ON	S7B.	1207	O	OF	-	When the signal IO1 (output to the virtual output OT1) is input, the operation delay [S7B.] is validated. This is valid when the function IO1 is ON.
	Delay when S2 signal is U or UF	UFD.	1208	O	5 msec	X10 1 ~ 99	The delay time to motor drive after backstitching output (B) output starts can be set. The factory setting [5] refers to [5 x 10 = 50] msec.
	Not used	E8R.	1209	O	OF	-	The delay time set in the P mode S3D will forcibly be added to the delay time when the A mode S2 signal operation mode S2M is set to U or UF.
	Not used	MRA.	1210	O	OF	-	Not used.
	UP position needle lifting at the power is turned ON	PAP.	1211	O	OF	-	If the needle UP position is applied at the power is turned ON when the P1P or P2P setting is [ON], the needle will be lifted. (Sewing machine rotates once again.)

Mode name	Function name	Factory setting GMFY	Unit	Setting range	Function name Digital display	Setting	Specification
	One stitch operation mode during UCR setting	ST1.	O	OF	-	5f!.	
	Setting one stitch operation, when "S01" signal is set	IT1.	O	OF	-	if!.	on ON of OF
	Operation mode during thread trimming protection signal (S6) input/release	S6M.	O	PO	-	56n.	po PO es ES
K mode  +  +  + 	Thread trimming protection signal (S6) operation mode	S6A.	O	OF	-	56R.	on ON of OF
	End tacking mode when TR function is set to chain stitch	KTM.	O	OF	-	tfn.	on ON of OF
	Lock stitch tacking menu display	KDM.	O	OF	-	tdn.	on ON of OF
	U, UF signal needle lift prohibit at position other than set position	UFP.	O	OF	-	ufp.	on ON of OF
	Weak brake validity when UP signal is ON	UPB.	O	OF	-	upb.	on ON of OF
	Weak brake forced OFF when stopped with ES signal	ESB.	O	OF	-	esb.	on ON of OF

Mode name	Function name	Factory setting GMFY	Unit	Setting range	Function name Digital display	Setting	Specification
Operability	UP position detection stop UPS.	O OF	-	-	UP5.	ON OF	Stop control when needle UP position is detected. The stop control of low speed detection control is applied. This is valid when the function NAN in K mode is [ON].
	Stop status after low speed detection UP2.	O OF	-	-	UP2.	ON OF	The stop control of high speed positioning is applied.
K mode	Low speed detection speed K.	X 280	rpm	0 ~ 2999	t.	*****	The sewing machine will always rotate once and then stop after the low speed is detected. This is valid when the function NAN is [ON] and UPS is [ON].
	Deceleration mode NAN.	O OF	-	-	nRn.	ON OF	The low speed detection speed can be set.
	Presser foot lifter operation during emergency stop ESF.	O OF	-	-	ESF.	ON OF	Deceleration is not started when needle position is detected after the run signal is turned OFF, but starts immediately when the run signal turns Off.
	OP output and OP1 output prohibit at restart PRC.	O OF	-	-	PnL.	ON OF	The presser foot lifter can be operated during emergency stop by the emergency stop signal (ES) is turned ON.
	S2 signal validity when S6 signal is ON. [A+] + [↑] + [A+] + [C]	O OF	-	-	rS6.	ON OF	The OP output and OP1 output is prohibited when the sewing machine restart. It is reset by the power switch is [ON] again. This is valid when the function PR is [ON] and P1R is [ON].
	Speed loop stopping control when the machine is overrun with the preset stitching PNC.	O OF	-	-	PnL.	ON OF	The thread trimming signal S2 will be valid when the thread trimming safety signal S6 is ON. Note that the motor will not rotate.
	Input port IL, I1 and I2 software noise filter validity MFN.	O OF	-	-	nFn.	ON OF	When this function setting is [ON], the stopping control when the sewing machine is overrun with the preset stitching will be the No. of stitches priority stop. (The stop position is loose.)
	All input port software noise filter validity PFN.	O OF	-	-	PFn.	ON OF	When this function setting is [OF], it will be the needle position priority stop. (It may be one rotation.)
	No. of stitches for noise removal during sensor input setting SEF.	O 0	stitche s	0 ~ 99	SEF.	**	The software noise filter for the input port IL (inside control box signal), input port I1 (option B connector No. 6 pin) and input port I2 (option B connector No. 9 pin) is invalidated.
	Deceleration state during PSU, PSD signal ON PSM.	O OF	-	-	PSn.	ON OF	The software noise filters for all input ports are invalidated.
	Low stitching speed validity when the preset stitching is two stitches 2ST.	O OF	-	-	2Sf.	ON OF	The sewing machine will decelerate immediately when the UP position priority stop signal PSU or DOWN position priority stop signal PSD turn ON. Note that during the preset stitching, the stitching will continue at a low speed.
	No. of set stitch stitching speed when PSU, PSD, SEN signal is ON PSS.	O OF	-	-	PSS.	ON OF	The stitching speed must not be set to the low speed L when tracking or preset stitching is two stitches or less.
							This is the stitching speed for the set No. of stitches when the UP position priority stop signal PSU, DOWN position priority stop signal PSD or sensor signal SEN is ON.
							The stitching speed of the setting No. of stitches is set to the middle speed M.
							The speed when PSU, PSD, SEN signal turn ON is continued.

Mode name	Function name	Factory setting GMFY	Unit	Setting range	Function name Digital display	Setting	Specification
Speed at PSU, PSD, SEN signal is ON	PSK.	1236	O	OF	-	PST.	This is the speed for when the UP position priority stop signal PSU, DOWN position priority stop signal PSD or sensor signal SEN is ON. The speed before the PSU, PSD, SEN signal was turned ON is maintained.
No. of stitches for removing noise when PSU signal is ON	PUF.	1237	O	0	stitche s	0 ~ 99 PUF.	** The No. of stitches for removing noise with the No. of stitches of UP position priority stop signal PSU can be set.
No. of stitches for removing noise when PSD signal is ON	PDF.	1238	O	0	stitche s	0 ~ 99 PDF.	** The No. of stitches for removing noise with the No. of stitches of DOWN position priority stop signal PSD can be set.
Zigzag during continuous tacking	CDR.	1239	O	OF	-	Ldr.	When using continuous tacking, and the tacking operation mode D1 in the [D] mode is set to D, the speed will forcibly be set to the medium speed M when the run signal S1 turns OFF. And the thread trimming signal S2 will be validated only at the stitching angle in all continuous tacking modes.
No. of stitches of zigzag stitch (sway width) setting	ZNC.	1240	O	0	stitche s	0 ~ F LnL.	* The No. of stitches of zigzag stitching (sway width) can be set. (No. of stitches of thinning)
BCR operation after thread trimming	BCR.	1241	O	OF	-	brL.	OP ON OF The set angle (reverse run/forward run) signal BCR operation is validated only after thread trimming.
Actual No. of USR operations	USN.	1242	O	OF	-	USn.	This is the actual No. of reverse run needle lifting operation USSR up to the set angle. Can be executed any number of times.
W output mode during S2R=OFF setting	2RW.	1243	O	ON	-	2rR.	OP ON OF Can be executed only once.
O1 output prohibit during tacking and thread trimming	BTC.	1244	O	OF	-	brL.	OP ON OF If the P mode S2 signal operation mode S2R is set to OFF, the wiper output (W) will be output even if the motor is not revolving with full heeling at the needle UP position stop.
OP output prohibit/permit changeover with input I1 during operation	PR.	1245	O	OF	-	Pr.	O1 output is prohibited during tacking and thread trimming. The operation output OP prohibit/permit changeover is executed when input I1 turns ON during sewing machine operation.
OP1 output prohibit/permit changeover with input I1 during operation	P1R.	1246	O	OF	-	PIr.	OP ON OF OP output is prohibited during sewing machine operation. OP output is permitted during sewing machine operation. The operation output OP1 prohibit/permit changeover is executed when input I1 turns ON during sewing machine operation.
B output OFF prohibit mode during thread trimming	TBC.	1247	O	OF	-	rbL.	OP ON OF OP1 output is permitted during sewing machine operation. Turning the backstitch output B OFF at the needle DOWN position during thread trimming is prohibited.
KS3 output and TF output prohibit during TL input ON	KTL.	1248	O	OF	-	trL.	OP ON OF The KS3 output and TF output are invalidated when thread trimming cancel signal TL is ON.

Mode name	Function name	Factory setting GMFY	Unit	Setting range	Function name	Setting	Specification	
							Digital display	
K mode  +  +  + 	Presser foot operation of F, S2, S3 signal is OFF when FUM function is ON, FU function is M or C.	FLC.	O	OF	-	-	F_LL.	The presser foot operation mode when the presser foot output FU stays ON and the full heelng (presser foot lift signal F, thread trimming signal S2, presser foot lift signal S3) is OFF.
	T output, L output protection function	SPT.	O	ON	-	-	SP_TL.	The FU output turns OFF (lowers) when the full heelng (F, S2, S3 signals) is OFF. The FU output does not turn OFF when the full heelng (F, S2, S3 signals) is OFF.
	Wiper output W ON simultaneously with presser foot lifting output FU	FW.	O	OF	-	-	F_W.	The thread trimming solenoid T and thread release solenoid L are protected. (Solenoid damage prevention)
	Input signal check function when power is turned on	PS1.	O	OF	-	-	PS₁.	The wiper output W will turn ON when the presser foot lifting output FU turns ON.
	Setting program stitch of the control switch panel	B2O.	X	OF	-	-	b2o.	If the input signals S01, BC, BCR or USR, etc., and is ON when the power is turned ON, the set function will be invalidated. Turn the input signal OFF once and turn ON again, and the set function will be validated.
	Setting "OT1" output while "B" output is ON/N	TOB.	O	OF	-	-	T_OB.	When main power is turned ON, the system of control box confirm the "ON" "OFF" condition related run signal, excluding one stitch operation signal. If the run signal is "ON", this run signal has to be turned off once to be run.
	Special specification setting of limit control.	2SL.	O	OF	-	-	25L.	It is not confirmed about the "S01", "BC", "BCR" and "USR", when main power switch is turned ON.
	Setting output at FWD input ON	NCK.	O	ON	-	-	nLt.	Setting the backstitch (reverse feed) output of control switch panel in each step of program stitching.
	Needle lift function is invalidated, excluding the needle down position.	UDN.	O	OF	-	-	Udn.	Backstitch (reverse feed) output of step set to virtual output "OT1" in program stitching.
	The set value of full speed	FSL.	O	90	%	1 ~ 98	F_SL.	Backstitch (reverse feed) output of step set to output "B" in program stitching.

Mode name	Function name	Factory setting GMFY	Unit	Setting range	Function name Digital display	Setting	Specification	
							ON OF	ON OF
Not used	UPR.	1259	O	OF	-	-	UPr. OF	Not used.
Operation gain for the big inertia sewing machine	HWG.	1260	O	OF	-	-	Hwg. OF	Operation gain for the big inertia sewing machine is valid.
Stop by pedal neutrality under operation PSU, PSD, PS1, PS2	PPS.	1261	X	OF	-	-	PPS. OF	The sewing machine stops when the pedal is neutralized while counting the number of set stitches when the PSU, PSD, PS1, PS2 signal is turned on. When the pedal is toe down again, the number of stitches of the remainder is sewn. When the heel or the trimming signal S2 is turned ON while stopping, the trimming operates, and the number of stitches of the remainder is cleared.
Not used	PCB.	1262	X	OF	-	-	PCb. OF	ON OF
Not used	TQT.	1263	O	0	%	0 ~ 99	Tqf. **	Not used.
Not used	E8T.	1264	O	0	X100 msec	0 ~ 99	E8f. **	Not used.
Not used	WBO.	1265	X	OF	-	-	Wbo. OF	ON OF
Not used	R3D.	1266	O	OF	-	-	r3d. OF	ON OF
Not used	MEA.	1267	O	OF	-	-	MEa. OF	ON OF
Not used	OCS.	1268	O	OF	-	-	OCS. OF	ON OF
Step ON/OFF	STP.	1269	O	OF	-	-	STP. OF	ON OF
Number of step execution lines.	STS.	1270	O	1	-	1 ~ 4	SfS. *	* The execution of the step a main number of lines can be specified.
Not used	HDS.	1271	O	OF	-	-	HdS. OF	ON OF
Not used	1ST.	1272	O	OF	-	-	1St. OF	Not used.
The unit of the display time is selected.	TMI.	1273	O	OF	-	-	Tm. OF	The unit of the display time on "Total integration time of power on.[P]" / "Total integration time of motor run.[M]" is selected like "x 10hours or x 1min." OF : x10 hours / ON : x1 min.)

Mode name	Function name	Factory setting GMFY	Operability	Direct call number	Setting range	Function name	Setting	Specification	
								Digital display	
Q mode 	Virtual S1 operation with VC levels	VCS.	1400	X	OF	-	υ[5.	οF	ON OFF
	Setting of VC1 and VC2 where virtual S1 turns ON	VCL.	1401	X	24	-	υ[L.	οF	**
	Input voltage hysteresis during virtual S1 signal ON/OFF by VC and VC2 level	VCD.	1402	X	4	-	υ[Ld.	οF	**
	VC curve reversal mode	V1R.	1403	X	OF	-	υ[1r.	οF	ON OFF
	VC input 5V/12V changeover mode	V15.	1404	X	OF	-	υ[15.	οF	The VC1 input range is set to 0~5V.
	VC2 operation mode	VC2.	1405	X	VC	-	υ[2.	οF	ON OFF
							υ[2.	οF	The external analog input VC2 function is set.
							υ[2.	οF	Speed command input
							υS.	οF	The virtual S1 signal turns on with the input voltage, and the sewing machine runs. This also acts as the speed command input.
							υR.	οF	The VC2 input acts as the variable resistor on the control box panel, and the variable resistor is invalidated.
P mode 							bL	BC	During operation with the BC and BCR input, the speed set with the program P mode C8 is invalidated, and the speed is controlled with the VC2 input.
							l7	LM	The speed control input for reciprocal stroke change.
							flD	MD	The value set in the program P mode M is invalidated, and the middle speed is controlled with the VC2 input voltage.
							l	1	Virtual input IO1 is selected
	VC2 curve reversal mode	V2R.	1406	X	OF	-	υ2r.	οF	ON OFF
	VC2 input 5V/12V changeover mode	V25.	1407	X	ON	-	υ25.	οF	ON OFF
	Speed limiter curve inflection point 1 percentage	VL1.	1408	O	67	-	υL1.	οF	**
	Speed limiter curve inflection point 1 point	VP1.	1409	O	40	-	υP1.	οF	**
	Speed limiter curve inflection point 2 point	VP2.	1410	O	70	-	υP2.	οF	**

Mode name	Function name	Factory setting GMFY	Unit	Setting range	Function name Digital display	Setting	Specification
Operability	Operation speed limit specification mode 1	FLM.	O OF	-	F	ON OFF	Operation speed limit is valid when all the below condition are met. 1."VC2" operation mode" is set to "LM or LM, medium speed limit mode during OT1 output ON" is set to "ON". 2."RFU, operation mode with F input during sewing machine operation is set to "ON". 3.The presser foot lifting output is ON.
	Operation speed limit specification mode 2	2LM.	O OF	-	2	ON OFF	The speed limit is valid only if the virtual output OT2 is ON when the VC2 operation mode is set to LM or the medium speed limit function LIM is set to ON during OT1 output ON.
	Speed command value correctly by middle speed digital during speed limit process	LMD.	O OF	-	L	ON OFF	The middle speed during the speed limit process is read into the speed command value (speed high speed signal SPH, speed end tacking signal SPB, speed medium speed signal SPM, high speed run signal S4, end tacking speed run signal S5V, medium speed run signal S5) other than the low speed from an external source by the digit.
	Speed limit with digital speed setting on operation panel	HMD.	O OF	-	H	ON OFF	The speed during stitching other than tacking is limited by the digital speed setting (LED.C and D) on operation panel.
Q mode + + + + +	Ignore detector error	E8C.	O OF	-	E B	ON OFF	The sewing machine detector error E8 will be ignored. If a signal is not received from the sewing machine detector within a set time during operation, the detector error E8 will not be displayed. If a signal is not received from the sewing machine detector within a set time during operation, the detector error E8 will be displayed and the sewing machine will stop.
	Thread break sensor valid	TH.	O OF	-	T	ON OFF	The thread break detector is validated.
Operation after thread break sensor detection	Operation after thread break sensor detection	TST.	O TR	-	T	NO NO	The operation after the thread break is detected (thread break sensor detection) is set.
						TR TR	The operation continues, and the thread break sensor output THO turns ON.
	Speed to ignore thread break sensor	B.	O 600	rpm 0 ~ 8999	b.	****	The sewing machine stops normally, and then the thread break sensor output THO turns ON.
	No. of stitches to ignore thread break sensor after starting stitching	THS.	O 7	stitche s 0 ~ F	T	*	Setting the number of stitch that the sensor of thread break detector becomes valid from first stitch.
	Number of stitches for judgment of thread break	THF.	O 0	stitche s 0 ~ F	T	*	The No. of stitches to judge the thread break detection when the thread break sensor input continues for a certain number of stitches can be set.
	Operation mode with F input during sewing machine operation	RFU.	O OF	-	r U.	ON OFF	The presser foot lifting output will turn ON by turning ON the presser foot lifting signal F during sewing machine operation. Note that the presser foot lifting signal F during sewing machine operation is invalid during sewing machine operation.

Mode name	Function name	Factory setting GMFY	Unit	Setting range	Function name Digital display	Specification	
						Setting	Setting
	Output of back tacking output (B) during OT1 output ON inhibited	S7C.	1422	O OF	-	57L. OF	ON OFF
	Medium speed (M) limit mode during OT1 output ON	LIM.	1423	O OF	-	L1L. OF	ON OFF
	Simultaneously ON of OP1 output during OT1 output ON	O1P.	1424	O OF	-	O1P. OF	ON OFF
	Disregard of S3 signal of Lever Unit	LVB.	1425	O ON	-	Lub. OF	ON OFF
Q mode	1 step heelng setting for the internal lever unit	PD1.	1426	O OF	-	Pd1. OF	ON OFF
	Adjustment mode for the internal lever unit	VCSE T.	1427	X -	-	VCSET.	The heelng operation of the pedal will be 1 step heelng operation.
	Not used.	MTJ.	1428	O OF	-	MTJ. OF	ON OFF
	Not used.	MOA.	1429	O 7	stitche s	NoR. **	Not used.
	Not used.	MOB.	1430	O 7	stitche s	NoB. **	Not used.
	Not used.	MOC.	1431	O 7	stitche s	NoC. **	Not used.
	VC assistance ON/OFF	VCA.	1432	O OF	-	VCRA. OF	ON OFF
	Strength of VC assistance	VCP.	1433	O 50	-	VCAP. **	The amount of the changes by the depressing speed can be set.

Function name	Factory setting GMFY	Unit	Setting range	Function name Digital display	Setting	Specification
Mode name	The EEPROM data is returned to the EEPROM back up state. This is used return the function setting to the factory settings.					
RESET.	-	X	-	-	rESEt.	-

R mode 

Mode name	Function name	Factory setting GMFY	Unit	Setting range	Function name Digital display	Setting	Specification
	KS1, KS2 output run mode	KSM.	1500	O OF	-	t S₁	This is the virtual output KS1 and KS2 run mode. The KS1 and KS2 output will turn ON only during normal operation. During the one needle stitching, half-stitching (one needle stitching signal S01, needle lift signal U, half-stitching signal UD, backstitching during run signal US, backstitching during run signal UDS, etc.), the outputs KS1 and KS2 will turn ON.
	Simple sequence start conditions	SQS.	1501	O NO	-	S Q₅	The simple sequence start conditions are set. nQ NO The simple sequence will not start. r'n IN When the virtual input IO4 is ON. r T When the thread trimming is completed. r R When run starts. s S When the motor starts. (This includes while stopped during the one needle stitching run.) r'r TR When stitching starts after thread trimming. sb SB When start tacking is completed. (If the start tacking setting is OFF, the operation will be identical to [TR].) go GO Normal starting.
S mode  +  + 	Simple sequence forced end conditions	SQE.	1502	O NO	-	S Q_E	The simple sequence forced end conditions are set. nQ NO The simple sequence will not forced end. lu LV When the virtual input IO5 is ON level. r'n IN When the virtual input IO5 is ON. r T When the thread trimming is completed. r R When run starts. s S When the motor starts. (This includes while stopped during the one needle stitching run.) r'r TR When stitching starts after thread trimming. sb SB When start tacking is completed. (If the start tacking setting is OFF, the operation will be identical to [TR].)
	Simple sequence output KS1 output beginning is time or the number of stitch is selected	NS1.	1503	O OF	-	n S₁	Selection stitch amount and time till ON for simple sequence output "KS1". (Amount have to be set at "K11") on ON Stitch amount is counted till ON of OFF Time is counted till ON (10 mill-second per each)
	Simple sequence output KS1 output is time or the number of stitch is selected	NE1.	1504	O OF	-	n E₁	Selection stitch amount and time till OFF for simple sequence output "KS1" (Amount have to be set at "K12") on ON Stitch amount is counted till OFF of OFF Time is counted till OFF (10 mill-second per each)

Mode name	Function name	Factory setting	Unit	Setting range	Function name	Setting	Specification
		GMFY		Digital display			
Operability	Output beginning standard of simple sequence output KS1 S1S.	1505	O	KS	-	5!5.	The simple sequence output starting point setting [S1S] can be set. Linked output. (ON edge of the front output)
Direct call number	Output end standard of simple sequence output KS1 S1E.	1506	O	KS	-	5!E.	Virtual input ON point. (KS1:IO6, KS2:IO7, KS3:IO8, KS4:IO9) When the thread trimming is completed. R When run starts. S When the motor starts. (This includes while stopped during the one needle stitching run.) TR When stitching starts after thread trimming. SB When start tacking is completed. (If the start tacking setting is OFF, the operation will be identical to [TR].)
	Simple sequence output KS2 output beginning is time or the number of stitch is selected NS2.	1507	O	OF	-	n52.	The simple sequence output end point setting [S1E] can be set. Linked output. (Each output starting point) OF Virtual input OFF point. (KS1:IO6, KS2:IO7, KS3:IO8, KS4:IO9) IN Virtual input ON point. (KS1:IOA, KS2:IOB, KS3:IOC, KS4:IOD) T When the thread trimming is completed. R When run starts. S When the motor starts. (This includes while stopped during the one needle stitching run.) TR When stitching starts after thread trimming. SB When start tacking is completed. (If the start tacking setting is OFF, the operation will be identical to [TR].)
	Simple sequence output KS2 output is time or the number of stitch is selected NE2.	1508	O	OF	-	nE2.	Selection stitch amount and time till ON for simple sequence output "KS2". (Amount have to be set at "K21") ON Stitch amount is counted till ON OF Time is counted till ON (10 mill-second per each)
						on	Selection stitch amount and time till OFF for simple sequence output "KS2". (Amount have to be set at "K22") ON Stitch amount is counted till OFF OF Time is counted till OFF (10 mill-second per each)

Mode name	Function name	Factory setting	Unit	Setting range	Function name	Setting	Specification
		GMFY		Digital display			
Operability	Output beginning standard of simple sequence output KS2 S2S.	1509	O	KS	-	525.	The simple sequence output starting point setting [S2S] can be set. Linked output. (ON edge of the front output)
						5	IN
						17	Virtual input ON point. (KS1:IO6, KS2:IO7, KS3:IO8, KS4:IO9)
						T	When the thread trimming is completed.
						R	When run starts.
						S	When the motor starts. (This includes while stopped during the one needle stitching run.)
						TR	When stitching starts after thread trimming.
						SB	When start tacking is completed. (If the start tacking setting is OFF, the operation will be identical to [TR].)
Direct call number	Output end standard of simple sequence output KS2 S2E.	1510	O	KS	-	52E.	The simple sequence output end point setting [S2E] can be set.
						5	Linked output. (Each output starting point)
						OF	OF
						17	Virtual input OFF point. (KS1:IO6, KS2:IO7, KS3:IO8, KS4:IO9)
						IN	Virtual input ON point. (KS1:IOA, KS2:IOB, KS3:IOC, KS4:IOD)
						T	When the thread trimming is completed.
						R	When run starts.
						S	When the motor starts. (This includes while stopped during the one needle stitching run.)
						TR	When stitching starts after thread trimming.
						SB	When start tacking is completed. (If the start tacking setting is OFF, the operation will be identical to [TR].)
S mode  +  + 	Simple sequence output KS3 output beginning is time or the number of stitch is selected NS3.	1511	O	OF	-	n52.	Selection stitch amount and time till ON for simple sequence output "KS3". (Amount have to be set at "K31")
						OF	ON
						OF	Stitch amount is counted till ON
						OF	Time is counted till ON (10 mill-second per each)
	Simple sequence output KS3 output is time or the number of stitch is selected NE3.	1512	O	OF	-	nE3.	Selection stitch amount and time till OFF for simple sequence output "KS3". (Amount have to be set at "K32")
						OF	ON
						OF	Stitch amount is counted till OFF
						OF	Time is counted till OFF (10 mill-second per each)

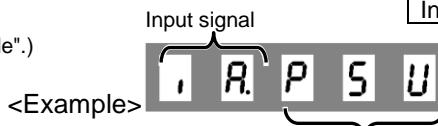
Mode name	Function name	Factory setting	Unit	Setting range	Function name	Setting	Specification
		GMFY		Digital display			
Operability	Output beginning standard of simple sequence output KS3 S3S.	1513	O	KS	-	535.	The simple sequence output starting point setting [S3S] can be set. Linked output. (ON edge of the front output)
						5	IN
						n	Virtual input ON point. (KS1:IO6, KS2:IO7, KS3:IO8, KS4:IO9)
						r	T When the thread trimming is completed.
						r	R When run starts.
						s	S When the motor starts. (This includes while stopped during the one needle stitching run.)
						r	TR When stitching starts after thread trimming.
						5b	SB When start tacking is completed. (If the start tacking setting is OFF, the operation will be identical to [TR].)
	Output end standard of simple sequence output KS3 S3E.	1514	O	KS	-	53E.	The simple sequence output end point setting [S3E] can be set. Linked output. (Each output starting point)
						5	KS
						oF	OF Virtual input OFF point. (KS1:IO6, KS2:IO7, KS3:IO8, KS4:IO9)
						n	IN Virtual input ON point. (KS1:IOA, KS2:IOB, KS3:IOC, KS4:IOD)
						r	T When the thread trimming is completed.
						r	R When run starts.
						s	S When the motor starts. (This includes while stopped during the one needle stitching run.)
						r	TR When stitching starts after thread trimming.
						5b	SB When start tacking is completed. (If the start tacking setting is OFF, the operation will be identical to [TR].)
S mode  +  + 	Simple sequence output KS4 output beginning is time or the number of stitch is selected	NS4.	1515	O OF	-	n54.	Selection stitch amount and time till ON for simple sequence output "KS4". (Amount have to be set at "K21")
						on	ON Stitch amount is counted till ON
						oF	OF Time is counted till ON (10 mill-second per each)
	Simple sequence output KS4 output is time or the number of stitch is selected	NE4.	1516	O OF	-	nE4.	Selection stitch amount and time till OFF for simple sequence output "KS4". (Amount have to be set at "K22")
						on	ON Stitch amount is counted till OFF
						oF	OF Time is counted till OFF (10 mill-second per each)

Mode name	Function name	Factory setting	Unit	Setting range	Function name	Setting	Specification
		GMFY		Digital display			
	Output beginning standard of simple sequence output KS4 S4S.	1517	O	KS	-	-	The simple sequence output starting point setting [S4S] can be set. [S4S] Linked output. (ON edge of the front output)
					545.	545.	 IN T When the thread trimming is completed. R When run starts. S When the motor starts. (This includes while stopped during the one needle stitching run.) TR When stitching starts after thread trimming. SB When start tacking is completed. (If the start tacking setting is OFF, the operation will be identical to [TR].)
	Output end standard of simple sequence output KS4 S4E.	1518	O	KS	-	-	The simple sequence output end point setting [S4E] can be set. [S4E] Linked output. (Each output starting point) OF Virtual input OFF point. (KS1:I06, KS2:I07, KS3:I08, KS4:I09) IN Virtual input ON point. (KS1:I0A, KS2:I0B, KS3:I0C, KS4:I0D) T When the thread trimming is completed. R When run starts. S When the motor starts. (This includes while stopped during the one needle stitching run.) TR When stitching starts after thread trimming. SB When start tacking is completed. (If the start tacking setting is OFF, the operation will be identical to [TR].)
S mode []+ [] []+ []	KS1 output start [Time]/[No. of Stitches] setting K11.	1519	O	7	X10 msec stitche s	0 ~ 99 t 1 1. **	 The output start time/output start No. of stitches for the simple sequence output KS1 can be set. When using time, the setting value will be $(7 \times 10 = 70)$ msec. When using No. of stitches, the setting value will be $(7 \times 1 = 7)$ stitches.
	KS1 output [Time]/[No. of Stitches] setting K12.	1520	O	7	X10 msec stitche s	0 ~ 99 t 1 2. **	 The output start time/output start No. of stitches for the simple sequence output KS1 can be set. When using time, the setting value will be $(7 \times 10 = 70)$ msec. When using No. of stitches, the setting value will be $(7 \times 1 = 7)$ stitches.
	KS2 output start [Time]/[No. of Stitches] setting K21.	1521	O	7	X10 msec stitche s	0 ~ 99 t 2 1. **	 The output start time/output start No. of stitches for the simple sequence output KS2 can be set. When using time, the setting value will be $(7 \times 10 = 70)$ msec. When using No. of stitches, the setting value will be $(7 \times 1 = 7)$ stitches.
	KS2 output [Time]/[No. of Stitches] setting K22.	1522	O	7	X10 msec stitche s	0 ~ 99 t 2 2. **	 The output start time/output start No. of stitches for the simple sequence output KS2 can be set. When using time, the setting value will be $(7 \times 10 = 70)$ msec. When using No. of stitches, the setting value will be $(7 \times 1 = 7)$ stitches.
	KS3 output start [Time]/[No. of Stitches] setting K31.	1523	O	7	X10 msec stitche s	0 ~ 99 t 3 1. **	 The output start time/output start No. of stitches for the simple sequence output KS3 can be set. When using time, the setting value will be $(7 \times 10 = 70)$ msec. When using No. of stitches, the setting value will be $(7 \times 1 = 7)$ stitches.

Mode name	Function name	Factory setting		Unit	Setting range	Function name	Setting	Specification	
		Setting	range					Digital display	
S mode ↓ + [B ¹] [S _s] + [D ¹]	KS3 output [Time]/[No. of Stitches] setting	K32.	1524	O	7	X10 msec stitche s	0 ~ 99	t 32.	**
	KS4 output start [Time]/[No. of Stitches] setting	K41.	1525	O	7	X10 msec stitche s	0 ~ 99	t 41.	**
	KS4 output [Time]/[No. of Stitches] setting	K42.	1526	O	7	X10 msec stitche s	0 ~ 99	t 42.	**
	KS1 output run mode	K1M.	1527	X	ON	-	-	t 11.	ON
	Run prohibit during KS1 output ON	K1D.	1528	O	OF	-	-	t 1d.	ON OF
	K11, K12 time clear during KS1 output ON	K1C.	1529	O	OF	-	-	t 1c.	ON OF
	K21, K22 time clear during KS2 output ON	K2C.	1530	O	OF	-	-	t 2c.	ON OF
	K31, K32 time clear during KS3 output ON	K3C.	1531	O	OF	-	-	t 3c.	ON OF
	Increase the number of K11 through K42 by ten	KSL.	1532	O	OF	-	-	t 5L.	ON OF
Sequence output time setting/[No. of stitch setting each by ten times setting]		KL1.	1533	O	OF	-	-	t L 1.	ON OF
Sequence output time setting/[No. of stitch setting each by ten times setting]		KL2.	1534	O	OF	-	-	t L 2.	ON OF
Sequence output time setting/[No. of stitch setting each by ten times setting]		KL3.	1535	O	OF	-	-	t L 3.	ON OF
Sequence output time setting/[No. of stitch setting each by ten times setting]		KL4.	1536	O	OF	-	-	t L 4.	ON OF

25 Table of input/output function for signal on C mode

(The item enclosed with  can be used even by "O mode".)



Input signal setting table

No.	Setting name	Setting value	Specification			
			Digital display			
1	Nothing signal	NO	no	The sewing machine will do nothing even if input NO is turned ON.		
2	Low speed run signal	S0	50	If input S0 is turned ON, the sewing machine will run at the speed set in low speed L.		
3	Variable speed run signal	S1	51	This signal is equivalent to full toe down when using the pedal. It is operated at the speed which was set with the [C] [D] key of control switch panel when the automatic operation AT is ON input S1 at the time of ON.		
4	Medium speed run signal	S5	55	If input S5 is turned ON, the sewing machine will run at the speed set in medium speed M.		
5	High speed run signal	S4	54	If input S4 is turned ON, the sewing machine will run at the speed set in maximum speed H.		
6	Stop position random run signal	RND	rnd	If input RND is turned ON, the sewing machine will run at the speed set in low speed L, and when stopping the sewing machine will stop at random regardless of the needle position.		
7	Correction stitching signal	COR	cor	If input COR is turned ON, correction stitching will be performed at the speed set in low speed L.		
8	Thread trimmer signal	S2	52	This signal is equivalent to full heeling when using the pedal. When S2 is ON and thread trimming or needle UP position stop has been completed, the wiper will operate. After that, the automatic presser foot lifting will function while the signal is ON.		
9	1 stitch signal	S01	501	If input S01 is turned ON, 1 stitch operation will start.		
10	Needle lift signal	U	u	If input U is turned ON, the needle lift operation will start.		
11	Half-stitch signal	UD	ud	If input UD is turned ON, half-stitch operation will start.		
12	Constant angle [reverse run/forward run] signal	BC	bC	The needle is stopped just above the fabric to confirm the fabric puncture position. Each time the signal turns ON, the operation will alternate between forward - reverse - forward run. If the pedal is toed down or the external run signal (S1) turns ON after that, forward run will start from that position. The needle position stop angle can be set with needle position stop angle C8 in the [B] mode.		
13	Constant angle [reverse run/forward run] signal	BCR	bCr	The needle is stopped just above the fabric to confirm the fabric puncture position. Each time the signal is turned ON, the operation will alternate between forward - reverse - forward run. If the pedal is toed down or the external run signal (S1) turns ON after stopping at a external run signal (S1) turns ON after stopping at a forward run position, forward run will start after reverse run. If stopped at a reverse run position, the sewing machine will forward run from that position. The needle position stop angle can be set with needle position stop angle C8 in the [P] mode.		
14	Constant angle reverse run signal	USR	usr	Reverse run needle lift will be performed to the set angle. The set angle can be adjusted from the DOWN position to UP position with reverse run angle K8 in the [P] mode. This is effective for blind stitch sewing machine.		
15	Needle lift, presser foot lift signal	UF	UF	If input UF is turned ON, the presser foot will lift after needle lifting.		
16	Presser foot lifter signal	S3	53	If input S3 is turned ON after trimming, the presser foot will lift. If input S3 is turned ON before trimming, the presser foot will lift, after delay time. The delay time is set by S3D the [P] mode of the 132 page.		
17	Presser foot lifter signal	F	F	If input F is turned ON, the presser foot lifter operation will start.		
18	Needle UP position priority stop signal	PSU	P5U	If input PSU is turned ON while the sewing machine is running, the needle will stop at the UP position after swing PSU stitches and thread trimming. The no. of stitches after PSU input is set by PSU the [P] mode of 130 page.		

Note1. The setting name will display in the descending order with each press of the [D] key.

2. The setting name will display in the ascending order with each press of the [C] key.

No.	Setting name	Setting value	Specification	
			Digital display	
19	Needle DOWN position priority stop signal	PSD	Psd	If input PSD is turned ON while the sewing machine is running, the needle will stop at the DOWN position after swing PSD stitches. The no. of stitches after PSD input is set by PSU the [P] mode of 130 page.
20	Emergency stop signal	ES	E5	If input ES is turned ON while the sewing machine is running, all running states will be canceled, and the sewing machine will stop with the brakes.
21	One shot signal	SH	SH	If input SH is turned ON, one shot operation will start. The operation mode set in [P] mode SHM function will be entered .
22	Reverse run signal	CW	CH	If input CW is turned ON while running with pedal toe down or external run signal, reverse run will be enabled while the signal is ON.
Note1	Thread trimmer protection signal	S6	56	If input S6 is turned ON while the sewing machine is running, the sewing machine will stop. If input S6 is turned ON during thread trimming, the operation will be completed, and operation will not be possible until input S6 is turned OFF.
	Thread trimmer cancel signal	TL	FL	If pedal full heeling or thread trimmer signal S2 is turned ON while input TL is ON, the thread will not be trimmed. After the thread trimmer interlock time passes, the presser foot lifting operation will start. When TLS of [D] mode is ON, and TL signal is turned ON a little time, next thread trimming is prohibited only once.
25	Low speed signal	SPL	SPL	If input SPL is turned ON while the sewing machine is running, the sewing machine will run at the speed set in low speed setting L while the signal is ON.
26	Medium speed signal	SPM	SPN	If input SPM is turned ON while the sewing machine is running, the sewing machine will run at the speed set in medium speed setting M while the signal is ON.
27	End tacking speed signal	SPB	SPb	If input SPB is turned ON while the sewing machine is running, the sewing machine will run at the speed set in end tacking speed V while the signal is ON.
28	High speed signal	SPH	SPH	If input SPH is turned ON while the sewing machine is running, the sewing machine will run at the speed set in high speed setting H while the signal is ON.
29	Variable speed signal	SPV	SPu	If input SPV is turned ON while the sewing machine is running, the sewing machine will run at a speed proportional to the variable speed voltage VC while the signal is ON.
30	Tacking cancel signal	BTL	bTL	If input BTL is turned ON, start and end tacking will be prohibited while the signal is ON. When BTS of [D] mode is ON, and BTL signal is turned ON a little time, next tacking is prohibited only once.
31	Start tacking cancel signal	SB	Sb	If input SB is turned ON, start tacking will be prohibited while the signal is ON. When BS of [D] mode is ON, and SB signal is turned ON a little time , next start tacking is prohibited only once.
32	End tacking cancel signal	EB	Eb	If input EB is turned ON, end tacking will be prohibited while the signal is ON. When BS of [D] mode is ON , and EB signal is turned ON a little time , next end tacking is prohibited only once.
33	Backstitching during run signal	S7	S7	If input S7 is turned ON while the sewing machine is running, backstitching (reverse feed) will start. Nothing will happen if input S7 is turned ON while the sewing machine is stopped.
34	Backstitching during run signal	UDS	uds	If input UDS is turned ON while the sewing machine is running, backstitching (reverse feed) will start. Half-stitch operation will start if input UDS is turned ON while the sewing machine is stopped.
35	Backstitching during run signal	US	us	If input US is turned ON while the sewing machine is running, backstitching (reverse feed) will start. Needle lift operation will start if input US is turned ON while the sewing machine is stopped.
36	Backstitching signal [when running when stopped]	BSL	bsl	If input BSL is turned ON when the sewing machine is running or stopped, backstitching (reverse feed) will start.
37	Backstitching signal when running	UCR	ucr	If input UCR is turned ON while the sewing machine is running, backstitching (reverse feed) will start. 1 stitch operation will start if input UCR is turned ON while the sewing machine is stopped.

Note1. The setting name will display in the descending order with each press of the [D] key.

2. The setting name will display in the ascending order with each press of the [C] key.

No.	Setting name	Setting value	Specification	
			Digital display	
38	Backstitching signal when running	UBR	ubr	If input UBR is turned ON while the sewing machine is running, backstitching (reverse feed) will start. 1 stitch operation with backstitching (reverse feed) will start if input UBR is turned ON while the sewing machine is stopped.
39	Thread trimmer output confirmation signal	TON	T on	The thread trimmer output T can be turned ON or OFF only when the sewing machine is stopped. (Thread trimmer solenoid confirmation signal)
40	Needle cooler output during rotation forced [OFF] signal	NCL	nCL	If input NCL is turned ON, the needle cooler output NCL during sewing machine rotation will forcibly be turned OFF.
41	1 position priority signal	P12	P 12	1 position will be set forcibly.
42	Weak brake [ON] signal	BK	bt	If input BK is turned ON, the weak brake will turn ON. Use this with the BK of the [D] mode set to [OF].
Note1	Sensor input signal	SEN	SEN	This is the cloth edge sensor input.
	Wiper output cancel signal	WL	WL	If input WL is turned ON, the wiper output W will not be output.
	Slow start signal	SL	SL	If the SL signal is ON, the slow start operation will be valid. Use this with the normal mode [B,SL] key set to [OF].
	Preset stitching forced [ON] signal	N	n	If input N is turned ON, preset stitching will start forcibly from that point.
	Continuous tack stitching forced [ON] signal	CBT	CbT	If input CBT is turned ON, continuous backstitching will start forcibly from that point.
	Non-stitching feed input	FWD	Fwd	If input FWD is turned ON, output OT3, output NCL and output FU will be turned ON forcibly. Output ROL and output PUL will be turned OFF forcibly.
	Up counter clear signal	CCU	CCU	If input CCU is turned ON, it clears an up counter in [0].
50	Down counter clear signal	CCD	CCd	If input CCD is turned ON, it clears an down counter in [the setting value].
51	Signal output to virtual output 1 during operation	IR1	ir 1	If input IR1 is turned ON, output OT1 turns ON only when the sewing machine is running.
52	Signal output to virtual output 2 during operation	IR2	ir 2	If input IR2 is turned ON, output OT2 turns ON only when the sewing machine is running.
53	Signal output to virtual output 3 during operation	IR3	ir 3	If input IR3 is turned ON, output OT3 turns ON only when the sewing machine is running.
54	Signal output to virtual output 1 when stopped	IS1	iS 1	If input IR1 is turned ON, output OT1 turns ON only when the sewing machine is stopped.
55	Signal output to virtual output 2 when stopped	IS2	iS 2	If input IR2 is turned ON, output OT2 turns ON only when the sewing machine is stopped.
56	Signal output to virtual output 3 when stopped	IS3	iS 3	If input IR3 is turned ON, output OT3 turns ON only when the sewing machine is stopped.
57	Signal output to virtual output 1	IO1	io 1	If input IO1 is turned ON, output OT1 will always be turned ON.
58	Signal output to virtual output 2	IO2	io 2	If input IO2 is turned ON, output OT2 will always be turned ON.
59	Signal output to virtual output 3	IO3	io 3	If input IO3 is turned ON, output OT3 will always be turned ON.
60	Signal output to virtual output 4	IO4	io 4	If input IO4 is turned ON, output OT4 will always be turned ON.
61	Signal output to virtual output 5	IO5	io 5	If input IO5 is turned ON, output OT5 will always be turned ON.

Note1. The setting name will display in the descending order with each press of the [D] key.

2. The setting name will display in the ascending order with each press of the [C] key.

No.	Setting name	Setting value	Specification	
			Digital display	
62	Signal output to virtual output 6	IO6	106	If input IO6 is turned ON, output OT6 will always be turned ON.
63	Signal output to virtual output 7	IO7	107	If input IO7 is turned ON, output OT7 will always be turned ON.
64	Signal output to virtual output 8	IO8	108	If input IO8 is turned ON, output OT8 will always be turned ON.
65	Signal output to virtual output 9	IO9	109	If input IO9 is turned ON, output OT9 will always be turned ON.
66	Signal output to virtual output A	IOA	10A	If input IOA is turned ON, output OTA will always be turned ON.
67	Signal output to virtual output B	IOB	10B	If input IOB is turned ON, output OTB will always be turned ON.
68	Signal output to virtual output C	IOC	10C	If input IOC is turned ON, output OTC will always be turned ON.
69	Signal output to virtual output D	IOD	10D	If input IOD is turned ON, output OTD will always be turned ON.
70	Signal output to virtual output E	IOE	10E	If input IOE is turned ON, output OTE will always be turned ON.
71	Signal output to virtual output F	IOF	10F	If input IOF is turned ON, output OTF will always be turned ON.
72	Signal output to virtual output G	IOG	10G	If input IOG is turned ON, output OTG will always be turned ON.
73	End tacking speed run signal	S5V	55U	If input S5V is turned ON, the sewing machine will run at the speed set in end tacking speed V.
74	Thread break detector input signal	THI	TH1	It is possible to use as the input signal of thread break detector.
75	Sensor stop input signal 1	PS1	PS1	If input PS1 is turned ON while the sewing machine is running, the needle will stop after swing set stitches. The operation mode at stopping is set by PS1 in the P mode. The no. of stitches after PS1 input is set by [1.] in the P mode.
76	Sensor stop input signal 2	PS2	PS2	If input PS2 is turned ON while the sewing machine is running, the needle will stop after swing set stitches. The operation mode at stopping is set by PS2 in the P mode. The no. of stitches after PS2 input is set by [2.] in the P mode.
77	Thread trimmer and tacking cancel signal	TLB	TLB	If input TLB is turned ON, end tacking and thread trimming will be prohibited
78	Variable speed run signal set to medium speed setting	SVM	5uN	The sewing machine can be operated at the variable speed set to medium speed M when this signal SVM is turned ON and during ON while machine operates.
79	Needle down signal	D	d	When needle down signal D is turned ON, needle down operation will start.
80	Thread trimmer signal after reverse needle lift	URT	UrF	Not used.

Note1. The setting name will display in the descending order with each press of the [D] key.

2. The setting name will display in the ascending order with each press of the [C] key.

Output signal setting table

Output signal setting table

No.	Setting name	Setting value	Specification		
			Digital display		
1	Output for slow start	SL	SL	During the no. of the setting stitches, SL output is turned ON. The setting no. of stitches can select SLN on [P] mode or HOF on [G] mode by setting SLH on [F] mode	
2	Run output 1	OP	OP	OP output is turned ON while the sewing machine is running (not including needle lifting during thread trimming) .	
3	Run output 2	OP1	OP1	OP1 output is turned ON while the sewing machine is running. (not including needle lifting during thread trimming) OP1 output will turn ON during needle lifting when directly heeling.	
4	Run output 3	OP2	OP2	OP1 output is turned ON while the pedal is toed down, the external operation signal (S0, S1, SH), full pedal heeling or thread trimming signal (S2) is ON.	
5	Output for run signal	S1	S1	S1 output is turned ON when the run signal is ON except during on 1 stitch sewing.	
6	Output for blower	VAC	VAC	VAC output is turned ON during pedal full heeling or while thread trimmer signal S2 is ON.	
7	Output for needle cooler	NCL	NCL	NCL output is turned ON while the sewing machine is running (including needle lifting).	
8	Output for vacuum signal	VCM	VCM	VCM output is turned ON during pedal full heeling or while thread trimmer signal S2 is ON while the sewing machine is stopped.	
9	Output for signal during tacking	BT	BT	BT output is turned ON during tacking.	
10	Roller lift output	ROL	ROL	ROL output is turned ON when presser foot lifter output FU is ON, backstitching output B is ON, or when input IO2 signal is ON. ROL output is turned ON while tacking and while thread trimming if RLM of [F] mode is ON.	
11	Thread trimmer output	T	T	Thread trimming starts.	
12	Thread release output	L	L	Thread release operation starts.	
13	Wiper output	W	W	Wiper operation starts.	
14	Backstitch output (Condensed stitch)	B	B	Backstitching (reverse feed) starts. (Condensed stitch)	
15	[CH2] output	CH	CH	CH2 output for chain stitches.	
16	[TF] output	TF	TF	TF output for chain stitches. Refer to pages 93 and 94 for the output timing.	
17	[KS1] output	KS1	KS1	Behind operation signal ON, KS1 output is turned ON after the setting delay time. Refer to pages 95~97 for the output timing.	
18	[KS2] output	KS2	KS2	After the motor stopped, KS2 output is turned ON after the setting delay time. Refer to pages 95~97 for the output timing.	
19	[KS3] output	KS3	KS3	After trimming and stopped up position, KS3 output is turned ON after setting delay time. Refer to pages 95~97 for the output timing.	
20	[KS4] output	KS4	KS4	Simple sequence output 4. Refer to pages 95~97 for the output timing.	
21	[TB] output	TB	TB	TB output for chain stitches. Refer to pages 93 and 94 for the output timing.	
22	Presser foot lifter output	FU	FU	Presser foot lifter operation starts. The operation mode set in the [P] mode FUM function and FU function will be entered.	
23	Output for UP position when stopped	UC	UC	UC output is turned ON if at the needle UP position when the sewing machine is stopped.	
24	Needle UP position output	UPW	UPW	UPW output is turned ON if at the UP position when the, sewing machine is stopped, and while moving from the UP position to the DOWN position when the sewing machine is running.	

Note1. The setting name will display in the descending order with each press of the [D] key.

2. The setting name will display in the ascending order with each press of the [C] key.

No.	Setting name	Setting value	Specification	
			Digital display	
25	Needle DOWN position output	DNW	dNw	DNW output is turned ON if at the DOWN position when the sewing machine is stopped, and while moving from the DOWN position to the UP position when the sewing machine is running.
26	Output for error occurrence confirmation	ERR	Err	This is output when an error occurs. (Note that this is not output when error code E9 occurs.)
27	Output for power [OFF] confirmation	IPF	,PF	Not used.
28	Puller output	PUL	PUL	PUL output is turned ON during the presser foot lifter operation, during the IO2 output is ON.
29	Count up output	CUP	CUP	When +1 up counter does, the [CUP] output is turned on.
30	Thread break detector output	THO	THo	When detecting thread break detector, THO output is turned ON. (When re-operation, the signal is turned off)
31	Vacuum output for holding thread	FUW	FUW	FUW output is turned ON during the presser foot lifter operation or during wiper operation.
32	[NO] output	NO	no	Nothing is output.
33	Virtual output 1	OT1	OT1	OT1 output is turned ON according to each input specifications while inputs IO1, IR1 and IS1 are ON.
34	Virtual output 2	OT2	OT2	OT2 output is turned ON according to each input specifications while inputs IO2, IR2 and IS2 are ON.
35	Virtual output 3	OT3	OT3	OT3 output is turned ON according to each input specifications while inputs IO3, IR3 and IS3 are ON.
36	[OT4]output	OT4	OT4	OT4 output is turned ON according to each input specification while input IO4 is ON.
37	[OT5]output	OT5	OT5	OT5 output is turned ON according to each input specification while input IO5 is ON.
38	[OT6]output	OT6	OT6	OT6 output is turned ON according to each input specification while input IO6 is ON.
39	[OT7]output	OT7	OT7	OT7 output is turned ON according to each input specification while input IO7 is ON.
40	[OT8]output	OT8	OT8	OT8 output is turned ON according to each input specification while input IO8 is ON.
41	[OT9]output	OT9	OT9	OT9 output is turned ON according to each input specification while input IO9 is ON.
42	[OTA]output	OTA	OTA	OTA output is turned ON according to each input specification while input IOA is ON.
43	[OTB]output	OTB	OTB	OTB output is turned ON according to each input specification while input IOB is ON.
44	[OTC]output	OTC	OTC	OTC output is turned ON according to each input specification while input IOC is ON.
45	[OTD]output	OTD	OTD	OTD output is turned ON according to each input specification while input IOD is ON.
46	[OTE]output	OTE	OTE	OTE output is turned ON according to each input specification while input IOE is ON.
47	[OTF]output	OTF	OTF	OTF output is turned ON according to each input specification while input IOF is ON.
48	[OTG]output	OTG	OTG	OTG output is turned ON according to each input specification while input IOG is ON.
49	[CUE] output	CUE	CUE	This output becomes ON when Up-counter becomes end. This output becomes OFF when "CCU" input is turned on.

Note1. The setting name will display in the descending order with each press of the [D] key.

2. The setting name will display in the ascending order with each press of the [C] key.

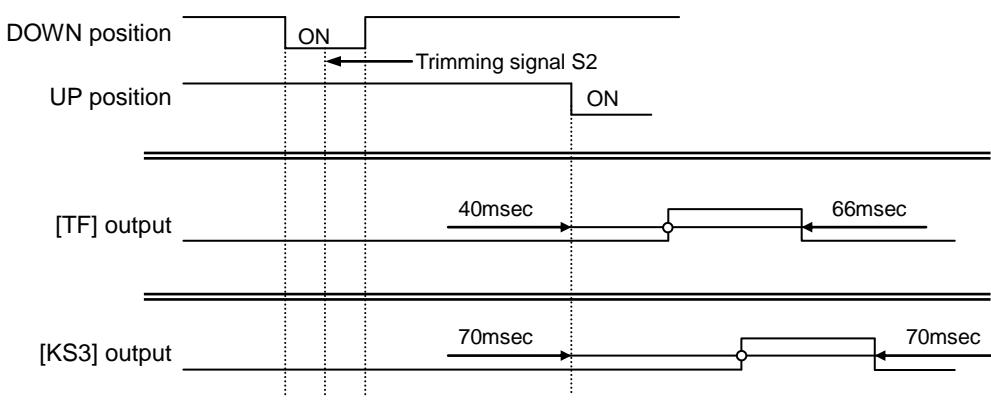
No.	Setting name	Setting value	Specification	
			Digital display	
50	[CDE] output	CDE	CdE	This output becomes ON when Down-counter becomes end. This output becomes OFF when "CCD" input is turned on.
51	Output for the PSU counting	PSU	PSU	Output signal for the during PSU counting. PSU output will turn ON during the PSU counting.
52	Output for the PSD counting	PSD	PSd	Output signal for the during PSD counting. PSD output will turn ON during the PSD counting.
53	Output for the PS1 counting	PS1	PS1	Output signal for the during the sensor input signal PS1 counting. PS1 output will turn ON during the PS1 operation.
54	Output for the PS2 counting	PS2	PS2	Output signal for the during the sensor input signal PS2 counting. PS2 output will turn ON during the PS2 operation.
55	[SPC] output for the reached setting speed	SPC	SPC	SPC output is turned ON when reached setting speed. The setting speed is set by [C.] in the C mode.
56	[SPD] output for the reached setting speed	SPD	SPd	SPD output is turned ON when reached setting speed. The setting speed is set by [D.] in the C mode.
57	[SPE] output for the reached setting speed	SPE	SPE	SPE output is turned ON when reached setting speed. The setting speed is set by [E.] in the C mode.
58	Always ON output	HI	H	In case of the power on, [HI] output is always ON.

Note1. The setting name will display in the descending order with each press of the [D] key.

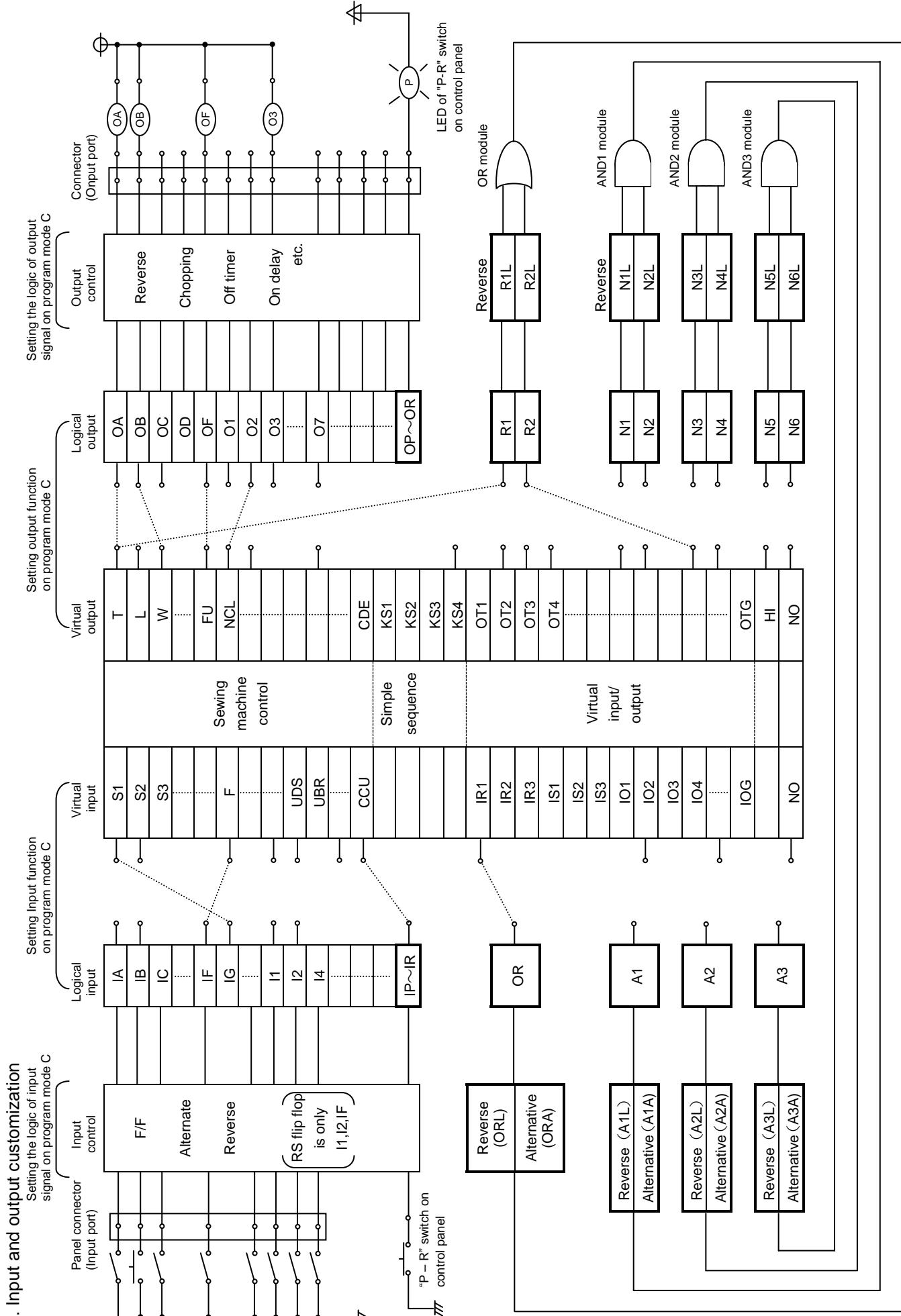
2. The setting name will display in the ascending order with each press of the [C] key.

Notice

The TF output and KS3 output timings are as shown below.

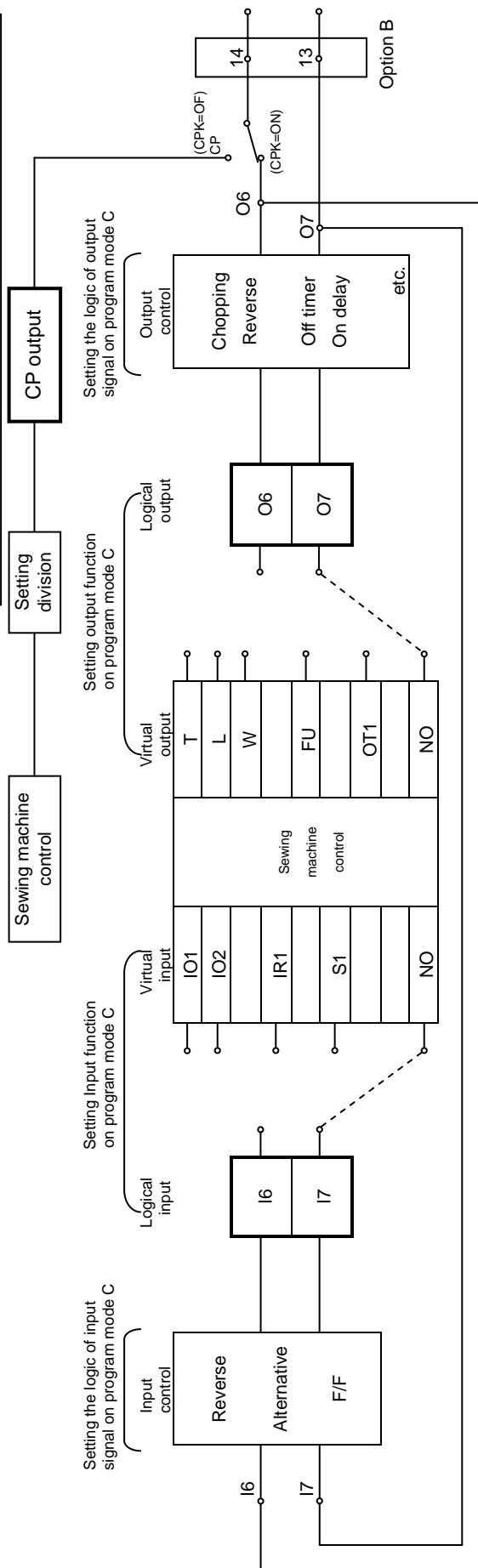


26 The composition figure of input and output customization



2. Coupling output signal with input signal

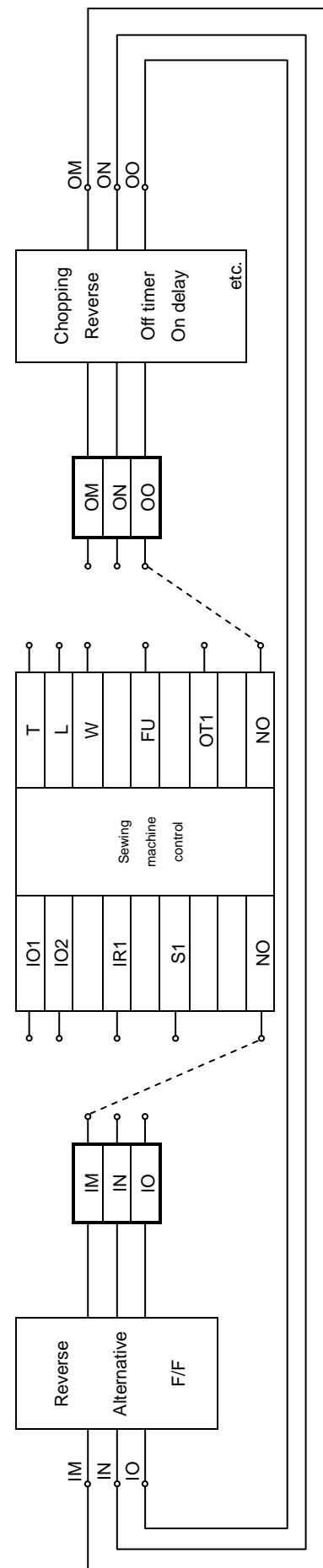
- * The CP output is enabled with the CPK [OF] setting in the C mode.
- * The division rate can be set with the division rate setting [CP] in the [C] mode.
(When the setting has been changed, turn the power OFF and ON once.)



* The input function settings [I6], [I7] are coupled to each the output function setting [O6], [O7] by software.

* No.13 pin and No.14 pin of the option B connector are not the input/output common port. (Only output port.)

* The factory settings of the output function settings [O6], [O7] and [I6], [I7] are all [NO].



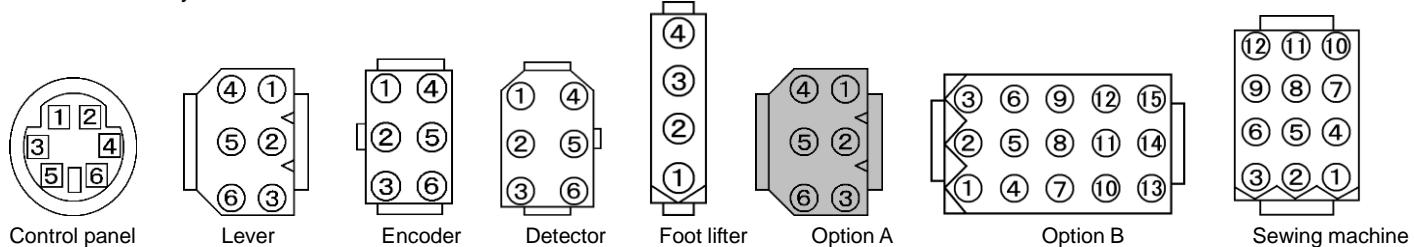
* The factory settings of the input function settings [IM], [IN], [IO] are all [NO].

* The factory setting of the output function settings [OM], [ON], [OO] are all [NO].

* The input function settings [IM], [IN], [IO] are coupled to each the output function setting [OM], [ON], [OO] by software.

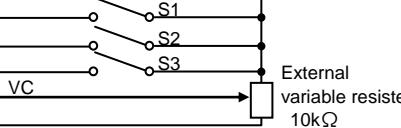
Variable operation are possible by adding external signals to the option connector. A current of approximately 1.5 mA flows through the switches used

1. Connector Layout



Lever (White)

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



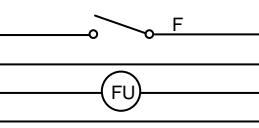
Communication /

Control panel (Note 4)

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

Presser foot lifter

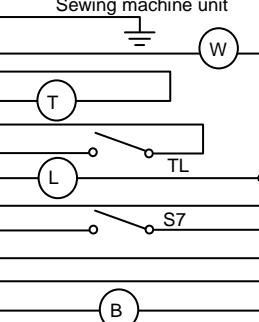
Signal name	Factory setting	
OV	0V	1
IF	F : presser foot input	2
OF	FU+ : presser foot lifter output +	3
	FU- : presser foot lifter output -	4



Sewing machine

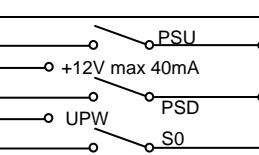
Signal name	Factory setting	
Ground	Ground	1
OB	W : Wiper output	2
+24V/(+30V)	+24V	3
OA	T : Thread trimming output	4
0V	0V	5
ID	TL : Thread trimmer cancel input	6
OD	L : Thread release output	7
+24V/(+30V)	+24V	8
IE	S7 : Backstitch input	9
O V/(+5V)	0V	10
+24V/(+30V)	+24V	11
OC	B : Backstitch output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

Sewing machine unit



Option A (Black)

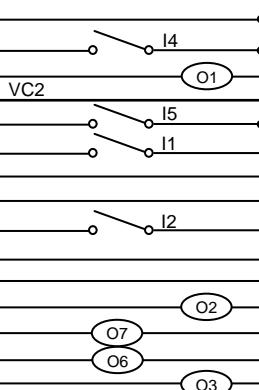
Signal name	Factory setting	
0V	0V	1
IA	PSU : Up position stop input	2
+12V/(+5V)	+12V	3
IB	PSD : Down position stop input	4
O4	UPW : Needle Up position output	5
IC	S0 : Low speed input	6



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

Option B

Signal name	Factory setting	
0V	0V	1
I4	No setting	2
O1	OT1 : Virtual output	3
VC2	VC2 : Variable speed command	4
I5	No setting	5
I1	(*) IO1 : Virtual 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



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.

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)

2. The explanation of the input/output signal

Connector name	Pin number	The input/output signal name (Factory setting)	Physics input port name	Specification
Lever connector	2	Variable speed run signal S1	IG	This signal is equivalent to full toe down when using the pedal. It is operated at the speed which was set with the [C][D] key of control switch panel when the automatic operation AT is ON input S1 at the time of ON.
	3	Thread trimmer signal S2	IH	This signal is equivalent to full heeling when using the pedal. When S2 is ON and thread trimming or needle UP position stop has been completed, the wiper will operate. After that, the automatic presser foot lifting will function while the signal is ON.
	4	Presser foot lifter signal S3	II	If input S3 is turned ON after trimming, the presser foot will lift. If input S3 is turned ON before trimming, the presser foot will lift after delay time. The delay time is set by S3D the [P] mode of the 132 page.
	5	Variable speed command voltage VC1	VC1	It is speed regulation input from outside. By giving variable speed command voltage (0-11V), the speed which is proportional to the voltage is gotten.
	6	Constant voltage power supply +12V	+12V	This is the power for the variable speed command. A DC12V (max.40mA) is output.
	2	Wiper output W	OB	Wiper operation starts.
Sewing machine connector	4	Thread trimmer output T	OA	Thread trimming starts.
	6	Thread trimmer cancel signal TL	ID	If pedal full heeling or thread trimmer signal S2 is turned ON while input TL is ON, the thread will not be trimmed. After the thread trimmer interlock time passes, the presser foot lifting operation will start. When TL of [D] mode signal is turned ON a little time and TLS setting is ON, next thread trimming is prohibited at once.
	7	Thread release output L	OD	Thread release operation starts.
	9	Backstitching during run signal S7	IE	If input S7 is turned ON while the sewing machine is running, backstitching (reverse feed) will start. Nothing will happen if input S7 is turned ON while the sewing machine is stopped.
	12	Backstitch output (Condensed stitch) B	OC	Backstitching (reverse feed) starts. (Condensed stitch)
	2	Presser foot lifter signal F	IF	If input F is turned ON, the presser foot lifter operation will start.
Presser foot lifter	3	Presser foot lifter output FU+ FU-	OF	Presser foot lifter operation starts. The operation mode set in the [P] mode FUM function and FU function will be entered.
	4			
Option A connector	2	Needle UP position priority stop signal PSU	IA	If input PSU is turned ON while the sewing machine is running, the needle will stop at the UP position after swing PSU stitches and thread trimming. The no. of stitches after PSU input is set by PSU the [P] mode of 130 page.
	3	Constant voltage power supply +12V	+12V	The constant voltage power supply. DC +12V (max.40mA)
	4	Needle DOWN position priority stop signal PSD	IB	If input PSD is turned ON while the sewing machine is running, the needle will stop at the DOWN position after swing PSD stitches. The no. of stitches after PSD input is set by PSD the [P] mode of 130 page.
	5	Needle UP position output UPW	O4	The UP position signal is output. This can be used as the signal for the stitch count, etc. The output voltage is DC 12V/5V (max. 10mA). The factory setting is 12V.
	6	Low speed run signal S0	IC	If input S0 is turned ON, the sewing machine will run at the speed set in low speed [L].
	2	Nothing signal NO	I4	Factory setting is NO setting. Refer to the [C mode input signal setting table].
Option B connector	3	Virtual output 1 OT1	O1	OT1 output is turned ON according to each input specifications while inputs IO1, IR1 and IS1 are ON.
	4	Variable speed command VC2	VC2	This is the input for external speed command. By applying the variable speed command voltage, the speed that is relative to the voltage is obtained.
	5	Nothing signal NO	I5	Factory setting is NO setting. Refer to the [C mode input signal setting table].
	6	Signal output to virtual output 1 IO1	I1	If input IO1 is turned ON, output OT1 will always be turned ON.
	7	Rated voltage power supply +5V	+5V	A DC 5V is output (max.50mA). This can be used as the power source for the photoelectric switches in the amplifier.
	9	Needle lift signal U	I2	If input U is turned ON, the needle lift operation will start.
	12	Output for needle cooler NCL	O2	NCL output is turned ON while the sewing machine is running (including needle lifting).
	13	Nothing output NO	O7	This port is for the air valve output. And it is an input/output coupling port. Factory setting is NO setting. Refer to page 207.
	14	Nothing output NO	O6/CP	This port is for the air valve output. And it is an input/output coupling port. Factory setting is NO setting. Refer to page 207. When using as the CP output, make 159 page C mode CPK OFF setting.
	15	[TF] output TF	O3	TF output for chain stitches. Refer to pages 93 and 94 for the output timing.

3. 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]

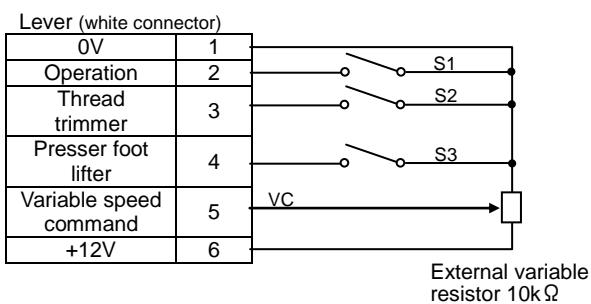
- Be sure to turn OFF the power switch when connecting or disconnecting the lever connector.
- Do not connect the lever connector when you set the function [PDS] to ON in the program mode [C] (Direct call number = "530")

[Basic procedure]

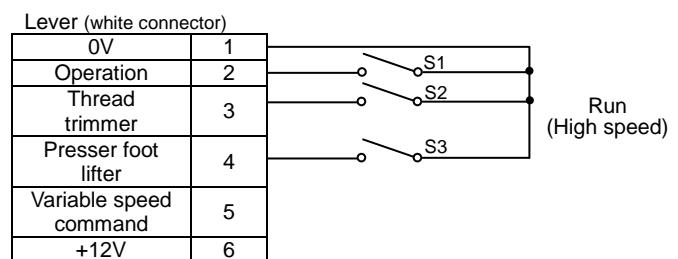
- (1) Disconnect the lever connector after turning OFF the power switch
- (2) Turn ON the power switch and then, set the function [PDS] to ON. The lever connector still disconnects.
- (3) Connect the lever connect after turning OFF the power switch.
- (4) Turn ON the power switch and confirm the operation.

※ 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)



28 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
P8r.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.

N5 / 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.
NR / 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.) (Refer to the VCSET setting (page 39).)

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.)

29 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.
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<Reference> Table of digital display

No.	0	1	2	3	4	5	6	7	8	9
Digital display	0	1	2	3	4	5	6	7	8	9
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	Ⓤ	Ⓜ	Ⓝ	Ⓞ	Ⓟ	Ⓠ				

30 Options

Options	Model name	Specifications
Control panel	XC-G500-Y	"XC-G500-Y" and "XC-G10" cannot be used together.
Automatic presser foot lifter	XC-FM-2	Electromagnetic type (for 24V)
	XC-FM-3	It is possible to use it for LS2-1380. (for 24V)
	LE-FA	Pneumatic type (common for 30V/24V)
Variable speed pedal	XC-CVS-2	3-series pedal, for standing operation sewing machine
Lever unit (separated type)	XC-GL-1-SET	For one-step pedal heeling (installation plate, extension cable set)
	XC-GL-2-SET	For two-step pedal heeling (installation plate, extension cable set)

Extention cable	Parts No.
Motor cable 1.0m (for 200V)	M97318099
Detector cable 0.6m	K14M71324830
Encoder cable 1.0m	K14M71725402
Detector cable for Singer machine	K14M72025530
Sewing machine cable for Basting machine	K14M72025730

Installation plate	Parts No.	Specifications
Mounting plate of motor and control box	K14M72354001	XL-G554 motor and old control box
	K14M72354101	Old motor and XC-GMFY control box

1. Motor assembly**(1) Clean periodically the dust filter in Fig. 1.**

(Clogged filter causes the overheat of motor.)

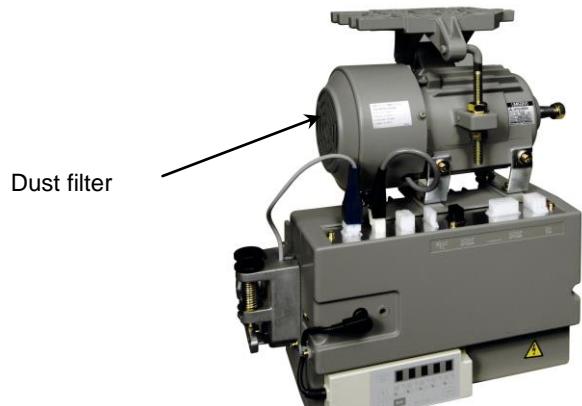


Fig. 1 Dust filter

(2) Internal inspection of motor

There is no need to disassemble the motor normally. However, when the revolution is not smooth, abnormal noises are generated or the encoder is replaced, inspect it with following procedures.

- 1) Turn off the power.
- 2) Remove the belt cover, belt and motor pulley.
- 3) Disassemble the motor from the sewing machine table.
- 4) Remove the end cover mounting screws (3 pcs.).
(Fig. 2.)
- 5) Remove the end cover and check for any foreign substance on the motor cooling fan, motor shaft, etc. or looseness of motor cooling fan mounting screws. To remove the motor cooling fan, unfasten the mounting screws. (Fig. 3)

Caution

Encoder appears (Fig. 4) as the motor cooling fan is removed. Since the encoder is a highly sensitive component, a sufficient care should be taken not to apply a strong shock when the motor inside is cleaned or the motor cooling fan is removed. If the motor cooling fan mounting screws become loose, abnormal noises may be generated. Lock them securely to avoid loosening. (appropriate tightening torque is about 3 N·m.) Use the screw lock agent when they are fastened.



Fig. 2 Cover mounting screw

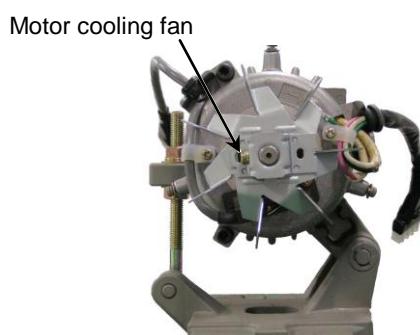


Fig. 3 Motor cooling fan mounting screw

- 6) When the encoder sensor is replaced, remove the encoder sensor mounting screw A, B and encoder lead wire mounting screws.
(Fig. 4) When the sensor is installed, keep pressing the sensor against the sensor stop on the motor frame (toward the motor shaft) and lock the sensor mounting screw A first and B next.

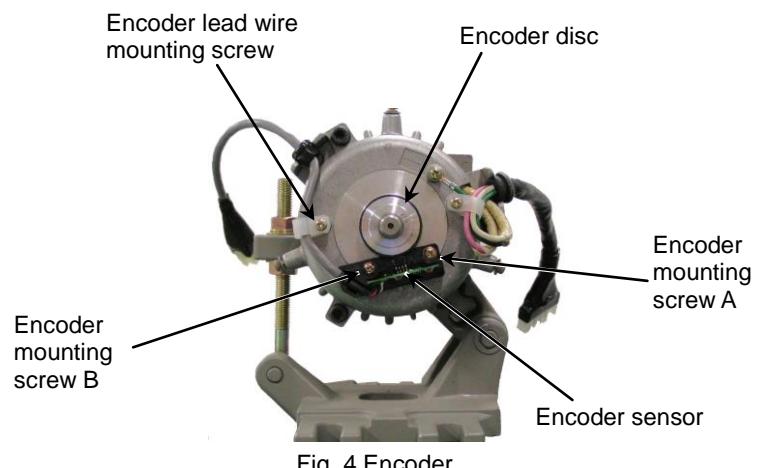


Fig. 4 Encoder

As the screws A and B are locked orderly while the motor frame stop is pressed against the sensor stop of motor frame, the gap between the sensor and the disc is determined automatically.

Since the encoder sensor (Fig. 5) is a highly sensitive component, a sufficient care should be taken not to damage it.

Caution

When replacing only the encoder sensor section, the work can be done without removing the motor cooling fan explained on the previous page.

When the fan has been removed, always apply a screw locking agent to fix it.

7) When the encoder disc is replaced, remove the disc set screws using a small hexagon wrench. To install the encoder disc, adjust the gap between the encoder disc and the encoder sensor at 0.14 ± 0.04 mm (Fig. 6) and adjust the space between the encoder disc and the motor frame at 10.0 ± 0.1 mm and fasten the lock screw. If the difference of this gap is larger, the encoder may fail to detect the motor revolution. Make sure to install it precisely.

8) When the bearing is replaced, remove first the encoder sensor and the disc. Remove next the encoder, then the lead wire mounting screws, motor frame lock screws and disassemble the motor frame. (Fig. 7) Separate the bearing from rotor and install a new bearing. Since the special type bearing is used, contact us if you have none in stock. After the bearing has been replaced, assemble in the order of encoder disc and encoder sensor with reference to the steps 6) and 7) above.

Caution

Fix securely the motor frame lock screws with the torque of more than 6 N·m.

9) Assemble the components in the reverse order of removal.

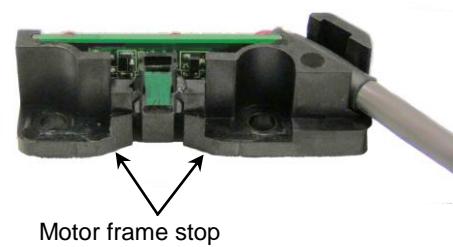


Fig. 5 Encoder sensor

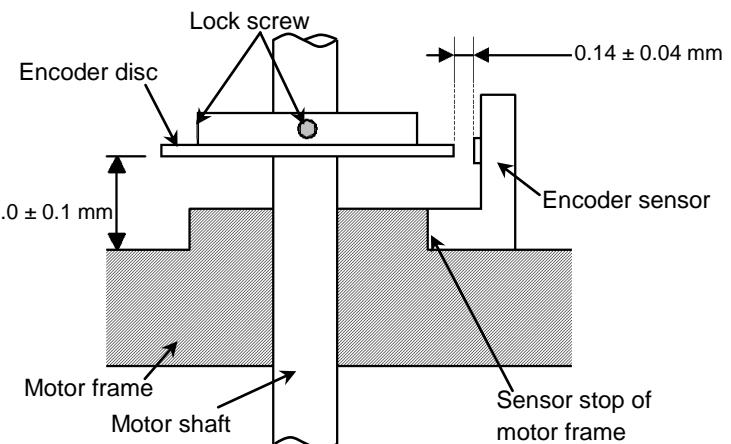


Fig. 6 Installation of encoder disc

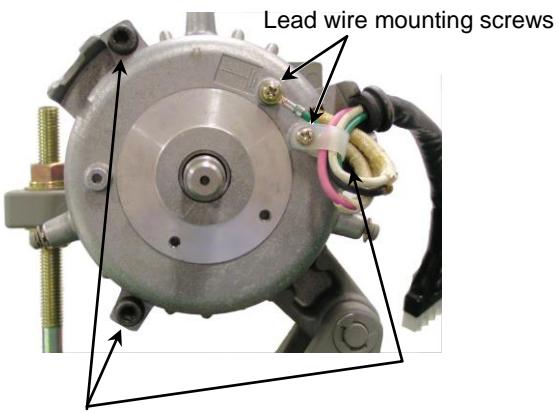


Fig. 7 Disassembly of motor

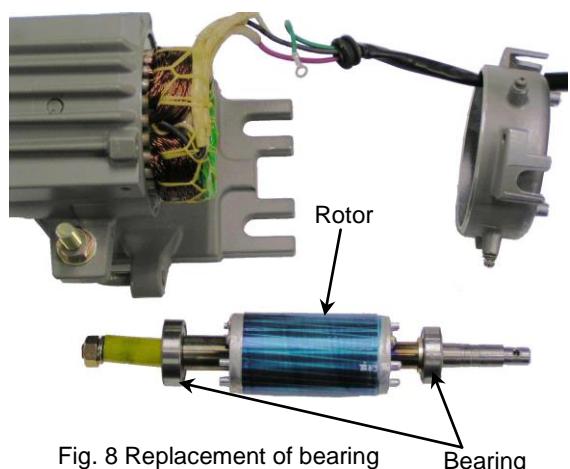
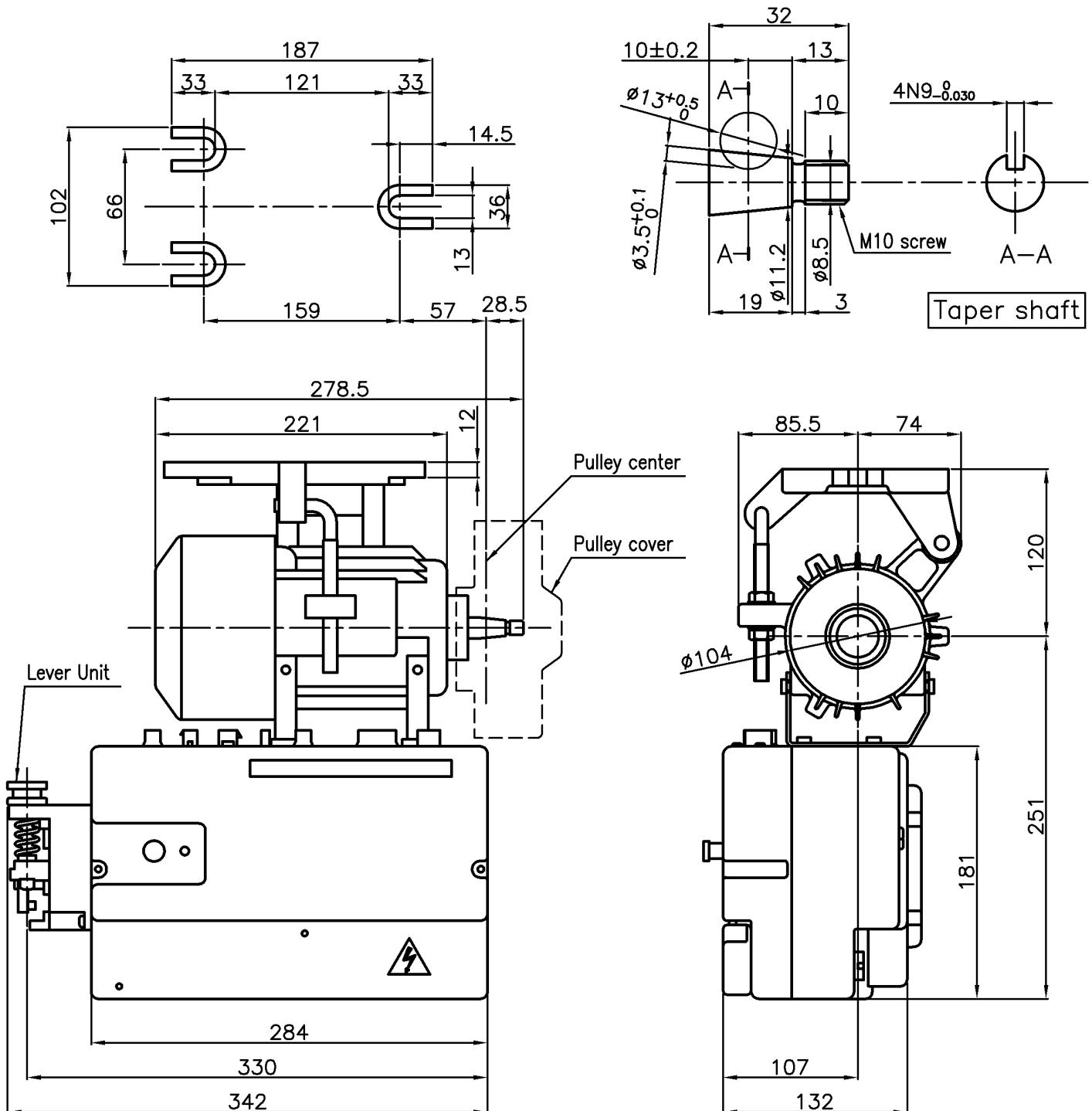


Fig. 8 Replacement of bearing

<Reference> Dimensions
*MOTOR and CONTROL BOX



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