MITSUBISHI ELECTRIC

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.

E723D757-B(201407)

1 Contents

2 Safety Instructions

1. To ensure safe use

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

1.1 Before starting

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

1.2 Application and purpose

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

1.3 Work environment

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

(1) Power voltage	- Place where voltage fluctuation exceeds ±10% of the rated voltage.
	- Place where the specified power capacity cannot be secured. (Refer to page 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.
	- Place where relative humidity is 45% or less and 85% or more, or where dew condensation occurs.
(4) Atmosphere	- Atmosphere with dust or corrosive gases.
	- Atmosphere with combustible gases or explosive atmosphere.
(5) Altitude	- Place where altitudes exceeds 1,000m above mean sea level.
(6) Storage	- Place where storage temperature is 55 ℃ or higher and -25℃ or lower.
(7) Vibration	- If excessive vibration occurs when the control box is installed on the sewing machine, install it separately.

2. Installation

2.1 Motor and control box

- Correctly install according to the attached technical manuals.

2.2 Accessories

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

2.3 Cable

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

2.4 Grounding

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

2.5 Accompanying appliances and accessories

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

2.6 Removal

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

3. Maintenance, inspection and repairs

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

4. Other safety measures

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

5. Hazard display, warning display

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

(2) This symbol indicates electrical risks and warnings.

(3) This symbol indicates thermal risks and warnings.

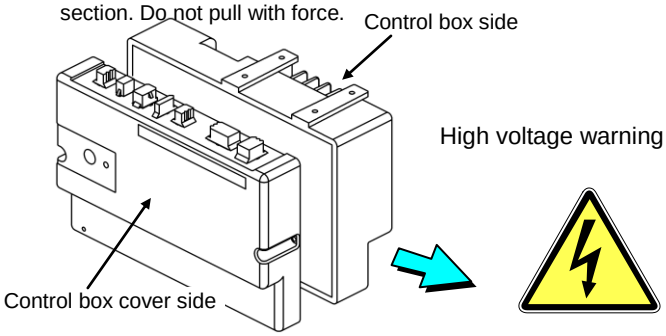
- Always deliver this instruction manual to the end user.
- Save these technical manuals for future reference.

3 Points of Caution

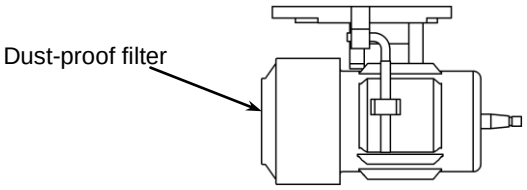
Caution

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

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

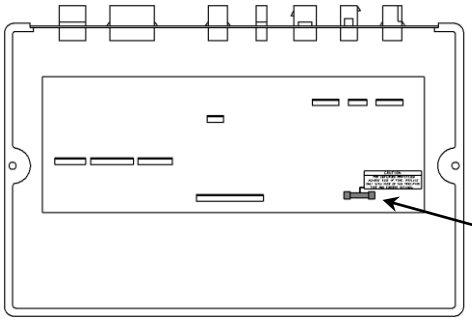


17. Remove the dust that has adhered on the motor's dust-proof filter once every two to three weeks.



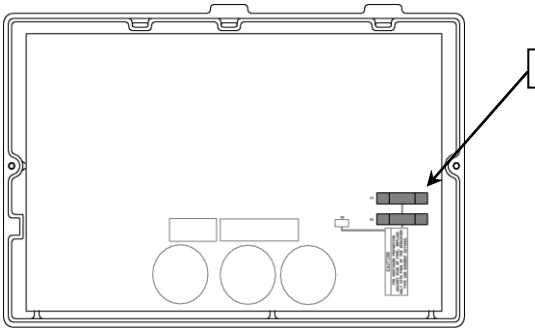
If the motor is run while the filter is clogged, the motor may overheat and affect the motor life.

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



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

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

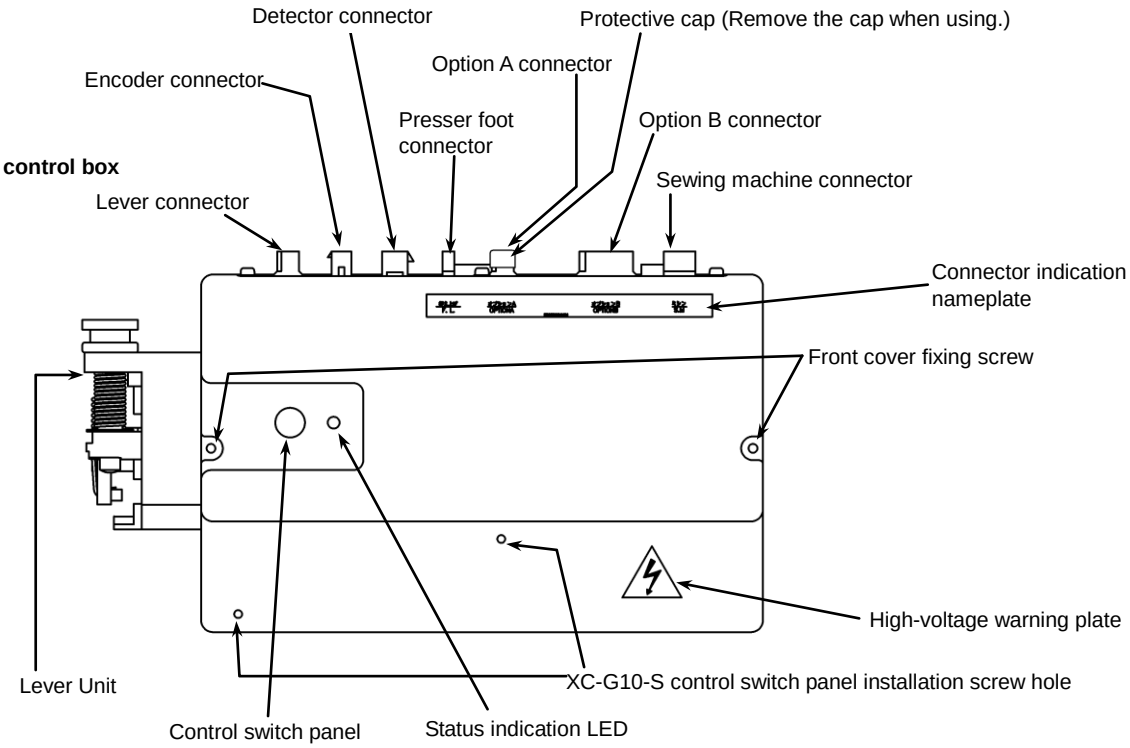


* The above fuses are for protection of the control box power supply section.

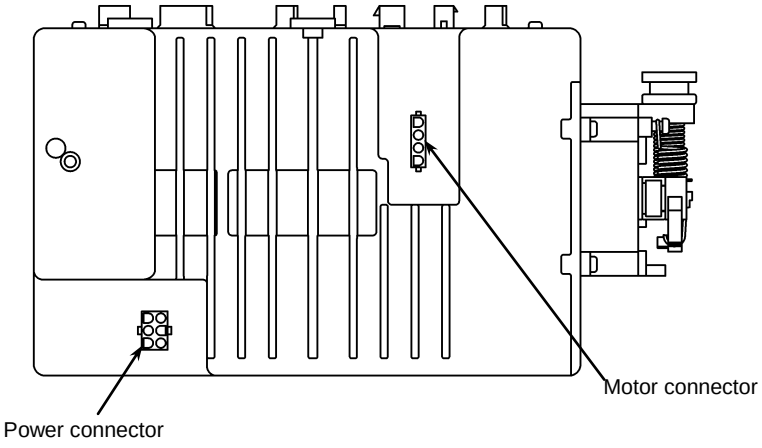
(Front view of box side PCB with control box cover removed.)

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

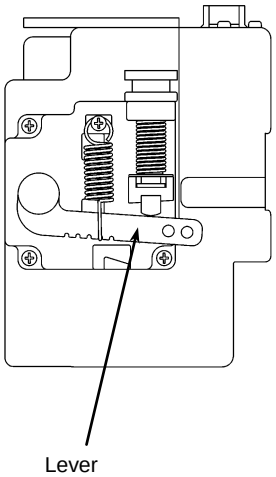
1. Front side of control box



2. Back side of control box



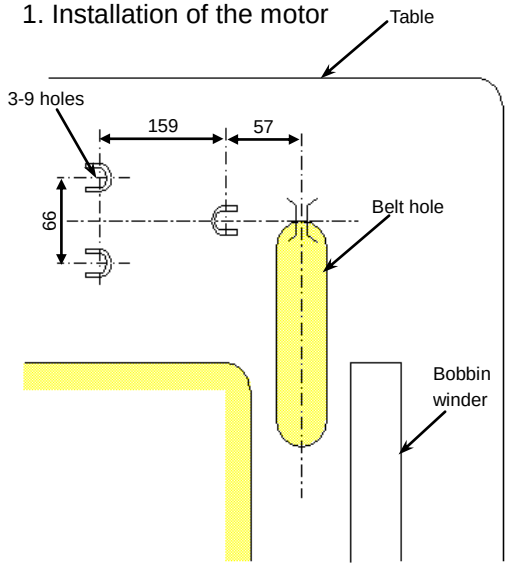
3. Left side of control box



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

5 Installation

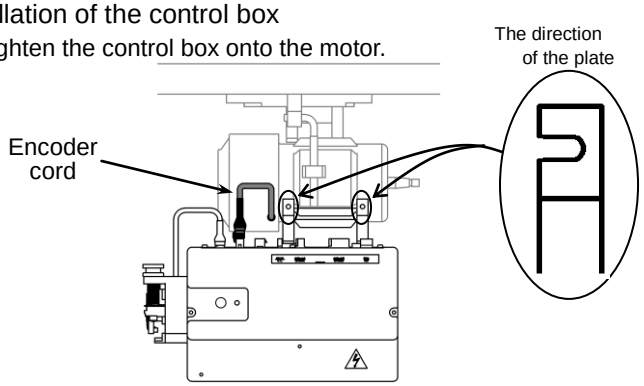
1. Installation of the motor



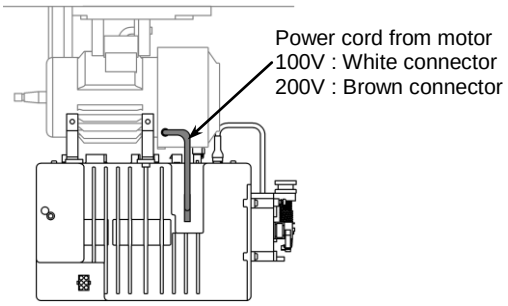
Open three 9mm holes on the table as seen from the above. Install the motor securely using the installation bolts, washers, spring washers and nuts.
The installation bolts, etc, are included with the motor as accessories.

2. Installation of the control box

(1) Tighten the control box onto the motor.



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

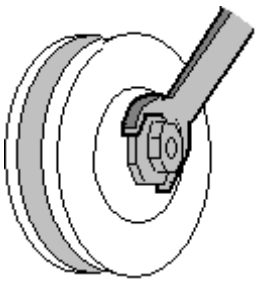


3. Installation of the pulley

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

Securely tighten the pulley.

Caution
Incomplete tightening may cause malfunctions.



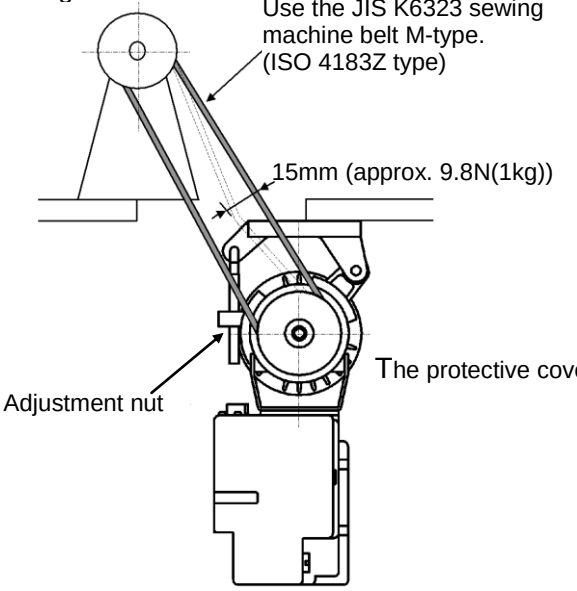
Select the correct pulley diameter to ensure complete use of the motor performance.

Selection of the motor pulley:

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

(*) The motor speed should be set at 3,600rpm. When the motor pulley diameter is selected with the above method and the pulley diameter is too small, select the minimum pulley in the range that the belt will not slip.
(**) Refer to page 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.

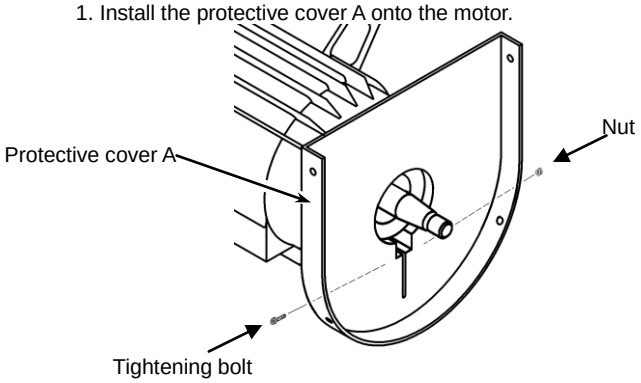
The protective cover A is not shown.

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

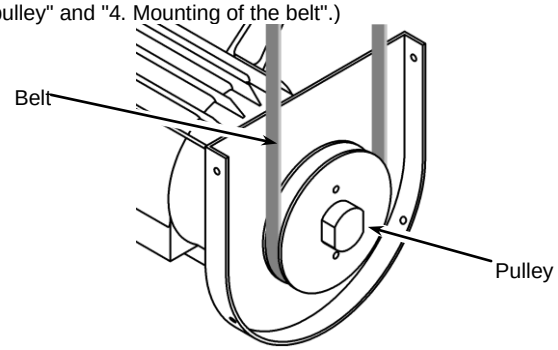
5. Installation of the protective cover (with belt slip off prevention part)

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

1. Install the protective cover A onto the motor.



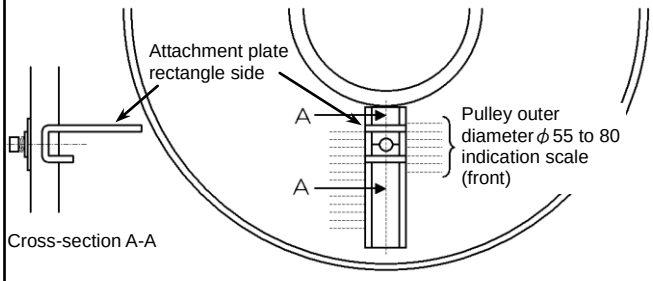
2. Install the pulley and attach the belt. (Refer to "3. Installing the pulley" and "4. Mounting of the belt".)



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

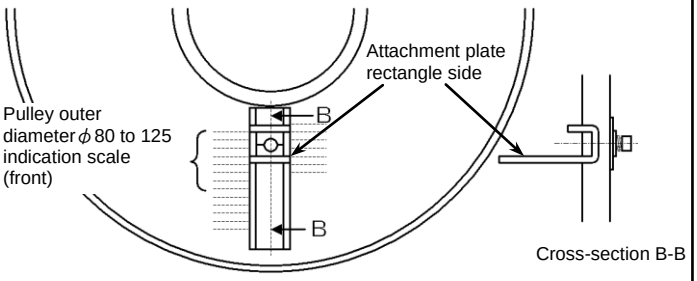
* Change the direction of the long and short side of the attachment plate according to the motor pulley outer diameter.

(a) For motor pulley outer diameter ϕ55 to ϕ80



(View from back of protective cover)

(b) For motor pulley outer diameter ϕ80 to ϕ125



(View from back of protective cover)

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

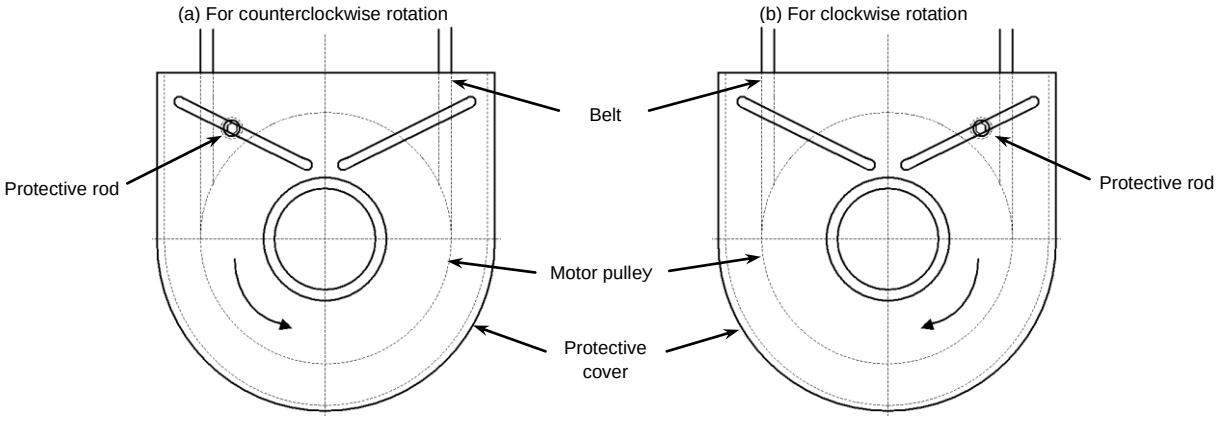
* Confirm that the belt does not contact the attachment plate.

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

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

(a) For counterclockwise rotation

(b) For clockwise rotation



(View from front of protective cover)

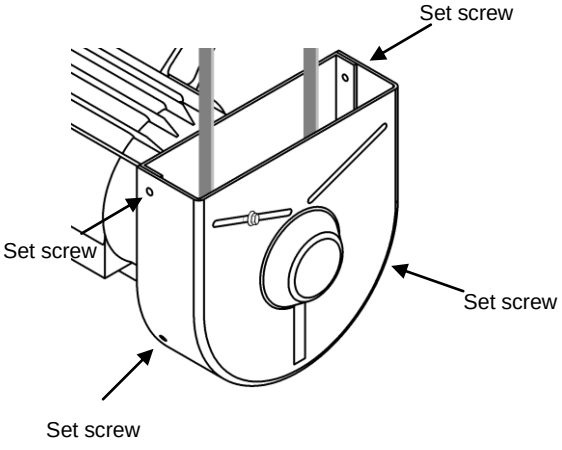
(View from front of protective cover)

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

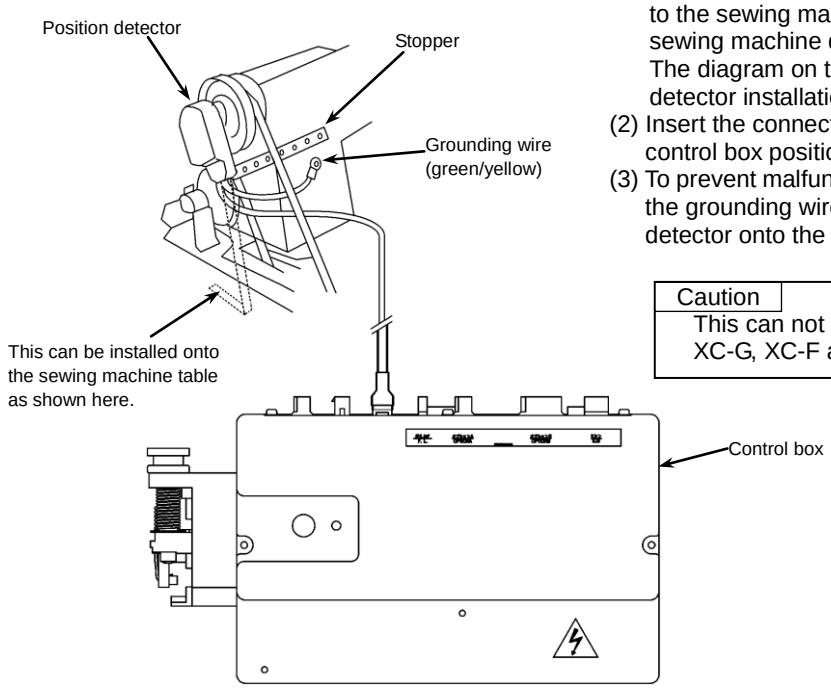
5. Set protective cover B onto protective cover A, and tighten with the four set screws.

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

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



6. Installation of the position detector



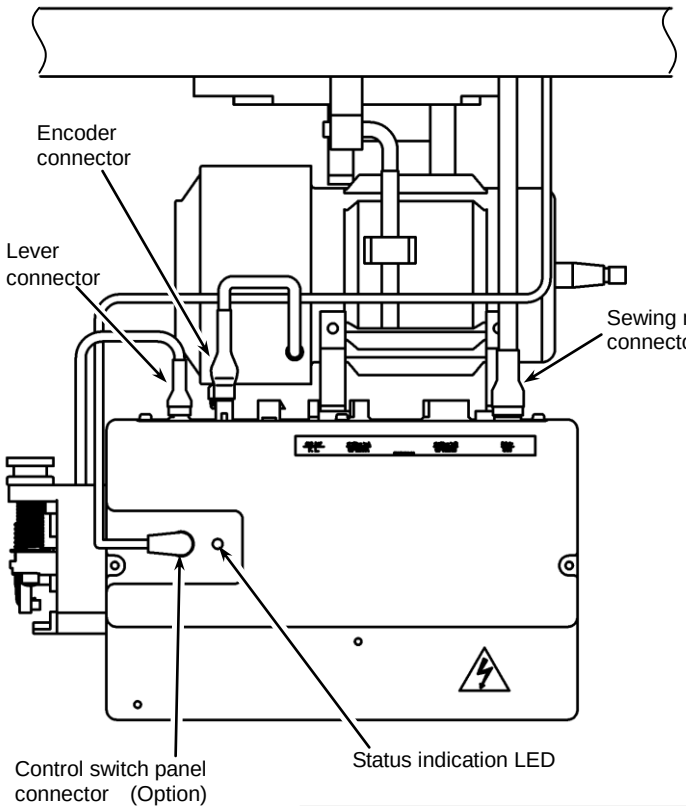
(1) The installation of the position detector will differ according to the sewing machine model, so please consult with your sewing machine dealer for details.
The diagram on the left shows an example of the position detector installation.
(2) Insert the connector from the position detector into the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

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

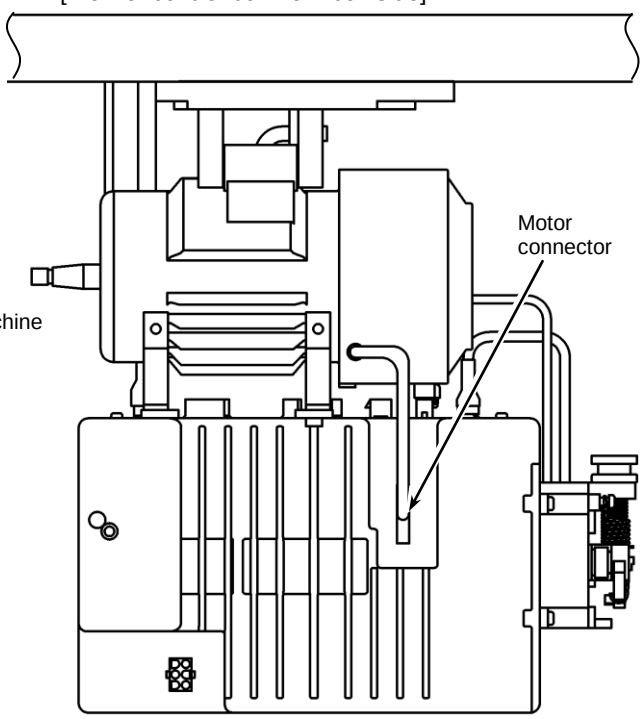
7. Connection of the Mitsubishi sewing machine and control box.

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

[View of control box from cover side]



[View of control box from box side]

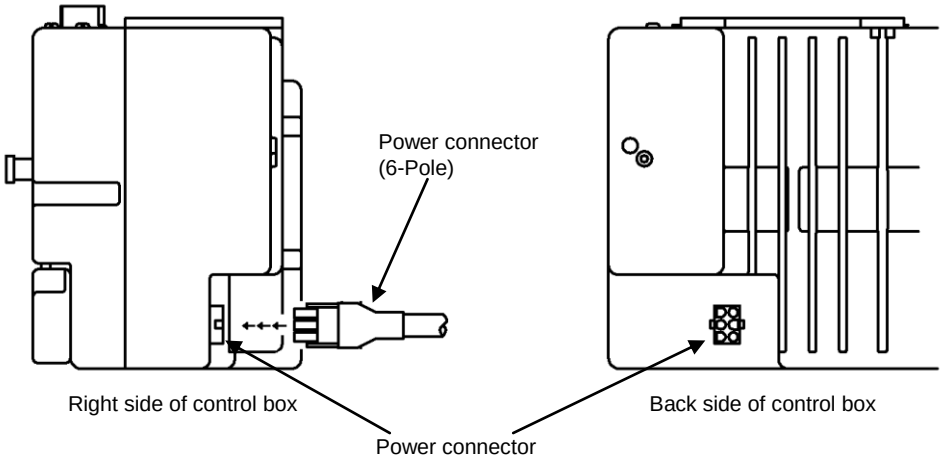


Caution
For safety purposes, always turn the power switch OFF and wait for the status indication LED or the [PWR. OF] (displayed for approx. 10 seconds) LED display on the control switch panel to turn OFF before connecting or disconnecting each connector.
This [PWR.OF] display is not an error.

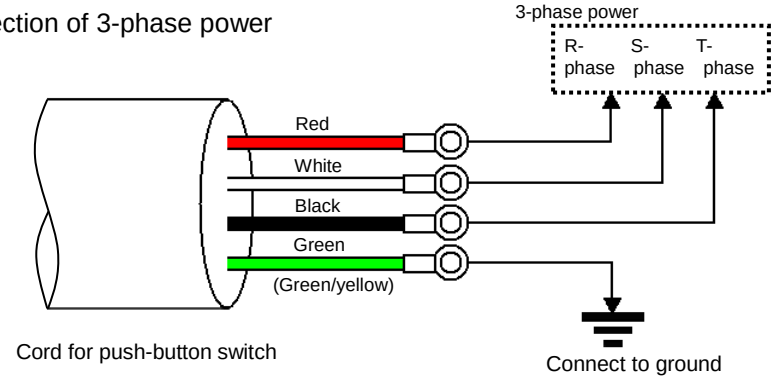
6 Wire and Grounding

1. Insertion of the power connector

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



2. Connection of 3-phase power



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

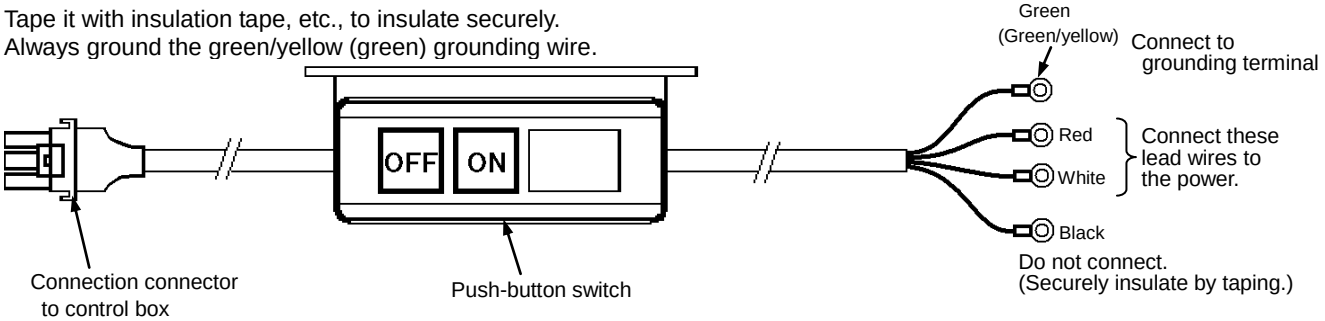
3. Current capacity

Use a fuse or complete breaker for the power.

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

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

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



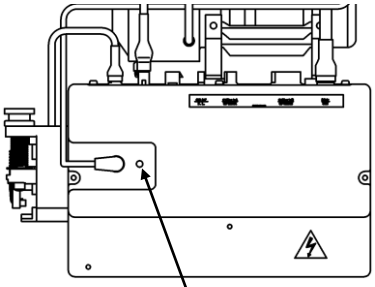
7 Confirmation

1. Before turning switches on.....

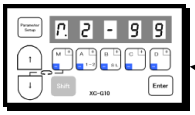
Places to confirm	Reference
(1) Is the power and capacity suitable ?	Current capacity on page 10.
(2) Is the power voltage the same as the factory preset voltage of the rated nameplate on the side of the control box?	Voltage value given on rated nameplate on side of control box. XC-GMFY-20-05 : 200 to 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.....

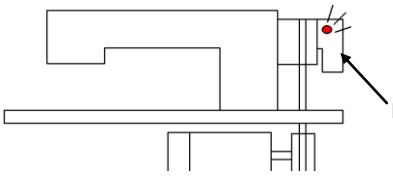
(1) Does the status indication LED on the control box light up in green?
There is a problem if the LED is flickering or is lit up in red.



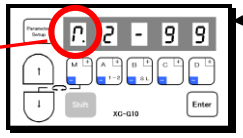
(2) Is the control switch panel LED turning ON?
(When control switch panel is connected)



(3) Does the position detector lamp light ?



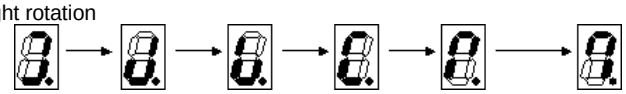
(4) Is the sewing machine rotation direction correct? (When control switch panel is connected)



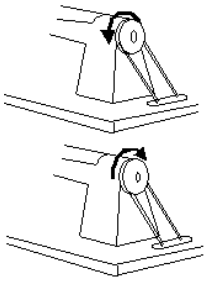
- For left rotation

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

- For right rotation

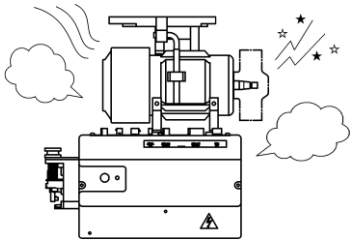


The sewing machine rotates to the right looking from the pulley side.



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?



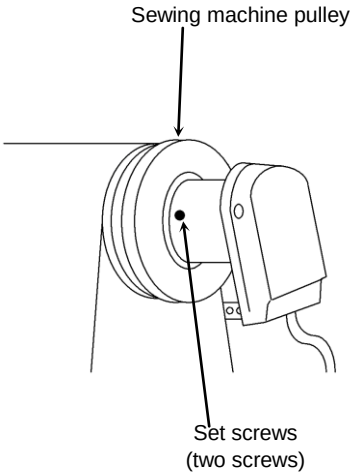
Turn the power OFF and disconnect the power plug from the socket if any heating, abnormal odors or abnormal noise is found. Contact your dealer immediately.

1. Adjustment of stopping position

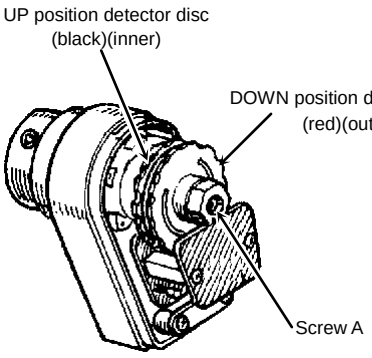
Adjust this position with the detector installed onto the sewing machine and while stopping at the UP and DOWN positions.
For safety, disconnect the connector for the sewing machine.

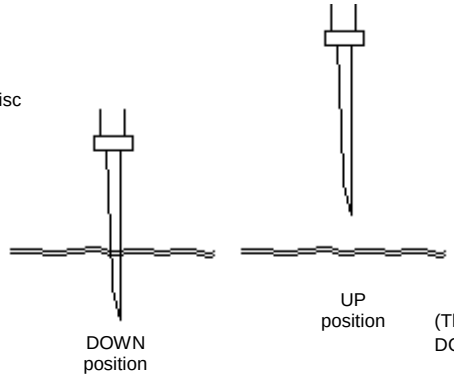
(1) Adjustment of UP position
- -Loosen the two set screws on the detector joint, and set the stop position by rotating by hand.
- -If adjustment is not possible by turning the joint, loosen the cross-recessed screw A shown of the following figure, and turn all detector plates simultaneously to adjust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

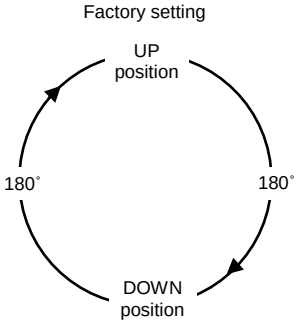
(2) Adjustment of DOWN position
- -The relation of the DOWN position and UP position will differ according to the model, so adjust this according to the sewing machine.
- -When changing the DOWN position, remove the detector cover, and turn only the red detector plate to adjust to the designated stop 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.



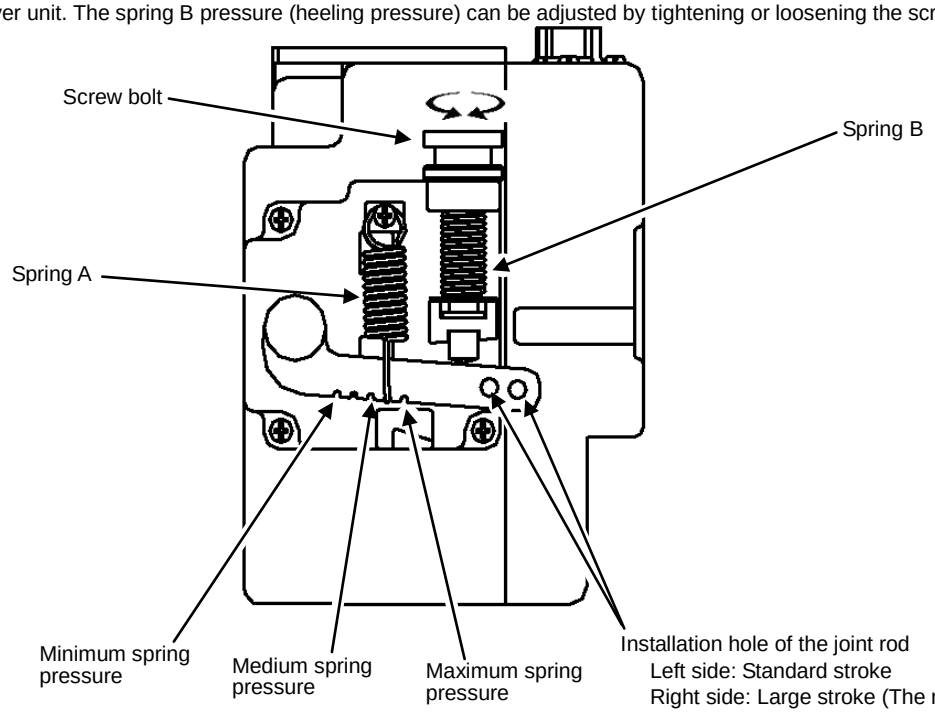




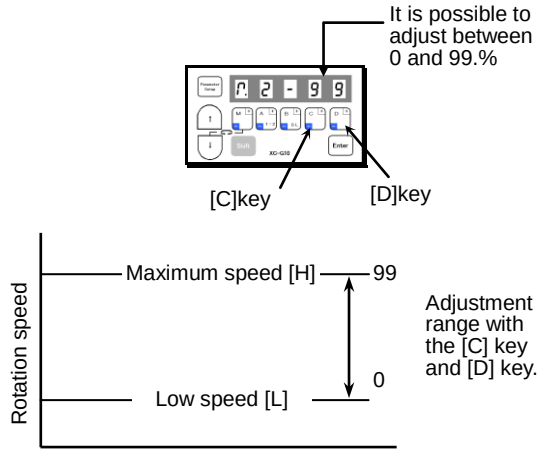
(The factory setting of the clearance from the DOWN position to UP position is approx. 180)

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

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



3. Adjustment of operation speed

Adjustment of each speed		Reference	Factory setting (speed)
Maximum speed	H	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. 	

Caution

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

9 Changing the solenoid voltage and output voltage

1. To change solenoid voltage DC24V/DC30V

To change solenoid voltage from 24V to 30V

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

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

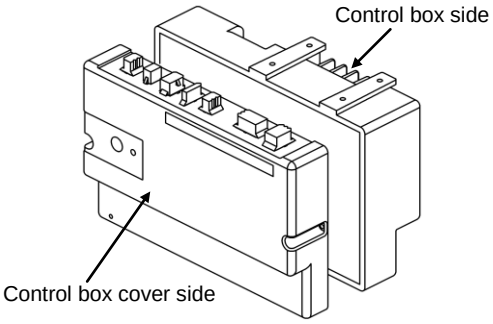
(3) Set the cover to the original position after change.

To change solenoid voltage from 30V to 24V

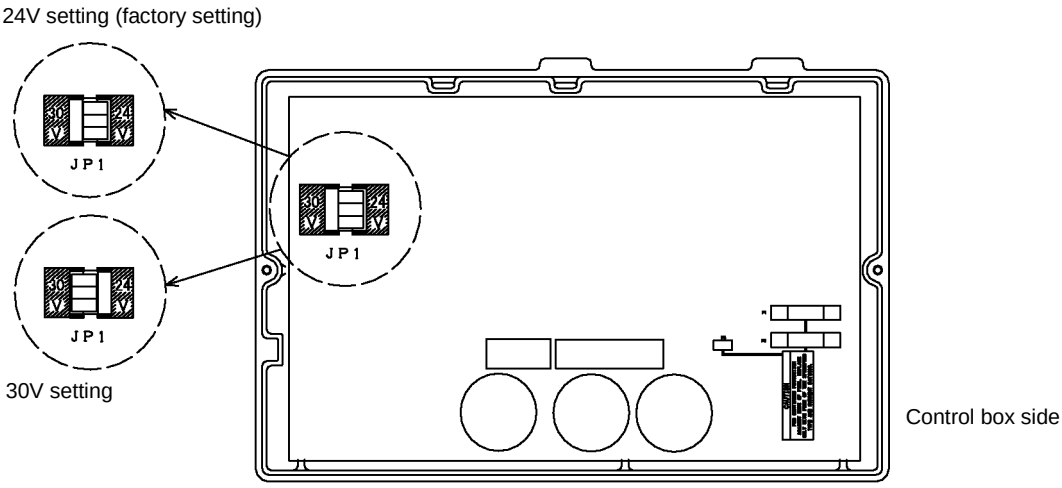
(1) Remove the front cover from the control box.

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

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



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



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

(1) Remove the control box cover.

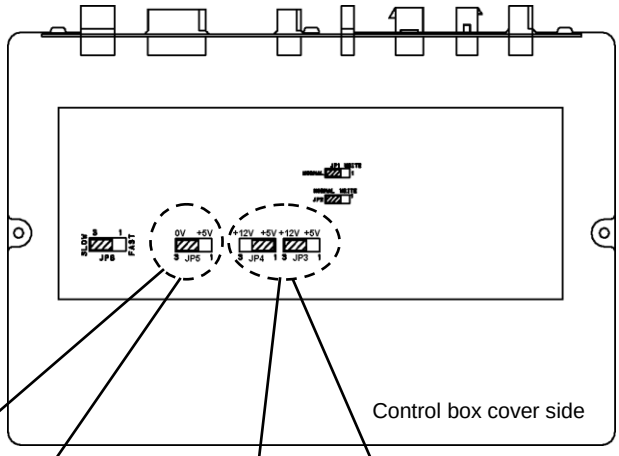
(2) Change the output voltage 5/12VDC with the jumper JP3 and JP4 on the front cover PCB as shown on the right. Change the output voltage 0/5VDC with the jumper JP5 on the front cover PCB.

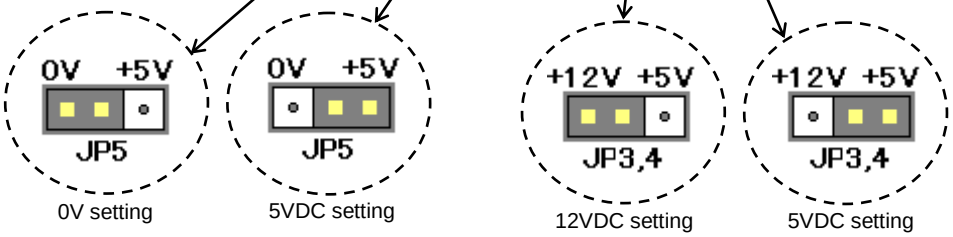
(3) The output voltage can be changed by reconnecting the connector as shown on the right.

(4) The factory setting

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

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





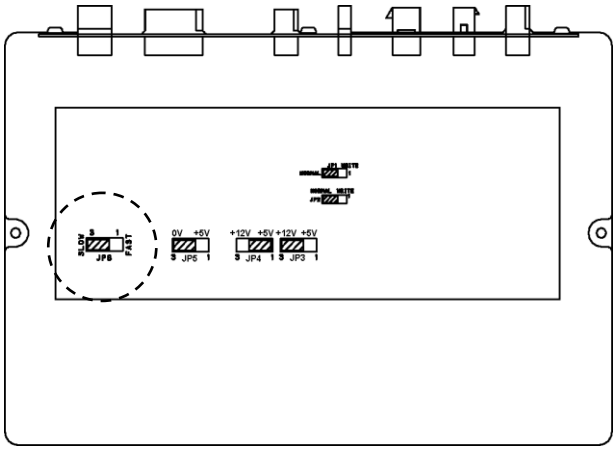
Wait at least 10 minutes after turning the power switch OFF before opening the control box.

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

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

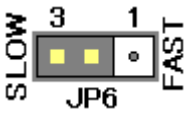
For safety, turn the power switch OFF before opening cover

(1) Remove the cover.

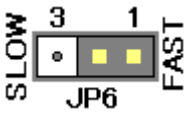


(2) The solenoid return speed can be increased with the setting of the JP6 connector on the front cover PCB as shown on the right.

(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

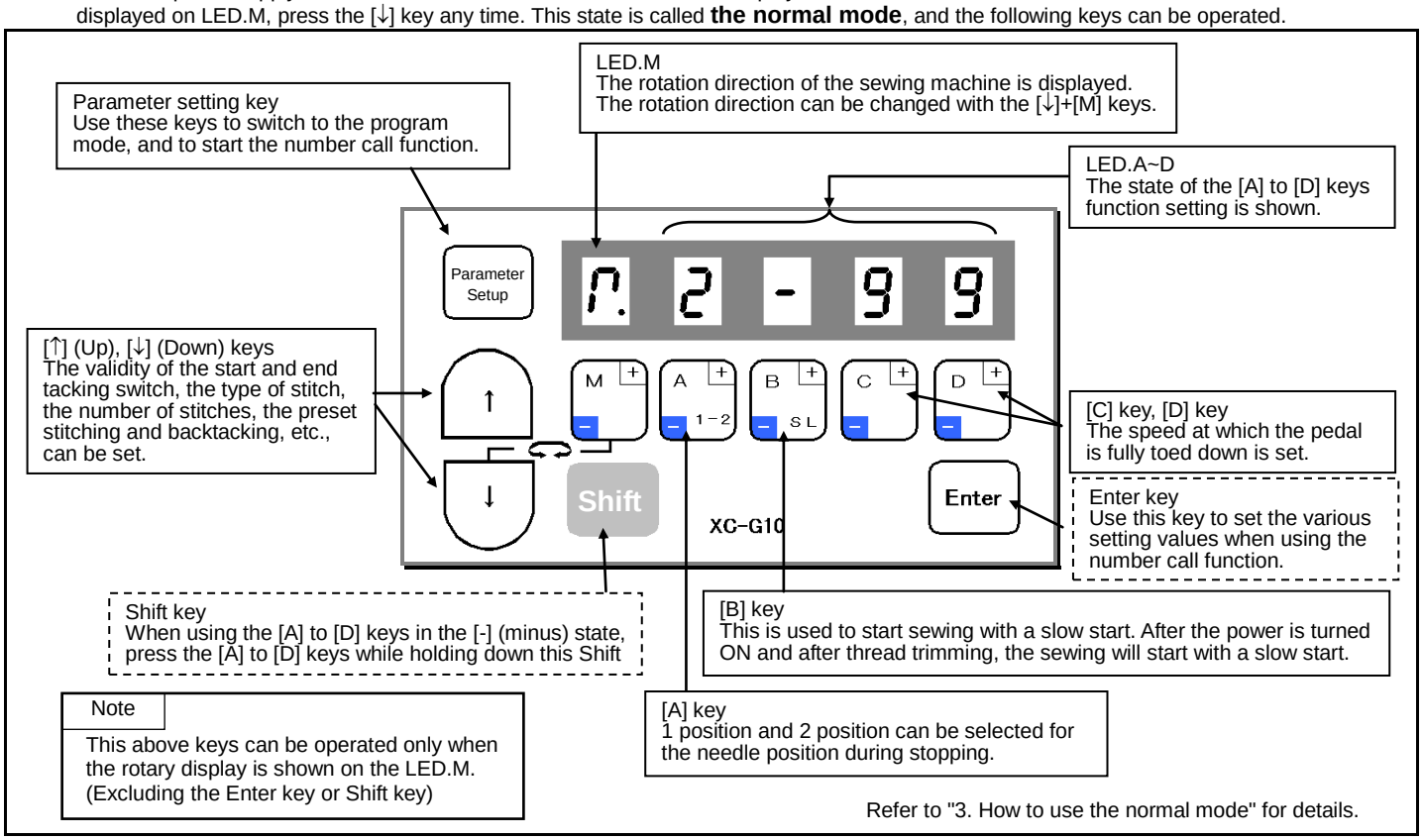
(5) After change, always set the cover to the control box.

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.



Refer to "3. How to use the normal mode" for details.

2. Selection of each mode

The modes can be changed from the normal mode to various program modes and various basic functions and application functions set with this control switch panel. (Refer to "24 Table of Program Mode Function" for details on each mode's function.)

(1) Types of program mode

Normal mode

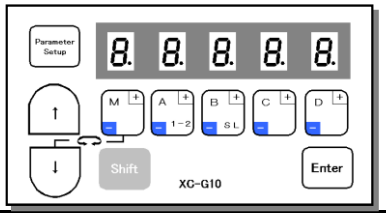
(The rotation direction is displayed on LED.M)

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

→
- Program mode [P] The setting to often use 1 *Sewing machine, etc.
- Program mode [A] The setting to often use 2 *Servo motor, etc.
- Program mode [B] The setting to often use 3 *Counter/Speed display, etc.
- Program mode [C] Applied function [C] setting mode * Customizing, etc.
- Program mode [D] Tacking setting mode
- Program mode [E] H/W checking mode * The input/output function can be checked, and the error statue during a fault can be investigated.
- Program mode [F] Cutter setting mode
- Program mode [G] Thread trimming timing setting mode
- Program mode [H] Setting speed limit setting mode
- Program mode [I] Save mode of the setting data
- Program mode [J] Panel switch cancel mode
- Program mode [K] Various setting mode
- Program mode [O] Extended I/O function
- Program mode [Q] Speed command, Speed limit, Thread break detector setting mode
- Program mode [R] Reset/returning to original data. * The state set with each program mode can be returned to the original settings (factory settings).
- Program mode [S] Simple sequence mode
- Program mode [1] Simple setting mode for Mitsubishi thread trimming sewing machine.
  Program mode [2] Simple setting mode for chain stitch sewing machine.
  Program mode [3] Simple setting mode for other lock stitch sewing machine.

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

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



Mode name	Key operation		Digital display		Return to the normal mode
Tacking type setting mode	Press the [↑] key one time from the normal mode.		b. - 2 - 2	*The tacking setting mode will be entered.	Press the [↓] key one time.
No. of tacking stitch setting mode	Press the [↑] key two times from the normal mode.		n. 4 4 4 4	*The tacking stitches setting mode will be entered. Note) Skipping 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. S r. 1.	*The pattern No. selection mode will be entered.	Press the [↓] key four times.
Program mode [P]	While holding down the [↓] key, press the [↑] key for 2 seconds or more from the normal mode.	The mode can also be selected with the "Direct number call operation". (Refer to the next section.)	P - P H. 4 0 0 0	*The display will flicker. *The program mode [P] will be entered. Switch the function item with the [↓] or [↑] key.	Press down [↓] key, press [↑] key.
Program mode [A]	While holding down the [↓] key, press the [A] key for 2 seconds or more from the normal mode.		P - A G A . L	*The display will flicker. *The program mode [A] will be entered. Switch the function item with the [↓] or [↑] key.	Press down [↓] key, press [↑] key.
Program mode [B]	While holding down the [↓] key, press the [B] key for 2 seconds or more from the normal mode.		P - b S. 0	*The display will flicker. *The program mode [B] will be entered. Switch the function item with the [↓] or [↑] key.	Press down [↓] key, press [↑] key.
Program mode [C]	While holding down the [↓] key, press the [C] key for 2 seconds or more from the normal mode.		P - C , A. P S U	*The display will flicker. *The program mode [C] will be entered. Switch the function item with the [↓] or [↑] key.	Press down [↓] key, press [↑] key.
Program mode [D]	While holding down the [↓] key, press the [D] key for 2 seconds or more from the normal mode.		P - d d 1. n	*The display will flicker. *The program mode [D] will be entered. Switch the function item with the [↓] or [↑] key.	Press down [↓] key, press [↑] key.
Program mode [E]	While holding down the [↓] key , press the [A] key and the [↑] key for 2 seconds or more from normal mode.		P - E 1. E - -	*The display will flicker. *The program mode [E] will be entered. Switch the function item with the [↓] or [↑] key.	Press down [↓] key, press [↑] key.
Program mode [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 A. 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 r r. n 1	*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.

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.	Press down [↓] key, press [↑] key.
				*The program mode [J] will be entered. Switch the function item with the [↓] or [↑] 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.	Press down [↓] key, press [↑] key.
				*The program mode [K] will be entered. Switch the function item with the [↓] or [↑] 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.	Press down [↓] key, press [↑] key.
				*The program mode [O] will be entered. Switch the function item with the [↓] or [↑] 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.	Press down [↓] key, press [↑] key.
				*The program mode [Q] will be entered. Switch the function item with the [↓] or [↑] 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.	Press down [↓] key, press [↑] key.
				*The program mode [S] will be entered. Switch the function item with the [↓] or [↑] 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.	Press [D] key for 2 seconds or more. [*1]
				*The program mode [I] will be entered.	
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.	Press [D] key for 2 seconds or more. [*1]
				*The program mode [R] will be entered.	
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.	Press [D] key for 2 seconds or more. [*1]
				*The program mode [1] will be entered. Switch the function item with the [↓] or [↑] key.	
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.	Press [D] key for 2 seconds or more. [*1]
				*The program mode [2] will be entered. Switch the function item with the [↓] or [↑] key.	
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.	Press [D] key for 2 seconds or more. [*1]
				*The program mode [3] will be entered. Switch the function item with the [↓] or [↑] key.	

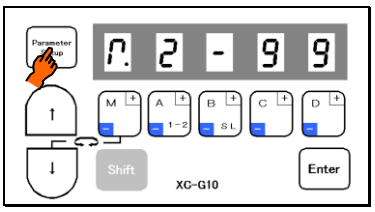
[*1] To return to the normal mode without executing each function in mode [I], [R], [1], [2]or [3], press the [↓] and [↑] keys simultaneously.

(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]

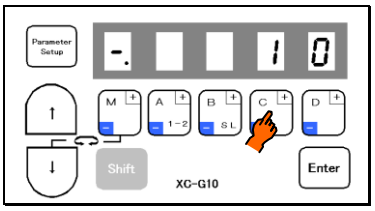
(1) Press Parameter Setup in the normal mode and switch to the number selection mode.



(The normal mode)

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

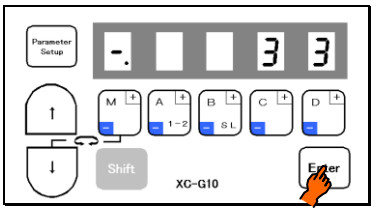
(To use the above "+/-" key as a "-" key, press A 1-2 to D while holding down Shift.)



(The number selection mode)

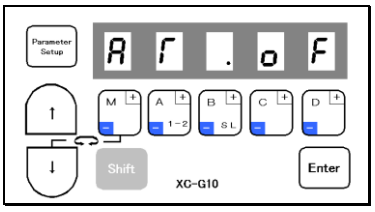
(3) When the target function item number appears, press Enter.

(Number 33 is called out in this example.)



(4) This completes calling of the function item.

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

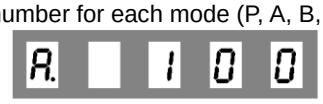


13 Function list

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

[Miscellaneous/Precautions]

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



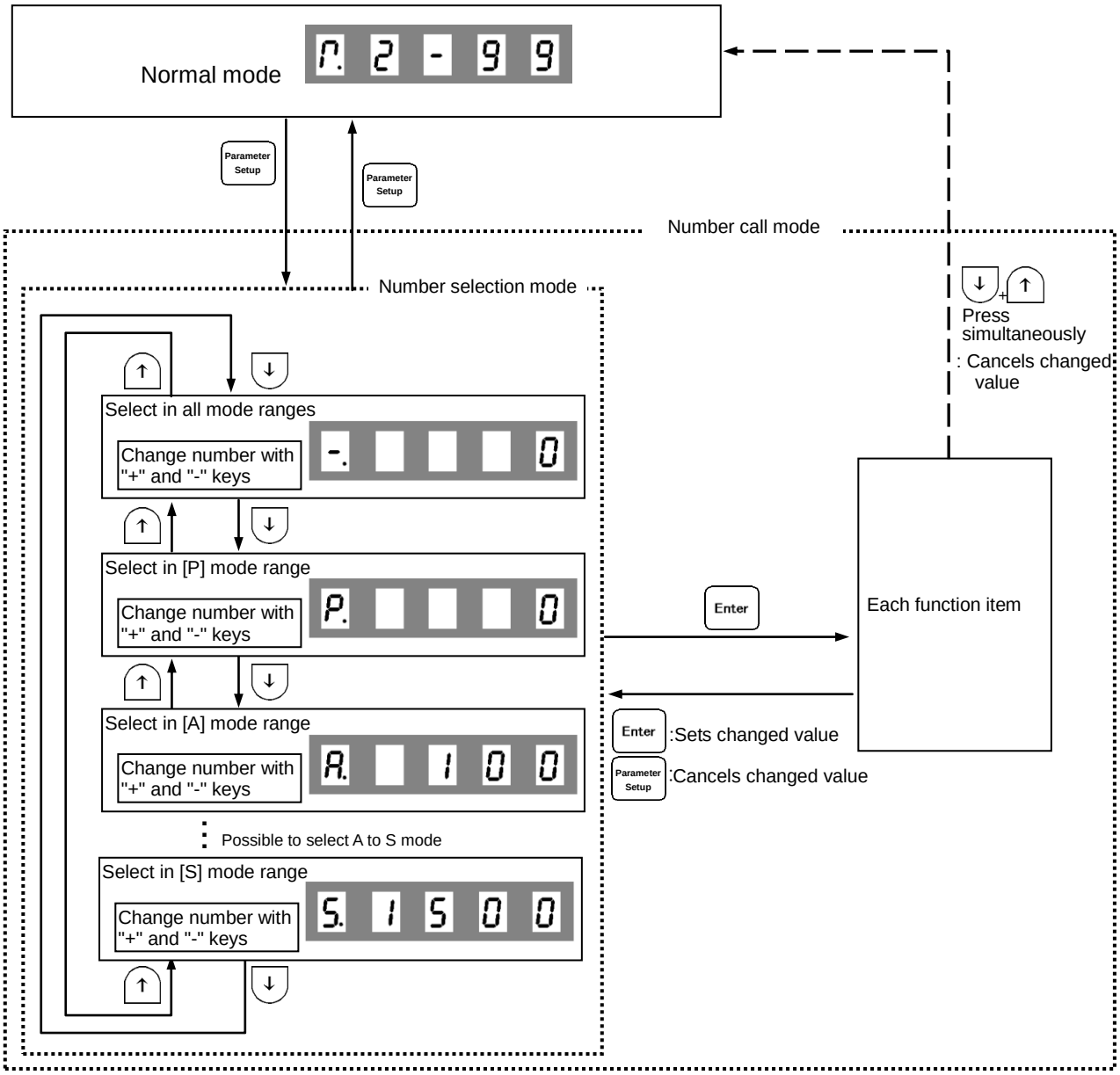
(Selection can be made in A mode range)

  (2) Selection of all mode numbers

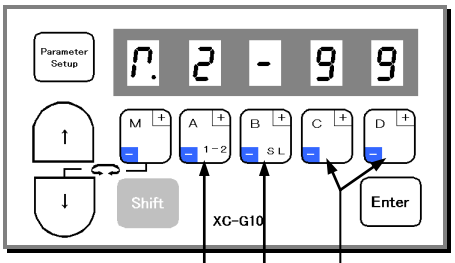
(Selection can be made in all mode ranges)

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

Status transition diagram (Direct number call operation)



3. Using the normal mode



Speed adjustment

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

Changing between position 1 and position 2

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

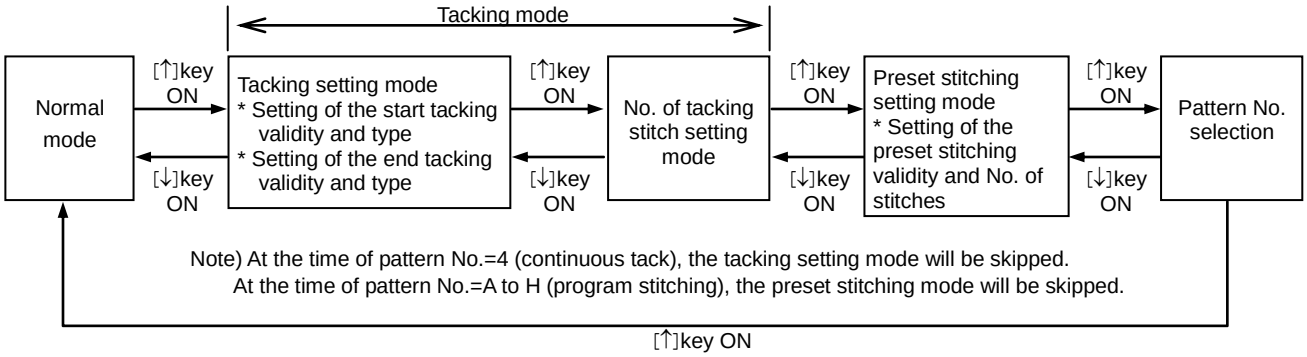
1 indicates position 1.
2 indicates position 2.

Slow start ON/OFF

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

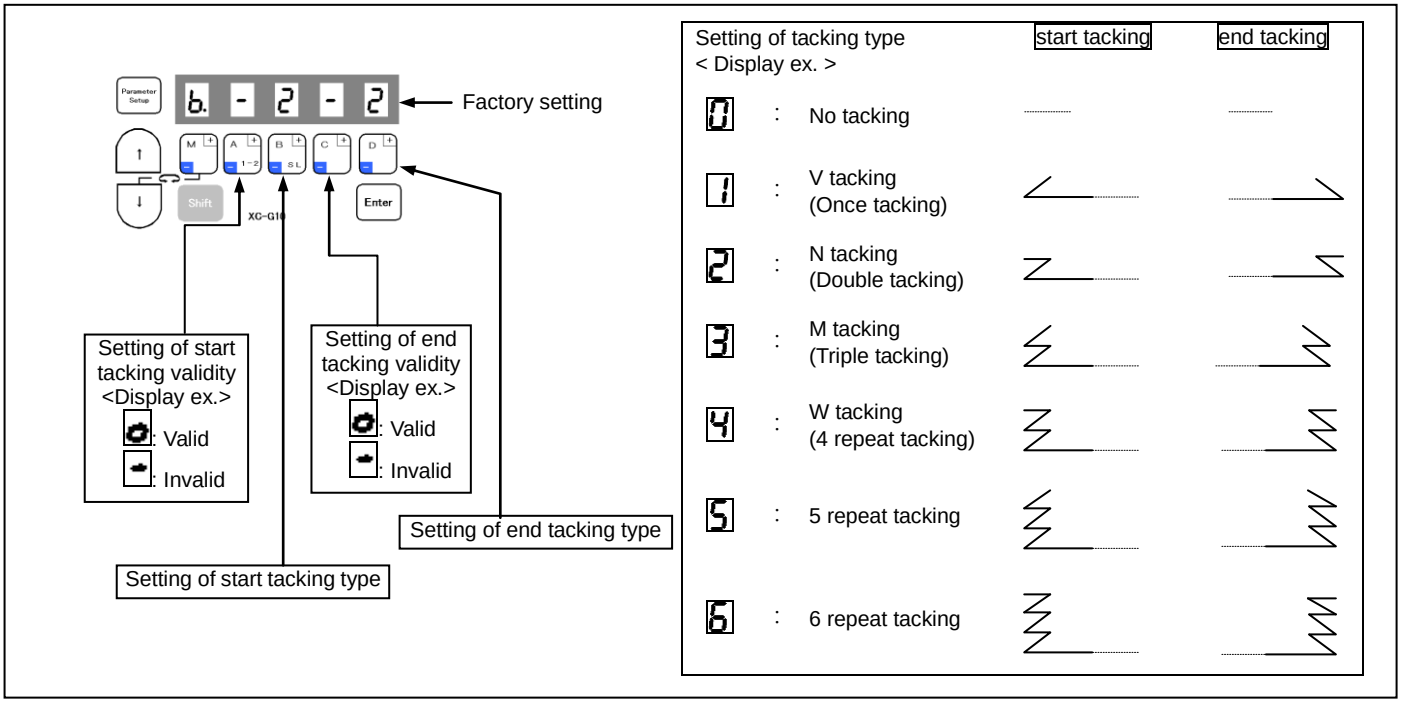
- indicates OFF.
0 indicates ON.

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



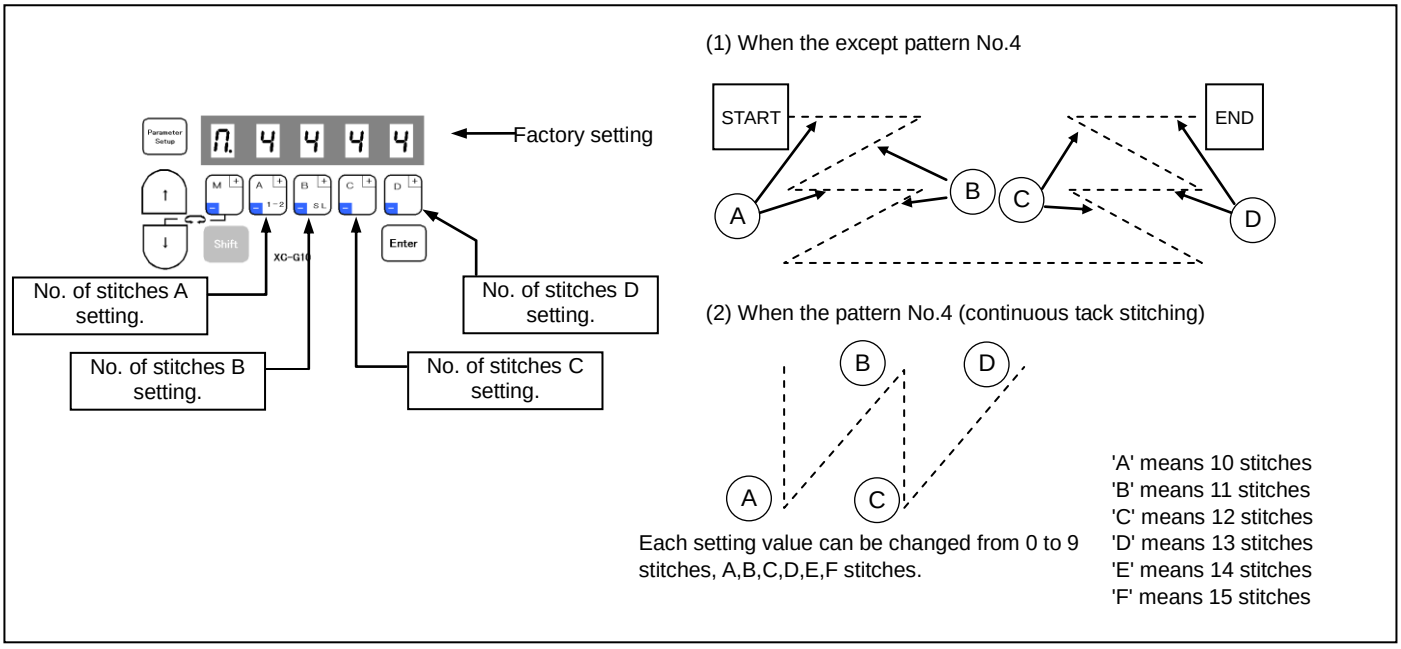
(1) Tacking setting mode (At the time of pattern No.=4, this mode will be skipped.)

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



(2) No. of tacking stitches setting mode

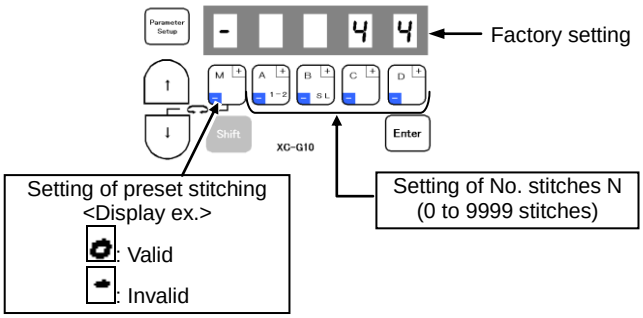
When the [↑] key is turned ON again, n. will display above the [M] key indicator, and the No. of stitches can be set.]

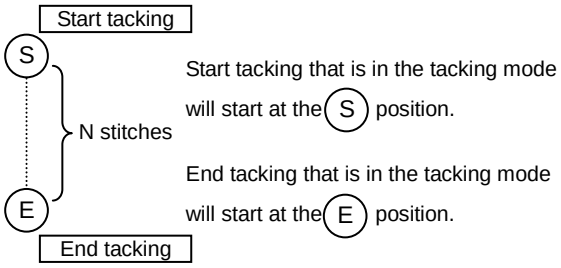


(3) Preset stitching setting mode

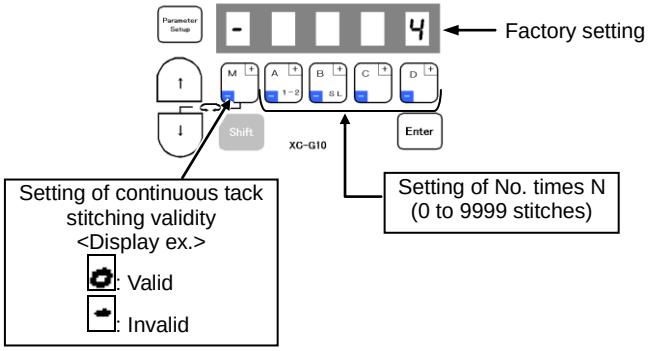
The preset stitching setting mode is entered when the [↑] key is turned ON again. The validity of preset stitching and the number of stitches N can be set.

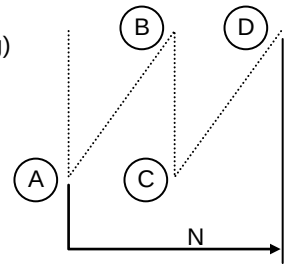
(1) When the pattern is the time except pattern No.4





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





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

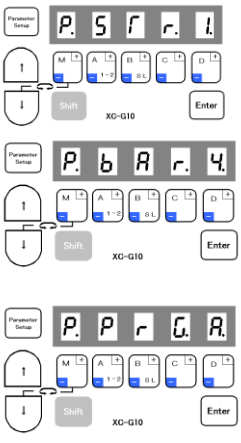
(4) Pattern No. selection mode

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

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

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

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



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

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

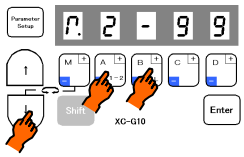
a. Patterns A to H correspond to the programs and teaching patterns A to H input with the XC-G500 type control panel. The control switch panel is used to change and confirm the settings.
(Refer to the XC-G500 type control switch panel instruction manual for details on the program and teaching.)

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

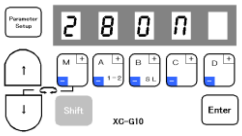
To set the settings to a specific machine in simple setting.
(For example, to set to "LU2-4410-B1T" ... Function setting [410B])

(1)



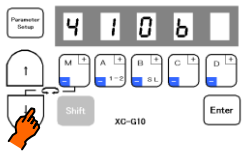
*Enter the program mode [1].
([↓] + [A] + [B] keys)

(2)



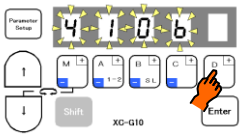
*The mode will change to the program mode [1].

(3)



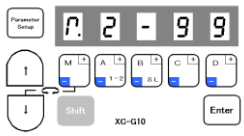
*Press the [↓] key or [↑] key to change the function to [410B].

(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].)

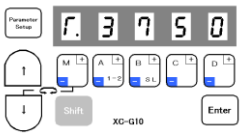
B. After selecting the function name, holds down the [D] key over 2 seconds or more. The function name's set speed and function setting will be set automatically. To return to the normal mode without setting the function name here, press the [↑] key while holding down the [↓] key.

> 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 Parameter Setup)

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

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

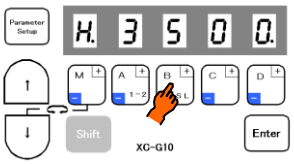
*1 Factory setting is [280M].
*2 The effective diameter of the sewing machine pulley is 70 mm.
(Note : In case of LY2-3310/3319/3750 it is 80 mm, LU2-4410/4412/4430/4650/4652/4710/4730 it is 85 mm.)
*3 A function name is displayed in order to the direction of [↓] every time it presses a [↓] key.
*4 A 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"))

(2)



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

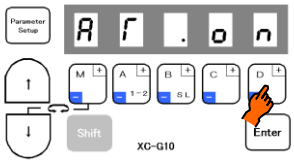
A. The setting range of the maximum speed is 0 to 8999 rotations.
B. By pressing each of the [A], [B], [C] and [D] keys, the setting value will change between 0 and 9. (However, the [A] key is only between 1 and 8.) To lower the value, press the [A], [B], [C], [D] keys while holding down the [Shift] 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.
(This explanation regarding the flickering dot is omitted in the following explanations.)

2. To set the standing work type .....Function 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"))

(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 Enter and then press Parameter Setup.

Description

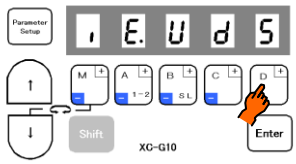
A. This is used for high speed operation during standing operations.
When setting it to turning ON, it operates at the speed with the rate which has been set with the [C] and the [D] key in normal mode regardless of the pedal stepping quantity.
B. This setting is first priority to the key switch [AUTO] 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"))

(2)



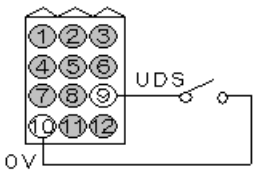
*Press the [D] key and set to "UDS" for the setting value.

(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])

sewing machine connector

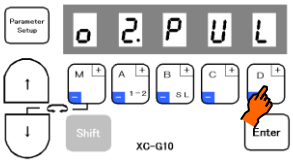


Note) When using this function, always return to the normal mode before starting operations.

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"))

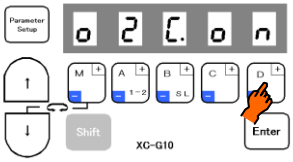
(2)



*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)

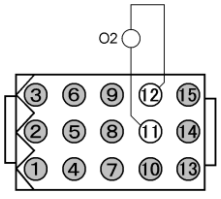


*Press the [D] key and set to "ON" for the setting value.

(5) Entering the normal mode
For mode call: [↓] + [↑]
For direct number call: Set with Enter and then press Parameter Setup.

Description

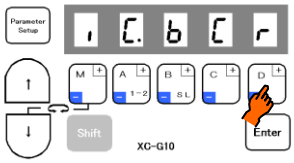
A. Select puller output [PUL]. Set to connect [O2] and [PUL].
B. The spare output O2 turns ON only when the presser foot lifter is operating.



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"))

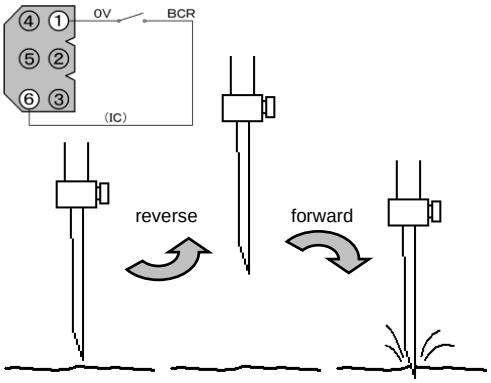
(2)



*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.

Option A



Description

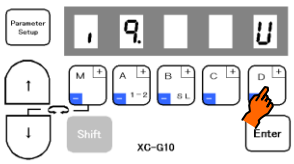
A. This is used to increase the penetration strength of the first stitch when the fabric is thick. Each time the switch [BCR] connected to the No.6 pin in the option A connector is turned ON, the (forward)-(reverse) operation will be repeated, and the needle will stop right with forward operation, above 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.

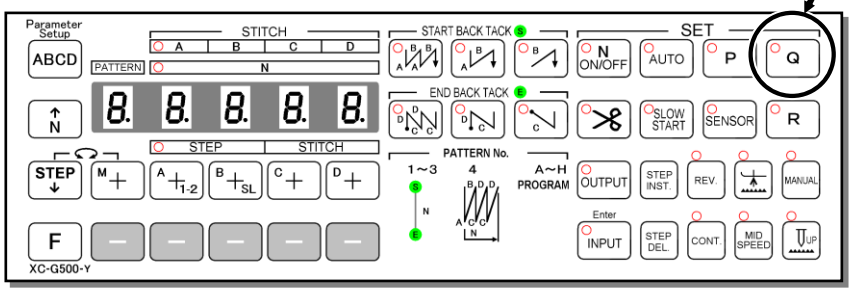
(3) Entering the normal mode
For mode call: [↓] + [↑]
For direct number call: Set with Enter and then press Parameter Setup.

Description

A. When the [Q] key of the control panel is pushed, the needle lift oparation 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.

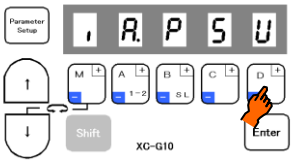
[Q] key



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)

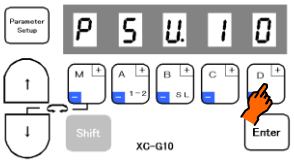


* Press the [D] key and set the value to "PSU".

(3) Set the function [IA] settings.
For mode call: [↓] + [↑]
For direct number call: Set with Enter.

(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"))

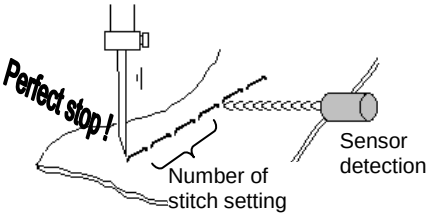
(5)



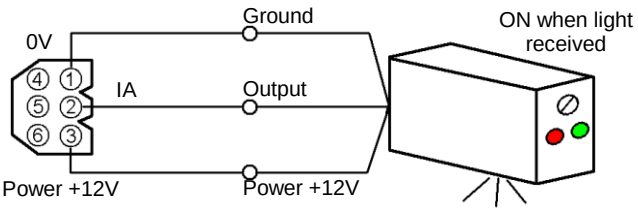
* Press the [C] and [D] keys and set the value to "10".

(6) Entering the normal mode
For mode call: [↓] + [↑]
For direct number call: Set with Enter and then press Parameter Setup.

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.

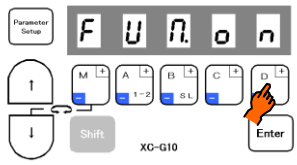
Sensor supply source : DC12V (40mA max.)
Sensor output type : NPN open collector type
(Residual voltage : 0.4V max. when 5V / 2.0mA)

(* 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"))

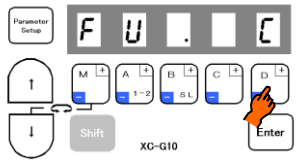
(2)



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

(3) 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.

(4)



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

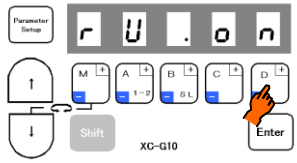
(5) Entering the normal mode
For mode call: [↓] + [↑]
For direct number call: Set with Enter and then press Parameter Setup.

Description
A. 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"))

(2)



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

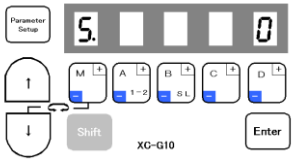
(3) Entering the normal mode
For mode call: [↓] + [↑]
For direct number call: Set with Enter and then press Parameter Setup.

Description
A. 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.****]

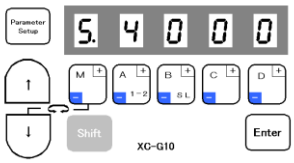
(1) Call out the program mode [B] function [S].
(This can be called with mode call or direct number call. Refer to pages 17 to 20.
(Direct call number = "0200"))

(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.

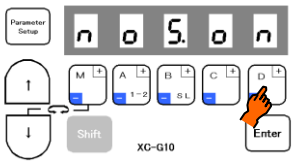
(4) Return to the normal mode after confirming
For mode call: [↓] + [↑]
For direct number call: Press Parameter Setup twice.

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

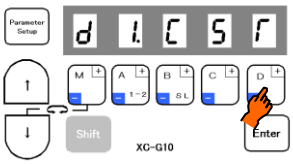
(1) To adjust tacking surely ..... Function setting [D1. CST] + [CT. 10]

(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)



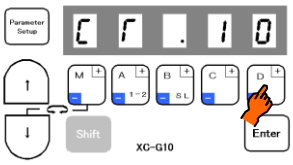
*Press the [D] key and set to "CST" for the setting value.

(3) Call out the program mode [D] function [CT].

For mode call: [↓]

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

(4)



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

(5) Entering the normal mode

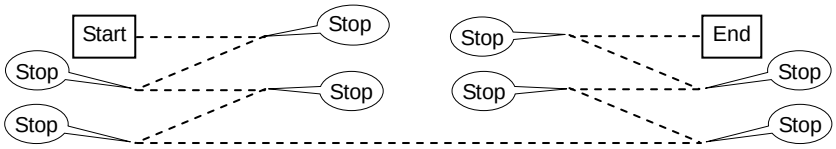
For mode call: [↓] + [↑]

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

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.)

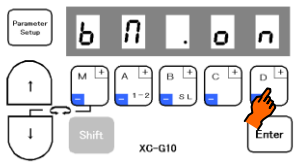
E. The setting value will change between 0 and 9 each time the [C] and [D] key is pressed in step (4). To lower the value, press the [C] or [D] key while holding down the [Shift] key.

(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 Enter and then press Parameter Setup.

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

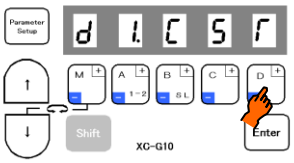
..... [D1. CST] + [CT. 1]

(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)



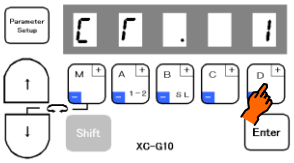
*Press the [D] key and set to "CST" for the setting value.

(3) Call out the program mode [D] function [CT].

For mode call: [↓]

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

(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 Enter and then press Parameter Setup.

Description

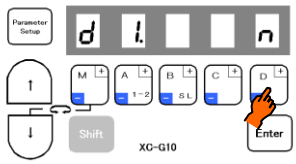
A. Set the type of start/end tacking and the no.of stitches before making the above setting. (Refer to page 21)
B. This setting is good for adjust tacking accurately.
C. Each time the [D] key is pressed in step 2), the setting will change in the order of [M], [D], [N], [CST], [CSU] and [CSD]. (factory 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 Enter and then press Parameter Setup.

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])

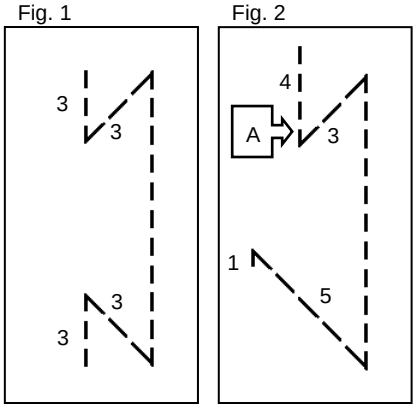
14. Setting the tacking stitch correction

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).)

Fig. 1 Fig. 2



Set stitches Actual stitches

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

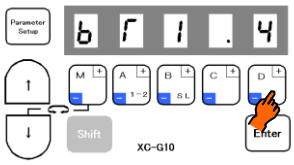
(This can be called with mode call or direct number call. Refer to pages 17 to 20. (Direct call number = from "0604" to "0606"))

(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)

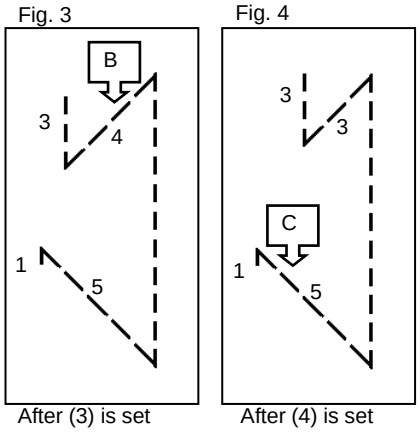
Call out the program mode [D] function [BT1].

(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.

Fig. 3 Fig. 4



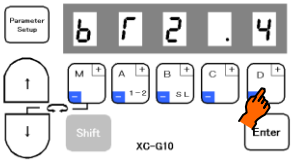
After (3) is set After (4) is set

(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 press Enter.



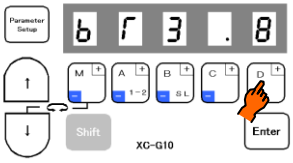
In the following table, the number of correction stitches "-1" corresponds to 4. Set [BT2] to 4. (This completes correction of the start tacking section.)

(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)

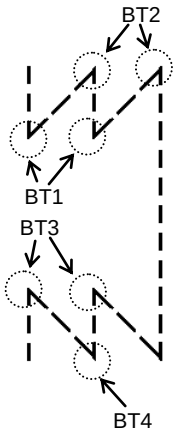
Call out the program mode [D] function [BT3].

For mode call: [↓]

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



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)



BT1: Correction for forward start tacking.
BT2: Correction for backward start tacking.
BT3: Correction for backward end tacking.
BT4: Correction for forward end tacking.

(6) Entering the normal mode

For mode call: [↓] + [↑]

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

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	$-2\frac{1}{4}$	-2	$-1\frac{3}{4}$	$-1\frac{2}{4}$	$-1\frac{1}{4}$	-1	$-\frac{3}{4}$	$-\frac{2}{4}$	$-\frac{1}{4}$	0	$+\frac{1}{4}$	$+\frac{2}{4}$	$+\frac{3}{4}$	+1	$+1\frac{1}{4}$	$+1\frac{2}{4}$

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.

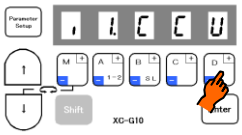
[2] When up counter amount "U" become the setting amount "P", sewing will be prohibited.

[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].**

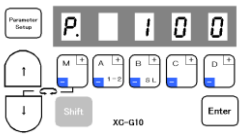
For mode call: [↓] + [↑]

For direct number call: Set with Enter.

(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)



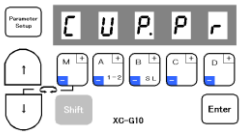
* Press the [A] to [D] keys and set the value to "100".

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

For mode call: [↓]

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

(7)



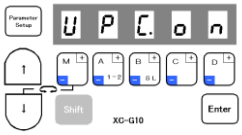
* Press the [D] key and set the value to "PR".

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

For mode call: [↓]

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

(9)



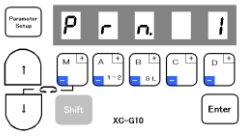
* Press the [D] key and set the value to "ON".

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

For mode call: [↓]

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

(11)



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

(12) **Entering the normal mode**

For mode call: [↓] + [↑]

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

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.

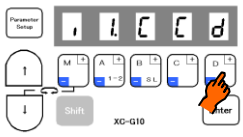
[PRN. 1] one trimming time add one count amount.

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"))

(2)

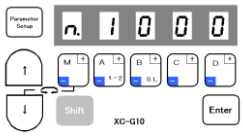


* Press the [D] key and set the value to "CCD".

(3) Set the function [I1].
For mode call: [↓] + [↑]
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"))

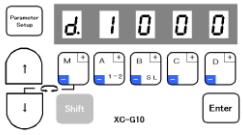
(5)



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

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

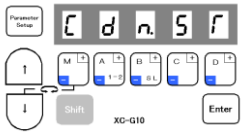
(7)



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

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

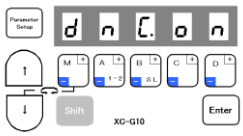
(9)



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

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

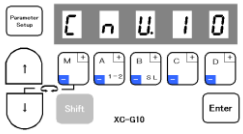
(11)



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

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

(13)



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

(14) Entering the normal mode
For mode call: [↓] + [↑]
For direct number call: Set with Enter and then press Parameter Setup.

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].

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.

Items marked with an asterisk * are the factory settings.

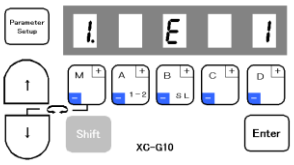
16. To check the error code history and input/output signal

(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].

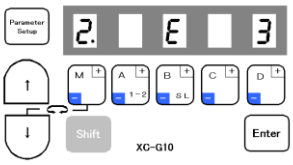
(This can be called with mode call or direct number call. Refer to pages 17 to 20. (Direct call number = "0700"))

(2) Call out function [1].



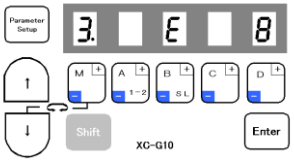
* The last error code is displayed.
(Ex. error code E1 is displayed.)

(3) Call out function [2].



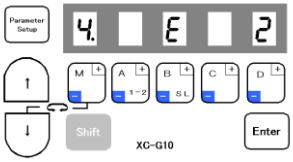
* The error code before the last is displayed.
(Ex. error code E3 is displayed.)

(4) Call out function [3].



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

(5) Call out function [4].



* The error code before the third is displayed.
(Ex. error code E2 is displayed.)

(6) Entering the normal mode

For mode call: [↓] + [↑]

For direct number call: Press Parameter Setup.

Description

A. 4 times errors from the last to the fourth error can be viewed.
B. Refer to page 211 for the error code.

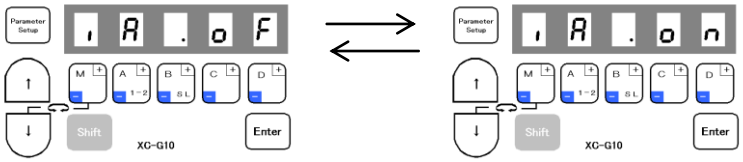
(2) To check input signals

..... 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
Backstiting 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.

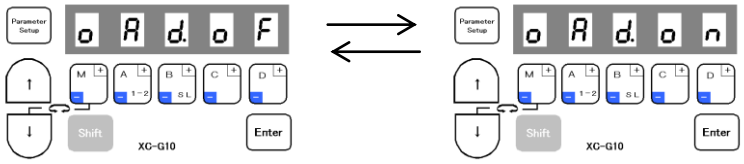
(3) To check output signal (check in operation)

..... 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

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

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

(3) Entering the normal mode

For mode call: [↓] + [↑]

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

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)	OBO
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: [↓] + [↑]

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

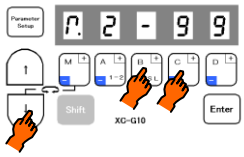
Description

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.

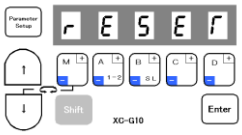
17. To return all settings to the factory settings ..... Function setting [RESET]

(1)



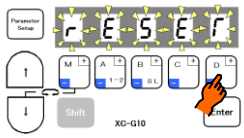
* Enter program mode [R]
([↓] + [B] + [C] keys)

(2)



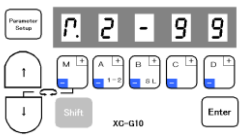
* Program mode [R] will be entered.

(3)



* [RESET] will flicker when the [D] key is held down, and the reset process will be executed.

(4)



* The data will be set to the factory setting when the [D] key is pressed over 2 seconds or more, and then the normal mode will be returned to. (Process is completed)

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.

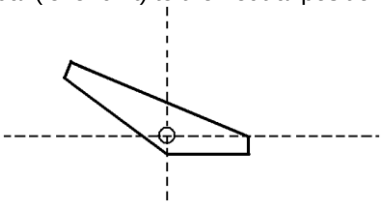
B. To return to the normal mode from the [RESET] display without executing the reset process, press the [↑] key while holding down the [↓] key. In this case, the settings will not be returned to the factory setting.

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.

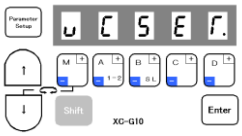
18. To adjust the position data for the lever unit ..... Function setting [VCSET]

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



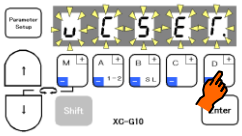
(2) Call out the program mode [Q] function [VCSET].

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



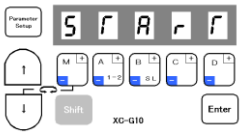
* Enter program mode [Q] ([↓] + [A] + [C] keys)

(3)



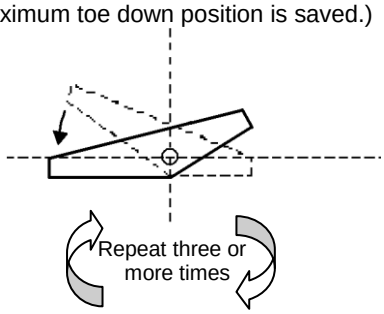
[VCSET] will flicker when the [D] key is held down.

(4)

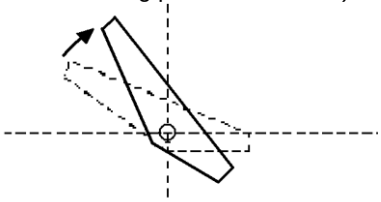


The display will change to [START].
(The neutral position is saved at this point.)

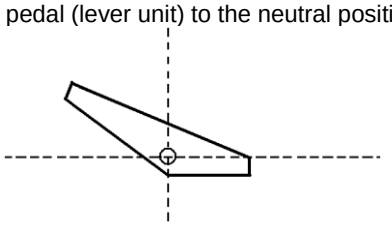
(5) Fully toe down the pedal (lever unit).
(The maximum toe down position is saved.)



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



(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

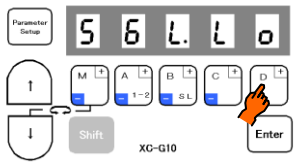
- To enter the [VCSET] state with mode call and then return to the normal mode, press down the [↓] and [↑] keys simultaneously. The lever unit's neutral, toe down and heeling positions are not adjusted in this case.
- The error "MA" will appear as shown on note 1, when the position data for the lever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

(2)



*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 Enter and then press Parameter Setup.

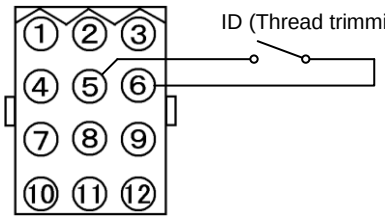
Description

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 when the sewing machine stops.)

D. Connection example



Sewing machine

ID (Thread trimming protective signal S6)

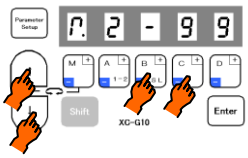
[HI] setting.....Stops when S6 is open.
[LO] setting.....Stops when S6 is short circuited.

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

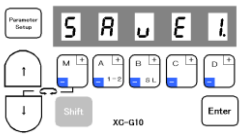
1. How to use the program mode [I]
   To save the setting data ..... Function setting [SAVE*]
   (Two types of data, [SAVE1] and [SAVE2] can be saved. The [SAVE1] data can be read out with [LOAD1], and the [SAVE2] data with [LOAD2].)

(1)



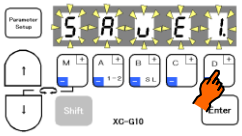
* Enter program mode [I]
  ([↓] + [↑] + [B] + [C] key)

(2)



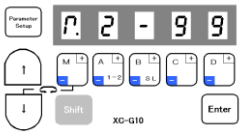
* Program mode [I] will be entered.

(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)

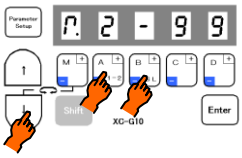
Description

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.

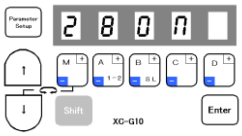
D. Reading the setting data saved with the [SAVE*] function
   The setting data saved with the [SAVE*] function above can be read out with the following procedure (program mode [1]).

(1)



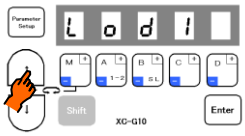
* Enter program mode [1]
  ([↓]+[A]+[B] key)

(2)



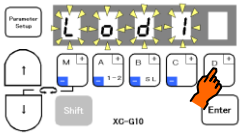
* Program mode [1] will be entered.

(3)



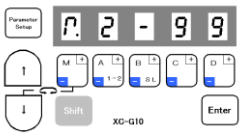
Press the [↑] key and set the function to [LOAD1].

(4)



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

(5)

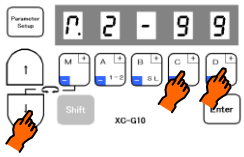


* Press [D] key (2 seconds or more) to return to the normal mode. (Process is completed)

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

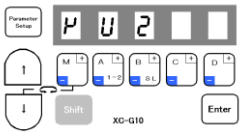
1. How to use the program mode [2]
   No.1 To set the functions for chain stitch sewing machine in simple setting
   (Ex. to set for the VC2800, VC3800 class, "YAMATO").....Function setting [YU4]

(1)



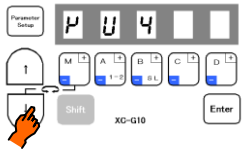
*Enter the program mode [2].
([↓] + [C] + [D] keys)

(2)



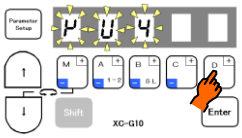
*The mode will change to the program mode [2].

(3)



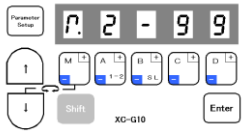
*Press the [↓] key or [↑] key to change the function to [YU4].

(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.

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	1/2 pos	High speed H	Low speed L	Trimming speed T	Start condensed speed N	End condensed speed V
YU2	YAMATO	VC2600, VC2700 class Solenoid-operated under thread trimmer	Fig.1	Fig.50	30V	12V	Sewing machine stops when switch:open	*Note 6	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			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	Sewing machine stops when switch:open	*Note 6	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			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	***Do not use !!***												
NO7	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
NO7A	PEGASUS	W(T)600,200 series /UT device 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 theread 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 signal S6	Note 4 Setting of switch to increase solenoid return speed	1/2 pos	High speed H	Low speed L	Trimming speed T	Start condensed speed N	End condensed speed V
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	1400
KA2	KANSAI	D series Automatic thread trimmer with air wiper	Fig.7	Fig.53	30V	12V			2	6000	250	250	1400	1400
KA3	KANSAI	F series Air-operated under thread trimmer with air wiper	Fig.8	Fig.53	30V	12V			2	6000	250	250	1400	1400
KA4	KANSAI	DX series Air-operated under thread trimmer with air wiper	Fig.7	Fig.53	30V	12V			2	6000	250	250	1400	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	2999
UN2	UNION SPECIAL	34800skcc class Solenoid-operated under thread trimmer	Fig.10	Fig.54	30V	12V			2	5500	200	200	1400	2999
UN3	UNION SPECIAL	34700 class Push and Pull air-operated under thread trimmer with air wiper	Fig.10	Fig.55	30V	12V			2	4000	200	200	1400	2999
U345	***Do not use !!***													
U346	***Do not use !!***													
U348	***Do not use !!***													
U347	***Do not use !!***													
U160	***Do not use !!***													
U16	***Do not use !!***													
U362	***Do not use !!***													
UFCW	***Do not use !!***													
BR1	BROTHER	FD3, FD4 series	Fig.11	----	24V	5V	Sewing machine stops when switch:short	*Note 6	2	6000	200	200	1400	1400
RM1	RIMOLDI	----	Fig.12	----	24V	5V			1	6000	200	200	1400	1400
SRB1	SIRUBA	----	Fig.13	----	24V	5V			2	6000	200	200	1700	1700
JMH	JUKI	MH-481-4-4, MH-484-4-4 class	Fig.14	----	24V	5V			2	5500	200	200	1700	1900

Note : The function name will display in the order of [YU2], [YU3], [YU4].....[NO1].....[KA1].....[UN1].....[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.

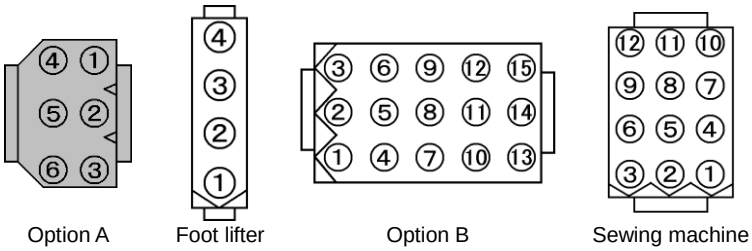
1. Refer to page 14 for how to change the solenoid voltage. The factory setting is 24V.
2. Refer to page 14 for how to change the option A connector DC5V/12V. The factory setting is 12V.

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

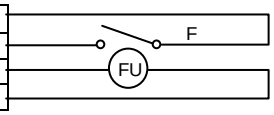
Fig.1 "YAMATO"

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



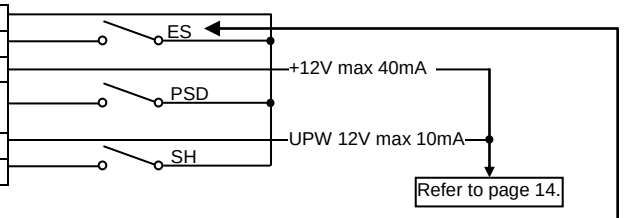
Presser foot lifter

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



Option A (Black connector)

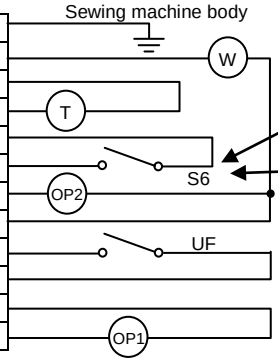
	0V	1
IA	Emergency stop signal	2
	Power +12V	3
IB	Needle DOWN position priority stop signal	4
O4	Needle UP position output	5
IC	One shot signal	6



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

Sewing machine

	Ground	1
OB	Wiper output	2
	+30V	3
OA	Thread trimming output	4
	0V	5
ID	Thread trimming protection signal	6
OD	Operation/thread trimming output	7
	+30V	8
IE	Needle lifting/presser foot lifting signal	9
	0V	10
	+30V	11
OC	Operation output	12

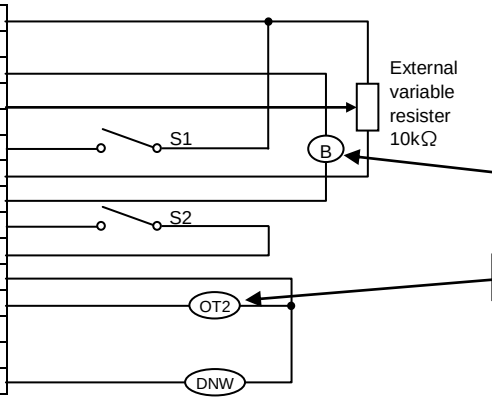


Sewing machine stops when S6 : Open

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
	+5V	7
	+30V	8
I2	Thread trimming signal	9
	0V	10
	+30V	11
O2	Solenoid output No.2	12
O7	-----	13
O6	-----	14
O3	Needle DOWN position output	15



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

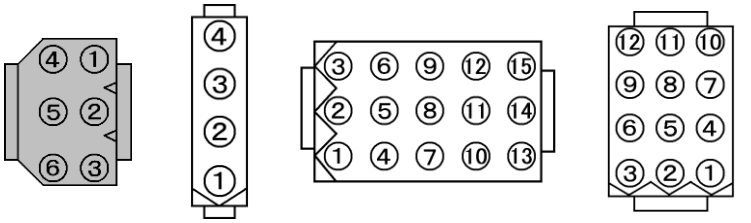
Note : Nothing is output.

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.

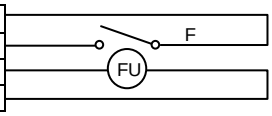
Fig.2 "PEGASUS"

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



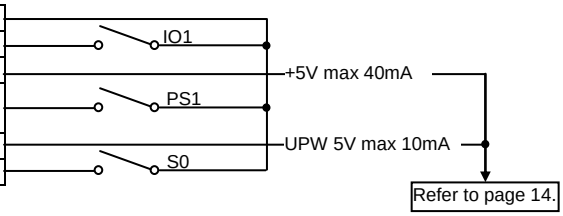
Presser foot lifter

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



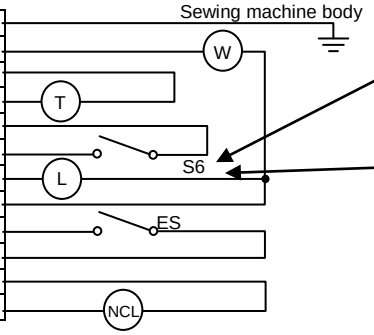
Option A (Black connector)

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



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



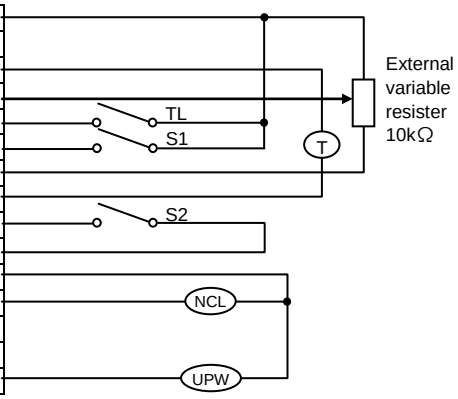
Caution :
The rotation direction display of the control switch panel will stop when the sewing machine does not work.

Sewing machine stops when S6 : Open

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

Option B

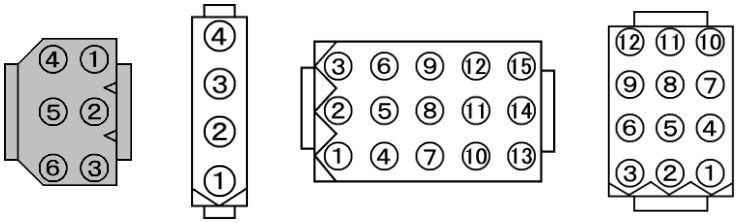
	0V	1
I4	Needle DOWN position priority stop signal	2
O1	Thread trimming output	3
VC2	Variable speed command	4
I5	Thread trimmer cancel signal	5
I1	Operation signal	6
	+12V (Change JP4 connector)	7
	+24V	8
I2	Thread trimming signal	9
	0V	10
	+24V	11
O2	Needle cooler output	12
O7	Output for the PS1 counting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



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.

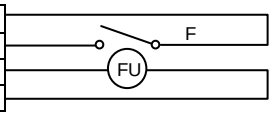
Fig.3 "PEGASUS"

Function setting [NO5], [NO5A]



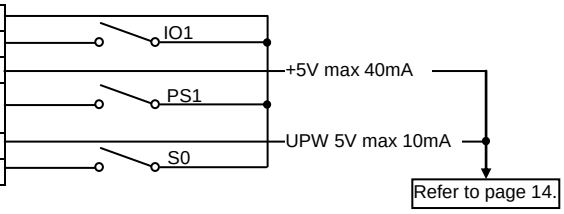
Presser foot lifter

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



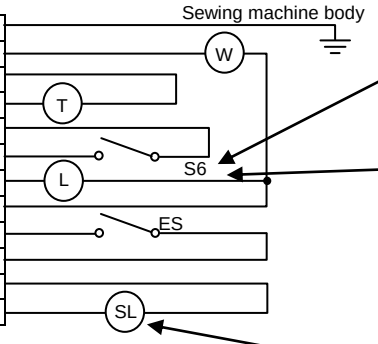
Option A (Black connector)

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



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	Output for slow start	12



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

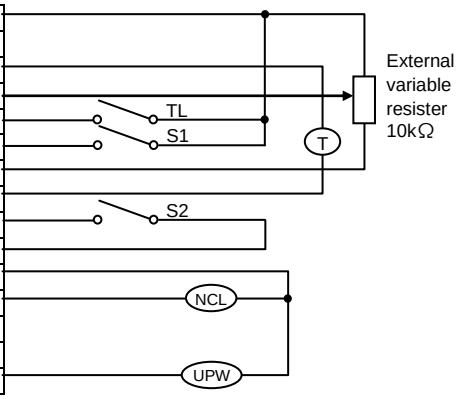
Sewing machine stops when S6 : Open

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

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

Option B

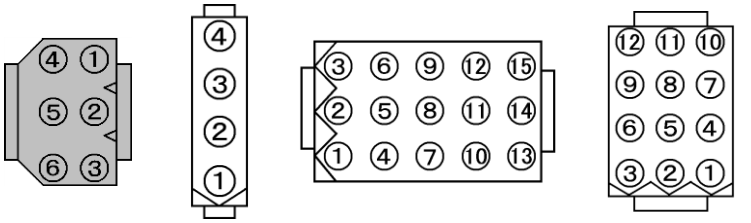
	0V	1
I4	Needle DOWN position priority stop signal	2
O1	Thread trimming output	3
VC2	Variable speed command	4
I5	Thread trimmer cancel signal	5
I1	Operation signal	6
	+12V (Change JP4 connector)	7
	+24V	8
I2	Thread trimming signal	9
	0V	10
	+24V	11
O2	Needle cooler output	12
O7	Output for the PS1 counting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



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.

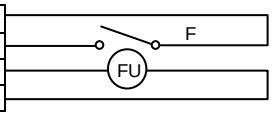
Fig.4 "PEGASUS"

Function setting [NO7] and [NO7A]



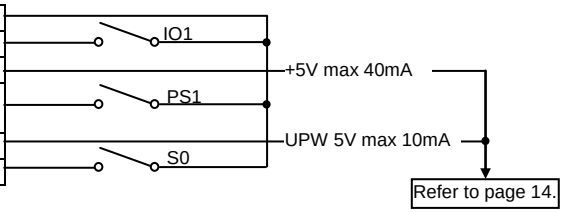
Presser foot lifter

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



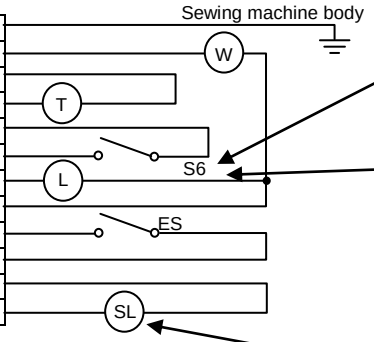
Option A (Black connector)

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



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	Condensed stitch output	12



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

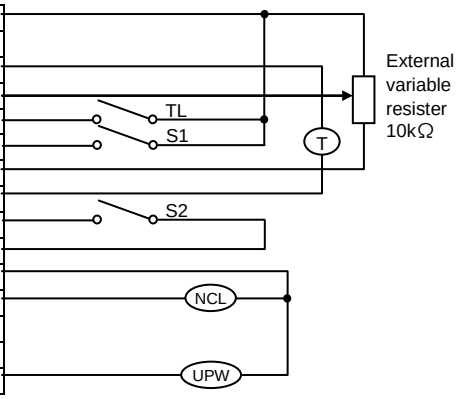
Sewing machine stops when S6 : Open

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

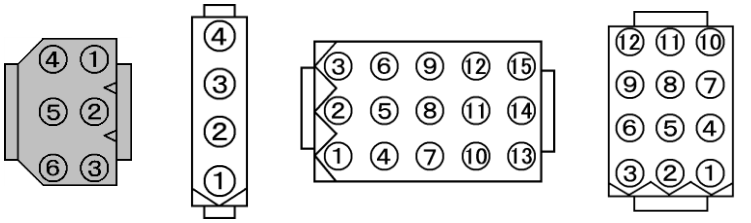
	0V	1
I4	Needle DOWN position priority stop signal	2
O1	Thread trimming output	3
VC2	Variable speed command	4
I5	Thread trimmer cancel signal	5
I1	Operation signal	6
	+12V (Change JP4 connector)	7
	+24V	8
I2	Thread trimming signal	9
	0V	10
	+24V	11
O2	Needle cooler output	12
O7	Output for the PS1 counting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

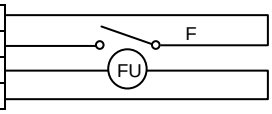
Fig.5 "PEGASUS"

Function setting [NOD]



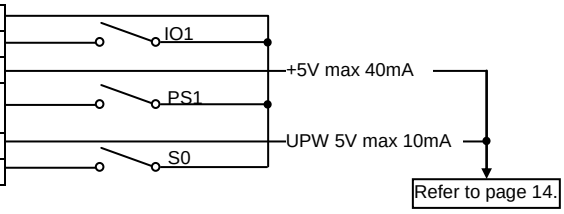
Presser foot lifter

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



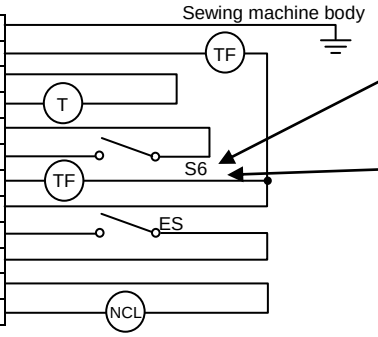
Option A (Black connector)

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



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

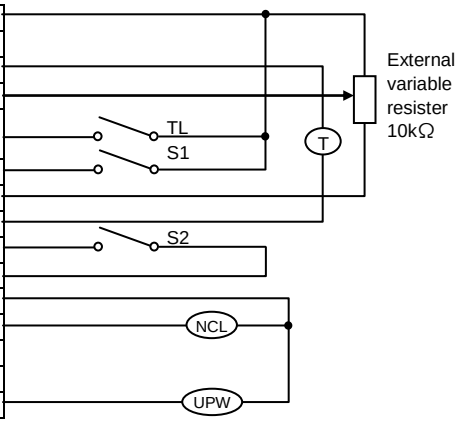
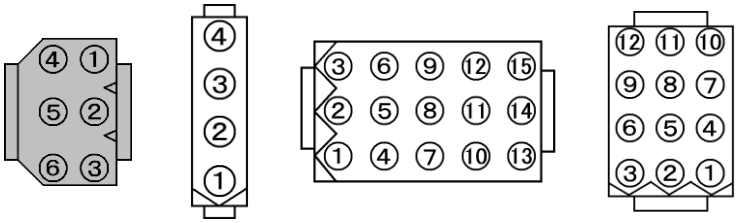


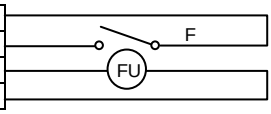
Fig.6 "PEGASUS"

Function setting [NOF]



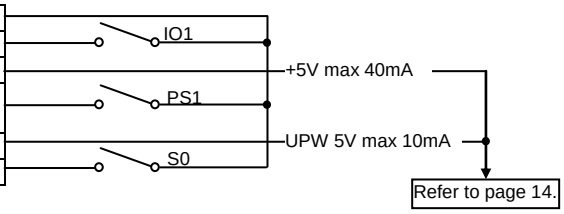
Presser foot lifter

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



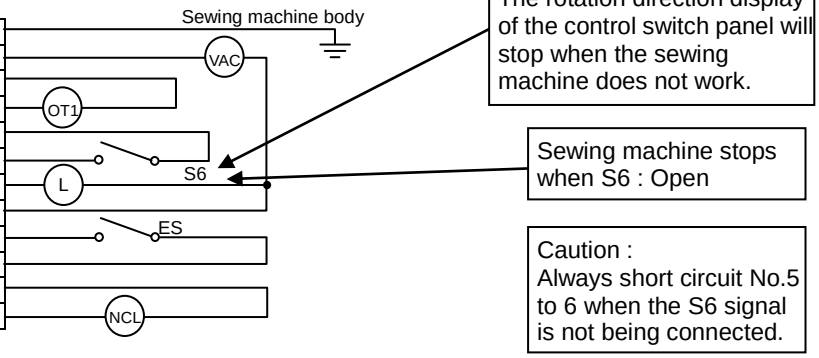
Option A (Black connector)

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



Sewing machine

	Ground	1
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



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

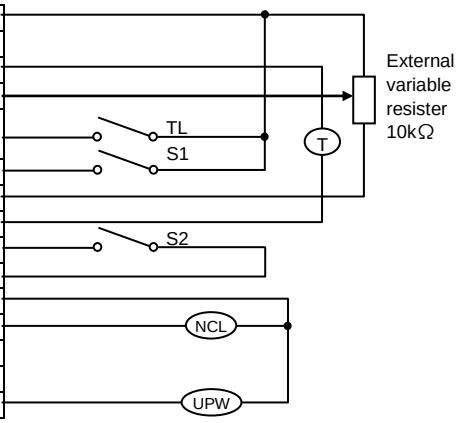
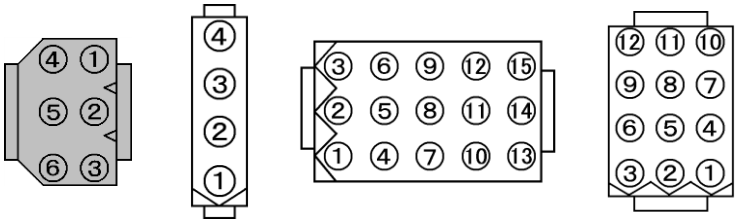


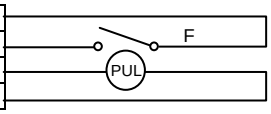
Fig.7 "KANSAI"

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



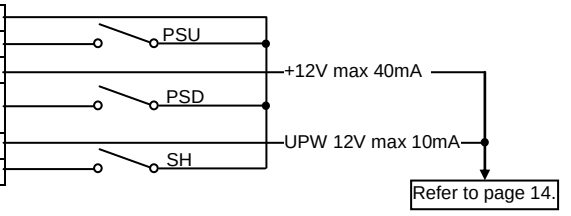
Presser foot lifter

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



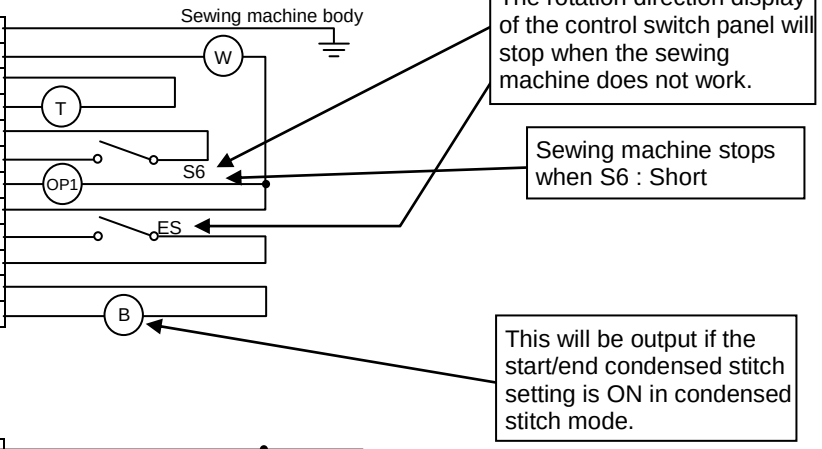
Option A (Black connector)

	0V	1
IA	Needle UP position priority stop signal	2
	Power +12V	3
IB	Needle DOWN position priority stop signal	4
O4	Needle UP position output	5
IC	One shot signal	6



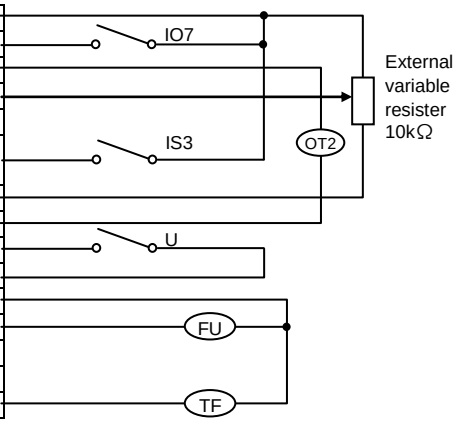
Sewing machine

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



Option B

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

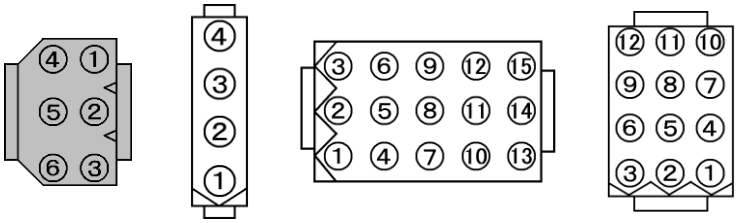


Please refer to page 14.
How to change 24/30V of solenoid power source.

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.

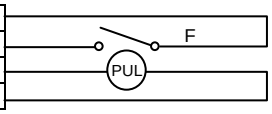
Fig.8 "KANSAI"

Function setting [KA3]



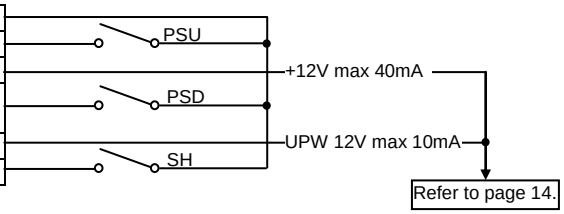
Presser foot lifter

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



Option A (Black connector)

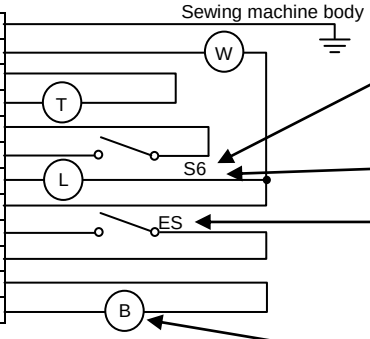
	0V	1
IA	Needle UP position priority stop signal	2
	Power +12V	3
IB	Needle DOWN position priority stop signal	4
O4	Needle UP position output	5
IC	One shot signal	6



Refer to page 14.

Sewing machine

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



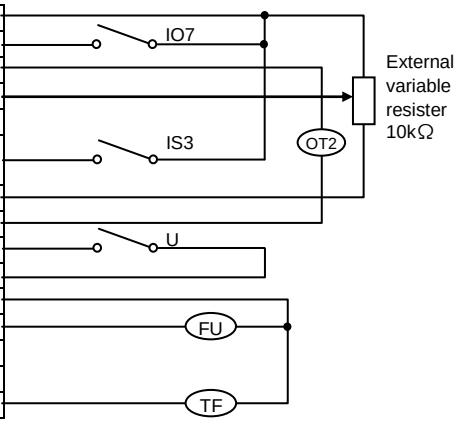
Caution :
The rotation direction display of the control switch panel will stop when the sewing machine does not work.

Sewing machine stops when S6 : Short

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

Option B

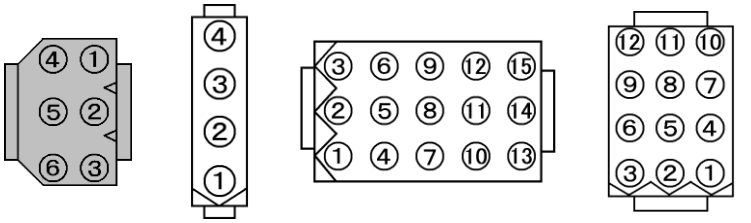
	0V	1
I4	Virtual input IO7	2
O1	Virtual output OT2	3
VC2	Variable speed command	4
I5	-----	5
I1	Signal output to virtual output 3 when stopped	6
	+5V	7
	+30V	8
I2	Needle lifting signal	9
	0V	10
	+30V	11
O2	Presser foot lifting output	12
O7	-----	13
O6	-----	14
O3	Thread tension output	15



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

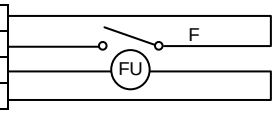
Fig.9 "UNION SPECIAL"

Function setting [UN1]



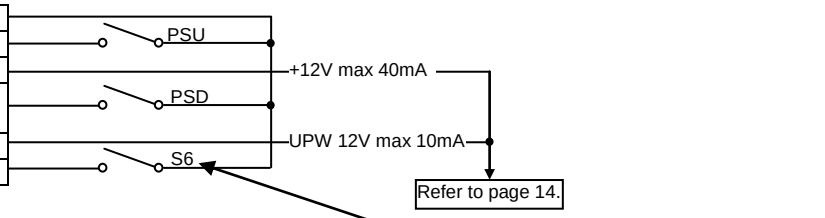
Presser foot lifter

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



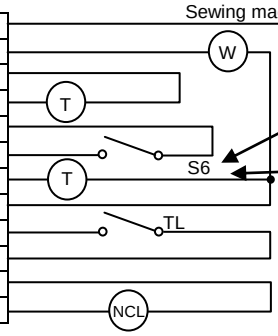
Option A (Black connector)

	0V	1
IA	Needle UP position priority stop signal	2
	Power +12V	3
IB	Needle DOWN position priority stop signal	4
O4	Needle UP position output	5
IC	Thread trimming protection signal	6



Sewing machine

	Ground	1
OB	Wiper output	2
	+30V	3
OA	Thread trimming output	4
	0V	5
ID	Thread trimming protection signal	6
OD	Thread trimming output	7
	+30V	8
IE	Thread trimmer release signal	9
	0V	10
	+30V	11
OC	Needle cooler output	12



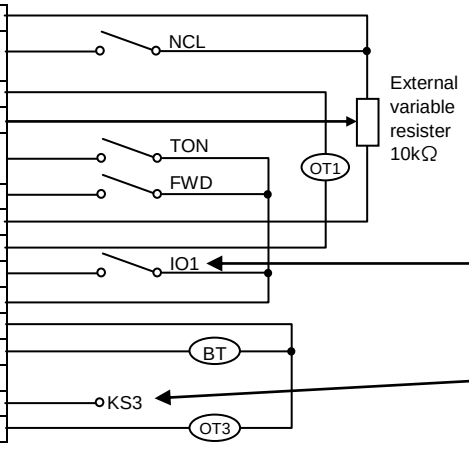
Caution :
The rotation direction display of the control switch panel will stop when the sewing machine does not work.

Sewing machine stops when S6 : Open

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

Option B

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



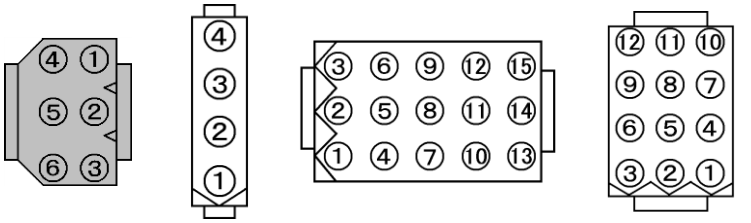
If input IO1 is turned ON, output OT1 will always be turned ON.

This output is not for the solenoid output.

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

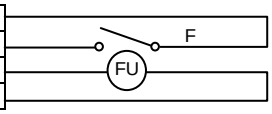
Fig.10 "UNION SPECIAL"

Function setting [UN2], [UN3]



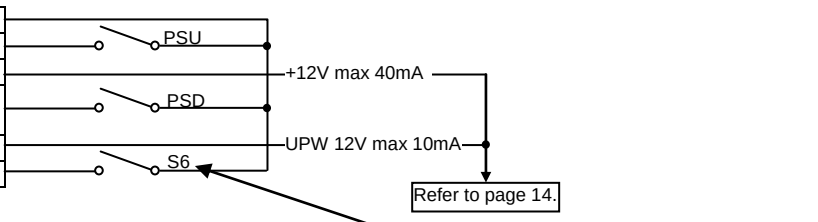
Presser foot lifter

	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 +12V	3
IB	Needle DOWN position priority stop signal	4
O4	Needle UP position output	5
IC	Thread trimming protection signal	6

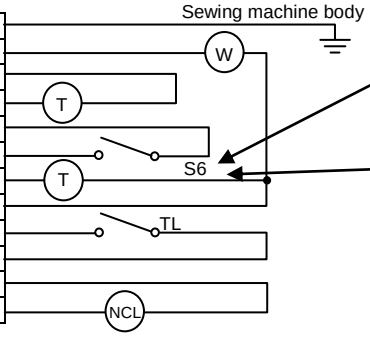


Refer to page 14.

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

Sewing machine

	Ground	1
OB	Wiper output	2
	+30V	3
OA	Thread trimming output	4
	0V	5
ID	Thread trimming protection signal	6
OD	Thread trimming output	7
	+30V	8
IE	Thread trimmer release signal	9
	0V	10
	+30V	11
OC	Needle cooler output	12

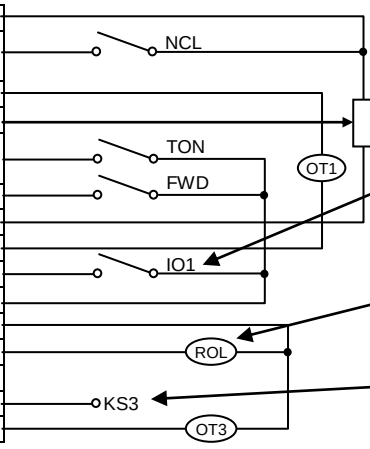


Sewing machine stops when S6 : Open

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

Option B

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



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.

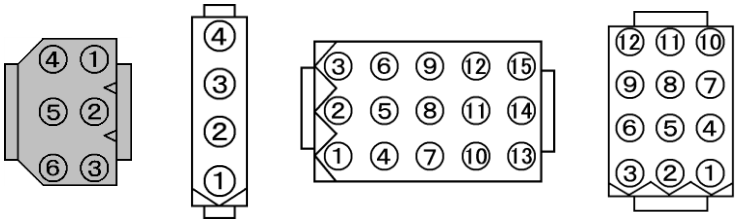
This output is not for the solenoid output.

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.

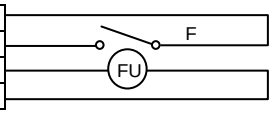
Fig.11 "BROTHER"

Function setting [BR1]



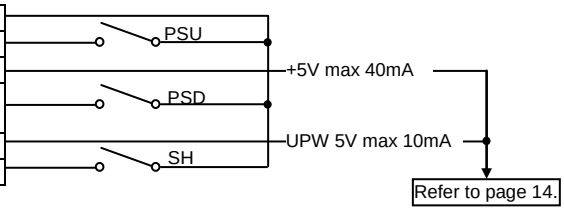
Presser foot lifter

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



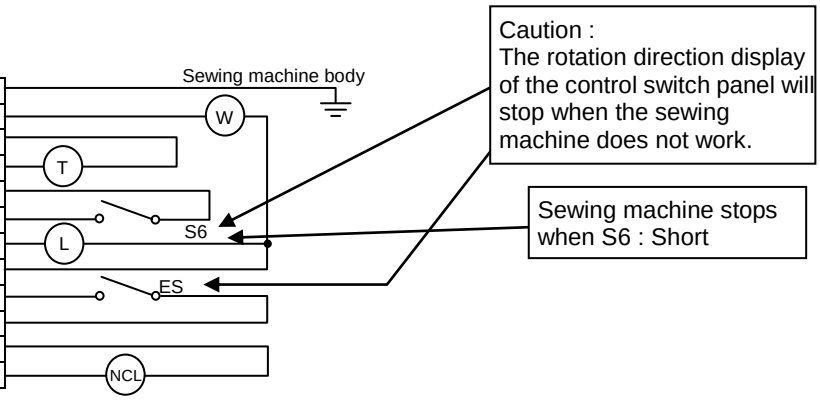
Option A (Black connector)

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



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



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

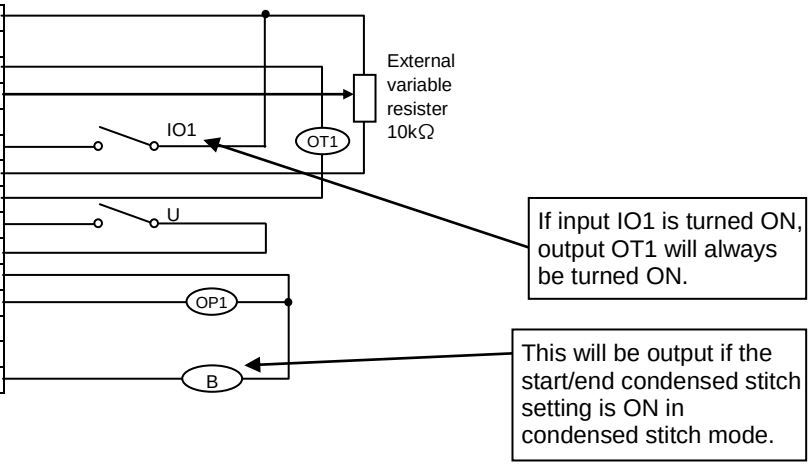
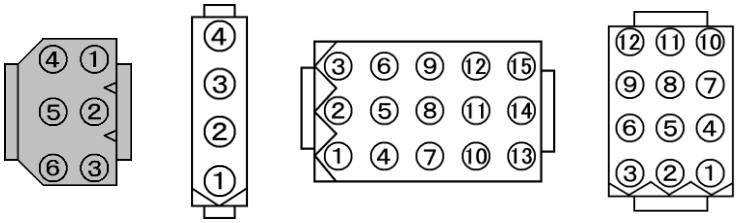


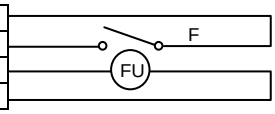
Fig.12 "RIMOLDI"

Function setting [RM1]



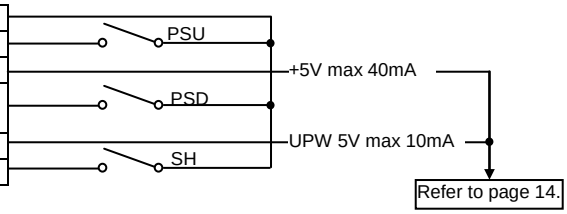
Presser foot lifter

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



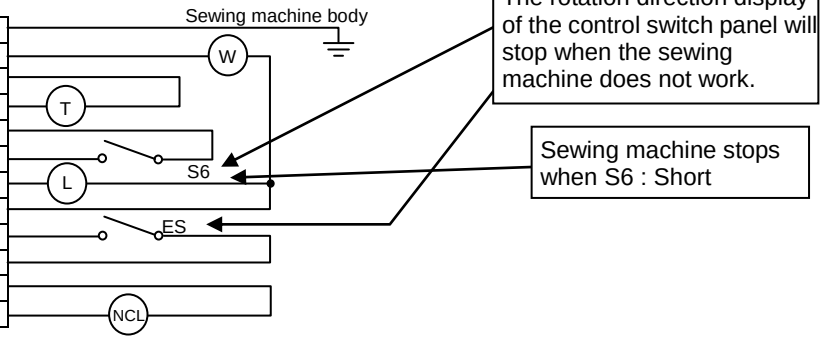
Option A (Black connector)

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



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



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

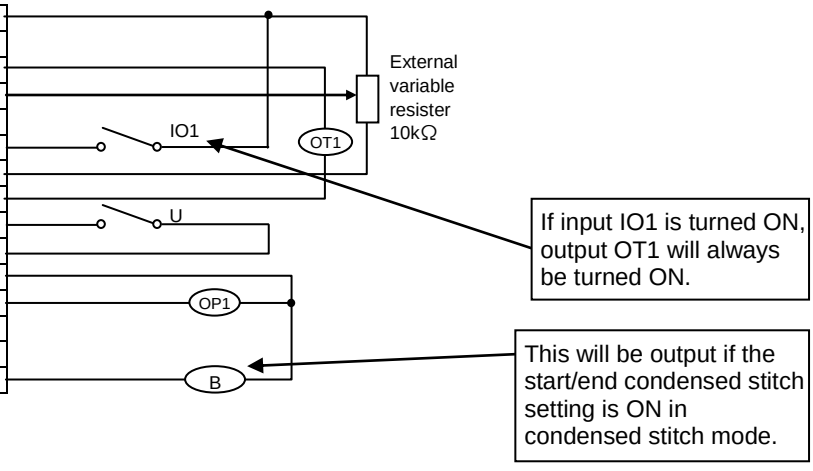
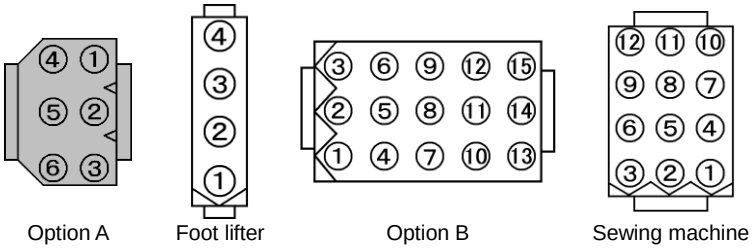


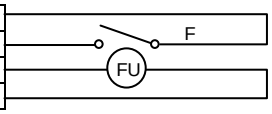
Fig.13 "SIRUBA"

Function setting [SRB1]



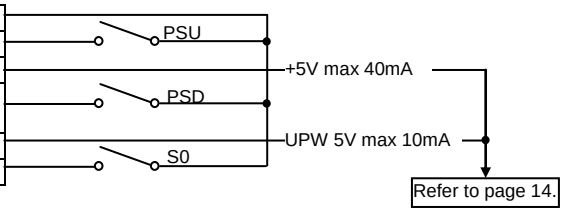
Presser foot lifter

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



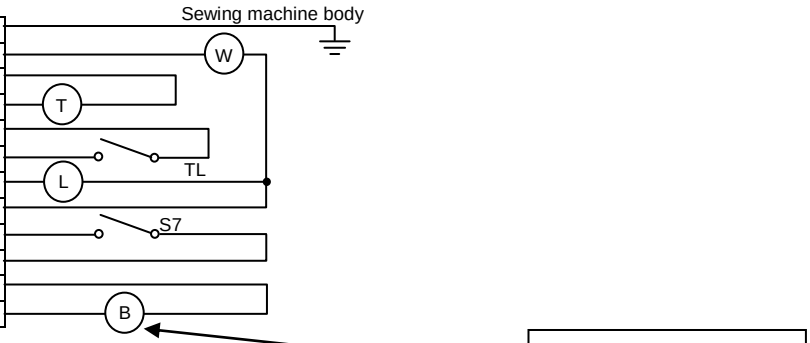
Option A (Black connector)

	0V	1
IA	Needle UP position priority stop signal	2
	Power +5V (Change JP3 connector)	3
IB	Needle DOWN position priority stop signal	4
O4	Needle UP position output	5
IC	Low speed run signal	6



Sewing machine

	Ground	1
OB	Wiper output	2
	+24V	3
OA	Thread trimming output	4
	0V	5
ID	Thread trimmer cancel signal	6
OD	Thread release output	7
	+24V	8
IE	Backstitching during run signal	9
	0V	10
	+24V	11
OC	Condensed stitch output	12



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	Needle cooler output	12
O7	-----	13
O6	-----	14
O3	[TF] output	15

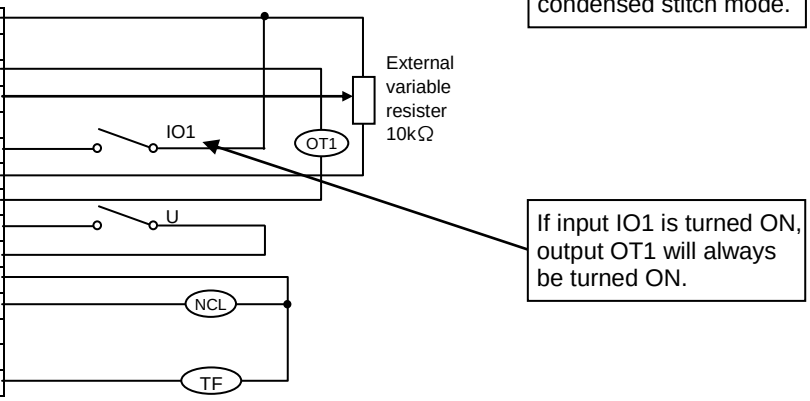
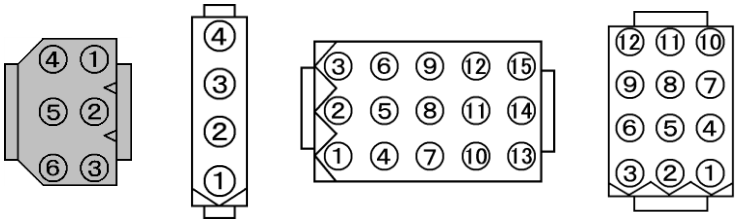


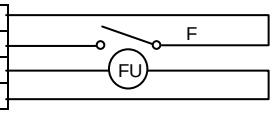
Fig.14 "JUKI"

Function setting [JMH]



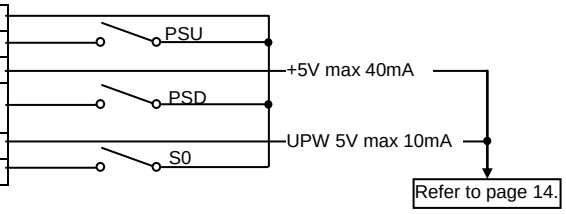
Presser foot lifter

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



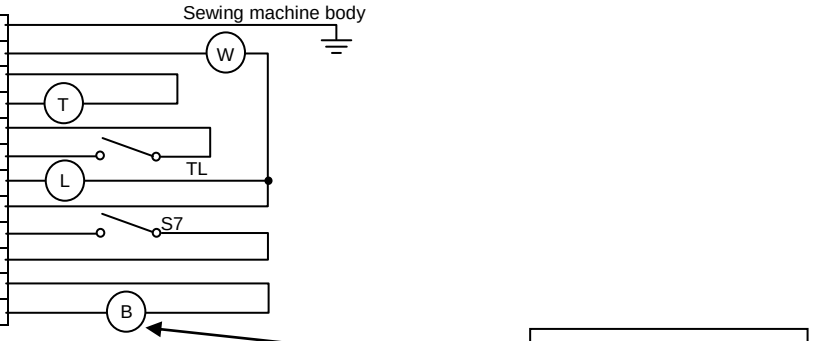
Option A (Black connector)

	0V	1
IA	Needle UP position priority stop signal	2
	Power +5V (Change JP3 connector)	3
IB	Needle DOWN position priority stop signal	4
O4	Needle UP position output	5
IC	Low speed run signal	6



Sewing machine

	Ground	1
OB	Wiper output	2
	+24V	3
OA	Thread trimming output	4
	0V	5
ID	Thread trimmer cancel signal	6
OD	Thread release output	7
	+24V	8
IE	Backstitching during run signal	9
	0V	10
	+24V	11
OC	Condensed stitch output	12



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	Needle cooler output	12
O7	-----	13
O6	-----	14
O3	[TF] output	15

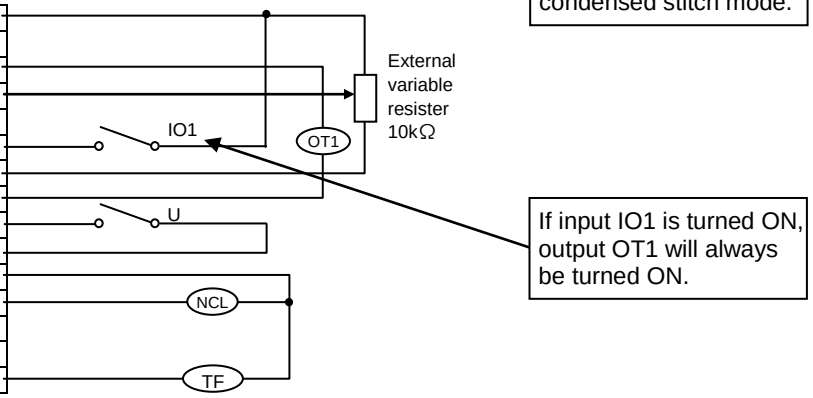


Fig.50 "YAMATO", Function setting [YU2],[YU3],[YU4] and [YU5]

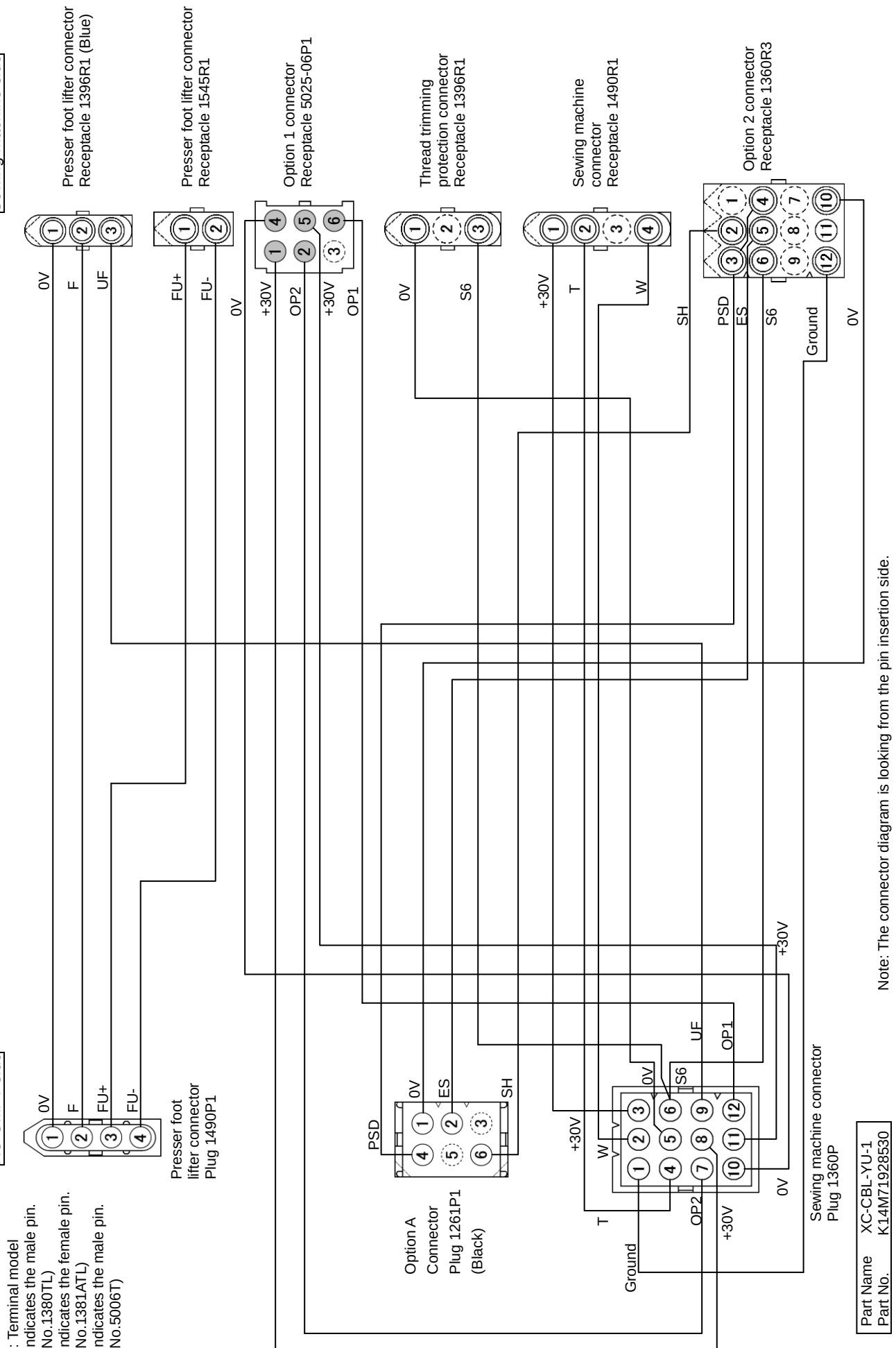
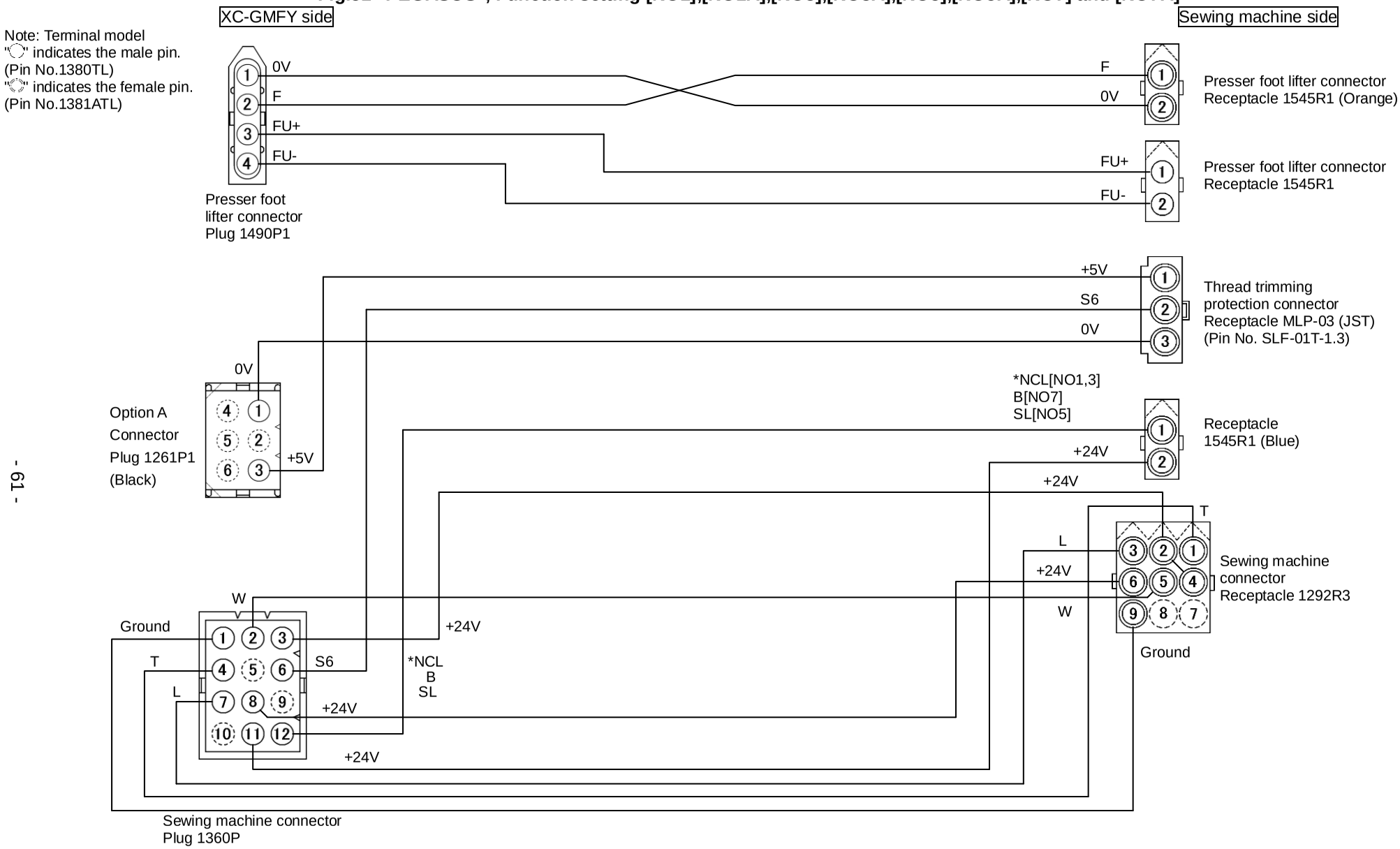


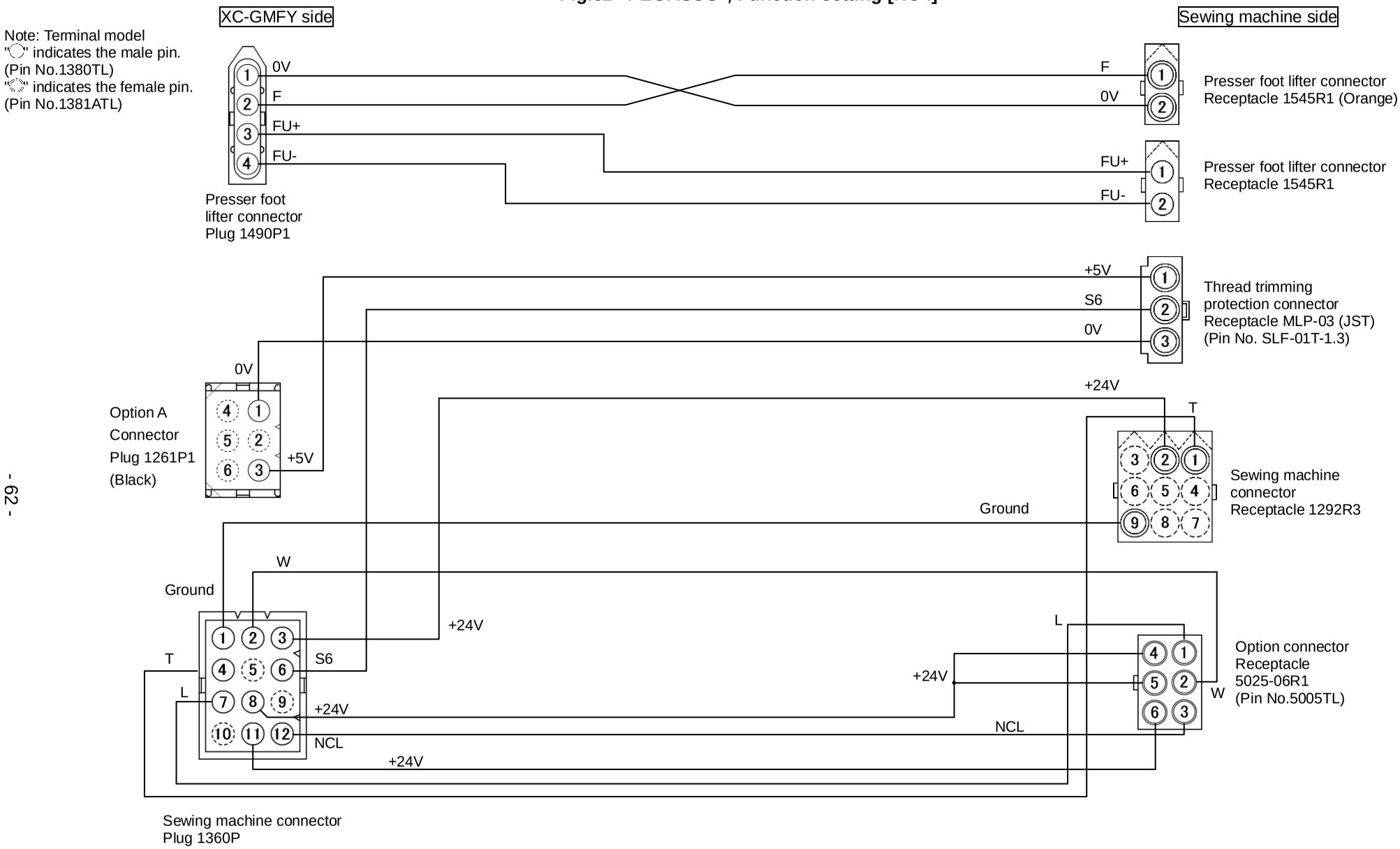
Fig.51 "PEGASUS", Function setting [NO1],[NO1A],[NO3],[NO3A],[NO5],[NO5A],[NO7] and [NO7A]



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

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].

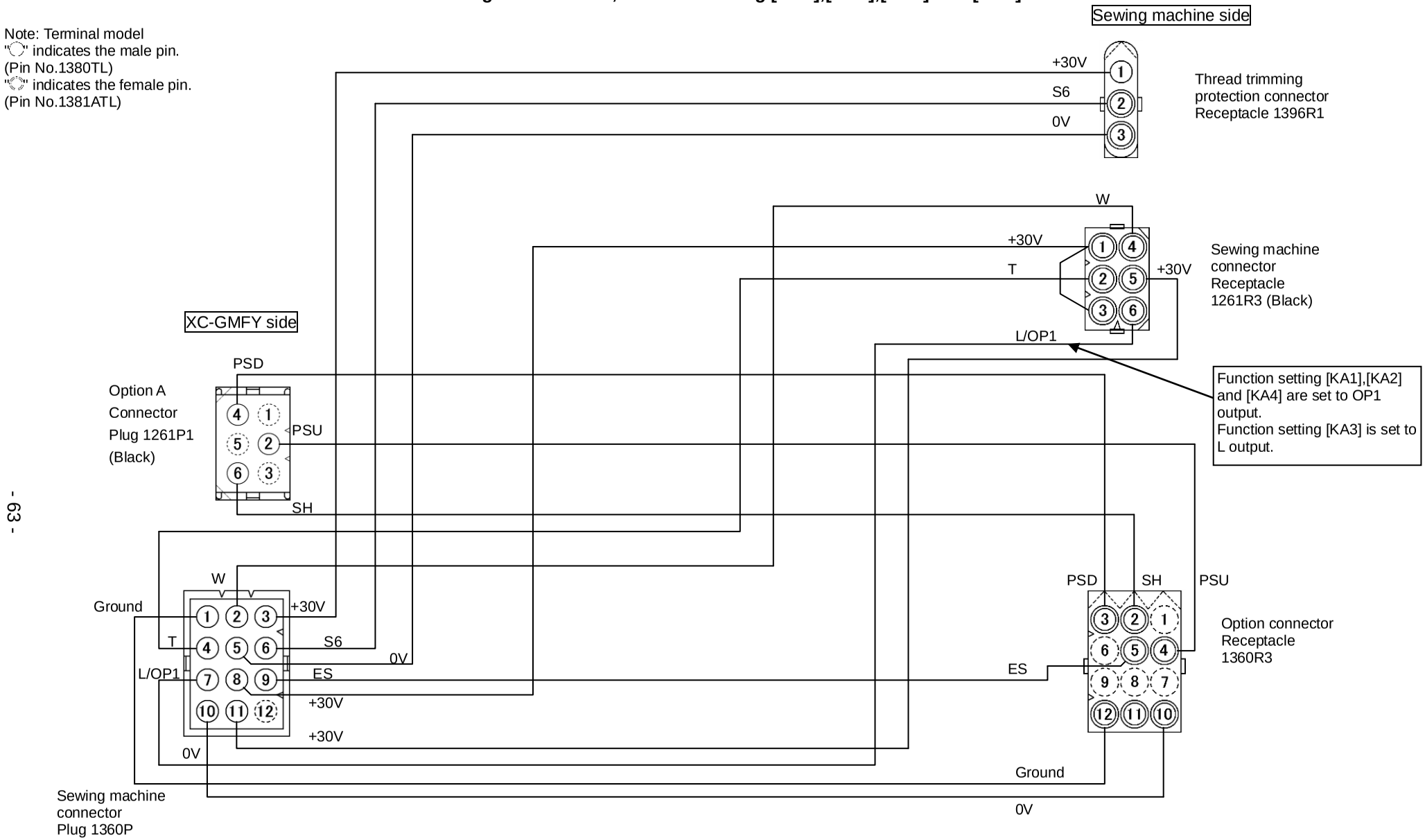
Fig.52 "PEGASUS", Function setting [NO4]



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

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

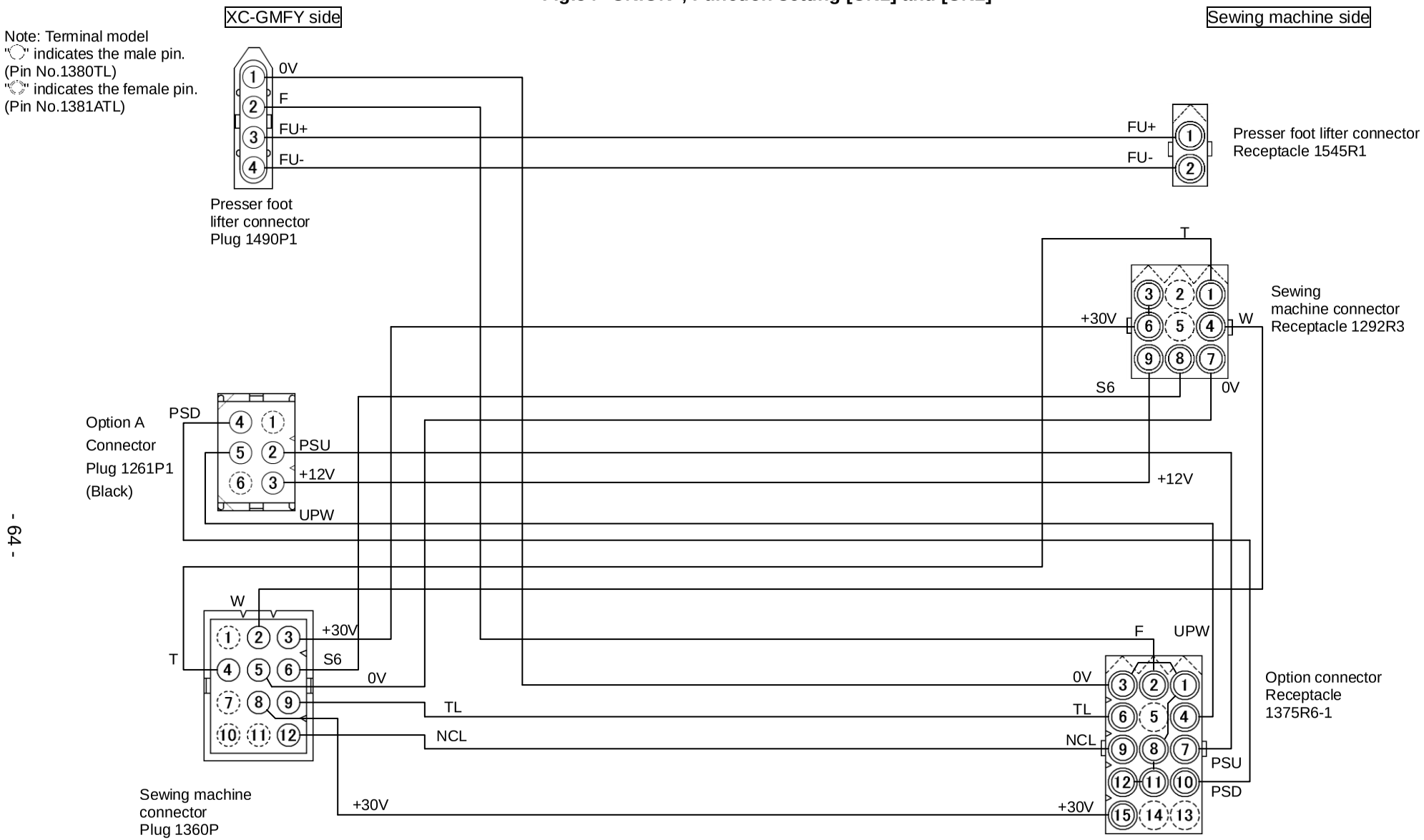
Fig.53 "KANSAI", Function setting [KA1],[KA2],[KA3] and [KA4]



Part Name	XC-CBL-KA-1
Part No.	K14M71928931

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

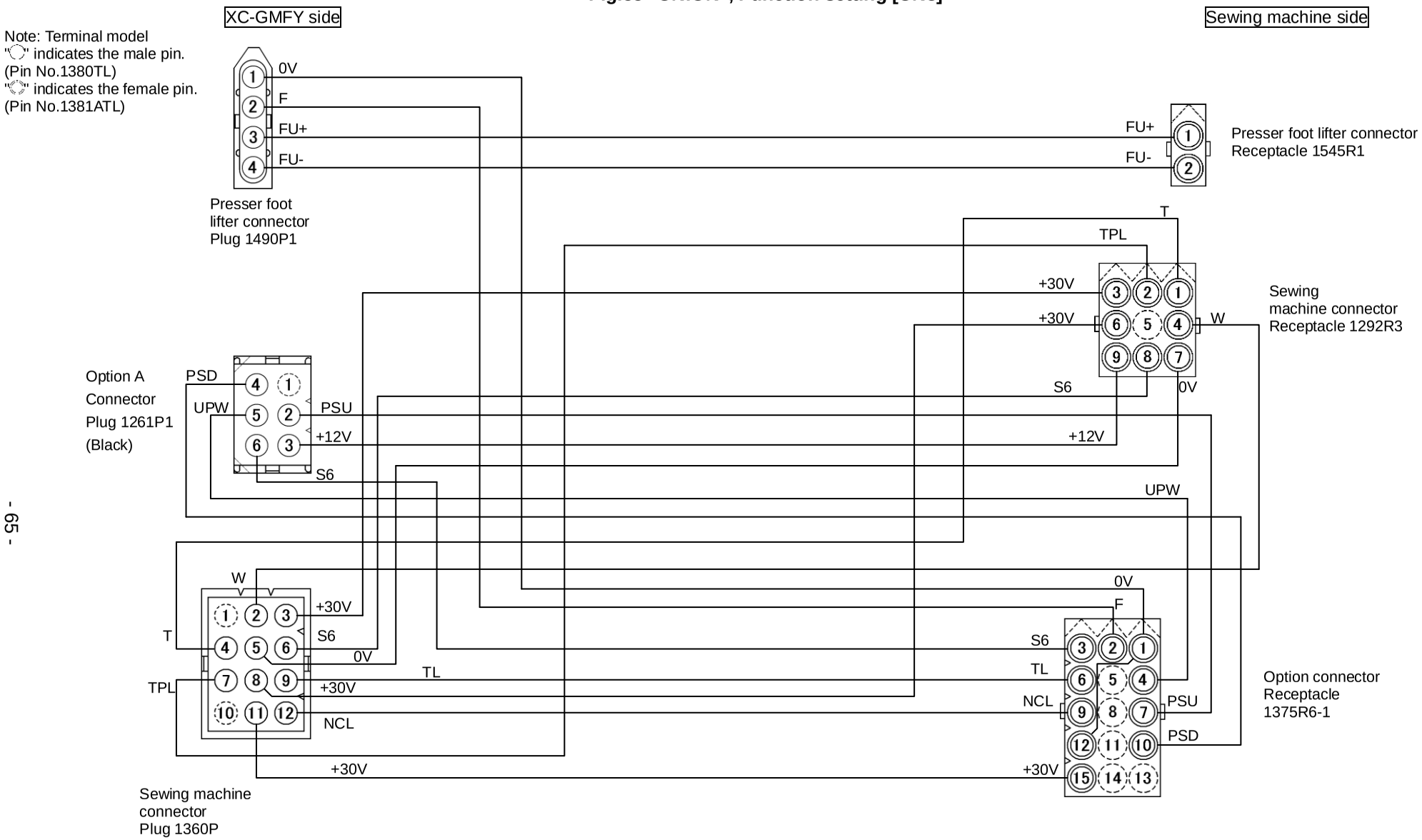
Fig.54 "UNION", Function setting [UN1] and [UN2]



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

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

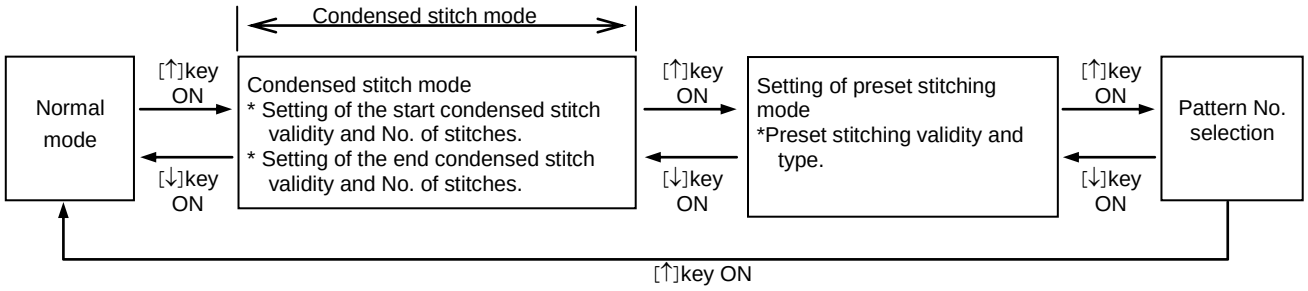
Fig.55 "UNION", Function setting [UN3]



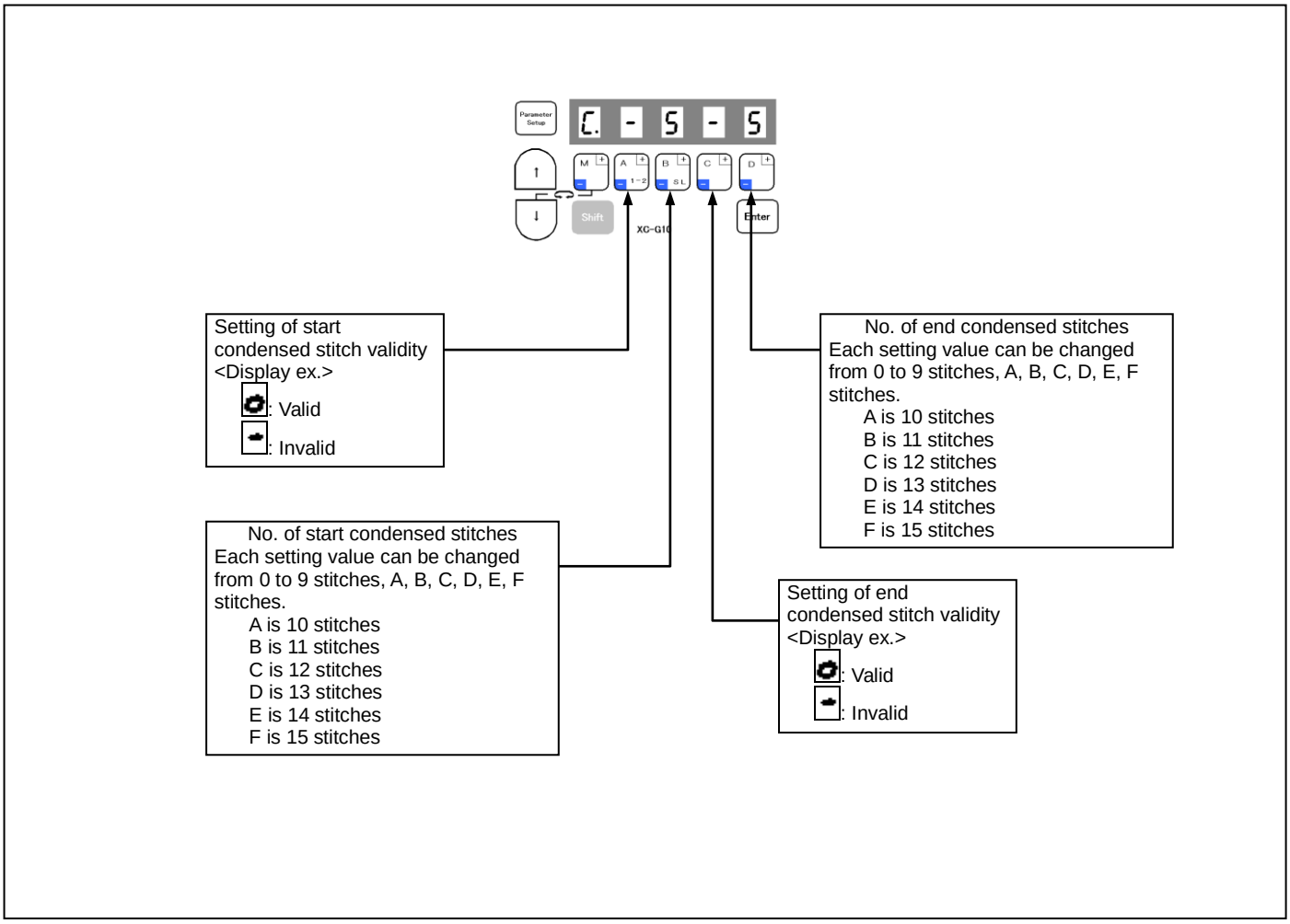
Part Name	XC-CBL-UN-2
Part No.	K14M71925130

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

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

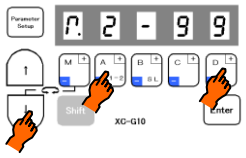


When the [↑] key is turned ON,  will display above the [M] key, and the condensed stitch mode will be entered.
The validity and No. of stitches of start and end condensed stitch can be set here.



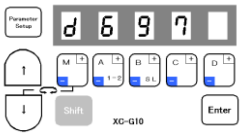
1.How to use Simple setting of Program Mode [3] (for lock stitch trimming machine)
To set the functions for the DÜRKOPP ADLER thread trimming sewing machine in one step
(For example, to set for the 271 class, "DÜRKOPP ADLER").....Function setting [D271]

(1)



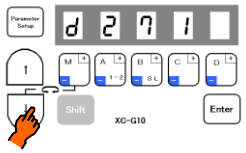
*Enter the program mode [3].
([↓] + [A] + [D] keys)

(2)



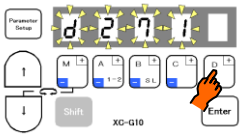
*The mode will change to the program mode [3].

(3)



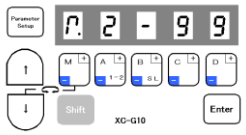
*Press the [↓] key or [↑] key to change the function to [D271].

(4)



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

(5)



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

Description

A. Select the model name that corresponds to the sewing machine model for the simple setting values for the DÜRKOPP ADLER thread trimming sewing machine on the "Technical manual". After selecting the function name, holds down the [D] key over 2 seconds or more. The function name's set speed and function will be set automatically.
B. To return to the normal mode from the [D271] display, press the [↑] key while holding down [↓]. In this case, [D271] will not be set, and the last settings will be used.
C. Each time the [↓] key is pressed in step 3, the function will change in order from [D697], [D271], [D273].....[750].

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

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	d697	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	---	Refer to "5. HOW TO CONNECT BROTHER MACHINE".	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-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-B837,DB2-B838 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-B848,LT2-B872,LT2-B875,LT2-B8750 class	---		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	---	Refer to "6. HOW TO CONNECT JUKI MACHINE".	30V	5V	2	5000	200	200	1700	1900
J505	J505	JUKI	DDL-505,DDL-505A,DDL-506,DDL-506A,DDL-506E,DDL-560-5,DDL-5600,DLU-5494NBB-6-WB,PLW-1245-6,PLW-1246-6,PLW-1257-6,PLW-1264-6,PLW-1266-6 class	---		30V	5V	2	4000	200	200	1700	1900
J555	J555	JUKI	DDL-555-2-2B,DDL-555-2-4B,DDL-555ON,DDL-5570,DDL-5571,DDL-5580 class	---		30V	5V	2	4000	200	200	1700	1900
JDL	JdL	JUKI	DLD-432-5,DLD-436-5,DLM-5400N-6,DLM-5400-6,DLN-415-5,DLN-5410N-6,DLN-5410-6,DLU-450,DLU-490-5,DLU-491-5,DLU-5490BB-6-OB,DLU-5490BB-6-WB,DLU-5490N-6,DMN-530-5,DMN-531-5 class	---		30V	5V	2	4200	200	200	1700	1900
JDU	JdU	JUKI	DNU-241H-5,DNU-241H-6,DSC-244-6,DSC-244V-6,DSC-245-5,DSC-245-6,DSC-246-6,DSC-246V-6,DSU-142-6,DSU-144-6,DSU-145-5,DSU-145-6,DU-141H-4,DU-141H-5,DU-141H-6,DU-161H-6 class	---		30V	5V	2	2000	200	200	1700	1900
JLH	JLH	JUKI	LH-1172,LH-1180-5,LH-1182-5,LH-1150,LH-1152,LH-1160,LH-1162 class	---		30V	5V	1	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

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	T100	TOYOTA	AD1012,AD1012B,AD1012G,AD1013,AD1013A,AD1013G,AD1020,AD1102,AD1102B,AD1102G,AD1103,AD1103A,AD1202,AD1203,AD1204S,AD1205,AD1205S,AD1212G,AD1213,AD2200,AD5010S class	---	Refer to "7. HOW TO CONNECT TOYOTA MACHINE".	30V	12V	2	3500	200	200	1700	1700
T157	T157	TOYOTA	AD157,AD157G class	---		30V	12V	2	4000	200	200	1700	1700
T158	T158	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	T300	TOYOTA	AD3110,AD3110P,AD320-2,AD320-22,AD320-202,AD331,AD3310,AD3310P,AD332,AD340-2,AD340-22,AD340-202,AD340B-2,AD340B-22,AD340B-202,AD341-2,AD341-22,AD341-202,AD345-2,AD345-22,AD345-202,AD352 class	---		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

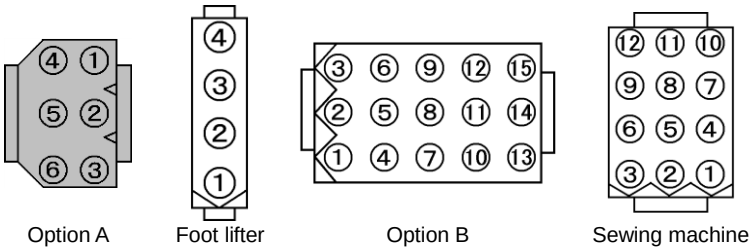
Note : 1. Refer to page 14 for how to change the solenoid voltage. The factory setting is 24V.

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

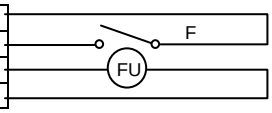
Fig.20 "DÜRKOPP ADLER"

Function setting [D697]



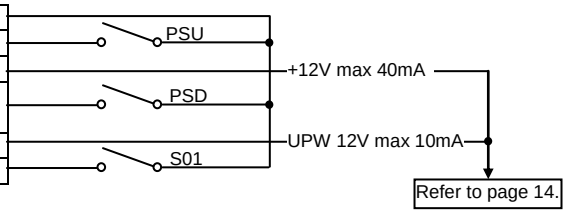
Presser foot lifter

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



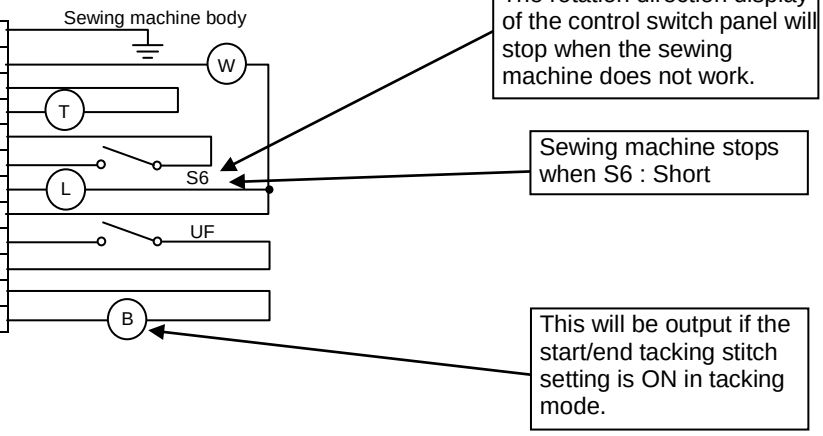
Option A (Black connector)

	0V	1
IA	Needle UP position priority stop signal	2
	Power +12V	3
IB	Needle DOWN position priority stop signal	4
O4	Needle UP position output	5
IC	One stitch signal	6



Sewing machine

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



Option B

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

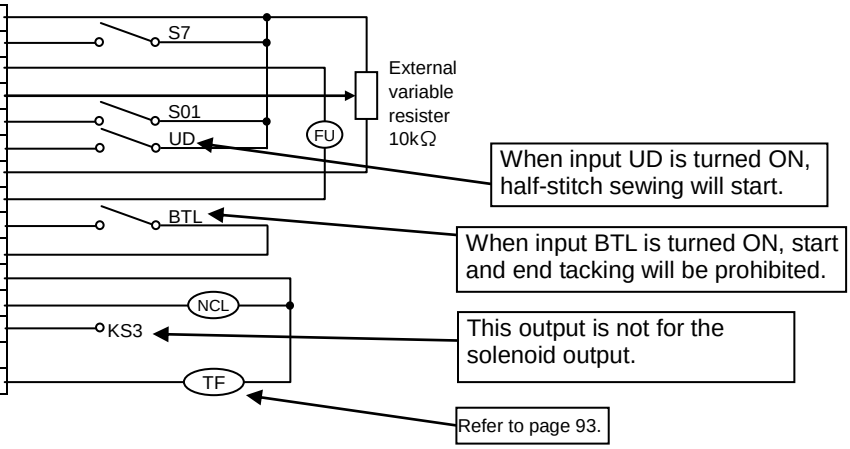
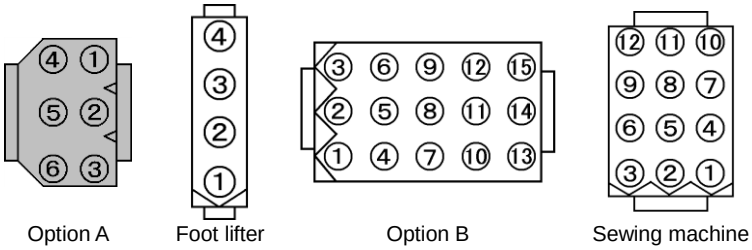


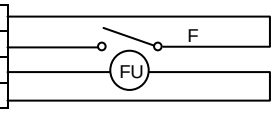
Fig.21 "DÜRKOPP ADLER"

Function setting [D271]



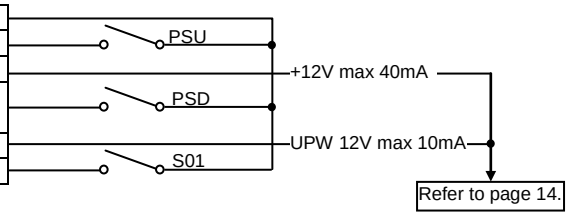
Presser foot lifter

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



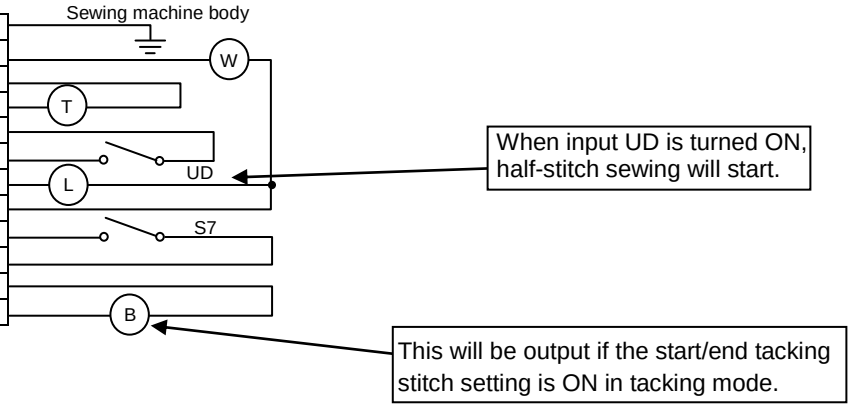
Option A (Black connector)

	0V	1
IA	Needle UP position priority stop signal	2
	Power +12V	3
IB	Needle DOWN position priority stop signal	4
O4	Needle UP position output	5
IC	One stitch signal	6



Sewing machine

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



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
	+5V	7
	+24V	8
I2	Tacking cancel signal	9
	0V	10
	+24V	11
O2	Needle cooler output	12
O7	[KS3] output	13
O6	-----	14
O3	TF output	15

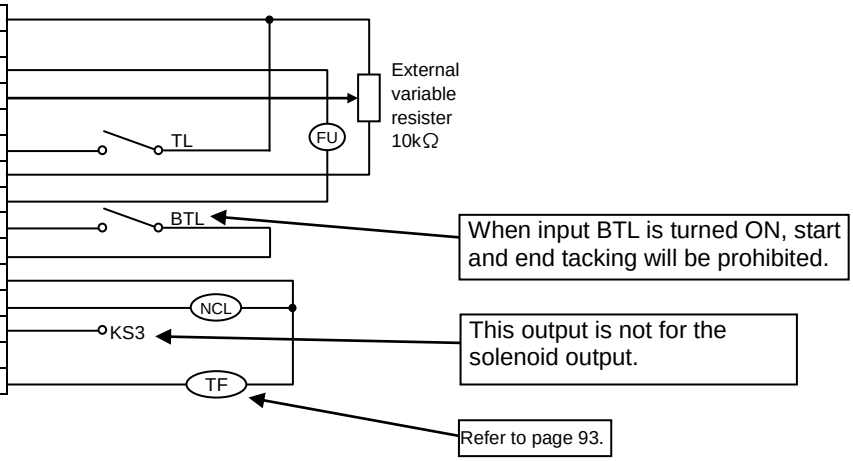
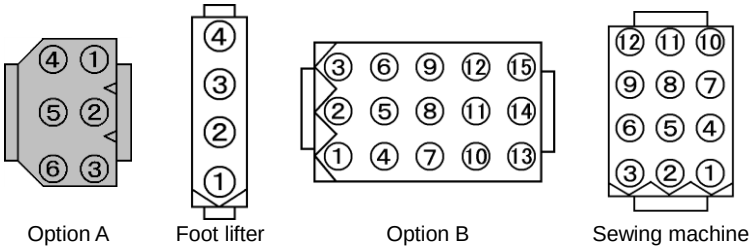


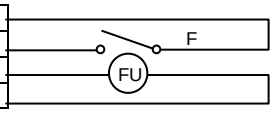
Fig.22 "DÜRKOPP ADLER"

Function setting [D273]



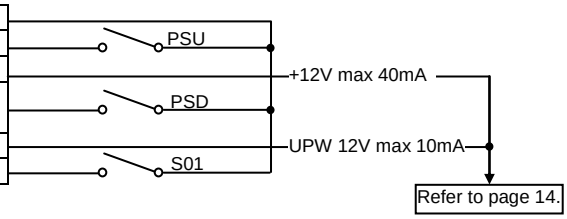
Presser foot lifter

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



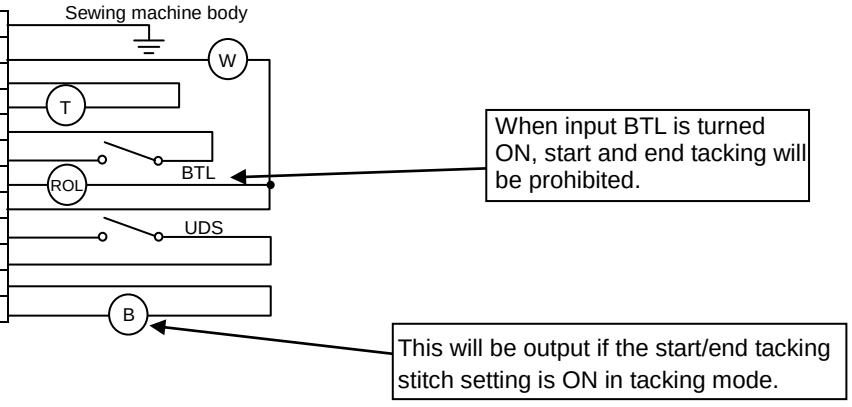
Option A (Black connector)

	0V	1
IA	Needle UP position priority stop signal	2
	Power +12V	3
IB	Needle DOWN position priority stop signal	4
O4	Needle UP position output	5
IC	One stitch signal	6



Sewing machine

	Ground	1
OB	Wiper output	2
	+24V	3
OA	Thread trimming output	4
	0V	5
ID	Tacking cancel signal	6
OD	Roller lifting output	7
	+24V	8
IE	Backstitching during run signal	9
	0V	10
	+24V	11
OC	Backstitch output	12



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
	+5V	7
	+24V	8
I2	One stitch signal	9
	0V	10
	+24V	11
O2	Needle cooler output	12
O7	[KS3] output	13
O6	Virtual output OT2	14
O3	Thread tension output	15

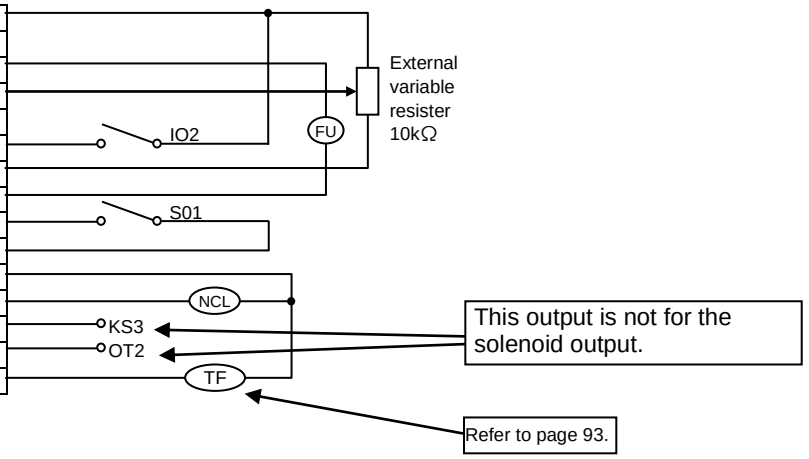
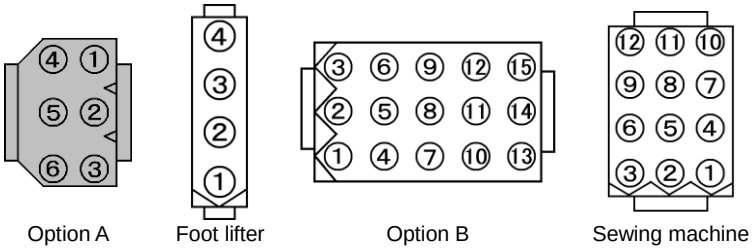


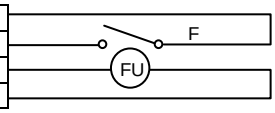
Fig.23 "UNION SPECIAL"

Function setting [U639]



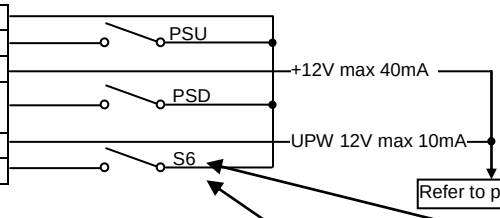
Presser foot lifter

	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 +12V	3
IB	Needle DOWN position priority stop signal	4
O4	Needle UP position output	5
IC	Thread trimmer protection signal	6

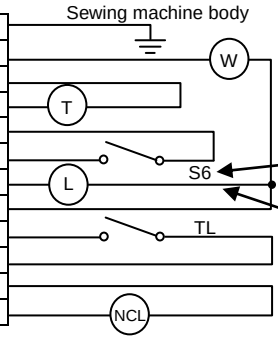


Refer to page 14.

Sewing machine stops when S6 : Short

Sewing machine

	Ground	1
OB	Wiper output	2
	+30V	3
OA	Thread trimming output	4
	0V	5
ID	Thread trimmer protection signal	6
OD	Thread release output	7
	+30V	8
IE	Backstitching during run signal	9
	0V	10
	+30V	11
OC	Needle cooler output	12

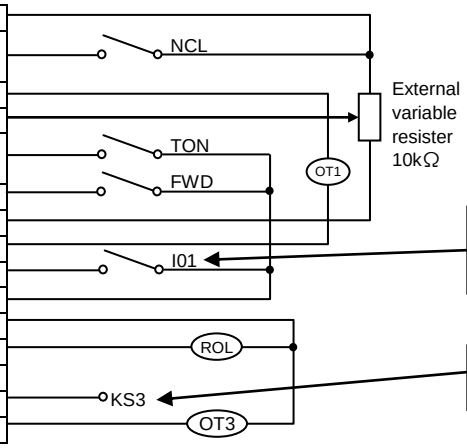


Caution :
The rotation direction display of the control switch panel will stop when the sewing machine does not work.

Sewing machine stops when S6 : Short

Option B

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



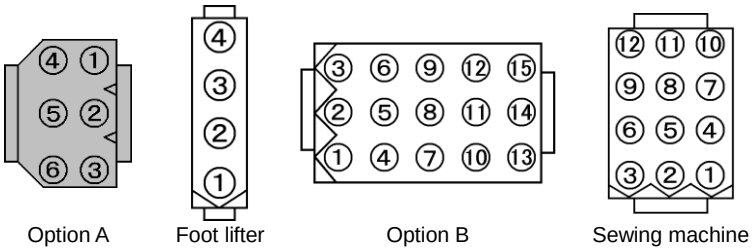
If input IO1 is turned ON, output OT1 will always be turned ON.

This output is not for the solenoid output.

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

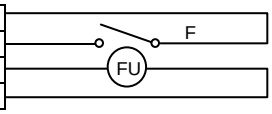
Fig.24 "SINGER"

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



Presser foot lifter

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

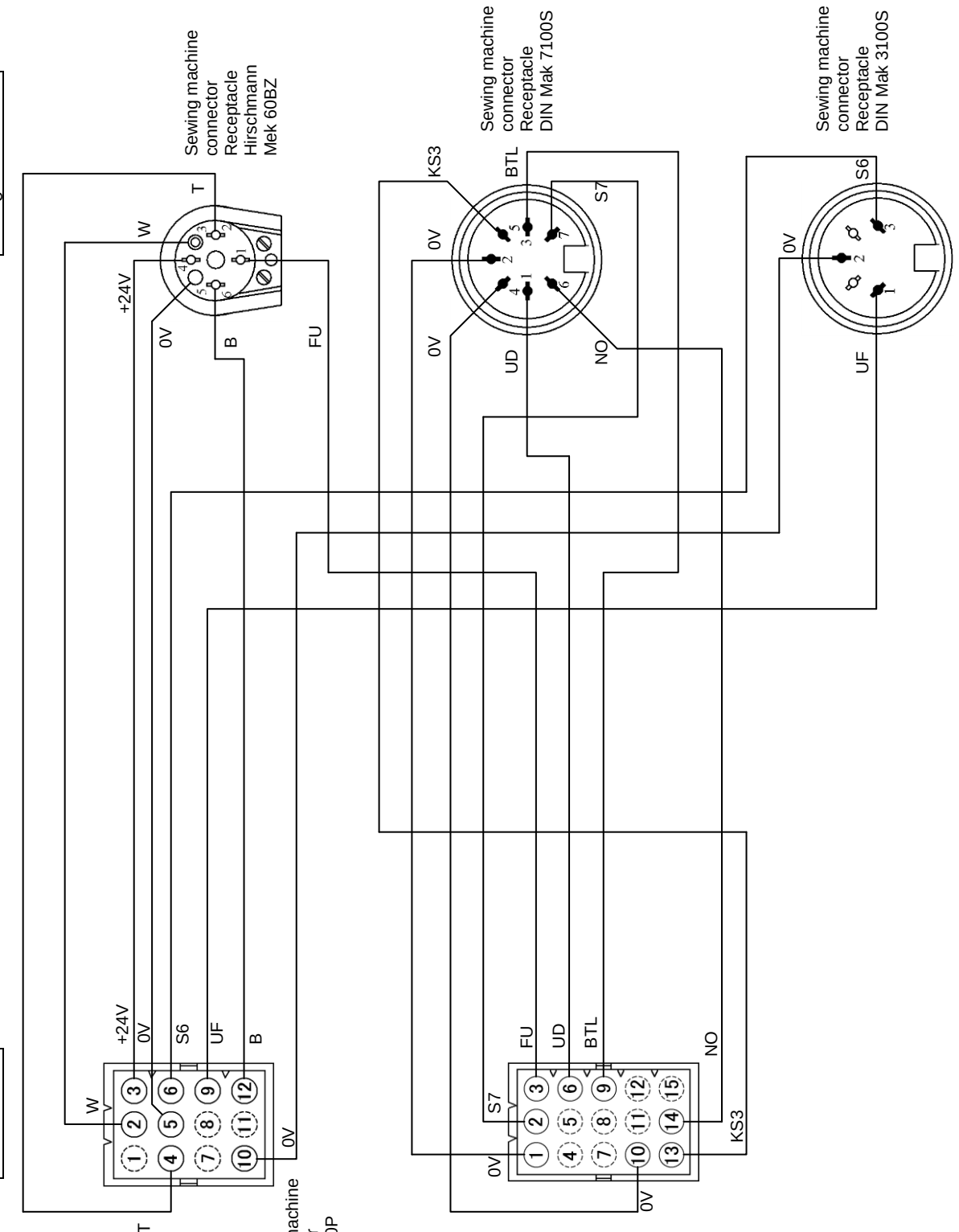
	Ground	----	1	Ground
OB	Wiper solenoid output	457G, 457F,750	2	It will be for wiper solenoid output.
	Thread release solenoid output	691A,691B		It will be for thread release solenoid output.
	Option solenoid output	411U,412U, 591,211A, 212A,591V		This output is always turned ON when option solenoid input 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.

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



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

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

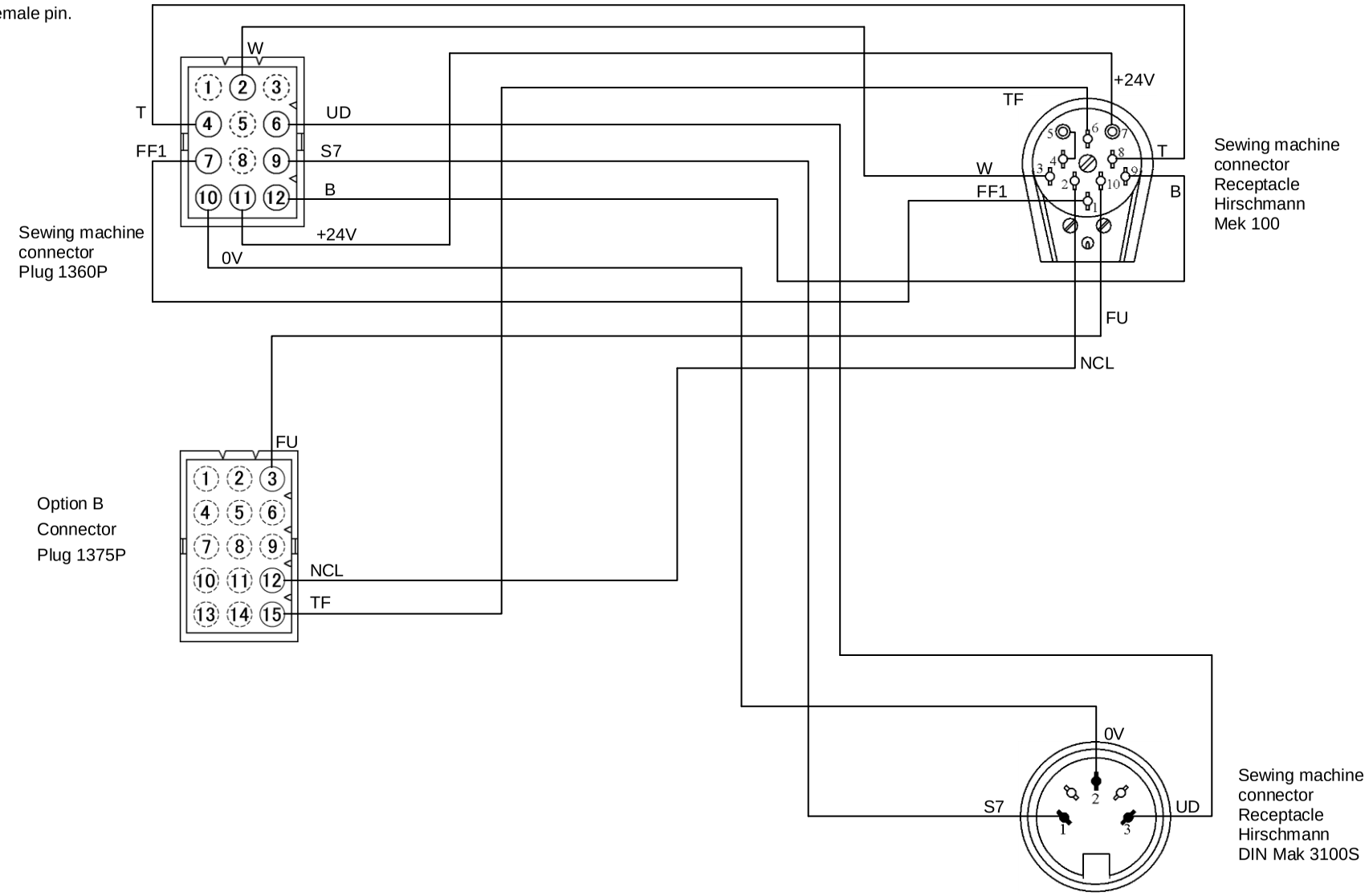
Part Name	XC-CBL-DA-1
Part No.	K14M71924730

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

XC-GMFY side

Sewing machine side

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



Part Name	XC-CBL-DA-2
Part No.	K14M71924830

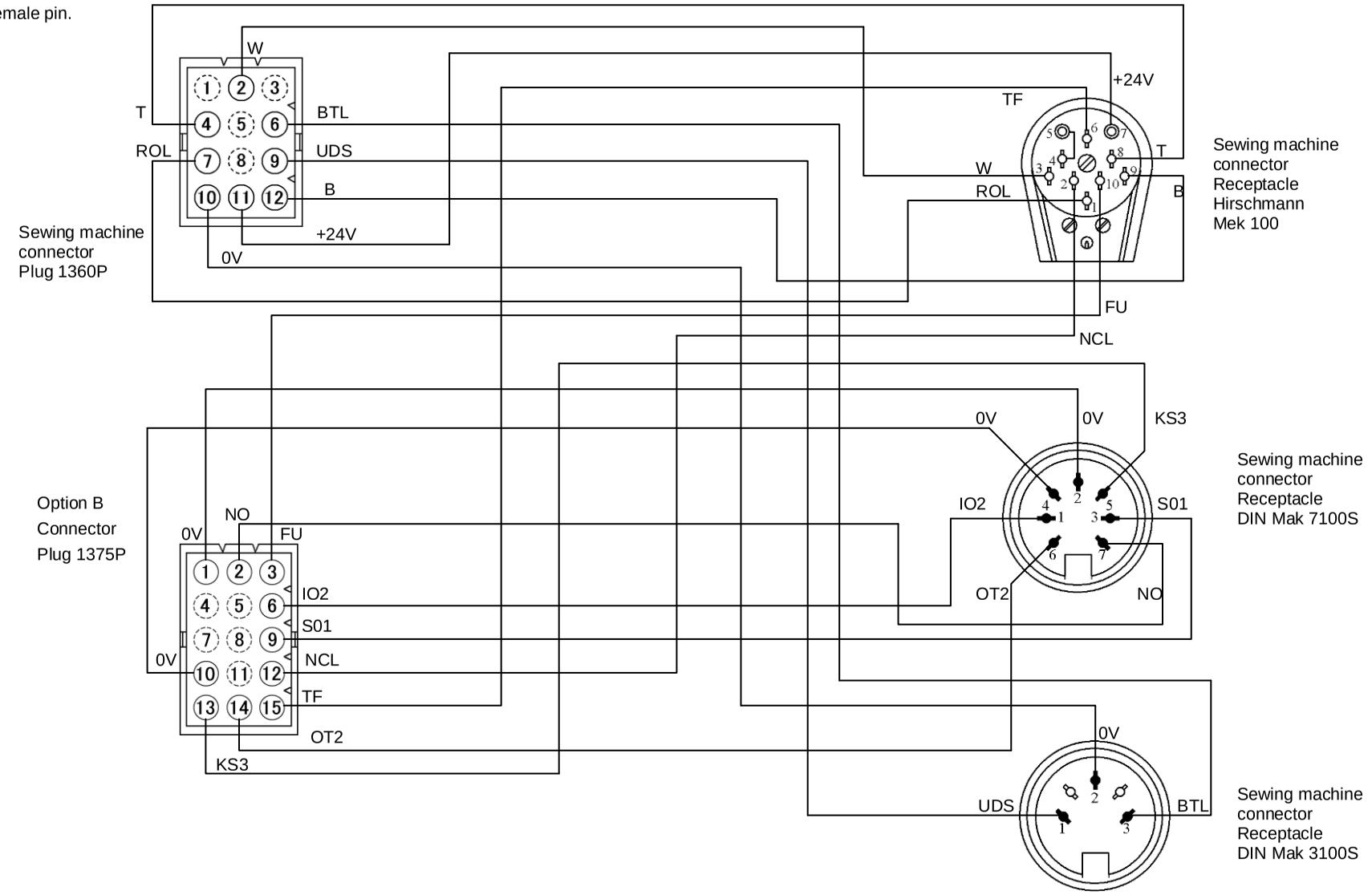
Note: The sewing machine connector and option B connector diagrams are looking from the pin insertion side.

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

XC-GMFY side

Sewing machine side

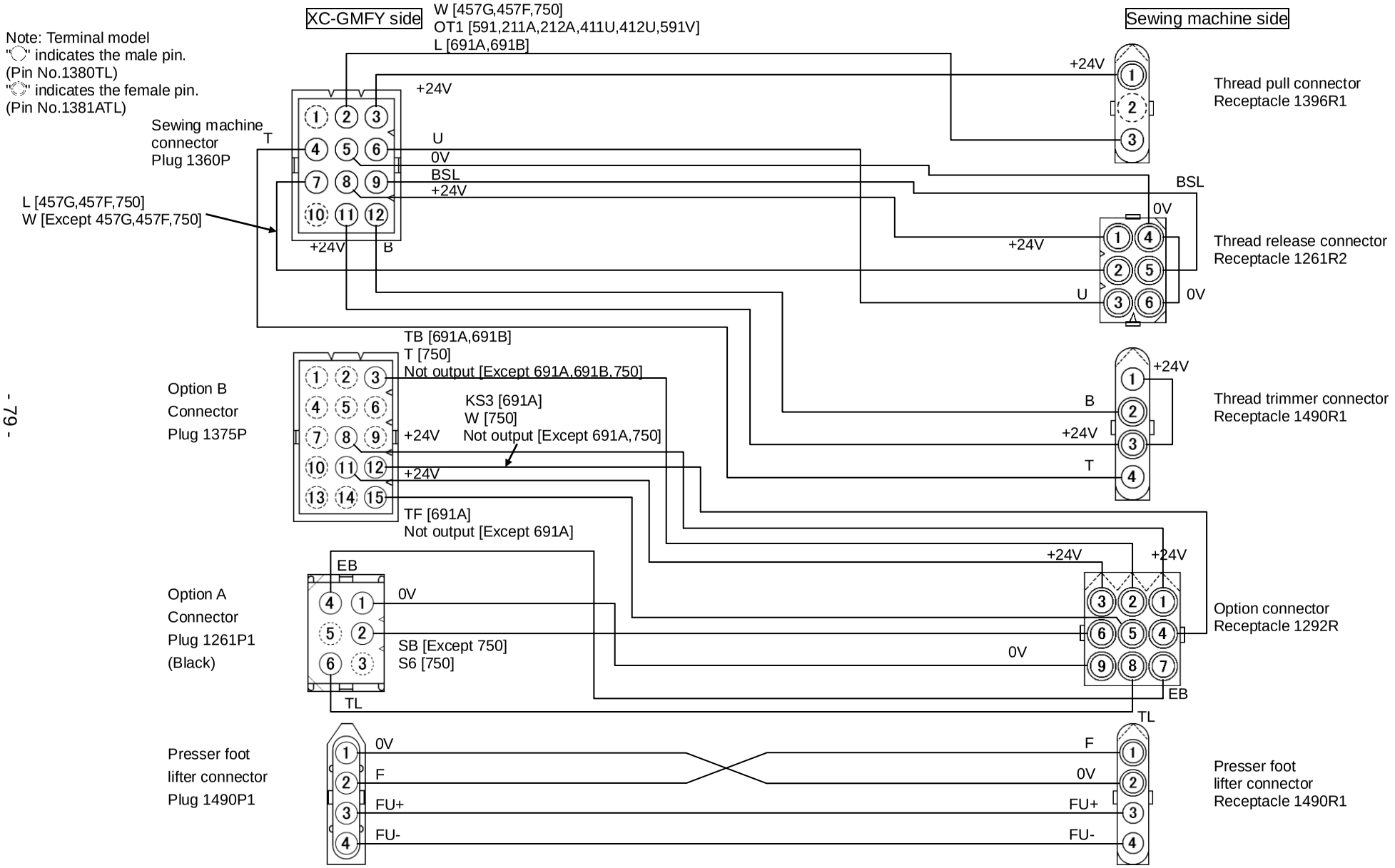
Note: Terminal model
"◌" indicates the male pin.
(Pin No.1380TL)
"◌" indicates the female pin.
(Pin No.1381ATL)



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]

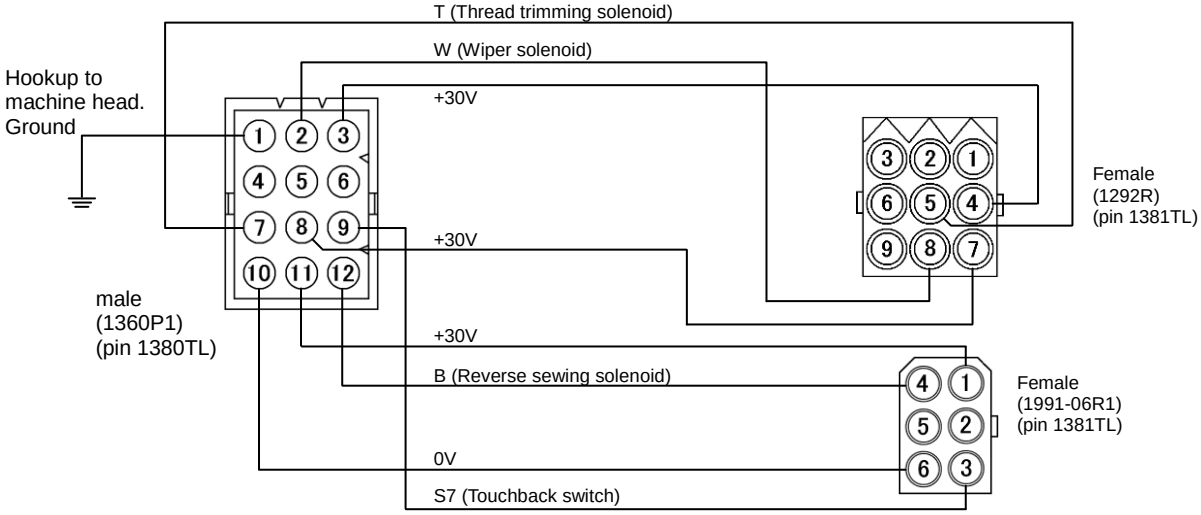


Part Name	XC-CBL-SG-1
Part No.	K14M72022131

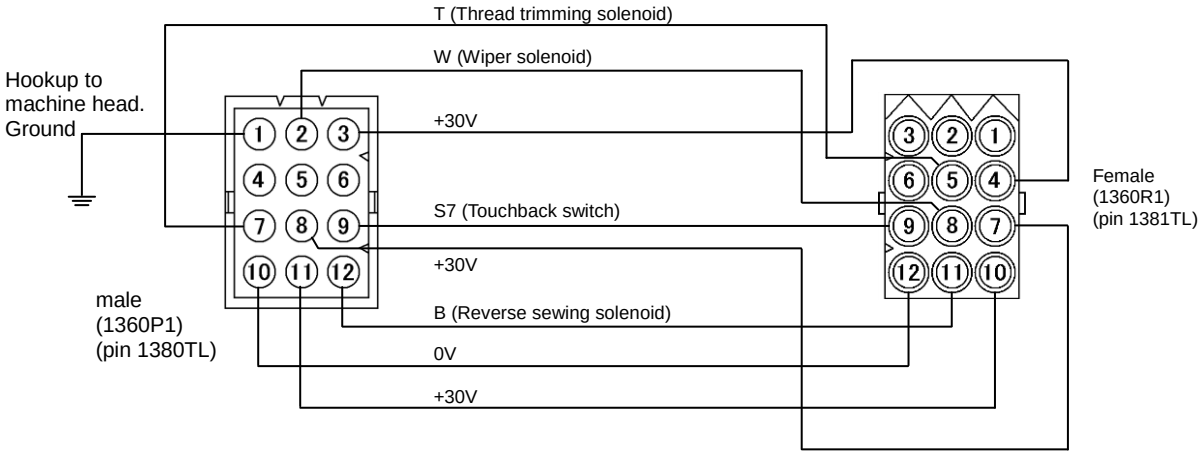
5. How to connect BROTHER machine

5.1 Junction wiring

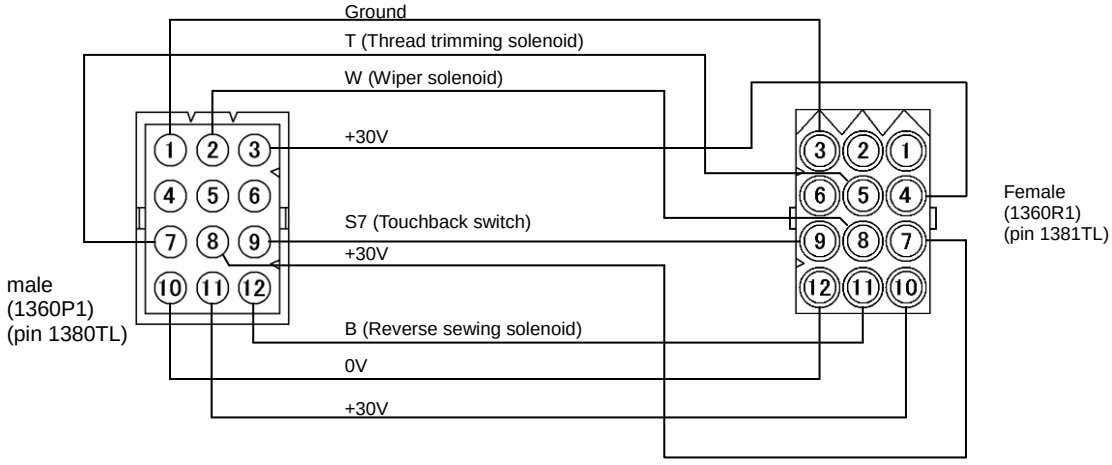
(1)DB2-715 (XC-CBL-BR-1)



(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

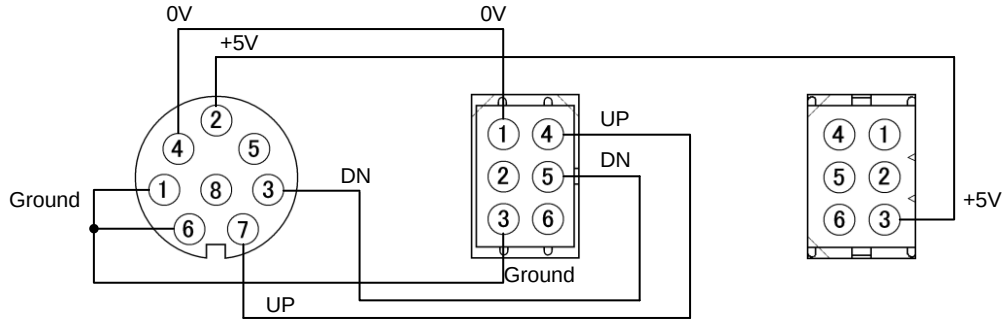
(a) Applicable brother built-in type detector
brother control box: MODEL MD-803, MD-813

(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).

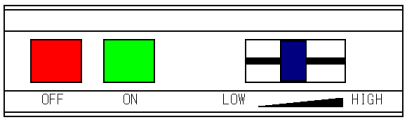
(b) Connect by relay cable (XC-CBL-BR-4)



TO BROTHER BUILT-IN DETECTOR CONNECTOR	TO LIMI-SERVO DETECTOR CONNECTOR	TO LIMI-SERVO OPTION A CONNECTOR
8 PIN DIN TYPE	MOLEX CONNECTOR	MOLEX CONNECTOR
HOSIDEN CONNECTOR	CONNECTOR 1991-06P1	CONNECTOR 1261P1
TCS8086-01-5201	TERMINAL 1380TL	TERMINAL 1380TL
	OR AMP CONNECTOR	OR AMP CONNECTOR
	CONNECTOR 770361-1	CONNECTOR 770090-1
	TERMINAL 770147-1	TERMINAL 770147-1

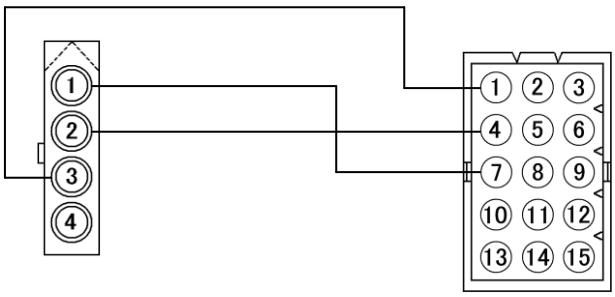
5.3 How to connect BROTHER'S built-in volume type push button switch

(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

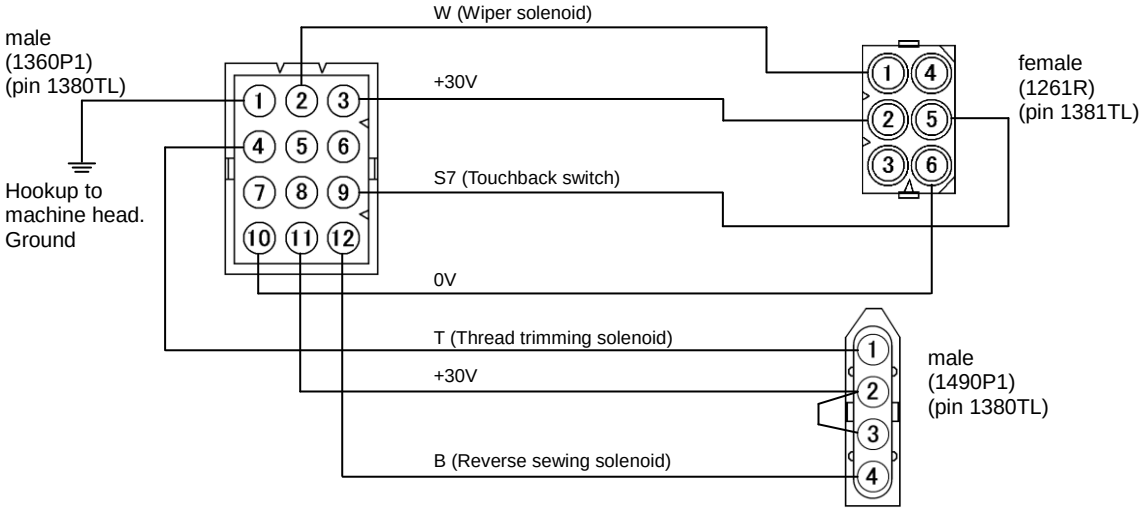
MOLEX CONNECTOR
CONNECTOR 1375P3
TERMINAL 1380TL
OR AMP CONNECTOR
CONNECTOR 770107-1
TERMINAL 770147-1

(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.

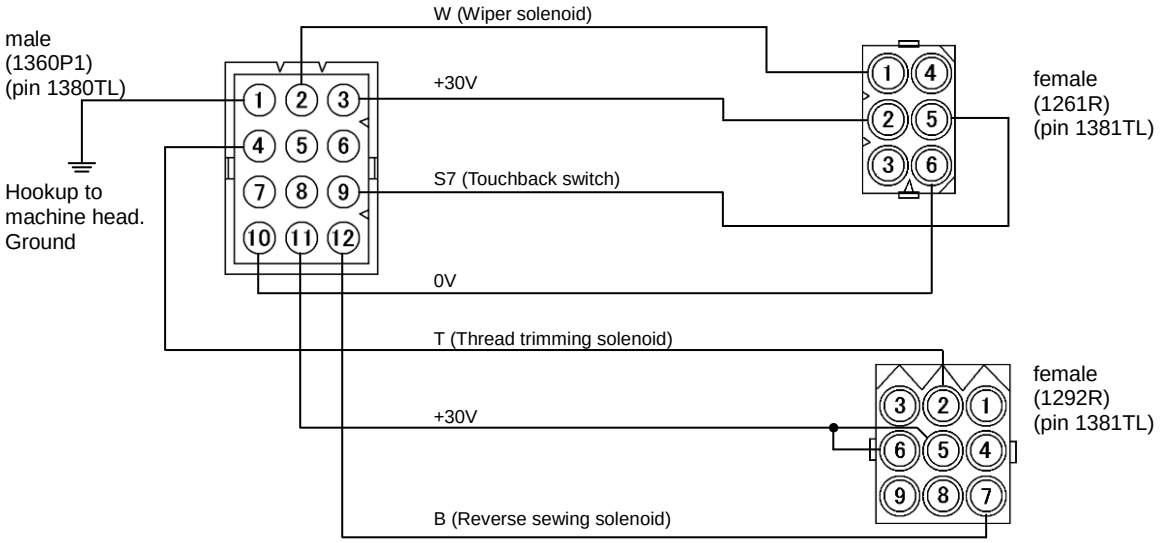
6. How to connect JUKI machine

6.1 Junction wiring

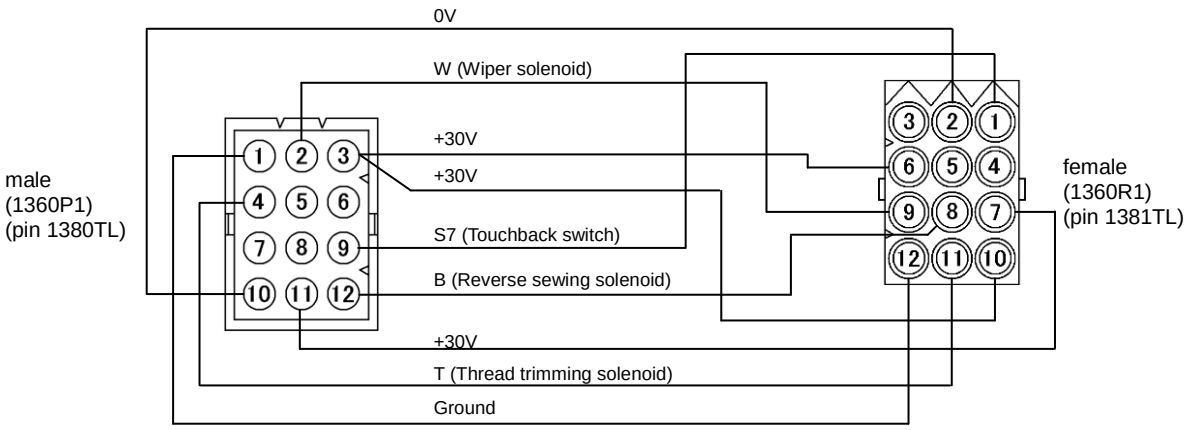
(1) For DDL-500 (XC-CBL-JK-1)



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

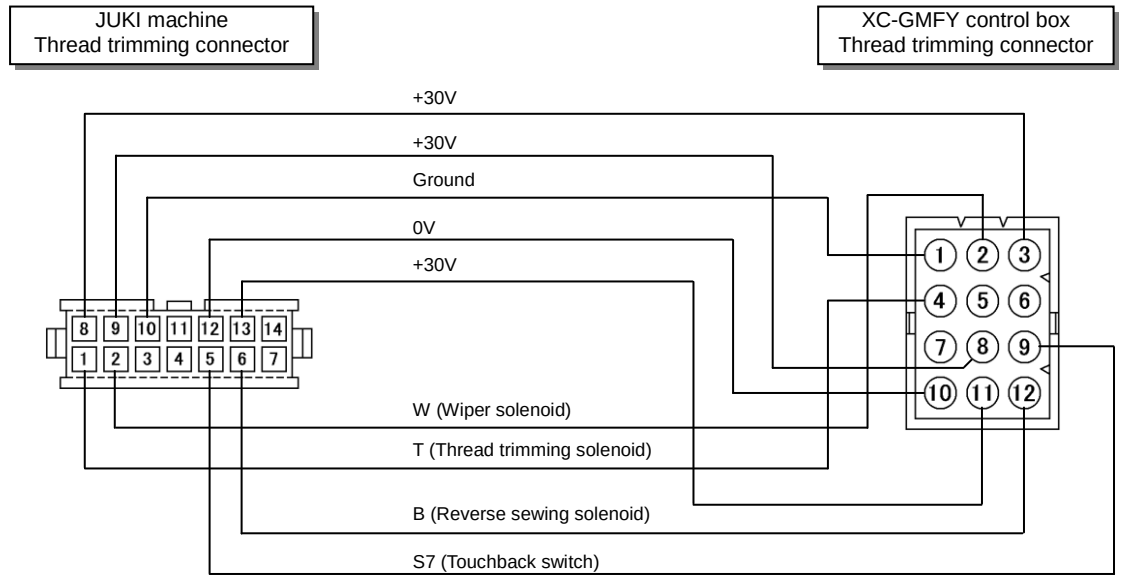


(3) For DDL-505, 506, 5570, 5580, DLU-5490 (XC-CBL-JK-3)



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

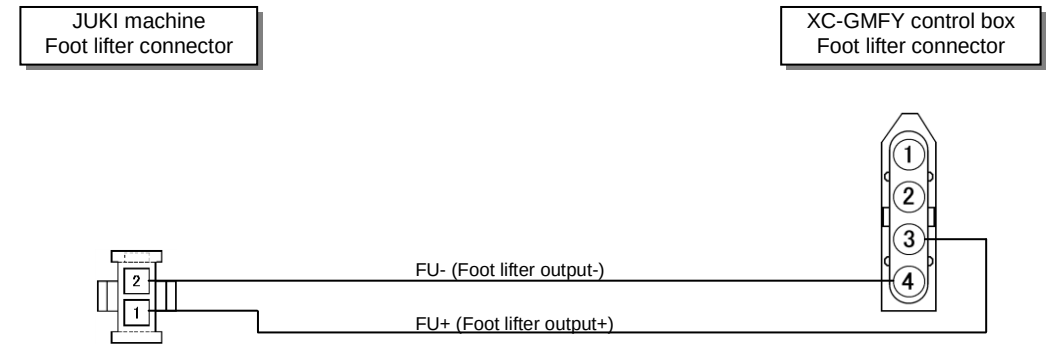
(a) For thread trimming [Parts Name:XC-CBL-JK-5 (Parts No.:K14M72021130)]



Connector 5559-14P (MOLEX)
Terminal 5558TL (MOLEX)

Connector 1360P1 (MOLEX)
770102-1 (AMP)
Terminal 1380TL (MOLEX)
770147-1(AMP)

(b) For foot lifter [Parts Name:XC-CBL-JK-6 (Parts No.:K14M72021230)]



Connector 5559-02P (MOLEX)
Terminal 5558TL (MOLEX)

Connector 1490P1 (MOLEX)
770078-1 (AMP)
Terminal 1380TL (MOLEX)
770147-1(AMP)

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

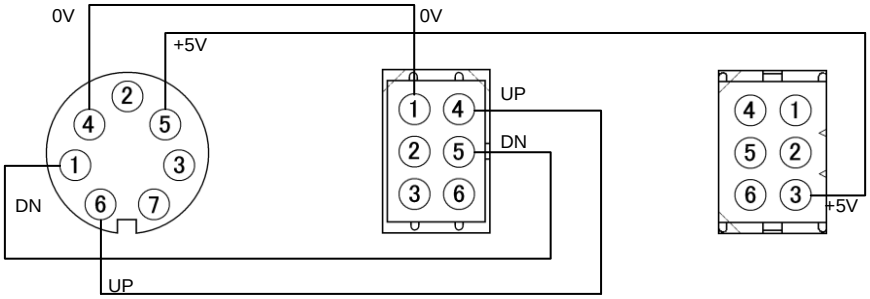
LIMI-SERVO X MODEL XC-FMFY control box

(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)

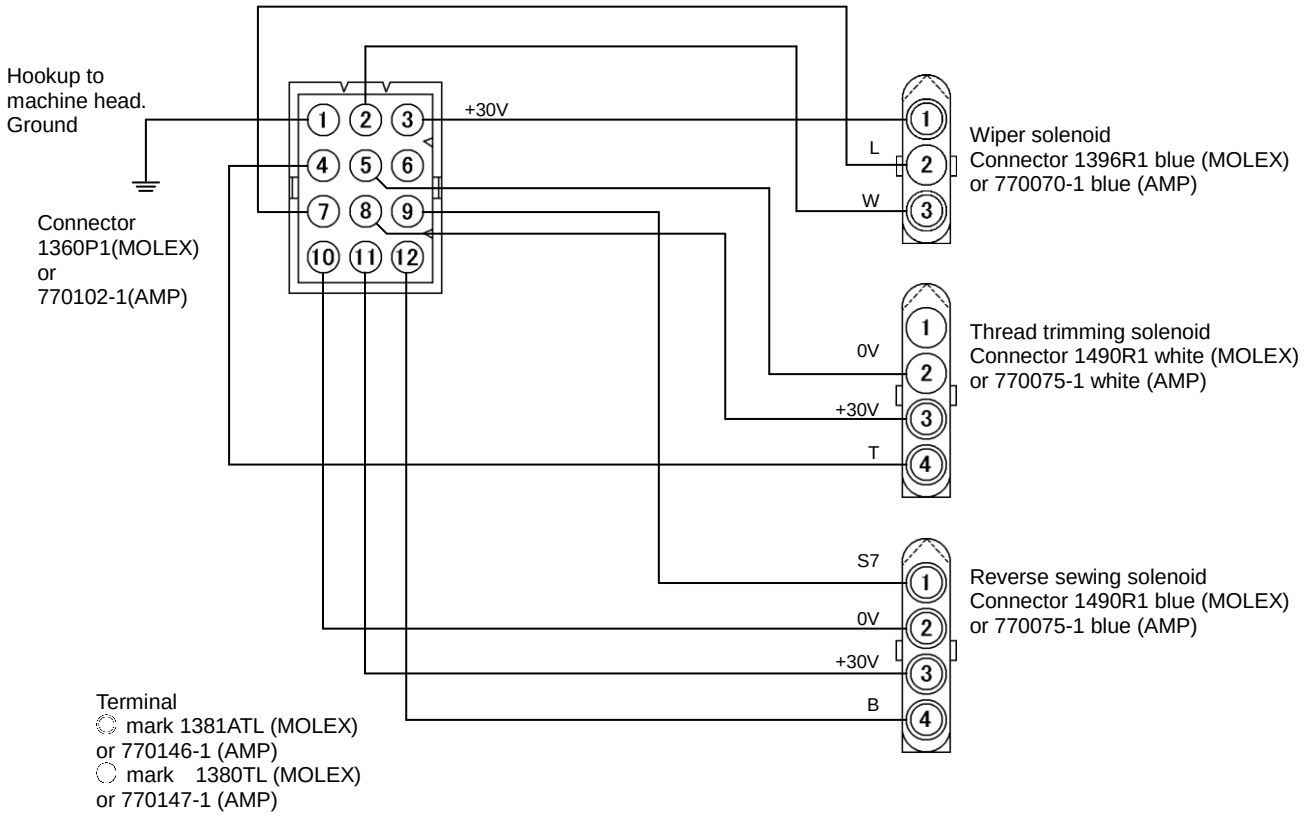


TO JUKI BUILT-IN DETECTOR CONNECTOR 7 PIN DIN TYPE HOSIDEN CONNECTOR TCS8076-01-5201	TO LIMI-SERVO DETECTOR CONNECTOR MOLEX CONNECTOR CONNECTOR 1991-06P1 TERMINAL 1380TL OR AMP CONNECTOR CONNECTOR 770361-1 TERMINAL 770147-1	TO LIMI-SERVO OPTION A CONNECTOR MOLEX CONNECTOR CONNECTOR 1261P1 TERMINAL 1380TL OR AMP CONNECTOR CONNECTOR 770090-1 TERMINAL 770147-1

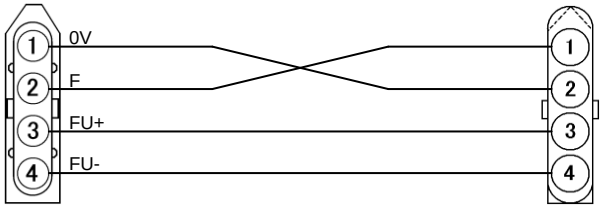
7. How to connect TOYOTA machine

7.1 Junction wiring

(1)XC-CBL-TY-1



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

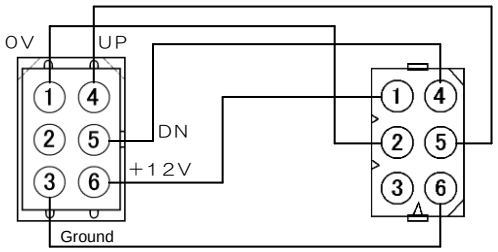


To LIMI-SERVO foot lifting connector
Connector 1490P1 white (MOLEX)
or 770078-1 white (AMP)
Terminal 1380TL male (MOLEX)
or 770147-1 (AMP)

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)

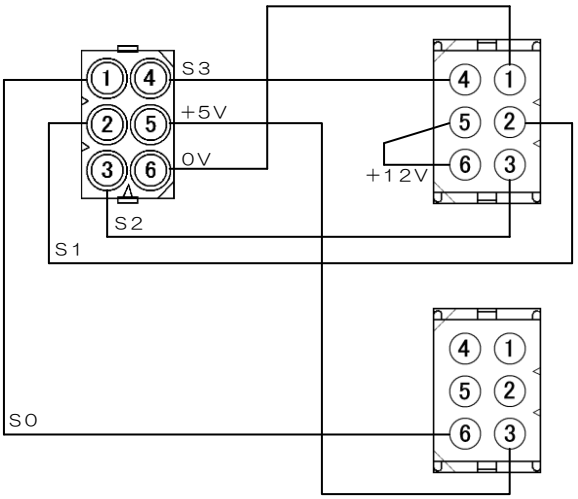


To TOYOTA built-in synchronizer
Connector 1261R1 white (MOLEX)
or 770086-1 white (AMP)
Terminal 1380TL male (MOLEX)
or 770147-1 (AMP)

(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.)



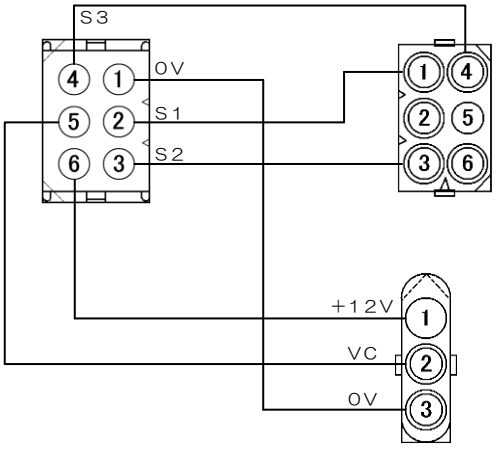
To LIMI-SERVO lever connector
Connector 1261P1 white (MOLEX)
or 770090-1 white (AMP)
Terminal 1380TL male (MOLEX)
or 770147-1 (AMP)

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)



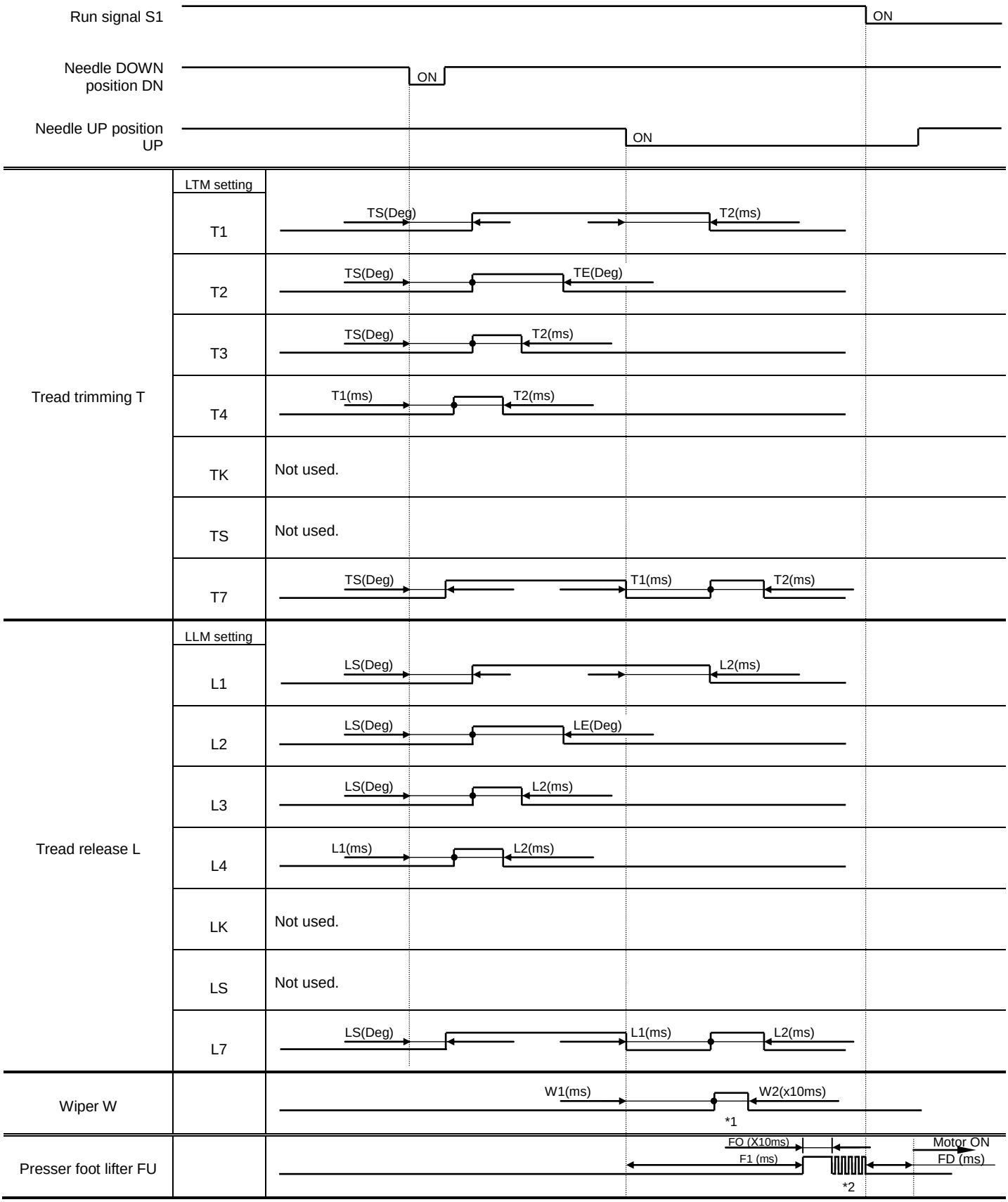
To TOYOTA variable speed pedal
Connector 1261R1 (MOLEX)
or 770086-1 (AMP)

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

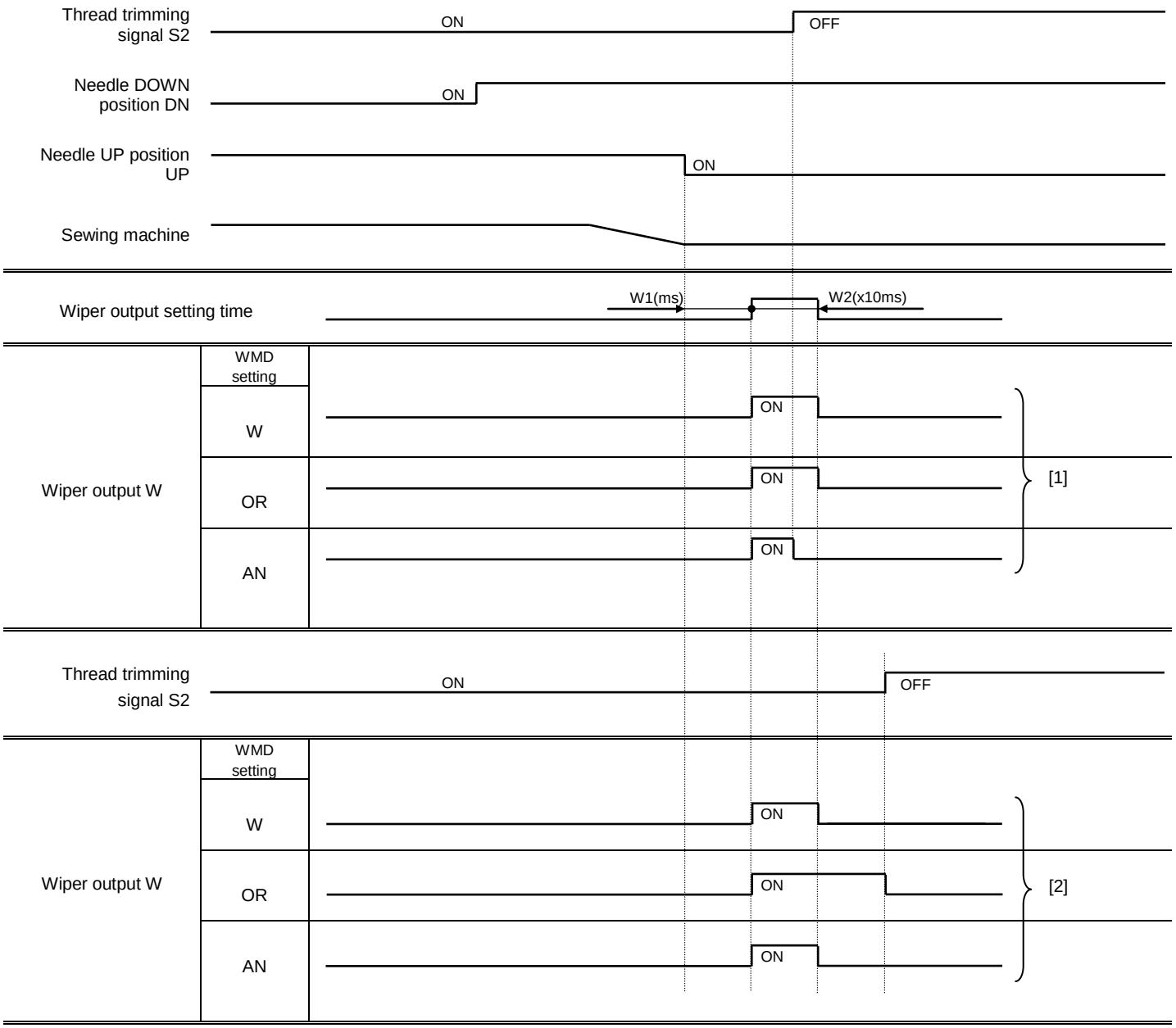


Notes: *1.The wiper output [W] becomes special operation according to the [G] mode WMD setting, as shown on page 89.

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

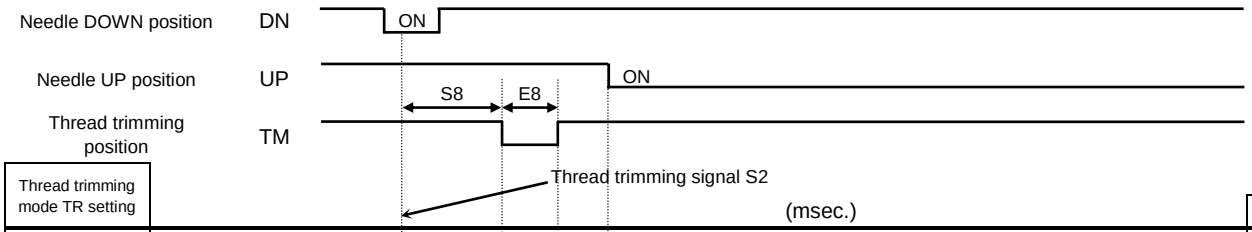
2. Wiper output timing

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

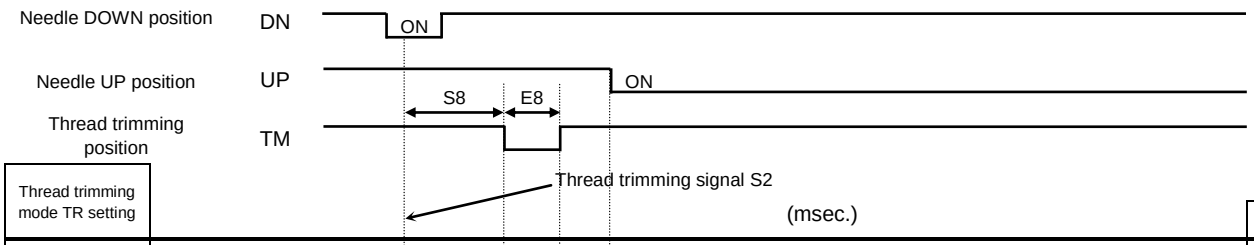


* Wiper output OFF timing is changed by S2 signal OFF timing like above chart [1] and [2].

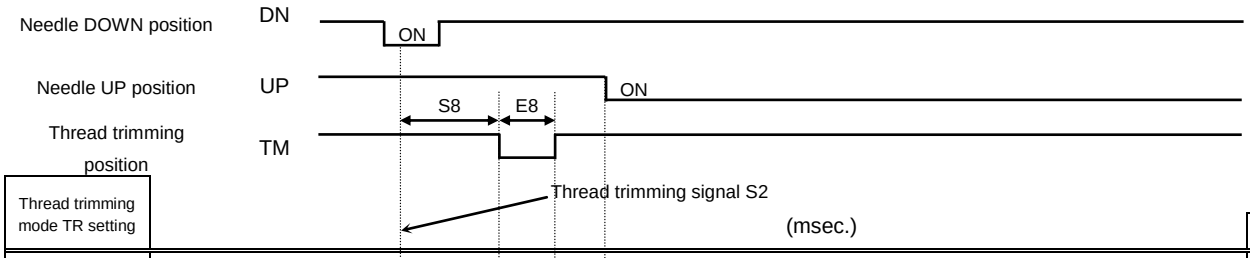
3. Thread trimming timing for each setting in the thread trimming mode TR



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



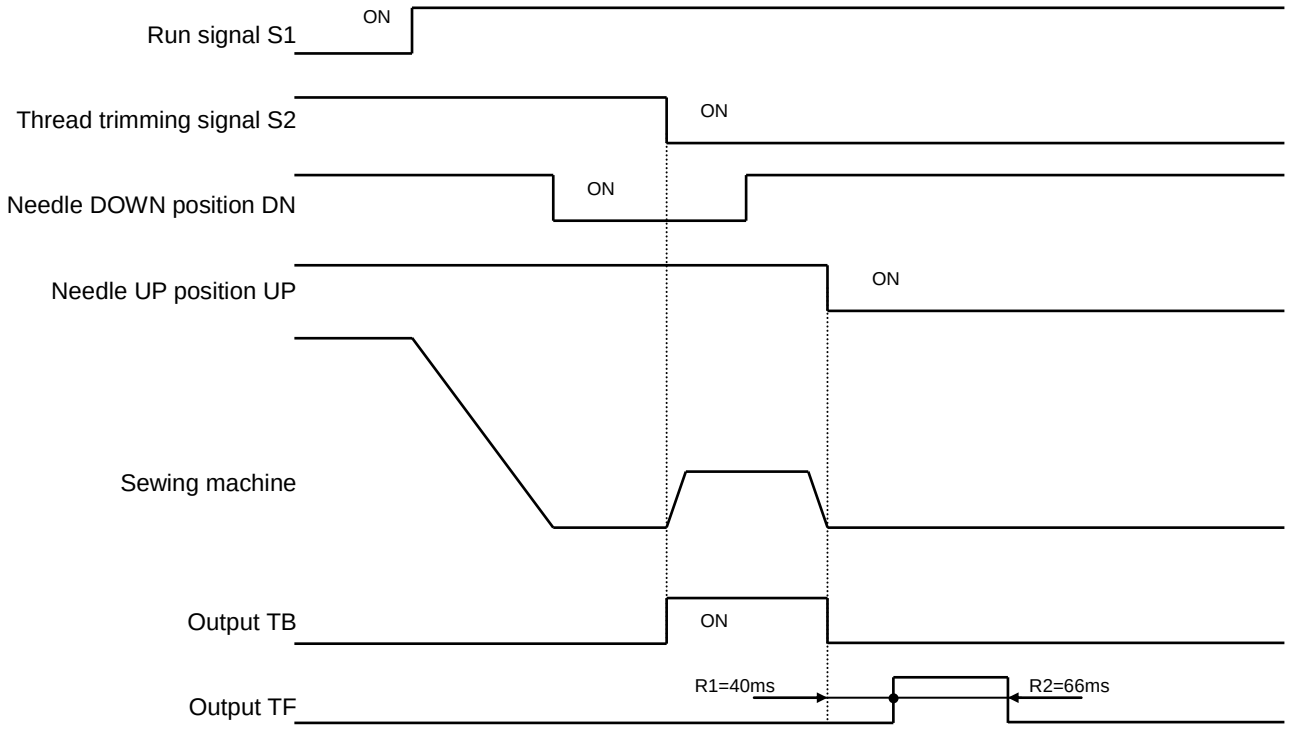
Thread trimming mode TR setting			Applicable models
N1	Thread trimmer	T	
	Thread release	L	
	Wiper	W	
	Presser foot lifting	FU	
P1	Thread trimmer	T	PFAFF (for solenoid) 463 900
	Thread release	L	
	Wiper	W	
	Presser foot lifting	FU	
P2	Thread trimmer	T	PFAFF (for air)
	Thread release	L	
	Wiper	W	
	Presser foot lifting	FU	
P3	Thread trimmer	T	PFAFF (for air)
	Thread release	L	
	Wiper	W	
	Presser foot lifting	FU	



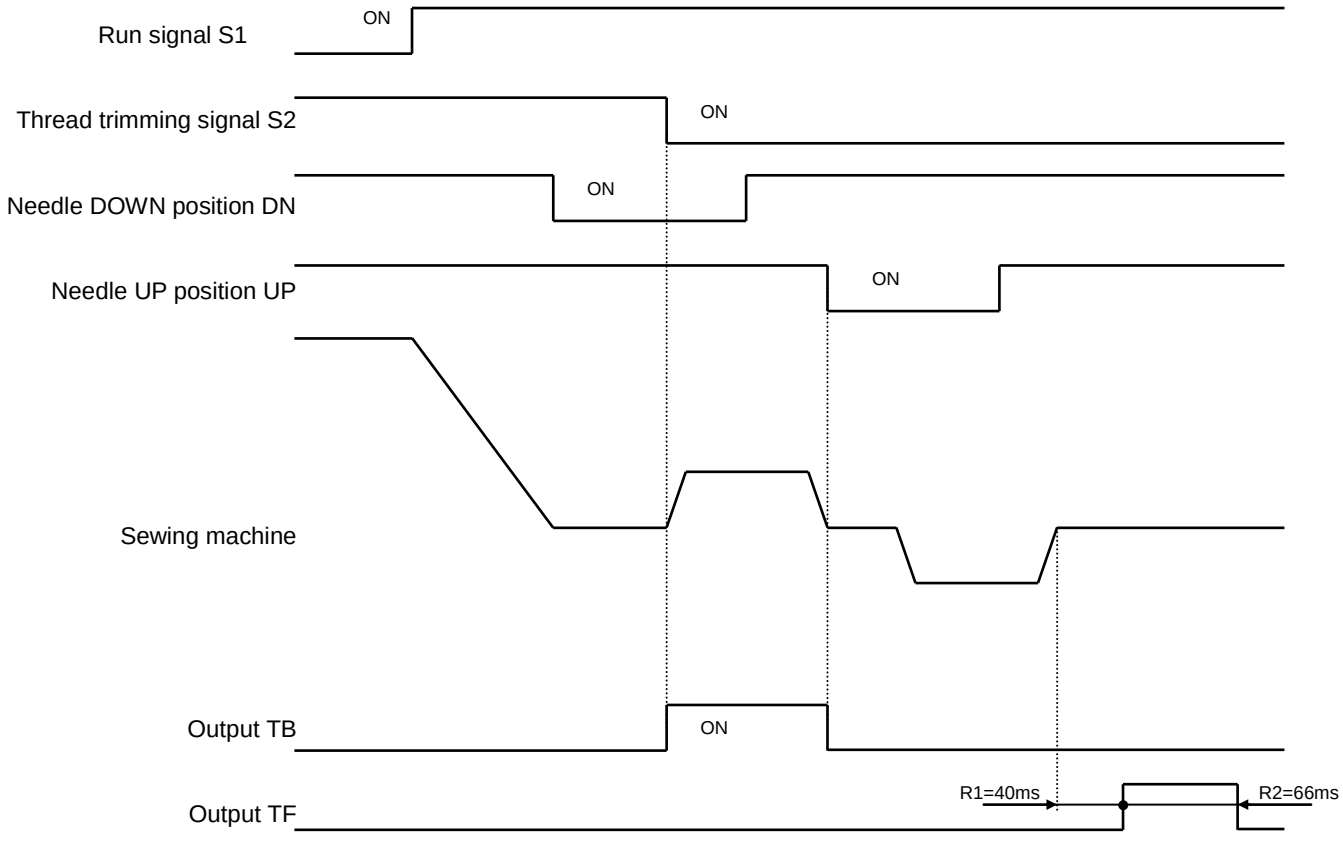
Thread trimming mode TR setting			Applicable models
P4	Thread trimmer	T	PFAFF (for air)
	Thread release	L	
	Wiper	W	80
	Presser foot lifting	FU	140
T1	Thread trimmer	T	Toyota AD158 157 340 341
	Thread release	L	
	Wiper	W	45
	Presser foot lifting	FU	70
T2	Thread trimmer	T	Toyota AD3110
	Thread release	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	80 Reverse
	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

16 Output TB,TF timings

(1) Output normal timing

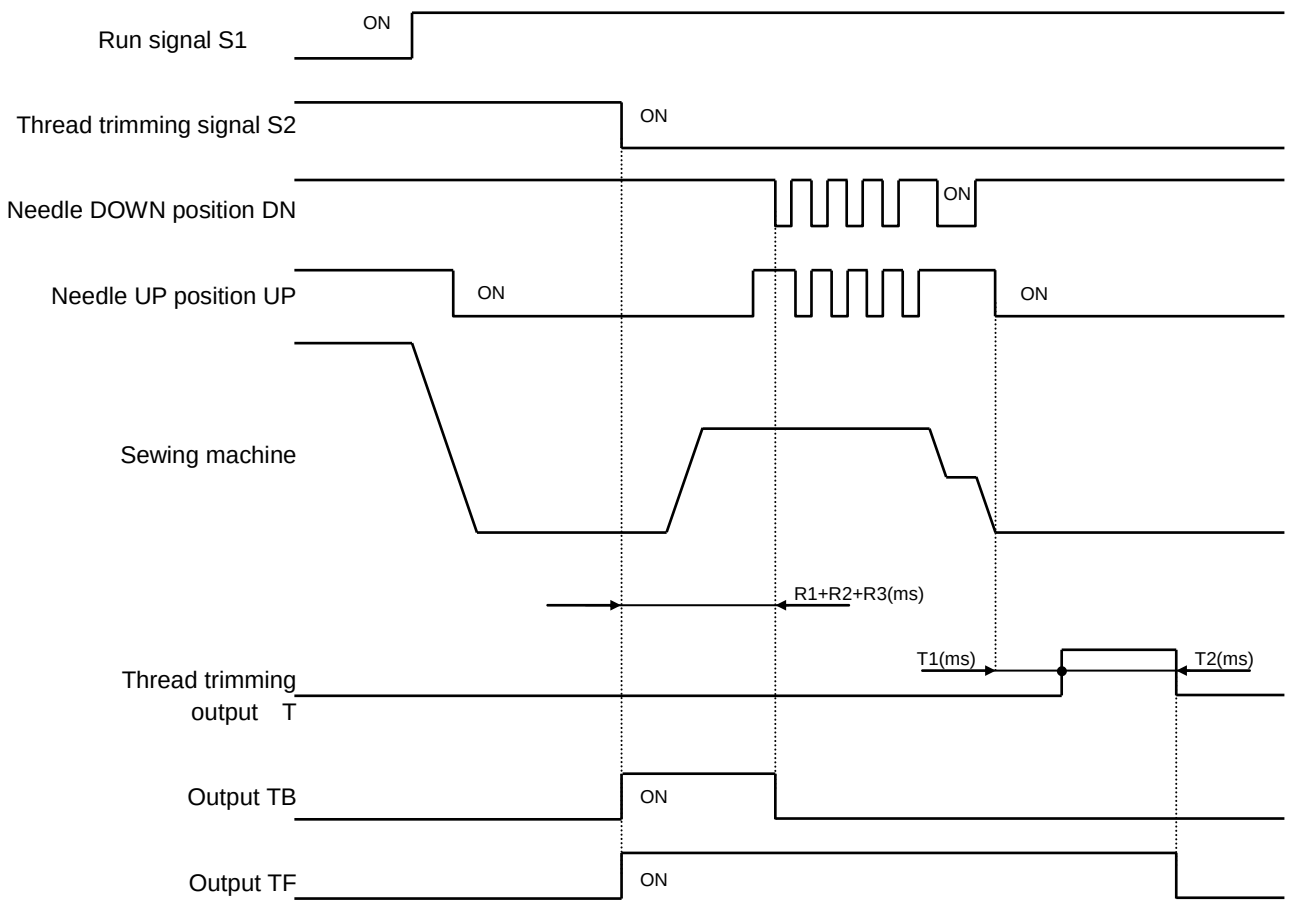


(2) Function setting [RU [ON]] in program mode [P]

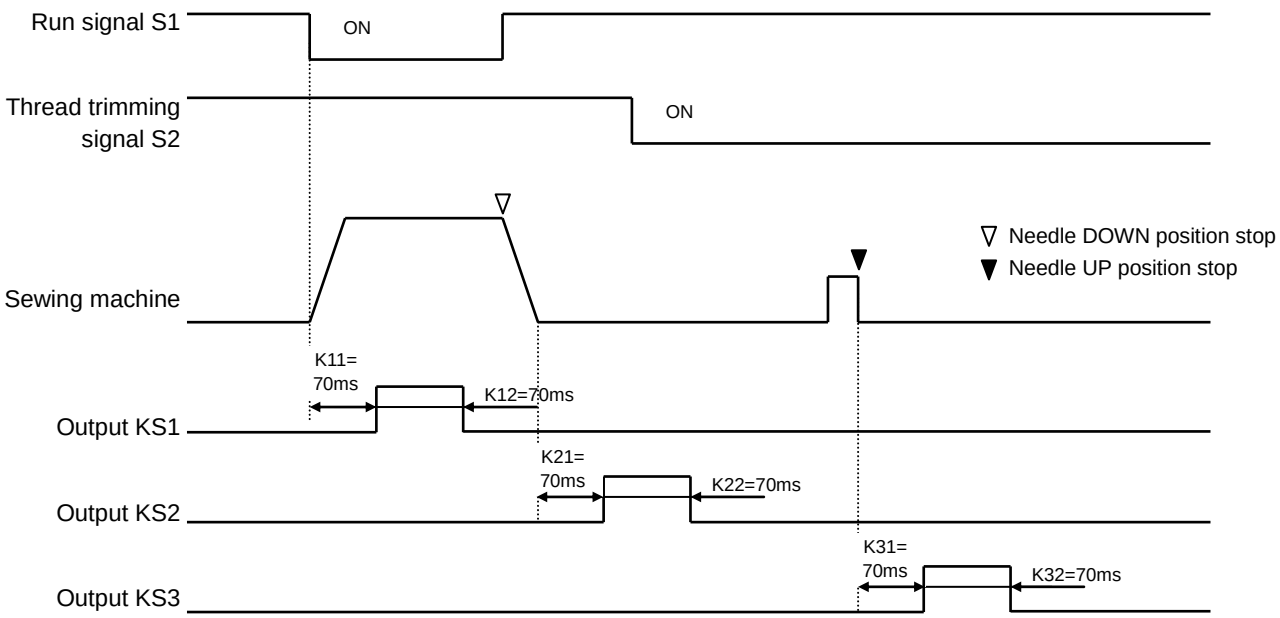


Note 1. The TF output start time can be set with R1 in the [G] mode.
The TF output time can be set with R2 in the [G] mode.
2. The above-mentioned timing is function setting [TRM [LK]] in program mode [G].

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



17 Output KS1,KS2,KS3 timings



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.)

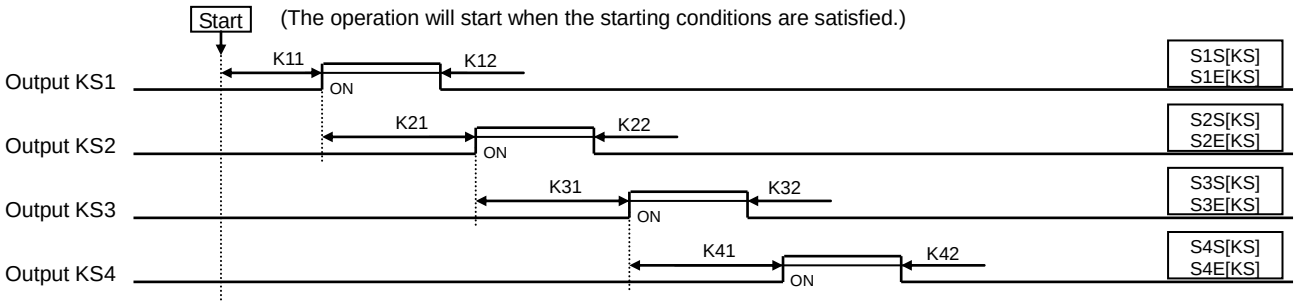
4. Simple sequence output end point setting

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

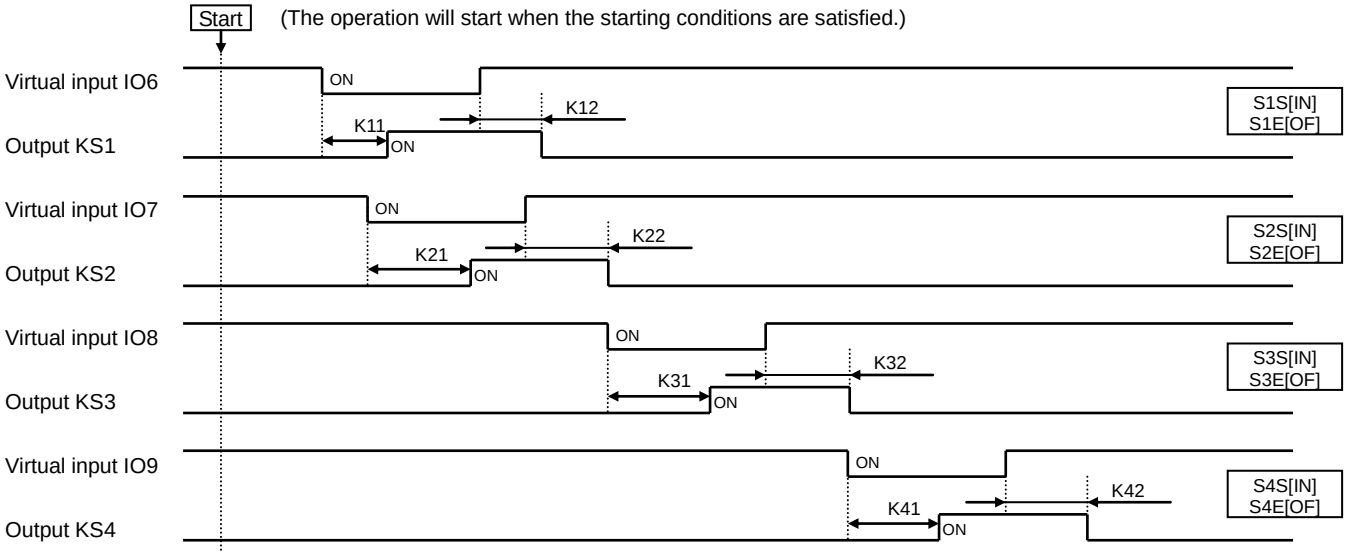
- [KS] : Linked output. (Each output starting point)
- [OF] : Virtual input OFF point. (KS1:IO6, KS2:IO7, KS3:IO8, KS4:IO9)
- [IN] : Virtual input ON point. (KS1:IOA, KS2:IOB, KS3:IOC, KS4:IOD)
- [T] : When thread trimming is completed.
- [R] : When operation is starting.
- [S] : When motor is stopped. (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

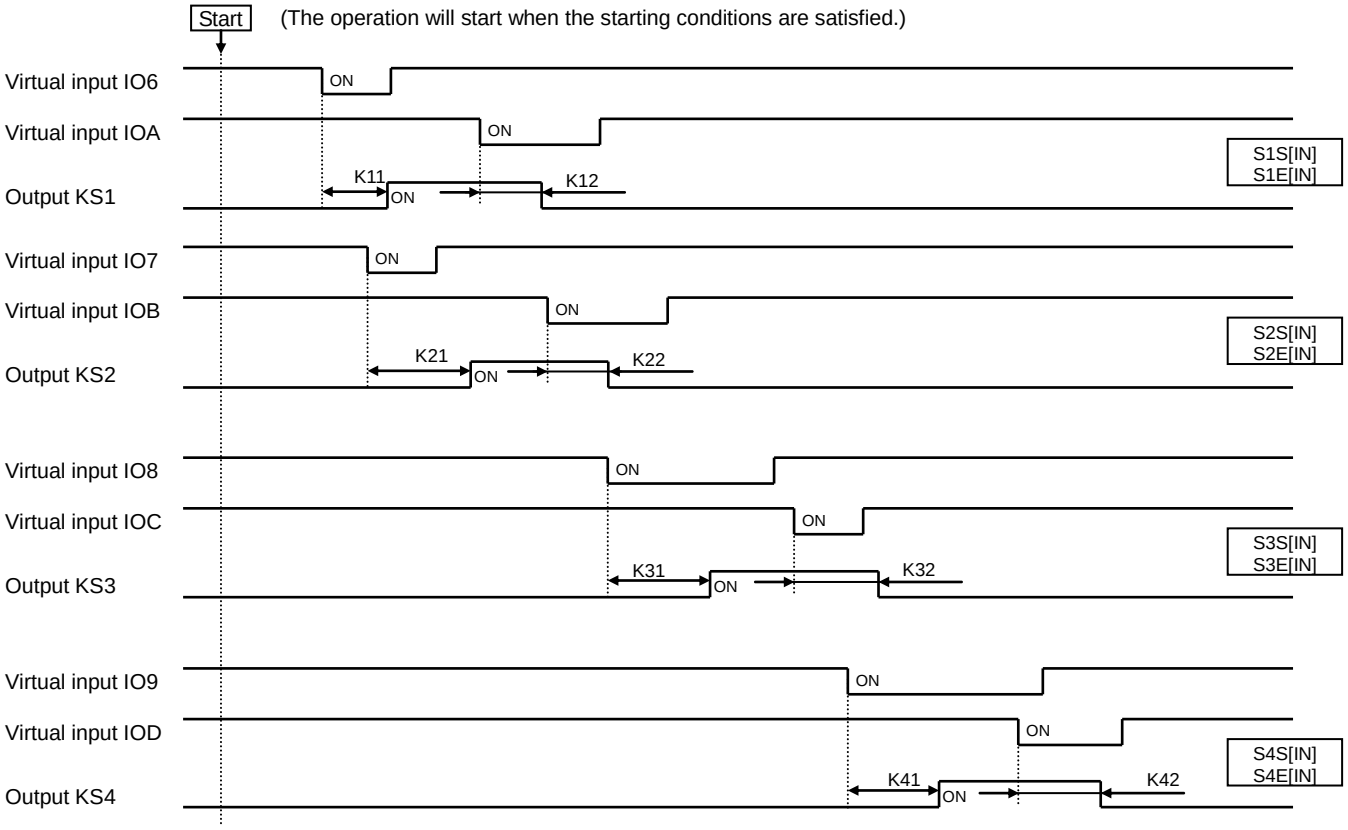
5-1. (Starting point setting : [KS], End point setting : [KS])



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])

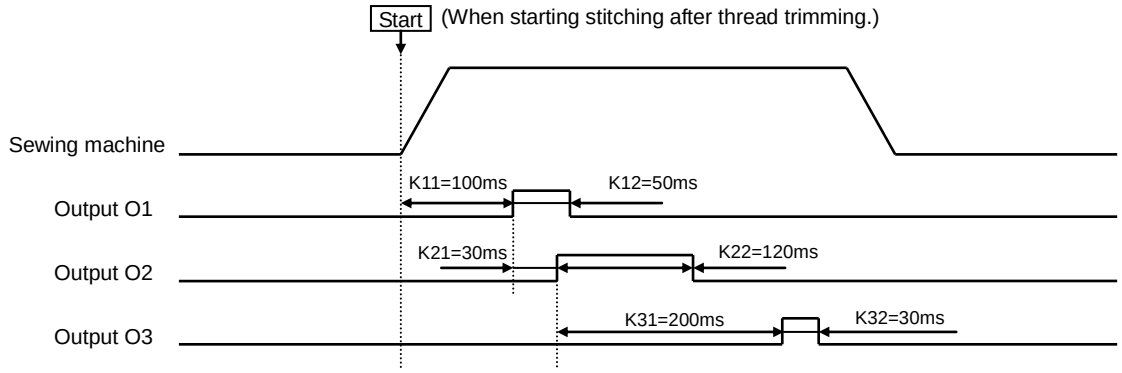
(c) Sequence output [KS1] [KS2] [KS3] [KS4] time setting/No. of stitch setting each by ten times setting [KL1] [KL2] [KL3] [KL4]
[OF] setting : Time setting/No. of stitch setting ([K11][K12], [K21][K22], [K31][K32], [K41][K42])
[ON] setting : Time setting/No. of stitch setting by ten times ([K11][K12]x10, [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)

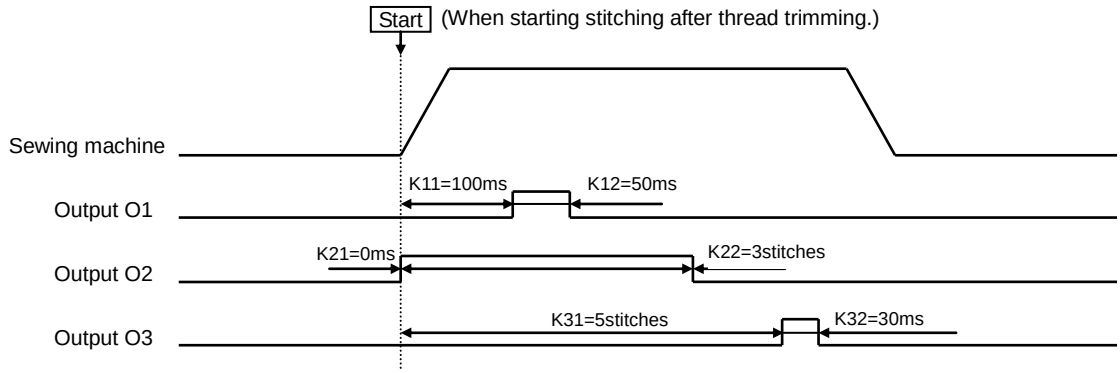
Function	Standard	Setting	Description
O1	OT1	**KS1**	Selection of output signal function
O2	NCL	**KS2**	Selection of output signal function
O3	TF	**KS3**	Selection of output signal function

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)

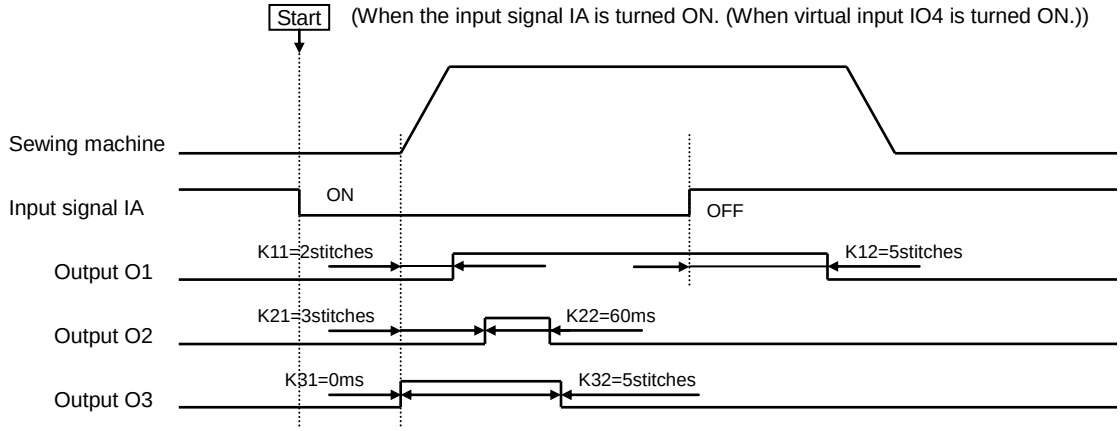
Function	Standard	Setting	Description
O1	OT1	**KS1**	Selection of output signal function
O2	NCL	**KS2**	Selection of output signal function
O3	TF	**KS3**	Selection of output signal function

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)

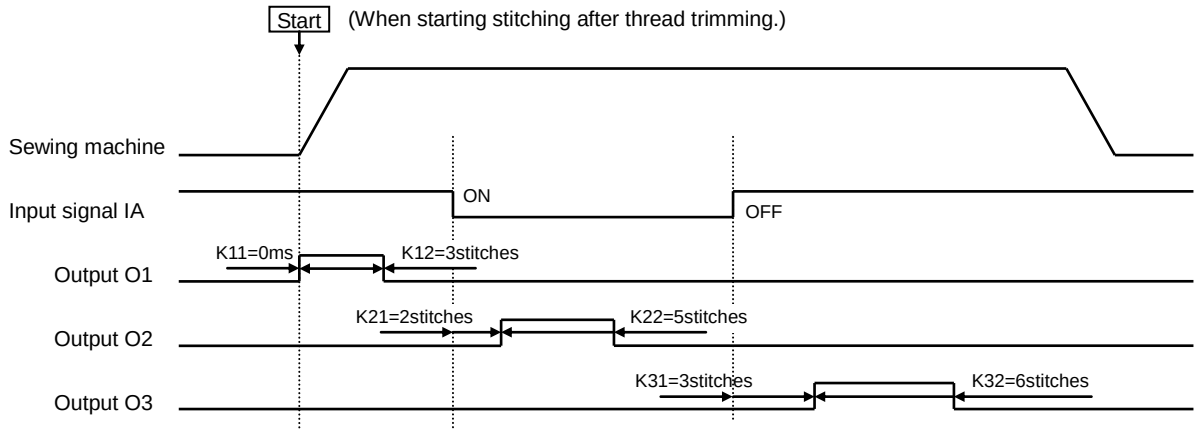
Function	Standard	Setting	Description
IA	PSU	**IO4**	Selection of input signal function
IM	NO	**IO6**	Selection of input signal function
O1	OT1	**KS1**	Selection of output signal function
O2	NCL	**KS2**	Selection of output signal function
O3	TF	**KS3**	Selection of output signal function
OM	NO	**OT4**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

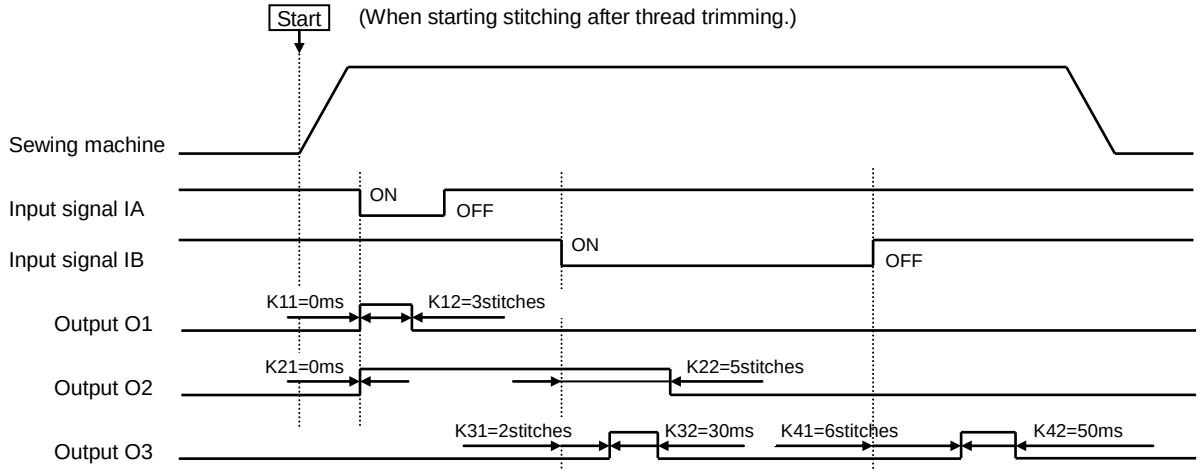
Function	Standard	Setting	Description
IA	PSU	**IO7**	Selection of input signal function
IM	NO	**IO8**	Selection of input signal function
O1	OT1	**KS1**	Selection of output signal function
O2	NCL	**KS2**	Selection of output signal function
O3	TF	**KS3**	Selection of output signal function
OM	NO	**OT7**	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)

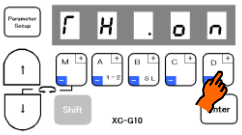
20 How to set Thread break detector

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)



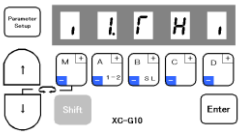
* Press the [D] key and set the value to "ON".

(3) Set the function [TH].
For mode call: [↓] + [↑]

For direct number call: Set with Enter.

(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)

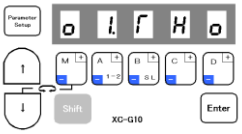


* Press the [D] key and set the value to "THI".

(6) Call out the program mode [C] function [O1].
For mode call: [↓]

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

(7)



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

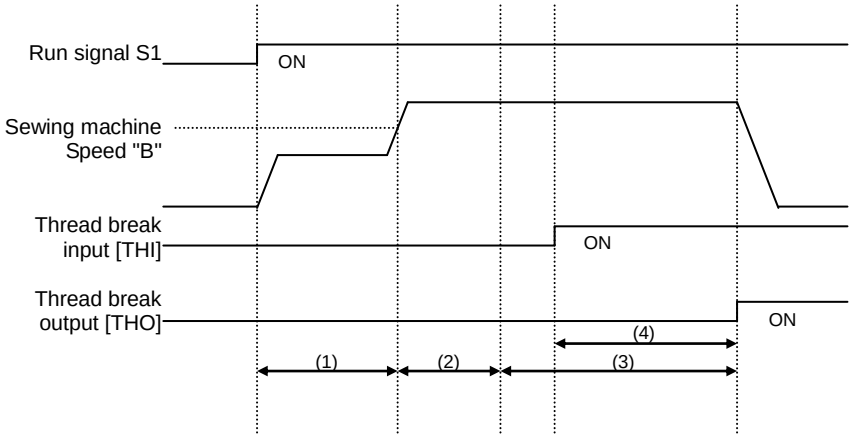
(8) Entering the normal mode
For mode call: [↓] + [↑]

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

Description

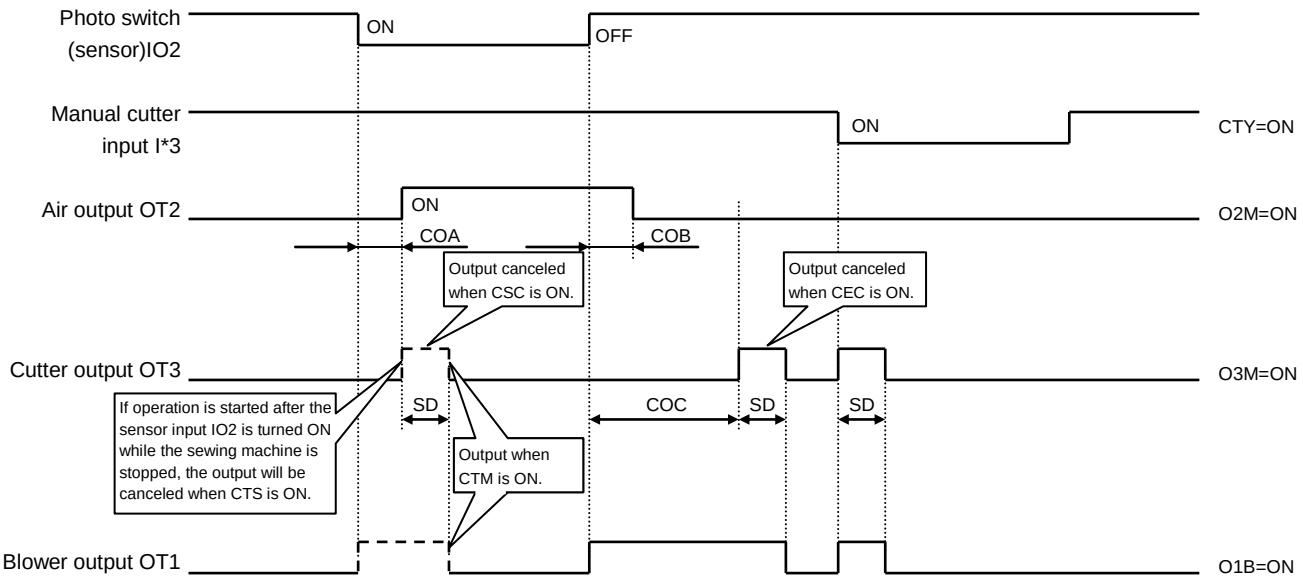
Selection the function on program mode [Q].
[TH.ON] : To use upper thread break detector function, set to "ON"
[TH.OF] : Upper thread break detector function is invalid.
Selection the function on program mode [Q].
[TST.] : Setting the action, after thread was broken.
[NO] : "THO" output function become 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.



Term (1) : Sewing machine speed is under "B" speed, so it neglect thread break function.
Term (2): After sewing machine speed become over "B" speed, still under "THS" stitch amount, so it neglect thread break function.
Term (3) : Thread break function is valid.
Term (4) : The judgment stitch amount "THF" of thread break. after this stitch amount, thread break function move to "TST" function.

1. Cutter output function



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

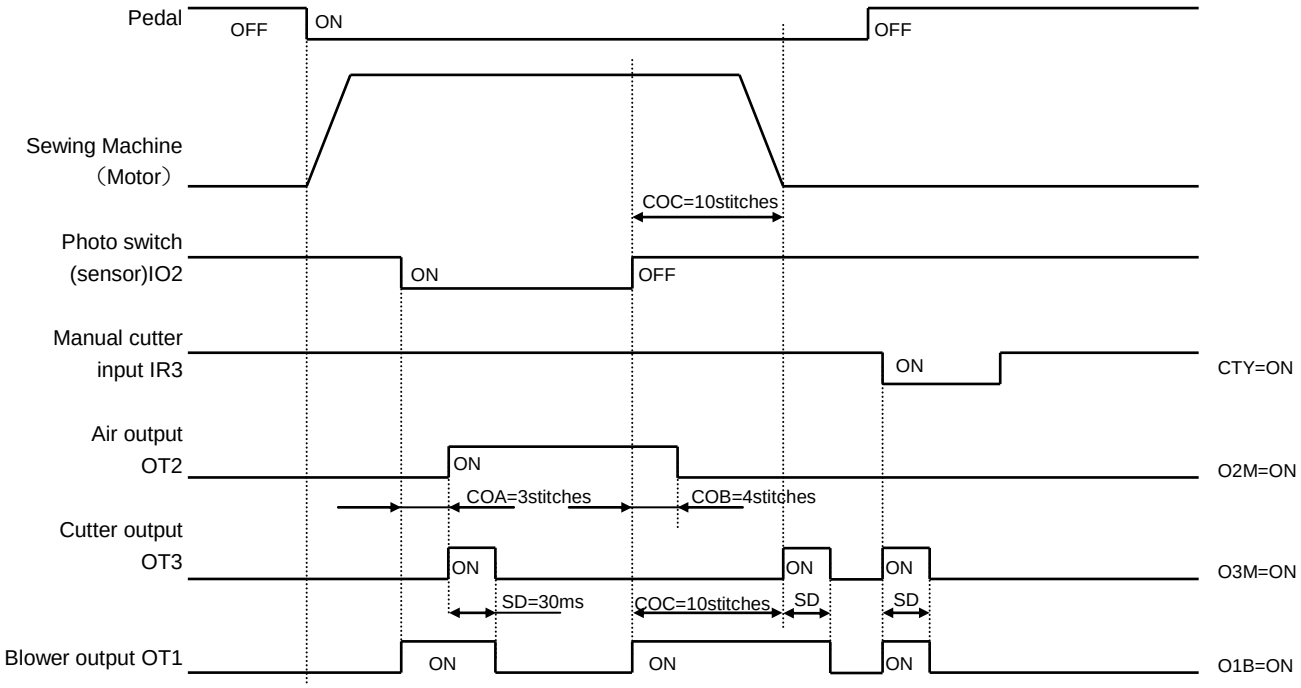
F mode setting

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

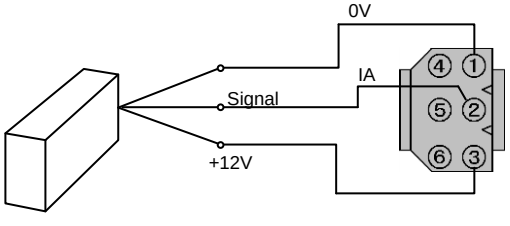
C Mode ([↓]+[C] key)

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)

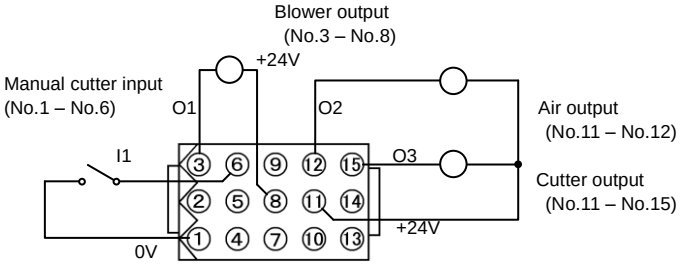
Function	Standard	Setting	Description
O1B	OF	**ON**	Set OT1 output to blower output.
O2M	OF	**ON**	Set OT2 output to air output.
O3M	OF	**ON**	Set OT3 output to cutter output.
CTY	OF	**ON**	Set I*3 input to manual cutter input.
CTM	OF	**ON**	Set OT3 cutter output to both OFF→ON and ON→OFF of IO2 photo 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



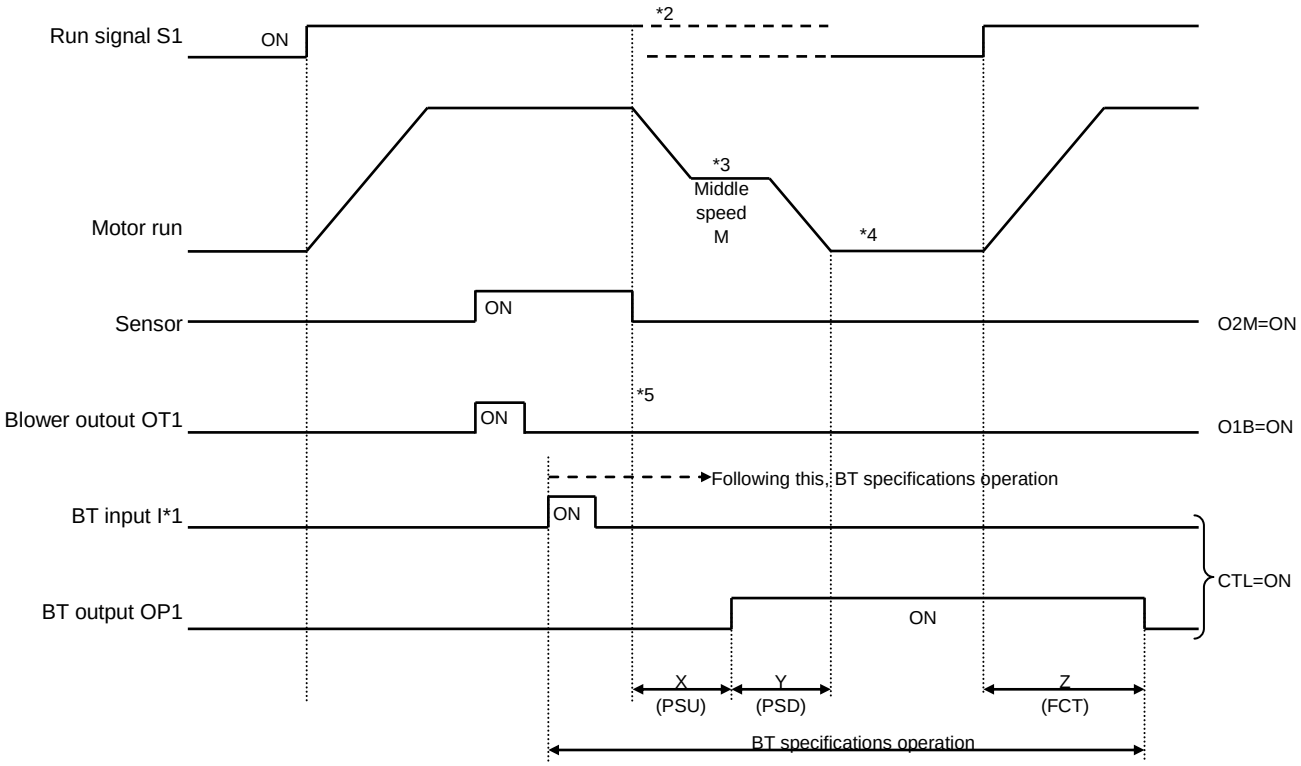
(Photo sensor)

(Option A connector)



(Option B connector)

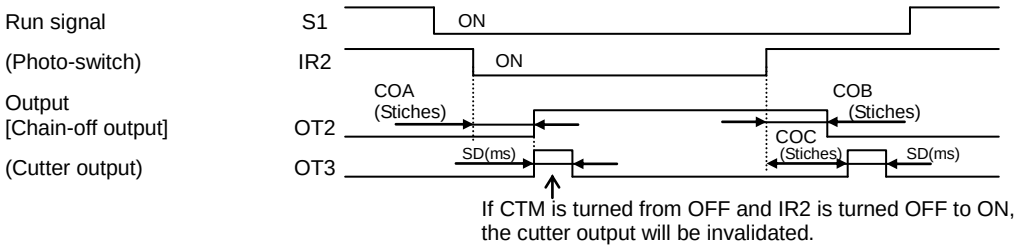
3. BT specifications (*1) operation chart and required settings



*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

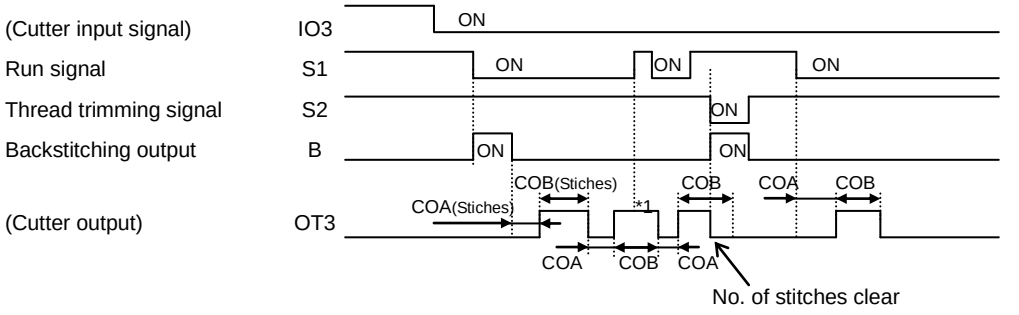


(1) Function setting of the program mode [C]
Ex. function setting [I1. IR2] + [O1. OT2] + [O2. OT3]

(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.

Control switch panel applications

1. Examples of using control switch panel

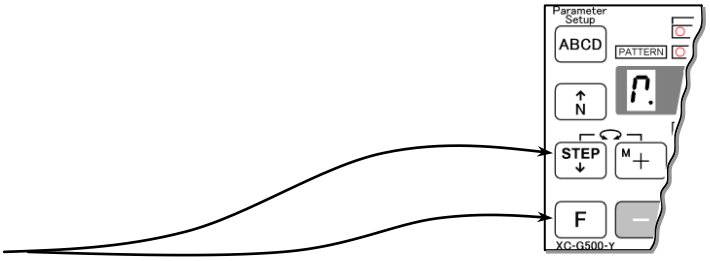
SELECTION OF MODE

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 rEAd.
(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 (n5) 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 WritE.
(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 (n5) 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 (n5) 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.)

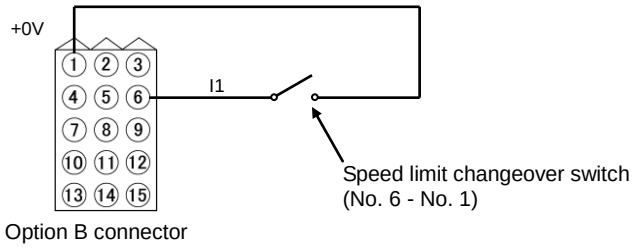
[Setting] (For example, to change the high-speed speed limit between 2000 rotations and 600 rotations.)

(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.)

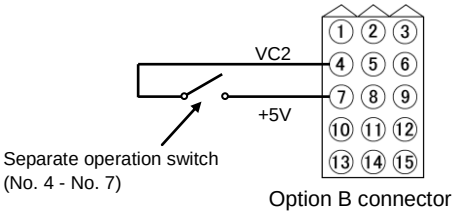
• Applicable control box : XC-GMF
• Working specifications : High-speed operation using variable-speed pedal (XC-CVS-2) and separate switch
(Digital keys C and D on the control panel is valid)

[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]

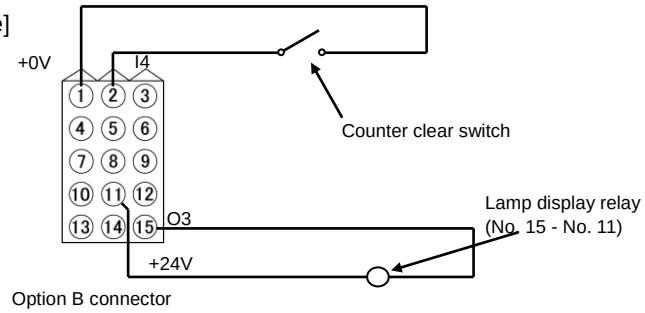
C Mode ([↓]+[C] key)

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 [↓] + [↑] + [A] + [C], and enter the K mode.

(2) Next, press the [↑] or [↓] 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**

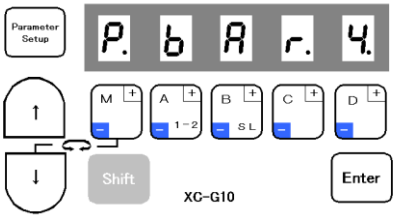
(Note that when using the back tacking function, start/end tacking (automatic repeat sewing) cannot be used.) An example for 4-point zigzag sewing is given below. For other cases, change the number of stitches. (Note: When setting example 1 above has been set, always return the function [ZNC.] setting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

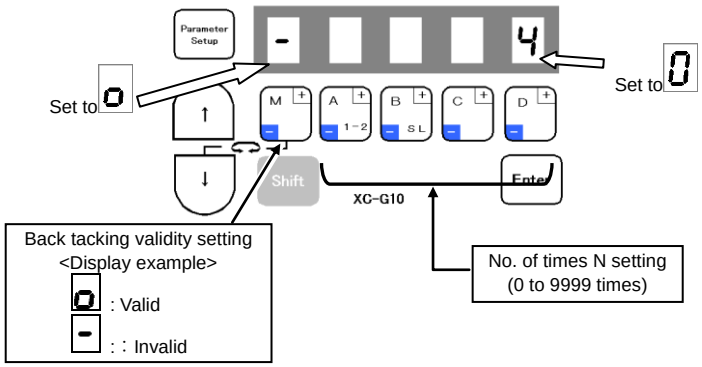
Key operation	Display
Press ↑ key four times from normal mode.	* The pattern No. selection mode will appear. 

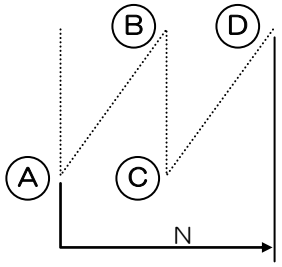
(2) In the pattern sewing mode, set the back tacking mode (pattern 4). Press the [D] key and set the pattern No. to 4. (Back tacking mode) The following display will appear.



(3) Next, press the [↓] key, and set the back tacking validity and the number of times.

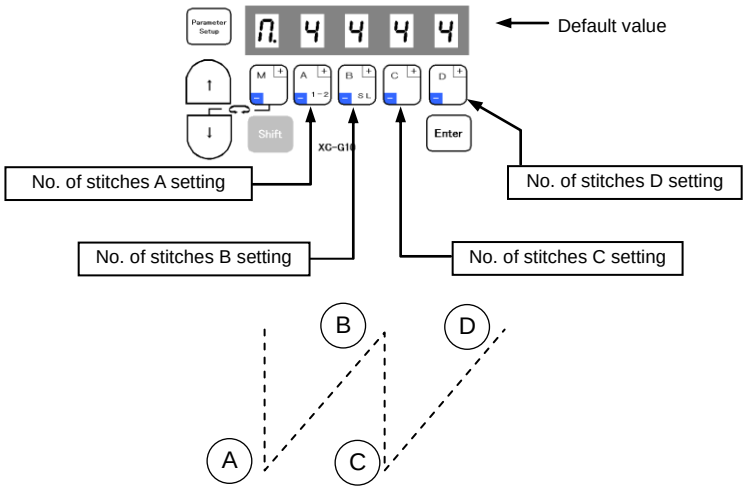
- Set the back tacking validity setting to [Valid].
- Set the number of back tacking times N to "0".





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.

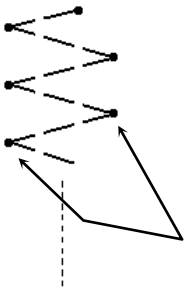
(4) Next, press the [↓] key, and enter the number of back tacking stitch setting mode, and set the number of stitches for A, B, C and D.



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).

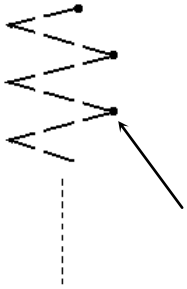


If the pedal is turned OFF during stitching,
the needle will always stop at the ● mark point shown on the left.

The needle will stop at either end.

(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).



If the pedal is turned OFF during stitching,
the needle will always stop at the ● mark point shown on the left.

The needle will always stop at this end.

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.

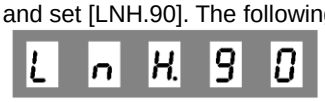
3 Set the various settings for the program mode.

(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.

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)

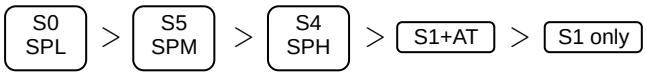
(Note 1) : For the (run) signal, an interlock is applied when the power is turned ON, thus, this will be invalid even if the S signal is ON when the power is turned ON. (The signal must be turned ON again.) * If the pedal is not at the neutral position or if the S1 signal is ON when the power is turned 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.

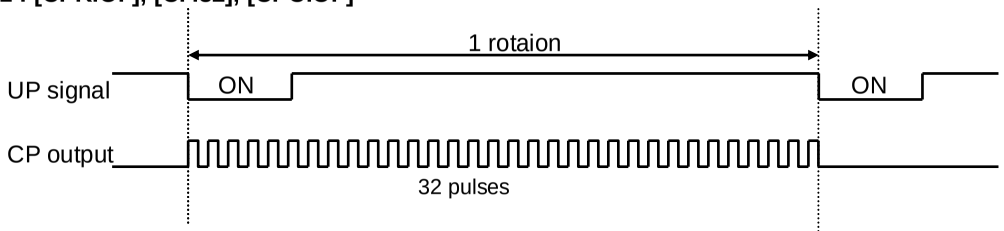
→ When the S1 signal is then turned OFF, the thread trimmer will operate, the machine will stop, and then the presser foot lifter will operate.

10. CP output

Mode name	Function name		Direct call number	Operability	Factory setting GMFY	Unit	Setting range	Function name / Digital display	Setting		Specification
C mode	Feed pulse output (CP) cancel function	**CPK.**	0520	O	ON	-	-	CPt.	on OF	ON 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".
↓ + C	Setting CP pulse amount	**CP.**	0521	O	32	-	1～99	CP.	**	**	Setting the number of pulse [CP]. After changing this number, turn on power switch again.
	Prohibited angle of output CP pulse	**CPC.**	0522	O	OF	-	-	CPC.	on OF	ON 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.))

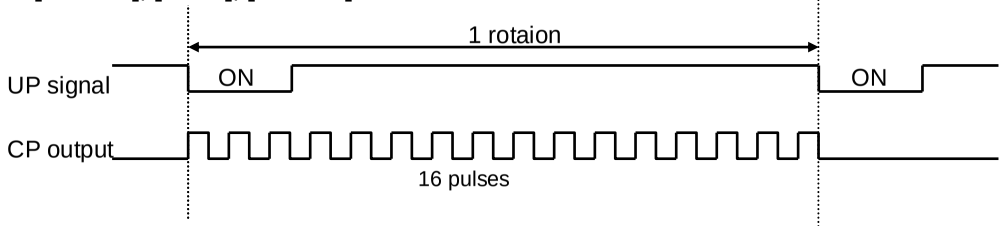
Example 1 : [CPK.OF], [CP.32], [CPC.OF]



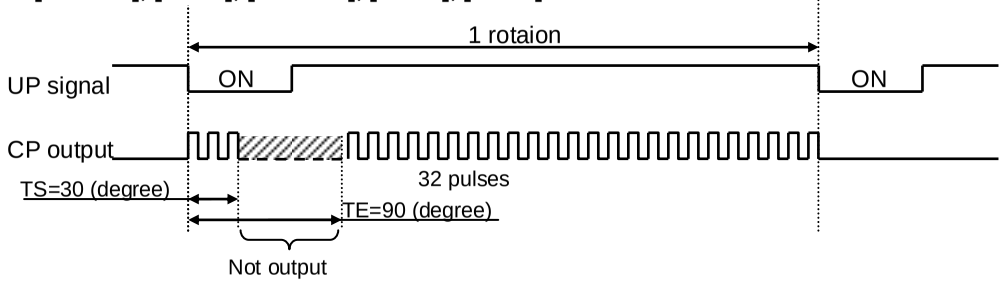
Note)

When the sewing machine is high-speed, the pulse output might not be output according to setting. Use an external counter separately in the business mind when the sewing machine is high speed and a usage in which accuracy is demanded.

Example 2 : [CPK.OF], [CP.16], [CPC.OF]

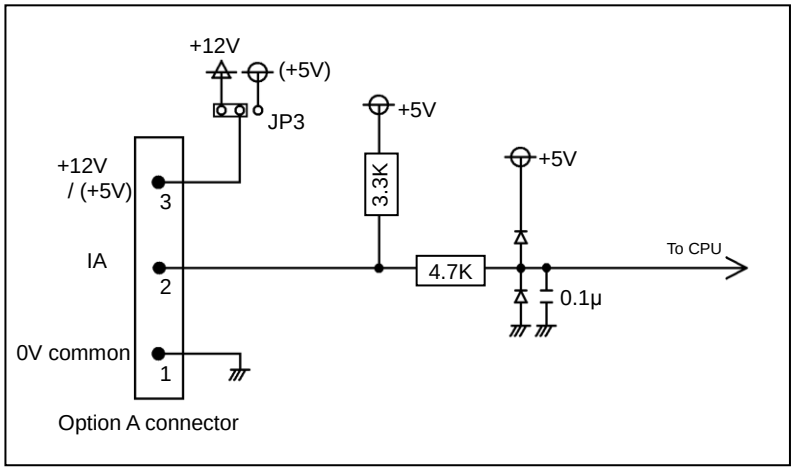


Example 3 : [CPK.OF], [CP.32], [CPC.ON], [TS.30], [TE.90]



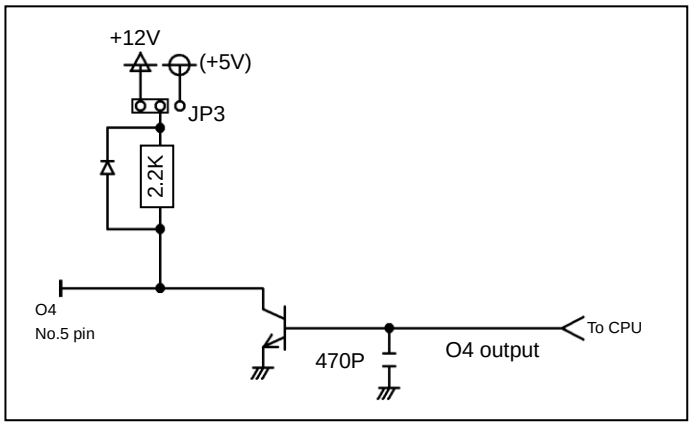
11. Main input/output circuits

(1) Input circuit for option A connector No. 2 pin (IA)



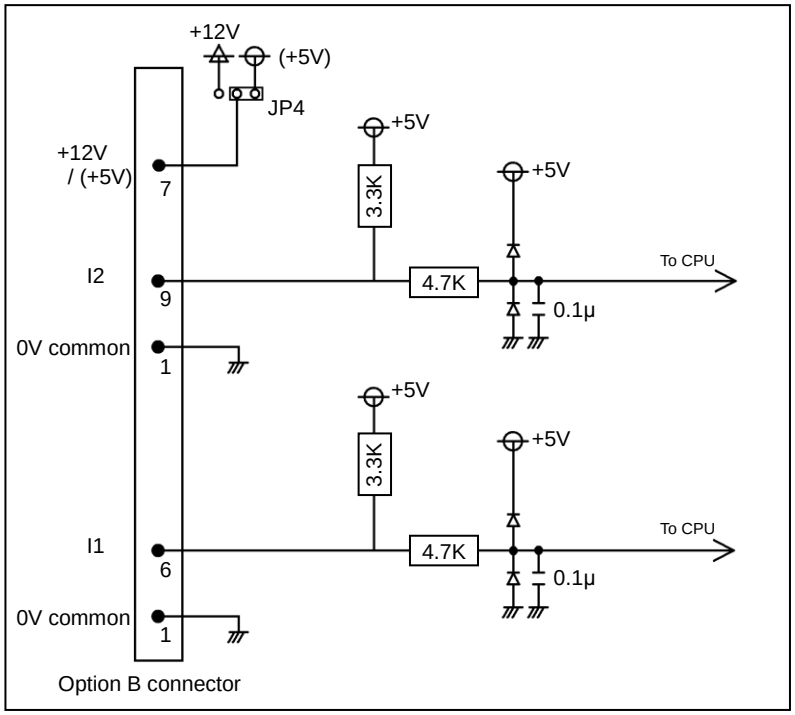
Caution)
The input circuit for the option A connector's No. 4 pin (IB) and No. 6 pin (IC) is the same as that shown on the left.

(2) Output circuit for option A connector No. 5 pin (O4)



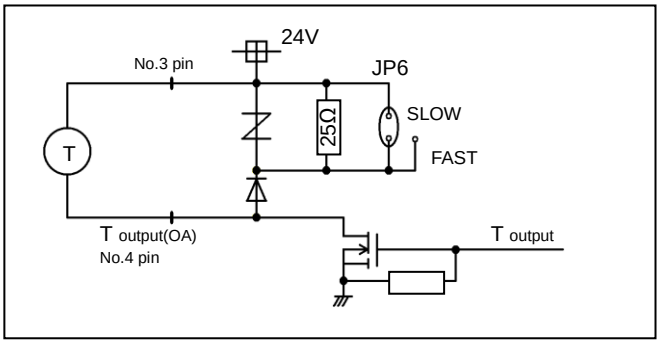
Caution)
As the default, the O4 output is set to the needle UP position output (UPW).
The needle UP position signal is output.
The output will be 12V output (default).
The output can be selected with the C mode settings.

(3) Input circuit for option B connector pin No. 6 (I1) and pin No. 9 (I2)

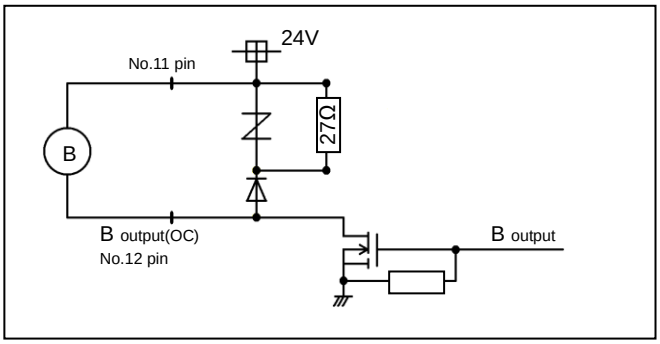


Caution)
The input circuit for the option B connector No. 2 pin (I4) and No. 5 pin (I5) is the same as that shown on the left.

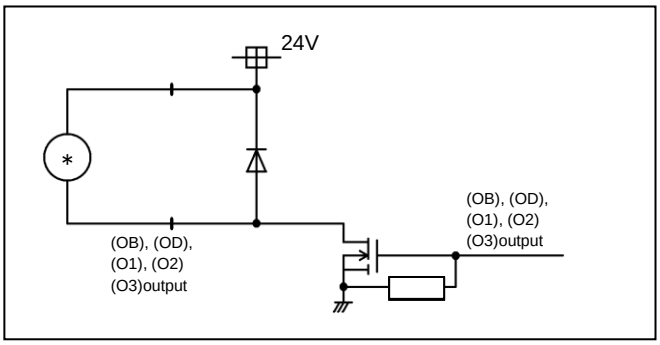
(4) Output circuit for sewing machine connector T output (OA)



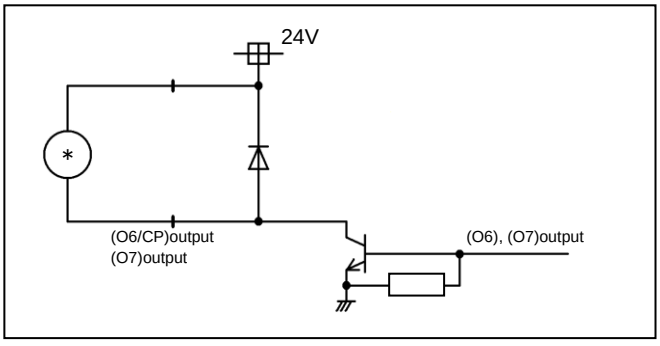
(5) Output circuit for sewing machine connector B output (OC)



(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		
Control box type / Detector type		XC-GMF	XC-FMF	XC-EMF XC-EN	XC-BMF XC-BMBL XC-BFL XC-BN	XC-AFL XC-AN	XC-AMF XC-AM	XC-M XC-FL XC-N	XC-MF	ZK-AMBL	LF-AMDF LF-AM	ZK-MBL ZK-FL ZK	LF-M	LF-MDF (DIP switch 32P side)	LF-MDF (DIP switch 64P side)
General detector	XC-KE-01P	◎	◎	◎	○ Note1	×	×	×	×	×	×	×	×	×	×
	XC-KB-12P	○	○	○	◎	○	× Note2	○	× Note2	○	× Note2	○	○	× Note2	×
	XC-KB-12	○	○	○	○	◎	△ Note3	○	△ Note3	○	△ Note3	○	○	△ Note3	×
	XC-KB-22	×	×	×	×	○	○	○	○	○	○	○	○	○	×
	XC-K-12P	○	○	○	◎	○	× Note2	○	× Note2	○	× Note2	○	○	× Note2	×
	XC-K-22	×	×	×	×	○	◎	○	◎	○	◎	○	○	○	×
	XC-K-12	○	○	○	○	◎	△ Note3	◎	△ Note3	◎	△ Note3	○	○	△ Note3	×
	LA-K-22	×	×	×	×	○	○	○	○	○	○	○	○	◎	×
	LA-K-12	○	○	○	○	○	△ Note3	○	△ Note3	○	△ Note3	◎	◎	△ Note3	×
Mitsubishi Sewing machine detector	XC-K-2000	○	○	○	○	○	× Note2	○	× Note2	×	×	×	×	×	×
	XC-K-1002	○	○	○	○	○	× Note2	○	× Note2	○	× Note2	○	○	× Note2	×
	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	○	○	○	○ Note4	×	×	×	×	×	×	×	×	×	○
	LA-K-180	○	○	○	○	○	○	○	○	○	○	○	○	○	×
	XA-K-230-C XA-K-230-D	○	○	○	○ Note4	×	×	×	×	×	×	×	×	×	○
	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.

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
B mode (For counter/speed display) : [↓]+[B] key	**S.**	Display sewing speed	0200
	N.	Down counter setting count amount	0201
	D.	Down counter display count amount	0202
	P.	Up counter setting count amount	0203
	U.	Up counter display count amount	0204
	CUP.	Up counter the selection of setting mode	0205
	USC.	Up counter the selection of counter operation	0206
	UCM.	Up counter changing sewing pattern	0207
	UPC.	Up counter valid / invalid	0208
	NXU.	Up counter operation after counting over	0209
	CDN.	Down counter the selection of setting mode	0210
	DSC.	Down counter the selection of counter operation	0211
	DCM.	Down counter changing sewing pattern	0212
	DNC.	Down counter valid / invalid	0213
	NXD.	Down counter operation after counting over	0214
	PCM.	Counter condition turning on power switch	0215
	PRN.	Setting Thread trimming times "N"	0216
	CNU.	Setting Number of stitches "N"	0217
	CCI.	Count modification (to use IO1, IO2)	0218
	PMD.	Display condition turning on power switch	0219
	CCM.	Reset for Up / Down counter during operation	0220

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

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

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

	name	Function	No.
	RESET.	Reset	-

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

	name	Function	No.
	280M	LS2-1280-M1T(W)	-
	:	**:**	-
	LOAD1	Load of the saved setting data1	-

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

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

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

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

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

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

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

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

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

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

	name	Function	No.
F mode (Cutter setting mode): [↓]+[↑]+[B] key	**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

	name	Function	No.
G mode (Thread trimming timing setting mode): [↓]+[↑]+[C] key	**TR.**	Thread trimming mode	0900
	TRM.	Motor operation mode during thread trimming	0901
	LTM.	Thread trimming output (T) output mode	0902
	LLM.	Thread release output (L) output mode	0903
	TS.	Thread trimming output start angle	0904
	TE.	Thread trimming output angle	0905
	LS.	Thread release output start angle	0906
	LE.	Thread release output angle	0907
	T1.	Thread trimming output start time	0908
	T2.	Thread trimming output time	0909
	L1.	Thread release output start time	0910
	L2.	Thread release output time	0911
	R1.	Thread release output start time (Output TF start time)	0912
	R2.	Thread release output time (TF output time)	0913
	R3.	Condensed stiching 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.
H mode (Setting speed limit setting mode): [↓]+[↑]+[D] key	**LHH.**	Upper limit of maximum speed [H]	1000
	LHL.	Lower limit of maximum speed [H]	1001
	LLH.	Upper limit of low speed [L]	1002
	LLL.	Lower limit of low speed [L]	1003
	LTH.	Upper limit of thread trimming speed [T]	1004
	LTL.	Lower limit of thread trimming speed [T]	1005
	LNH.	Upper limit of start/end tacking (condensed stitching) speed	1006
	LNL.	Lower limit of start/end tacking (condensed stitching) speed	1007
	LMH.	Upper limit of medium speed [M]	1008
	LML.	Lower limit of medium speed [M]	1009
	LSH.	Upper limit of slow start speed [S]	1010
	LSL.	Lower limit of slow start speed [S]	1011

	name	Function	No.
J mode (Panel switch cancel mode): [↓]+[↑]+[A]+[B] key	**MAC.**	Simple setting mode for [1],[2],[3] prohibit	1100
	TRC.	[P],[G] mode thread trimmer mode TR prohibit	1101
	CWC.	Rotation direction changeover prohibit	1102
	12C.	1-2 position changeover prohibit	1103
	SLC.	Slow start changeover prohibit	1104
	SPC.	Speed setting key changeover prohibit	1105
	JKC.	Not used	1106
	SBC.	Start tacking validity changeover prohibit	1107
	SNC.	No. of start tacking stitches changeover prohibit	1108
	EBC.	End tacking validity changeover prohibit	1109
	ENC.	No. of end tacking stitches changeover prohibit	1110
	SKC.	Start tacking type changeover prohibit	1111
	EKC.	End tacking type changeover prohibit	1112
	TSC.	Pattern stitching validity changeover prohibit	1113
	TNC.	Pattern stitching No. of stitches and times changeover prohibit	1114
	MDC.	Pattern mode pattern changeover prohibit	1115
	BAC.	Prohibit the all of key switches on control switch panel	1116
	BPC.	Prohibit the teaching mode key switches on control switch panel	1117
	BSC.	Prohibit the following key switches on control switch panel	1118
	PSW.	Operation prohibition of set value change key	1119
	BKC.	Prohibit the key switches on the control switch panel before thread trimming	1120
	NSV.	The use number is preserved by the number call.	1121
	CMP.	It blinks compared with a set value.	1122
	CMS.	At the comparison when it compares and it blinks destination.	1123
	PKC.	Prohibit "parameter setup (ABCD) key" during the normal mode.	1124
	NTM.	Not used	1125
	UDC.	Not used	1126

	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 fornoise 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

	name	Function	No.
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 contorol	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	**IA.**	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
	IIL.	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

	name	Function	No.
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
	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

	name	Function	No.
S mode (Simple sequence mode): [↓]+[B]+[D] key	**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		Direct call number	Operability	Factory setting GMFY	Unit	Setting range	Function name (Digital display)	Setting (Digital display)	Setting	Specification
P mode ↓ + ↑	Maximum speed	**H.**	0000	O	4000	rpm	0 ～ 8999	H.	****	****	The maximum speed can be set.
	Low speed	**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	u.	****	****	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	stitches	1 ～ 5	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.
									r	T	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.
									A	A	Slow start operation will begin when the pedal is toed down or when the external run signal (S0, S1) is turned ON.
	Slow start when power is turned ON	**SLP.**	0009	O	OF	-	-	SLP.	on oF	ON OF	Slow start operation will begin when the pedal is toed down for the first time after turning 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	**SH.**	0010	O	OF	-	-	SH.	on oF	ON 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.
	One shot operation mode	**SHM.**	0011	O	SH	-	-	SHM.			The one shot SH operation mode is selected. This is valid when one shot SH is [ON].
									SH	SH	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.
									SS	SS	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.
									SA	SA	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	Direct call number	Operability	Factory setting (GMFY)	Unit	Setting range	Function name (Digital display)	Setting		Specification
P mode ↓ + ↑	CONTINUED FROM PREVIOUS PAGE One shot operation mode **SHM.**	0011	O	SH	-	-	SHM.	ru	RV	If the automatic operation function is OFF and the one shot signal (SH) is turned ON, the sewing machine will run at the low speed. If the lever connector variable speed command [VC] is input in this state, the sewing machine speed will be approximately in proportion with the voltage. The sewing machine will continue to run at the speed proportional to the variable speed command [VC] even if the one shot signal (SH) is turned OFF in the normal mode. If the automatic operation function is ON and the one shot signal (SH) is turned on, the sewing machine will run at the speed set with the speed setting key ([C], [D] key). The sewing machine will continue to run at the set speed even if the one shot signal (SH) is turned OFF.
								rH	RH	The sewing machine will run at the maximum speed [H] when the one shot signal (SH) is turned ON. The sewing machine will continue to run at that speed even if the signal is turned OFF.
								rn	RM	The sewing machine will run at the medium speed [M] when the one shot signal (SH) is turned ON. The sewing machine will continue to run at that speed even if the signal is turned OFF.
								rL	RL	The sewing machine will run at the low speed [L] when the one shot signal (SH) is turned ON. The sewing machine will continue to run at that speed even if the signal is turned OFF.
								Au	AV	When the one shot signal (SH) is turned OFF=> (1)ON =>OFF=> (2)ON=>OFF => (3)ON =>OFF, the same operation as the sewing machine speed is set to [RV] above is executed at (1). The sewing machine will stop at (2) and will run at the same conditions as [RV] at (3).(This operation is referred to as alternate operation hereafter.)
								AH	AH	The alternate operation of [RH] is executed.
								An	AM	The alternate operation of [RM] is executed.
								AL	AL	The alternate operation of [RL] is executed.
	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	-	-	PS 1.			The operation of the sensor input signal PS1 can be set.
								U	U	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.
								d	D	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.
								r	T	After thread trimming, the needle will stop at the UP position. This setting is the same operation as the UP position priority stop signal PSU.
	No. of stitches after PS1 input **1.**	0015	O	0	stitches	0 ～ 9999	1.	****	****	After the sensor input signal PS1 is input, the no. of stitches until stopping can be set.

Mode name	Function name		Direct call number	Operability	Factory setting GMFY	Unit	Setting range	Function name Digital display	Setting		Specification
P mode ↓+↑	Sensor input signal PS2 operation mode	**PS2.**	0016	O	D	-	-	PS2.			The operation of the sensor input signal PS2 can be set.
									U	U	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 therad trimming signal (S2) is turned ON.
									d	D	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.
									r	T	After thread trimming, the needle will stop at the UP position. This setting is the same operation as the UP position priority stop signal PSU.
	No. of stitches after PS2 input	**2.**	0017	O	0	stitches	0 ～ 9999	2.	****	****	After the sensor input signal PS2 is input, the no. of stitches until stopping can be set.
	Restart after PSD,SEN input PSN	**PSN.**	0018	O	OF	-	-	PSn.	on oF	ON OF	After detecting the end of the fabric by a sensor with the PSU, PSD and SEN signals and stopping, restarting is possible with the pedal toe down or external run signal (S0, S1) even if the sensor does not detect the fabric (even if PSU, PSD signals are ON).
	Input sensor function valid / invalid	**SEN.**	0019	O	OF	-	-	SEn.	on 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	stitches	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.	on 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].
									n	M	After thread trimming with full heeling or the external thread trimmer signal S2, the presser foot lifting operation is continued.
									C	C	After thread trimming with full heeling 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.
									A	A	The presser foot lifting operation is activated 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.)
									r	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 setting for FUM operation mode (FU is set to [C], [T])	**FCT.**	0023	O	12	sec	1 ～ 99	FCT.	**	**	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.
	Time to motor drive after presser foot lifter bring down	**FD.**	0024	O	176	msec	0 ～ 998	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.

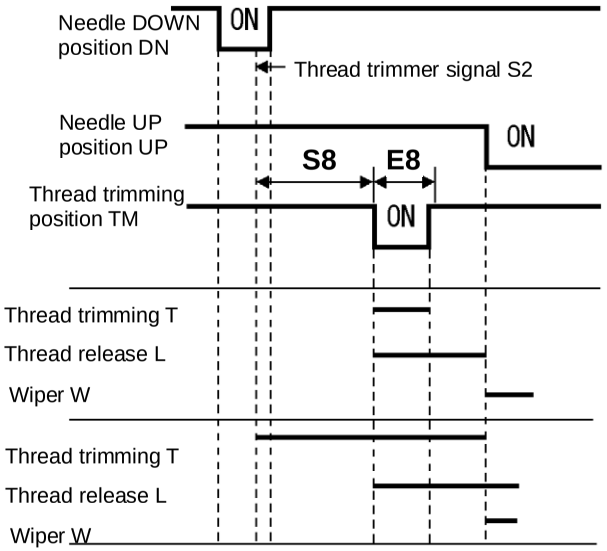
Mode name	Function name		Direct call number	Operability	Factory setting GMFY	Unit	Setting range	Function name / Digital display	Setting		Specification
P mode (↓)+(↑)	Full wave time of presser foot lifter output	**FO.**	0025	O	50	X10 msec	-	Fo.			The full wave time of the presser foot lifter output during [FU] operation can be set.
									20	20	Full wave time 200mS
									25	25	Full wave time 250mS
									30	30	Full wave time 300mS
									40	40	Full wave time 400mS
									50	50	Full wave time 500mS
									60	60	Full wave time 600mS
									80	80	Full wave time 800mS
									100	100	Full wave time 1 sec.
	Delay time of presser foot signal S3 input	**S3D.**	0026	O	10	X10 msec	1 ～ 99	S3d.	**	**	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.			The chopping output duty during holding after the presser foot lifting output FU presser foot lifting operation can be set.
									nS	MS	4ms ON/OFF, 50% duty
									nF	MF	2ms ON/OFF, 50% duty
									HI	HI	4ms ON,2ms OFF,66% duty
									26	26	2ms ON,6ms OFF,25% duty
									62	62	6ms ON,2ms OFF,75% duty
									84	84	8ms ON,4ms OFF,66% duty
									FL	FL	100% (full wave)
									Lo	LO	2ms ON, 4ms OFF, 33% duty
	Presser foot lifting output when power is turned ON	**PFU.**	0028	O	ON	-	-	PFU.	on oF	ON OF	The presser foot lifting operation begins when power is turned ON. This is valid when the FUM function is set to [ON]. When FU is set to [C] or [T], the presser foot will lift only while the timer is ON.
	Cancel the presser foot lifting with full heeling	**FL.**	0029	O	OF	-	-	FL.	on oF	ON OF	The presser foot lifting operation after thread trimming with full heeling or the external thread trimmer signal S2 is prohibited. However, the presser foot lifting is carried out with the presser foot lifting signal F or light heeling.
	Cancel presser foot lifting with light heeling	**S3L.**	0030	O	OF	-	-	S3L.	on oF	ON OF	The presser foot lifting operation with light heeling is prohibited. The presser foot operation is carried out with full heeling or the presser foot lifting signal F.
	Cancel of thread trimming operation	**S2L.**	0031	O	OF	-	-	S2L.	on oF	ON OF	The thread trimming operation and subsequent presser foot lifting operation with full heeling or external thread trimmer signal S2 is prohibited.

Mode name	Function name		Direct call number	Operability	Factory setting GMFY	Unit	Setting range	Function name Digital display	Setting		Specification
P mode ↓+↑	Thread trimming protection signal (S6) logical changeover	**S6L.**	0032	X	LO	-	-	S6L.			The operation can be changed when the thread trimming protection signal (S6) is turned Short/Open.
									Hi	HI	The sewing machine will stop when the input signal (S6) is Open.
									Lo	LO	The sewing machine will stop when the input signal (S6) is Short.
	Automatic operation	**AT.**	0033	O	OF	-	-	AT.	on oF	ON OF	Automatic operation (standing operation) can be set.
	Thread trimmer cancel	**TL.**	0034	O	OF	-	-	TL.	on oF	ON OF	The thread trimming operation with full heeling of the pedal or with the thread trimming signal S2 is not performed, and instead needle UP position stop will occur.
	Auto-stop of preset stitch sewing before trim	**TLS.**	0035	O	OF	-	-	TLS.	on oF	ON OF	Auto-stop of preset stitch sewing before thread trimming. And then it is free sewing till thread trimming.
	Reverse run needle lifting after thread trimming	**RU.**	0036	O	OF	-	-	rU.	on oF	ON OF	The motor is reverse run after thread trimming, and the needle will stop near the needle bar top dead point.
	RU reverse run angle	**R8.**	0037	O	30	degree	0 ～ 500	r8.	***	***	The reverse run angle from the UP position after thread trimming can be set for when the reverse run needle lifting after thread trimming RU is set to ON. The setting angle is in two degrees intervals.
	Thread trimming with reverse feed	**TB.**	0038	O	OF	-	-	Tb.	on oF	ON OF	The thread is trimmed with reverse feed by driving the backstitch solenoid simultaneously with the thread trimmer solenoid.
	Not used	**TBJ.**	0039	O	OF	-	-	TbJ.			Not used.
	Full heeling, S2 signal operation mode	**S2R.**	0040	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].
									on	ON	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.
									oF	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.
	Cancel of interlock after full pedal heeling	**IL.**	0041	O	OF	-	-	IL.			This releases the restart operation prohibit command during thread trimming. [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. Restart is possible if the pedal toe down or external run signal (S0, S1) is turned ON again after a set time is passed.
									on	ON	
									oF	OF	

Mode name	Function name	Direct call number	Operability	Factory setting (GMFY)	Unit	Setting range	Function name (Digital display)	Setting		Specification
P mode (↓)+(↑)	Thread trimming mode **TR.**	0042	O	M1	-	-	tr.			The thread trimming timing for each manufacturer's thread trimming sewing machine can be set.
								n1	M1	Mitsubishi, Toyota, Seiko, Yakumo, Brother (excluding those noted below)
								PrG	PRG	For free setting of the thread trimming.
								no	NO	Not thread trimming sewing machine
								tA1 ～ tA8	KA1～KA8	Not used
								tb1 ～ tb4	KB1～KB4	Not used
								b1	B1	Brother, Models: 705, 715, 716
								d1	D1	(DURKOPP ADLER, Model 270)
								J1	J1	JUKI (Lock stitch type)
								J2	J2	JUKI(MH 471/474type) Note: Please check machine rotation direction!
								n1	N1	Not used
								P1	P1	Puff, Models: 463, 900
								P2	P2	Not used
								P3	P3	Not used
								P4	P4	Not used
								t1	T1	Toyota, Model: AD158
								t2	T2	Toyota, Model: AD3110
								t	K	Chain stitch sewing machine Note: Please check machine rotation direction!
								tA9	KA9	Not used
								tb5	KB5	Not used
								tb6	KB6	Not used
								tAA	KAA	Not used
								tAb	KAB	Not used
								tAC	KAC	Not used
								rt	RK	The thread is trimmed by reverse running the motor at the set angle from the DOWN position with full heeling or the thread trimmer signal S2. The set angle can be adjusted with the reverse run angle K8 from the DOWN position to the UP position. This can be used for blind stitch sewing machine.
	Thread trimming validity at neutral pedal **POS.**	0043	O	OF	-	-	PoS.	on	ON	The needle will stop in the UP position after thread trimming, during neutral after pedal toe down or when external run signal (S0, S1) is turned OFF.
								oF	OF	

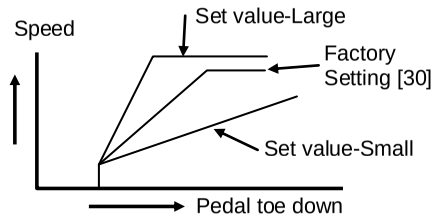
Caution

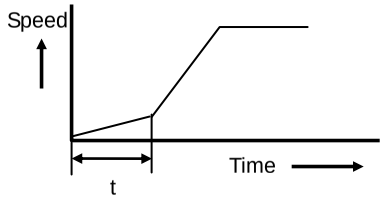
When setting for the B1 (Brother) or T2 (Toyota) machines, refer to the following thread trimming timing. Follow the sewing machine adjustment procedures, and adjust the setting.



Adjust the thread trimming position TM signal's ON starting angle S8, and ON angle E8. (The factory setting is 50 for S8, and 90 for E8.)

Mode name	Function name		Direct call number	Operability	Factory setting GMFY	Unit	Setting range	Function name Digital display	Setting		Specification
P mode ↓+↑	Operation when power is turned ON during 1 position setting.	**P1P.**	0044	O	OF	-	-	P 1P.	on oF	ON OF	When 1 position is set with the [A, 1-2] key in the normal mode, the needle will left to the UP position if not in the UP position when the power is turned ON.
	Operation when power is turned ON during 2 position setting.	**P2P.**	0045	O	OF	-	-	P2P.	on oF	ON OF	When 2 position is set with the [A, 1-2] key in the normal mode, the needle will lift to the UP position if not in the UP position when the power is turned ON.
	Needle stop position before fabric	**C8.**	0046	O	60	degree	0 ～ 360	C8.	***	***	The needle stop position angle can be set just above the fabric looking from the UP position when the input signal is set the [BC] or [BCR]. (The setting angle is in 2 degrees intervals.)
	Reverse run angle from DOWN position to UP position	**K8.**	0047	O	180	degree	0 ～ 360	t8.	***	***	The reverse run angle from the DOWN position to the UP position can be set when the S0 operation mode [USR] or reverse thread trimming mode operation mode TR[RK] is set in mode P.
	ON angle of virtual TM	**E8.**	0048	O	90	degree	0 ～ 360	E8.	***	***	The width of virtual signal "TM". N79 :When [TR] = [B1] or [T2], it is possible to use this function.
	ON start angle of virtual TM	**S8.**	0049	O	50	degree	0 ～ 360	S8.	***	***	The start angle of virtual signal "TM". :When [TR] = [B1] or [T2], it is possible to use this function.
	Setting sensor "SEN" input function	**SNM.**	0050	O	ON	-	-	SnM.	on oF	ON OF	[ON]:Input "SEN" is always valid. [OF]:Input "SEN" is only valid, when setting pattern is free sewing
	Virtual down Setting	**KD.**	0051	O	OF	-	-	td.	on oF	ON OF	Sewing machine run without down signal. The angle between up and down position is set to "K8". The width is set at 60 degree automatically.
	Virtual width of up and down signal	**KDU.**	0052	O	OF	-	-	tdU.	on oF	ON OF	It set the up and down signal width to 60 degree automatically.
	Not used	**PSJ.**	0053	O	OF	-	-	PSJ.	on oF	ON OF	Not used.
	Needle DOWN position stop angle	**D8.**	0054	O	28	degree	10 ～ 180	d8.	***	***	The coasting angle at the needle DOWN position stop can be set. (The setting angle is in 2 degrees intervals.)
	Needle UP position stop angle	**U8.**	0055	O	14	degree	10 ～ 180	U8.	***	***	The coasting angle at the needle UP position stop can be set. (The setting angle is in 2 degrees intervals.)

Mode name	Function name		Direct call number	Operability	Factory setting GMFY	Unit	Setting range	Function name / Digital display	Setting		Specification
A mode ↓ + A	Gain high/low selection	**GA.**	0100	O	L	-	-	GA.			The high/low gain can be set. Set with the following
									H	H	Sewing machine with large inertia.
									L	L	Sewing machine with small inertia.
									LL	LL	This is used when there is a slight vibration when stopping even when the gain is set to [L].
	Pedal curve	**PDC.**	0101	O	30	-	10 ～ 99	PdC.	**	**	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. 
	Acceleration time simple setting	**AC.**	0102	O	M	-	-	AC.			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	H	100mS
									M	M	140mS
									L	L	240mS
									-	-	The time set in the next acceleration time ACT is used.
	Acceleration time	**ACT.**	0103	O	14	X10 msec	6 ～ 99	ACT.	**	**	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 [-].
	Deceleration time simple setting	**DC.**	0104	O	M	-	-	dC.			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	H	90mS
									M	M	160mS
									L	L	230mS
									-	-	The time set in the next deceleration time DCT is used.
	Deceleration time	**DCT.**	0105	O	16	X10 msec	6 ～ 99	dCT.	**	**	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		Direct call number	Operability	Factory setting GMFY	Unit	Setting range	Function name Digital display	Setting		Specification
A mode +	S-character cushion	**SC.**	0106	O	OF	-	-	SC.	on oF	ON OF	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. 
	S-character cushion time setting	**SCT.**	0107	O	7	X10 msec	0 ～ 99	SCT.	**	**	The "t" time can set when S-character cushion is set to [ON].
	Full heeling S2 signal operation mode when power is turned on or after thread trimming	**S2M.**	0108	O	FU	-	-	S2n.			The operation mode of the full heeling or S2 signal when the power is turned on or after thread trimming is determined.
									FU	FU	The presser foot lifting operation is entered.
									U	U	The needle lifting operation is entered.
									no	NO	No operation.
									UF	UF	The presser foot lifting operation after needle lifting is entered.
	Sewing machine shaft/motor shaft speed setting selection	**PL.**	0109	O	OF	-	-	PL.	on oF	ON OF	The speed setting is set so that the normal sewing machine shaft speed is constant, but by the [ON] setting, it is possible to operate at the value which was set by the [MR], [SR] function. This is effective when the motor pulley diameter is small, the V belt slips and the sewing machine speed is unstable.
	Setting motor pulley diameter	**MR.**	0110	O	70	mm	20 ～ 349	Mr.	***	***	Set the diameter of motor pulley When "PL" is "ON", this function is valid.
	Setting sewing machine pulley diameter	**SR.**	0111	O	70	mm	20 ～ 349	Sr.	***	***	Set the diameter of sewing machine pulley When "PL" is "ON", this function is valid.
	No detector mode	**NOS.**	0112	O	OF	-	-	noS.	on oF	ON OF	Variable operation is possible when the detector has broken by setting to [ON] to invalidate the detector. The positioning stop and thread trimming operations will not be possible.
	First priority stop => speed control	**STM.**	0114	O	OF	-	-	Stn.	on oF	ON OF	When machine will be stopped, first priority become speed control. (Usually first priority to stop is stopped angle.)
	Brake time	**BKT.**	0115	O	14	X10 msec	0 ～ 99	bkT.	**	**	The brake time for stopping the sewing machine can be set.
	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		Direct call number	Operability	Factory setting GMFY	Unit	Setting range	Function name Digital display	Setting		Specification
A mode +	Reduction of weak brake sound	**BNR.**	0117	O	ON	-	-	bnr.	on oF	ON OF	Reducing the sound (noise) of weak brake.
	Weak brake force	**BKS.**	0118	O	99	%	1 ～ 99	bt5.	**	**	The weak brake force can be set.
	Weak brake mode	**BKM.**	0119	O	E	-	-	btn.			The weak brake force can be set for when stopping the sewing machine when the weak brake [BK] is set to [ON].
									E	E	Brake that allows manual rotation.
									H	H	Strong brake.
	Weak brake	**BK.**	0120	O	OF	-	-	bt.	on oF	ON OF	The weak brake validity can be set.

Mode name	Function name		Direct call number	Operability	Factory setting GMFY	Unit	Setting range	Function name Digital display	Setting		Specification
B mode ↓ + B SL	Display sewing speed	**S.**	0200	O	0	rpm	0 ～ 9999	S.	****	****	Display the round per minute of running sewing machine.
	Down counter setting count amount	**N.**	0201	O	99	-	0 ～ 9999	n.	****	****	Setting the number of down counter.
	Down counter display count amount	**D.**	0202	O	99	-	0 ～ 9999	d.	****	****	Display the number of current down counter.
	Up counter setting count amount	**P.**	0203	O	99	-	0 ～ 9999	P.	****	****	Setting the number of up counter.
	Up counter display count amount	**U.**	0204	O	0	-	0 ～ 9999	U.	****	****	Display the number of current up counter.
	Up counter the selection of setting mode	**CUP.**	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 "IO1"become ON. ("IO1"have to be set to input signal on the program mode C.)
									oU	OU	When output signal "O1"become ON. ("O1"have to be set to output function on "O1" of the program mode C.)
	Up counter the selection of counter operation	**USC.**	0206	O	ST	-	-	USC.			Selection of operation count over. (Up counter)
									SF	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.)
	Up counter changing sewing pattern	**UCM.**	0207	O	OF	-	-	UCn.	on oF	ON OF	[ON]:When sewing pattern is changed, it clear "up counter".
	Up counter valid / invalid	**UPC.**	0208	O	OF	-	-	UPC.	on oF	ON OF	[ON]:The up counter is valid.
	Up counter operation after counting over	**NXU.**	0209	O	OF	-	-	nIIU.			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		Direct call number	Operability	Factory setting GMFY	Unit	Setting range	Function name Digital display	Setting		Specification
B mode (↓ + B SL)	Down counter the selection of setting mode	**CDN.**	0210	O	CU	-	-	CdN.			Selection of count down condition.
									CU	CU	After thread trimming is finished
									ST	ST	The number of sewing stitch become "N" ("N" have to be set at "CNU")
									Pr	PR	The number of trimming times become "N" ("N" have to be set at "PRN")
									in	IN	When input function "IO1"become ON. ("IO1"have to be set to input signal on the program mode C.)
									oU	OU	When output signal "O1"become ON. ("O1"have to be set to output function on "O1" of the program mode C.)
	Down counter the selection of counter operation	**DSC.**	0211	O	ST	-	-	dSC.			Selection of operation at count over. (Down counter)
									ST	ST	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.)
									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.)
	Down counter changing sewing pattern	**DCM.**	0212	O	OF	-	-	dCn.	on oF	ON OF	[ON]:When sewing pattern is changed, it clear "down counter".
	Down counter valid / invalid	**DNC.**	0213	O	OF	-	-	dnC.	on oF	ON OF	[ON]:The down counter is valid.
	Down counter operation after counting over	**NXD.**	0214	O	OF			nIId.			The down counter action, after counting over. (It is valid, when [DSC] is set to "OF", "BZ".
									on	ON	The display shows "0" and the counting is stopped.
									oF	OF	The display shows "-" and the counting is continued.
	Counter condition turning on power switch	**PCM.**	0215	O	OF	-	-	PCn.			When power switch is turned on.
									on	ON	Up counter is clear (zero) and down counter is set the setting number.
									oF	OF	Both counter keep previous amount.
	Setting Thread trimming times "N"	**PRN.**	0216	O	0	times	0 ～ 99	Prn.	**	**	When "CUP" and "CDN" are PR, trimming times "N" is set.
	Setting Number of stitches "N"	**CNU.**	0217	O	1	stitches	1 ～ 99	CnU.	**	**	When "CUP" and "CDN" are ST, number of stitch "N" is set.

Mode name	Function name		Direct call number	Operability	Factory setting GMFY	Unit	Setting range	Function name / Digital display	Setting		Specification
B mode ↓ + B SL	Count modification (to use IO1, IO2)	**CCI.**	0218	O	OF	-	-	CCI.			Modification of count amount.
									on	ON	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".)
									oF	OF	Modification is prohibited.
	Display condition turning on power switch	**PMD.**	0219	O	OF	-	-	PMd.			Selection display mode, when power switch is turned on.
									on	ON	When power switch turned on, display shows previous condition. (Keep previous condition)
									oF	OF	When power switch turned on, display shows normal mode.
	Reset for Up / Down counter during operation	**CCM.**	0220	O	OF	-	-	CCn.			Reset for Up / Down counter during operation.
									on	ON	Reset for Up / Down counter is valid.
									oF	OF	Reset for Up / Down counter is invalid.

Mode name	Function name		Direct call number	Operability	Factory setting	Unit	Setting range	Function name	Setting		Specification
					GMFY			Digital display			
C mode	Function selection of input signal IA	**IA.**	0300	X	PSU	-	-	iA.	***	***	The input functions of each input signal IA can be selected from 80 types of functions. (*1)
	Logical conversion function of input signal IA	**IAL.**	0301	X	OF	-	-	iAL.	on oF	ON OF	The input logic of each Input signal IA is reversed.
	Alternating operation of input signal IA	**IAA.**	0302	X	OF	-	-	iAA.	on oF	ON OF	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	**IB.**	0303	X	PSD	-	-	ib.	***	***	The input functions of each input signal IB can be selected from 80 types of functions. (*1)
	Logical conversion function of input signal IB	**IBL.**	0304	X	OF	-	-	ibL.	on oF	ON OF	The input logic of each Input signal IB is reversed.
	Alternating operation of input signal IB	**IBA.**	0305	X	OF	-	-	ibA.	on oF	ON OF	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	**IC.**	0306	X	S0	-	-	iC.	***	***	The input functions of each input signal IC can be selected from 80 types of functions. (*1)
	Logical conversion function of input signal IC	**ICL.**	0307	X	OF	-	-	iCL.	on oF	ON OF	The input logic of each Input signal IC is reversed.
	Alternating operation of input signal IC	**ICA.**	0308	X	OF	-	-	iCA.	on oF	ON OF	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	**ID.**	0309	X	TL	-	-	id.	***	***	The input functions of each input signal ID can be selected from 80 types of functions. (*1)
	Logical conversion function of input signal ID	**IDL.**	0310	X	OF	-	-	idL.	on oF	ON OF	The input logic of each Input signal ID is reversed.
	Alternating operation of input signal ID	**IDA.**	0311	X	OF	-	-	idA.	on oF	ON OF	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	**IE.**	0312	X	S7	-	-	iE.	***	***	The input functions of each input signal IE can be selected from 80 types of functions. (*1)
	Logical conversion function of input signal IE	**IEL.**	0313	X	OF	-	-	iEL.	on oF	ON OF	The input logic of each Input signal IE is reversed.
	Alternating operation of input signal IE	**IEA.**	0314	X	OF	-	-	iEA.	on oF	ON OF	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	**IF.**	0315	X	F	-	-	iF.	***	***	The input functions of each input signal IF can be selected from 80 types of functions. (*1)

Mode name	Function name		Direct call number	Operability	Factory setting GMFY	Unit	Setting range	Function name / Digital display	Setting		Specification
	Logical conversion function of input signal IF	**IFL.**	0316	X	OF	-	-	iFL.	oN oF	ON OF	The input logic of each Input signal IF is reversed.
C mode ↓ + C	Operation selection of input signal IF	**IFM.**	0317	X	NO	-	-	iFM.			The operation mode of each input signal IF can be selected.
									no	NO	Normal operation.
									AL	AL	Alternating operation.
									rS	RS	RS F/F (Flip-Flop) operation.
	Set condition of RS F/F operation of input signal IF	**RFS.**	0318	X	IN	-	-	rFS.			Set condition RS F/F of IF When [IFM] is set to [RS], it is valid.
									IN	IN	RS F/F of IF is set by IF
									T	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.
									Tr	TR	When sewing start, after thread trimming.
									Sb	SB	When start tacking or condensed stitch was finished.
	Reset condition of RS F/F operation of input signal IF	**RFR.**	0319	X	IN	-	-	rFr.			Reset condition RS F/F of IF When [IFM] is set to [RS], it is valid.
									IN	IN	RS F/F of IF is reset by IOG.
									T	T	When thread trimming is done (stop to up position.)
									R	R	When motor start, RS F/F will be reset.
									S	S	When motor stops, RS F/F will be reset.
									Tr	TR	When sewing start, after trimming.
									Sb	SB	When start condensed stitch was finished.
									nC	NC	When sewing machine sew the setting stitch after set RS F/F, it will be reset. (R1N, R2N)
	Number of reset needles of RS F/F operation of input IF	**RFN.**	0320	X	3	stitches	0 ～ 99	rFn.	**	**	When [RFR] set [NC], the number of stitch is set by this counter.
	Function selection of input signal IG	**IG.**	0321	X	S1	-	-	iG.	***	***	The input functions of each input signal IG can be selected from 80 types of functions. (*1)
	Logical conversion function of input signal IG	**IGL.**	0322	X	OF	-	-	iGL.	oN oF	ON OF	The input logic of each Input signal IG is reversed.
	Alternating operation of input signal IG	**IGA.**	0323	X	OF	-	-	iGA.	oN oF	ON OF	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)
	Function selection of input signal IH	**IH.**	0324	X	S2	-	-	iH.	***	***	The input functions of each input signal IH can be selected from 80 types of functions. (*1)

Mode name	Function name		Direct call number	Operability	Factory setting GMFY	Unit	Setting range	Function name Digital display	Setting		Specification
C mode (↓ + C)	Logical conversion function of input signal IH	**IHL.**	0325	X	OF	-	-	IHL.	on OF	ON OF	The input logic of each Input signal IH is reversed.
	Alternating operation of input signal IH	**IHA.**	0326	X	OF	-	-	IHA.	on OF	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	-	-	II.	***	***	The input functions of each input signal II can be selected from 80 types of functions. (*1)
	Logical conversion function of input signal II	**IIL.**	0328	X	OF	-	-	IIL.	on OF	ON OF	The input logic of each Input signal II is reversed.
	Alternating operation of input signal II	**IIA.**	0329	X	OF	-	-	IIA.	on OF	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	-	-	IJ.	***	***	Not used.
	Not used	**IJL.**	0331	X	OF	-	-	IJL.	on OF	ON OF	Not used.
	Not used	**IJA.**	0332	X	OF	-	-	IJA.	on OF	ON OF	Not used.
	Not used	**IK.**	0333	X	NO	-	-	IK.	***	***	Not used.
	Not used	**IKL.**	0334	X	OF	-	-	IKL.	on OF	ON OF	Not used.
	Not used	**IKA.**	0335	X	OF	-	-	IKA.	on OF	ON OF	Not used.
	Not used	**IL.**	0336	X	NO	-	-	IL.	***	***	Not used.
	Not used	**ILL.**	0337	X	OF	-	-	ILL.	on OF	ON OF	Not used.
	Not used	**ILA.**	0338	X	OF	-	-	ILA.	on OF	ON OF	Not used.
	Function selection of input signal IM	**IM.**	0339	X	NO	-	-	IM.	***	***	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	-	-	IML.	on OF	ON OF	The input logic of each Input signal IM is reversed.
	Alternating operation of input signal IM	**IMA.**	0341	X	OF	-	-	IMA.	on OF	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	-	-	IN.	***	***	The input functions of each input signal IN can be selected from 76 types of functions. (*1)

Mode name	Function name		Direct call number	Operability	Factory setting GMFY	Unit	Setting range	Function name Digital display	Setting		Specification
	Logical conversion function of input signal IN	**INL.**	0343	X	OF	-	-	inL.	on oF	ON OF	The input logic of each Input signal IN is reversed.
C mode	Alternating operation of input signal IN	**INA.**	0344	X	OF	-	-	inA.	on 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	**IO.**	0345	X	NO	-	-	io.	***	***	The input functions of each input signal IO can be selected from 80 types of functions. (*1)
	Logical conversion function of input signal IO	**IOL.**	0346	X	OF	-	-	ioL.	on oF	ON OF	The input logic of each Input signal IO is reversed.
	Alternating operation of input signal IO	**IOA.**	0347	X	OF	-	-	ioA.	on 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	**IP.**	0348	X	CCU	-	-	iP.	***	***	The input functions of each input signal IP can be selected from 80 types of functions. (*1)
	Logical conversion function of input signal IP	**IPL.**	0349	X	OF	-	-	iPL.	on oF	ON OF	The input logic of each Input signal IP is reversed.
	Alternating operation of input signal IP	**IPA.**	0350	X	OF	-	-	iPA.	on 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	**IQ.**	0351	X	NO	-	-	iq.	***	***	The input functions of each input signal IQ can be selected from 80 types of functions. (*1)
	Logical conversion function of input signal IQ	**IQL.**	0352	X	OF	-	-	iqL.	on oF	ON OF	The input logic of each Input signal IQ is reversed.
	Alternating operation of input signal IQ	**IQA.**	0353	X	OF	-	-	iqA.	on 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	**IR.**	0354	X	NO	-	-	ir.	***	***	The input functions of each input signal IR can be selected from 80 types of functions. (*1)
	Logical conversion function of input signal IR	**IRL.**	0355	X	OF	-	-	irL.	on oF	ON OF	The input logic of each Input signal IR is reversed.
	Alternating operation of input signal IR	**IRA.**	0356	X	OF	-	-	irA.	on 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	**I1.**	0357	X	IO1	-	-	i1.	***	***	The input functions of each input signal I1 can be selected from 80 types of functions. (*1)
	Logical conversion function of input signal I1	**I1L.**	0358	X	OF	-	-	i1L.	on oF	ON OF	The input logic of each Input signal I1 is reversed.

Mode name	Function name		Direct call number	Operability	Factory setting GMFY	Unit	Setting range	Function name / Digital display	Setting		Specification
	Operation selection of input signal I1	**I1M.**	0359	X	NO	-	-	I1M.			The operation mode of each input signal I1 can be selected.
									no	NO	Normal operation.
									AL	AL	Alternating operation.
									rS	RS	RS F/F (Flip-Flop) operation.
C mode	Special setting for input signal " I1" (Neglecting of signal)	**I1O.**	0360	O	OF	-	-	I1o.	on / oF	ON / OF	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	-	-	I1F.	on / oF	ON / OF	When [I1M] set [AL] on program mode "C", the alternate operation of input[I1] sets virtual output [OT3] to alternative output.
	AL operation clearness of input signal I1	**I1C.**	0362	X	OF	-	-	I1C.	on / oF	ON / OF	AL operation of input signal [I1] is cleared by thread trimming operation.
	Delay time of AL operation of input signal I1	**1CT.**	0363	O	0	X100 msec	0 ～ 99	1CT.	**	**	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.	on / oF	ON / OF	The input signal I1 virtual F/F (flip-flop) operation is turned ON when power is turned ON. It is only valid, when [I1M] function is set to "AL" or "RS"
	Input signal I1 virtual F/F circuit operation 2	**F1C.**	0365	X	OF	-	-	F1C.	on / oF	ON / OF	The input signal I1 virtual F/F (flip-flop) operation is turned OFF when the sewing start No. of stitches RLN setting is completed.
	Input signal I1 virtual F/F circuit operation 3	**F1S.**	0366	X	OF	-	-	F1S.	on / oF	ON / OF	The input signal I1 virtual F/F (flip-flop) operation is turned ON when the tacking starts or after thread trimming.
	Set condition of RS F/F for I1	**R1S.**	0367	X	IN	-	-	r1S.			Set condition RS F/F of I1 When [I1M] is set to [RS], it is valid.
									IN	IN	RS F/F of I1 is set by I1
									T	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.
									Tr	TR	When sewing start, after thread trimming.
									Sb	SB	When start tacking or condensed stitch was finished.
	Reset condition of RS F/F for I1	**R1R.**	0368	X	IN	-	-	r1r.			Reset condition RS F/F of IF When [I1M] is set to [RS], it is valid.
									IN	IN	RS F/F of I1 is reset by IOE.
									T	T	When thread trimming is done (stop to up position.)
									r	R	When motor start, RS F/F will be reset.
									S	S	When motor stops, RS F/F will be reset.
									Tr	TR	When sewing start, after trimming.
									Sb	SB	When start condensed stitch was finished.
									nC	NC	When sewing machine sew the setting stitch after set RS F/F, it will be reset. (R1N, R2N)

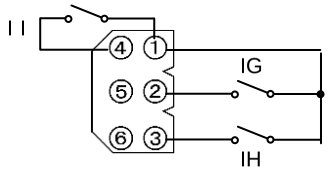
Mode name	Function name		Direct call number	Operability	Factory setting GMFY	Unit	Setting range	Function name Digital display	Setting		Specification
C mode + C	RS F/F reset stitch amount for I1	**R1N.**	0369	O	3	stitches	0 ～ 99	r 1n.	**	**	When [R1R] set [NC], the number of stitch is set by this counter.
	Function selection of input signal I2	**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	ON OF	The input logic of each Input signal I2 is reversed.
	Operation selection of input signal I2	**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	RS F/F (Flip-Flop) operation.
	AL operation clearness of input signal I2	**I2C.**	0373	X	OF	-	-	i2C.	on of	ON OF	AL operation of input signal [I2] is cleared by thread trimming operation.
	Delay time of AL operation of input signal I2	**2CT.**	0374	O	0	X100 msec	0 ～ 99	2CT.	**	**	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
									T	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.
									Tr	TR	When sewing start, after thread trimming.
									Sb	SB	When start tacking or condensed stitch was finished.

Mode name	Function name		Direct call number	Operability	Factory setting GMFY	Unit	Setting range	Function name Digital display	Setting		Specification
C mode (↓ + C)	Reset condition of RS F/F for I2	**R2R.**	0376	X	IN	-	-	r2r.			Reset condition RS F/F of IF When [I2M] is set to [RS], it is valid.
									in	IN	RS F/F of I2 is reset by IOF.
									T	T	When thread trimming is done (stop to up position.)
									r	R	When motor start, RS F/F will be reset.
									S	S	When motor stops, RS F/F will be reset.
									Tr	TR	When sewing start, after trimming.
									Sb	SB	When start condensed stitch was finished.
									nC	NC	When sewing machine sew the setting stitch after set RS F/F, it will be reset. (R2N)
	RS F/F reset stitch amount for I2	**R2N.**	0377	O	3	stitches	0 ～ 99	r2n.	**	**	When [R2R] set [NC], the number of stitch is set by this counter.
	Function selection of input signal I4	**I4.**	0378	X	NO	-	-	I4.	***	***	The input functions of each input signal I4 can be selected from 80 types of functions. (*1)
	Logical conversion function of input signal I2	**I4L.**	0379	X	OF	-	-	I4L.	on OF	ON OF	The input logic of each Input signal I4 is reversed.
	I4 input alternating operation	**I4A.**	0380	X	OF	-	-	I4A.	on OF	ON OF	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)
	Function selection of input signal I5	**I5.**	0381	X	NO	-	-	I5.	***	***	The input functions of each input signal I5 can be selected from 80 types of functions. (*1)
	Logical conversion function of input signal I5	**I5L.**	0382	X	OF	-	-	I5L.	on OF	ON OF	The input logic of each Input signal I5 is reversed.
	Alternating operation of input signal I5	**I5A.**	0383	X	OF	-	-	I5A.	on OF	ON OF	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)
	Function selection of input signal I6	**I6.**	0384	X	NO	-	-	I6.	***	***	The input functions of each input signal I6 can be selected from 80 types of functions. (*1)
	Logical conversion function of input signal I6	**I6L.**	0385	X	OF	-	-	I6L.	on OF	ON OF	The input logic of each Input signal I6 is reversed.
	Alternating operation of input signal I6	**I6A.**	0386	X	OF	-	-	I6A.	on OF	ON OF	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)
	Function selection of input signal I7	**I7.**	0387	X	NO	-	-	I7.	***	***	The input functions of each input signal I7 can be selected from 80 types of functions. (*1)

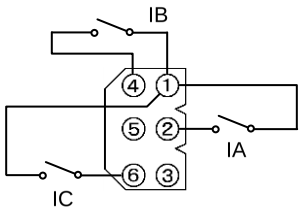
Mode name	Function name		Direct call number	Operability	Factory setting GMFY	Unit	Setting range	Function name (Digital display)	Setting		Specification
C mode	Logical conversion function of input signal I7	**I7L.**	0388	X	OF	-	-	I7L.	on oF	ON OF	The input logic of each Input signal I7 is reversed.
	Alternating operation of input signal I7	**I7A.**	0389	X	OF	-	-	I7A.	on oF	ON OF	If each input signal I7 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 output signal OA	**OA.**	0390	X	T	-	-	oA.	***	***	The output functions of each output signal OA can be selected from 58 types of functions. (*3)
	Logical conversion function of output signal OA	**OAL.**	0391	X	OF	-	-	oAL.	on oF	ON OF	The output logic of each output signal OA is reversed.

(*1)

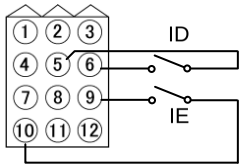
*Refer to [25.Table of input/output function for signal on C mode]
*Refer to [26.The composition figure of input and output customization]



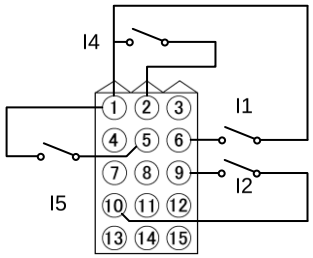
(Lever connector)
IG:S1(Variable speed run signal)
IH:S2(Thread trimmer signal)
I I:S3(Presser foot lifter signal)



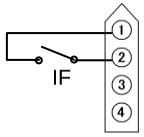
(Option A connector)
IA:PSU(Needle UP position priority stop signal)
IB:PSD(Needle DOWN position priority stop signal)
IC:S0 (Low speed run signal)



(Sewing machine connector)
ID:TL(Thread trimmer cancel signal)
IE:S7(Backstitching during run signal)



(Option B connector)
I1:IO1(Signal output to virtual output 1)
I2:U(Needle lift signal)
I4:NO(No setting)
I5:NO(No setting)

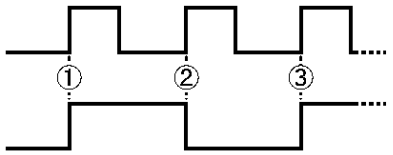


(Presser foot lifter connector)
IF:F(Presser foot lifter signal)

Caution
Input signal [I6,I7] are coupling port of input and output by the Software. So these input signal are not at connector.

(*2)

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.)



Mode name	Function name		Direct call number	Operability	Factory setting GMFY	Unit	Setting range	Function name Digital display	Setting		Specification
C mode ↓ + C	Chopping operation of output signal OA	**OAC.**	0392	X	OF	-	-	oAC.	on 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 OFF	**OAT.**	0393	X	OF	-	-	oAT.	on 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	dA.	***	***	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.	***	***	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	-	-	obL.	on oF	ON OF	The output logic of each output signal OB is reversed.
	Chopping operation of output signal OB	**OBC.**	0397	X	OF	-	-	obC.	on 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	**OBT.**	0398	X	OF	-	-	obT.	on 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	db.	***	***	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	-	-	oC.	***	***	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	-	-	oCL.	on oF	ON OF	The output logic of each output signal OC is reversed.
	Chopping operation of output signal OC	**OCC.**	0402	X	OF	-	-	oCC.	on 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	**OCT.**	0403	X	OF	-	-	oCT.	on 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 OC	**DC.**	0404	X	0	msec.	0 ～ 510	dC.	***	***	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.	***	***	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	-	-	odL.	on oF	ON OF	The output logic of each output signal OD is reversed.
	Chopping operation of output signal OD	**ODC.**	0407	X	OF	-	-	odC.	on 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		Direct call number	Operability	Factory setting GMFY	Unit	Setting range	Function name / Digital display	Setting		Specification
	Output signal OD compulsion OFF	**ODT.**	0408	X	OF	-	-	odr.	on oF	ON OF	In each output signal OD, 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.
C mode	Delay time of output signal OD	**DD.**	0409	X	0	msec.	0 ～ 510	dd.	***	***	In each output signal OD 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 OF	**OF.**	0410	X	FU	-	-	oF.	***	***	The output functions of each output signal OF can be selected from 58 types of functions. (*3)
	Logical conversion function of output signal OF	**OFL.**	0411	X	OF	-	-	oFL.	on oF	ON OF	The output logic of each output signal OF is reversed.
	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.
									nS	MS	4ms ON/OFF 50% duty
									nF	MF	2ms ON/OFF 50% duty
									HI	HI	4ms ON, 2ms OFF, 66% duty
									26	26	2ms ON,6ms OFF,25% duty
									62	62	6ms ON,2ms OFF,75% duty
									84	84	8ms ON,4ms OFF,66% duty
									FL	FL	100% (full wave)
									Lo	LO	2ms ON, 4ms OFF 33% duty
	Presser foot lifter FU full wave output time	**FO.**	0413	X	50	X10 msec	-	Fo.			The full wave output time of the presser foot lifter output FU can be set.
									20	20	200ms
									25	25	250ms
									30	30	300ms
									40	40	400ms
									50	50	500ms
									60	60	600ms
									80	80	800ms
									100	100	1000ms
	Presser foot lifter FU momentary mode	**FU.**	0414	X	M	-	-	FU.			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.
									n	M	The presser foot lifter operation is continued after full heeling or after thread trimmer with external thread trimmer signal S2.
									C	C	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 timer setting FCT in the P mode.
									A	A	The presser foot lifting operation is activated 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.)
									T	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.

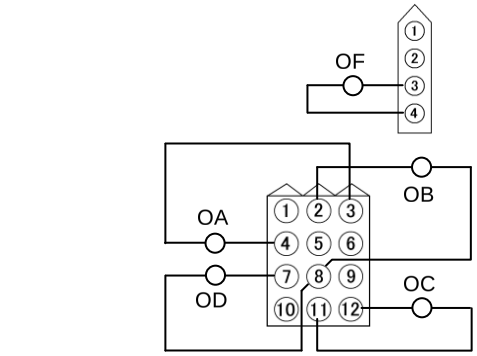
Mode name	Function name		Direct call number	Operability	Factory setting GMFY	Unit	Setting range	Function name Digital display	Setting		Specification
C mode ↓ + C	Delay time of output signal OF	**DF.**	0415	X	0	msec.	0 ～ 510	dF.	***	***	In each output signal OF the delay time to when each output is started can be set. Each delay time can be set in 2msec intervals.
	Function selection of output signal O1	**O1.**	0416	X	OT1	-	-	o 1.	***	***	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.**	0417	X	OF	-	-	o 1L.	on of	ON OF	The output logic of each output signal O1 is reversed.
	Chopping operation of output signal O1	**O1C.**	0418	X	OF	-	-	o 1C.	on 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 O1. (Chopping control) The full wave output time can be set with the full wave time [PO] function for each output.
	Output signal O1 compulsion OFF	**O1T.**	0419	X	OF	-	-	o 1T.	on of	ON OF	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.**	0420	X	0	msec.	0 ～ 510	d 1.	***	***	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.**	0421	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.**	0422	X	OF	-	-	o2L.	on of	ON OF	The output logic of each output signal O2 is reversed.
	Chopping operation of output signal O2	**O2C.**	0423	X	OF	-	-	o2C.	on 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 O2. (Chopping control) The full wave output time can be set with the full wave time [PO] function for each output.
	Output signal O2 compulsion OFF	**O2T.**	0424	X	OF	-	-	o2T.	on of	ON OF	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.
	Delay time of output signal O2	**D2.**	0425	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.**	0426	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.**	0427	X	OF	-	-	o3L.	on of	ON OF	The output logic of each output signal O3 is reversed.
	Chopping operation of output signal O3	**O3C.**	0428	X	OF	-	-	o3C.	on 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 O3. (Chopping control) The full wave output time can be set with the full wave time [PO] function for each output.
	Output signal O3 compulsion OFF	**O3T.**	0429	X	OF	-	-	o3T.	on of	ON OF	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.**	0430	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.**	0431	X	UPW	-	-	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.**	0432	X	OF	-	-	o4L.	on of	ON OF	The output logic of each output signal O4 is reversed.

Mode name	Function name		Direct call number	Operability	Factory setting	Unit	Setting range	Function name	Setting		Specification
					GMFY			Digital display			
C mode ↓ + C	Output signal O4 compulsion OFF	**O4T.**	0433	X	OF	-	-	o4r.	on oF	ON OF	In each output signal O4, 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 O4	**D4.**	0434	X	0	msec.	0 ～ 510	d4.	***	***	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.
	Function selection of output signal O5	**O5.**	0435	X	DNW	-	-	o5.	***	***	The output functions of each output signal O5 can be selected from 58 types of functions. (*3)
	Logical conversion function of output signal O5	**O5L.**	0436	X	OF	-	-	o5L.	on oF	ON OF	The output logic of each output signal O5 is reversed.
	Output signal O5 compulsion OFF	**O5T.**	0437	X	OF	-	-	o5r.	on oF	ON OF	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.
	Delay time of output signal O5	**D5.**	0438	X	0	msec.	0 ～ 510	d5.	***	***	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.
	Function selection of output signal O6	**O6.**	0439	X	NO	-	-	o6.	***	***	The output functions of each output signal O6 can be selected from 58 types of functions. (*3)
	Logical conversion function of output signal O6	**O6L.**	0440	X	OF	-	-	o6L.	on oF	ON OF	The output logic of each output signal O6 is reversed.
	Chopping operation of output signal O6	**O6C.**	0441	X	OF	-	-	o6C.	on 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 O6. (Chopping control) The full wave output time can be set with the full wave time [PO] function for each output.
	Output signal O6 compulsion OFF	**O6T.**	0442	X	OF	-	-	o6r.	on oF	ON OF	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.
	Delay time of output signal O6	**D6.**	0443	X	0	msec.	0 ～ 510	d6.	***	***	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.
	Function selection of output signal O7	**O7.**	0444	X	NO	-	-	o7.	***	***	The output functions of each output signal O7 can be selected from 58 types of functions. (*3)
	Logical conversion function of output signal O7	**O7L.**	0445	X	OF	-	-	o7L.	on oF	ON OF	The output logic of each output signal O7 is reversed.
	Chopping operation of output signal O7	**O7C.**	0446	X	OF	-	-	o7C.	on 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 O7. (Chopping control) The full wave output time can be set with the full wave time [PO] function for each output.
	Output signal O7 compulsion OFF	**O7T.**	0447	X	OF	-	-	o7r.	on oF	ON OF	In each output signal O7, 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 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	-	-	oM.	***	***	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	-	-	oML.	on oF	ON OF	The output logic of each output signal OM is reversed.

Mode name	Function name		Direct call number	Operability	Factory setting GMFY	Unit	Setting range	Function name Digital display	Setting		Specification
C mode (↓ + C)	Output signal OM compulsion OFF	**OMT.**	0451	X	OF	-	-	oMT.	on oF	ON OF	In each output signal OM, 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 OM	**DM.**	0452	X	0	msec.	0 ～ 510	dM.	***	***	In each output signal OM 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 ON	**ON.**	0453	X	NO	-	-	on.	***	***	The output functions of each output signal ON can be selected from 58 types of functions. (*3)
	Logical conversion function of output signal ON	**ONL.**	0454	X	OF	-	-	onL.	on oF	ON OF	The output logic of each output signal ON is reversed.
	Output signal ON compulsion OFF	**ONT.**	0455	X	OF	-	-	onT.	on oF	ON OF	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.
	Delay time of output signal ON	**DN.**	0456	X	0	msec.	0 ～ 510	dn.	***	***	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.
	Function selection of output signal OO	**OO.**	0457	X	NO	-	-	oo.	***	***	The output functions of each output signal OO can be selected from 58 types of functions. (*3)
	Logical conversion function of output signal OO	**OOL.**	0458	X	OF	-	-	ooL.	on oF	ON OF	The output logic of each output signal OO is reversed.
	Output signal OO compulsion OFF	**OOT.**	0459	X	OF	-	-	ooT.	on oF	ON OF	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.
	Delay time of output signal OO	**DO.**	0460	X	0	msec.	0 ～ 510	do.	***	***	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.
	Function selection of output signal OP	**OP.**	0461	X	NO	-	-	oP.	***	***	The output functions of each output signal OP can be selected from 58 types of functions. (*3)
	Logical conversion function of output signal OP	**OPL.**	0462	X	OF	-	-	oPL.	on oF	ON OF	The output logic of each output signal OP is reversed.
	Output signal OP compulsion OFF	**OPT.**	0463	X	OF	-	-	oPT.	on oF	ON OF	In each output signal OP, 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 OP	**DP.**	0464	X	0	msec.	0 ～ 510	dP.	***	***	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.
	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.	on oF	ON OF	The output logic of each output signal OQ is reversed.
	Output signal OQ compulsion OFF	**OQT.**	0467	X	OF	-	-	oqT.	on oF	ON 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.

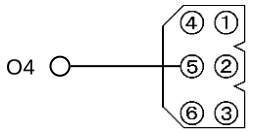
Mode name	Function name		Direct call number	Operability	Factory setting GMFY	Unit	Setting range	Function name Digital display	Setting		Specification
C mode	Delay time of output signal OQ	**DQ.**	0468	X	0	msec.	0 ～ 510	dQ.	***	***	In each output signal OQ the delay time to when each output is started can be set. Each delay time can be set in 2msec intervals.
	Function selection of output signal OR	**O.R.**	0469	X	NO	-	-	o.r.	***	***	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	-	-	o.rL.	on of	ON OF	The output logic of each output signal OR is reversed.
	Output signal OR compulsion OFF	**O.RT.**	0471	X	OF	-	-	o.rT.	on of	ON OF	In each output signal OR, 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 OR	**DR.**	0472	X	0	msec.	0 ～ 510	dr.	***	***	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.
	Full wave output time for each output	**PO.**	0473	O	50	X10 msec	-	Po.			The full wave output time of each output signal OA~OD, O1~O7 can be set.
									20	20	Set to [20] : 200ms
									25	25	Set to [25] : 250ms
									30	30	Set to [30] : 300ms
									40	40	Set to [40] : 400ms
									50	50	Set to [50] : 500ms
									60	60	Set to [60] : 600ms
									80	80	Set to [80] : 800ms
									100	100	Set to [100] : 1000ms
	Output chopping duty except of FU output	**POD.**	0474	O	MF	-	-	Pod.			Setting output chopping duty, except FU output
									MS	MS	Set to [MS] : 2ms ON/OFF 50% duty
									MF	MF	Set to [MF] : 4ms ON/OFF 50% duty
									HI	HI	Set to [HI] : 4ms ON, 2ms OFF, 66% duty
									Lo	LO	Set to [LO] : 2ms ON, 4ms OFF 33% duty
	Forced OFF timer setting function for each output	**OTT.**	0475	O	12	sec	1 ～ 24	oFT.	**	**	The timer that forcibly turns off output signals OA to OD, O1 to O7 and OM to OR can be set.
	FUM operation mode timer setting function	**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		Direct call number	Operability	Factory setting / GMFY	Unit	Setting range	Function name / Digital display	Setting		Specification
C mode	(*3) *Refer to [25.Table of input/output function for signal on C mode] *Refer to [26.The composition figure of input and output customization]										
	Logic [AND] module A1 input function selection	**A1.**	0477	X	NO	-	-	A 1.	***	***	Input function selection of the [A1] of the logic [AND] module.
	Logic [AND] module A1 setting of Hi /Low logic	**A1L.**	0478	X	OF	-	-	A 1L.	on of	ON OF	[A1] logic of the [AND] module is set to opposite.
	Logic [AND] module A1 Alternate	**A1A.**	0479	X	OF	-	-	A 1A.	on of	ON OF	[A1] of the [AND] module is set to alternative.
	Logic [AND] module N1 output function selection	**N1.**	0480	X	NO	-	-	n 1.	***	***	Output function selection of the [N1] of the logic [AND] module.
	Logic [AND] module N1 setting of Hi /Low logic	**N1L.**	0481	X	OF	-	-	n 1L.	on of	ON OF	[N1] logic of the [AND] module is set to opposite.
	Logic [AND] module N1 output function selection	**N2.**	0482	X	NO	-	-	n2.	***	***	Output function selection of the [N2] of the logic [AND] module.
	Logic [AND] module N2 setting of Hi /Low logic	**N2L.**	0483	X	OF	-	-	n2L.	on of	ON OF	[N2] logic of the [AND] module is set to opposite.
	Logic [AND] module A2 input function selection	**A2.**	0484	X	NO	-	-	A2.	***	***	Input function selection of the [A2] of the logic [AND] module.
	Logic [AND] module A2 setting of Hi /Low logic	**A2L.**	0485	X	OF	-	-	A2L.	on of	ON OF	[A2] logic of the [AND] module is set to opposite.

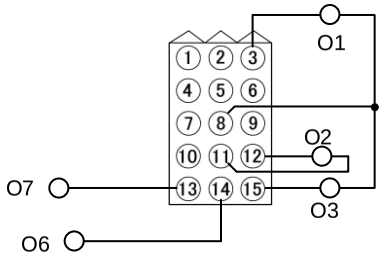


(Presser foot lifter connector)
OF:FU(Presser foot lifter output)

(Sewing machine connector)
OA:T(Thread trimmer output)
OB:W(Wiper output)
OC:B(Backstitch output)
OD:L(Thread release output)



(Option A connector)
O4:UPW(Needle UP position output)



(Option B connector)
O1:OT1(Virtual output)
O2:NCL(Needle cooler output)
O3:TF(TF output)
O6:NO(No setting)
O7:NO(No setting)

Caution
Output [O4,O5,O6,O7] are not solenoid output signal.
Output O5 is not at connector.

Mode name	Function name		Direct call number	Operability	Factory setting GMFY	Unit	Setting range	Function name Digital display	Setting		Specification
C mode ↓ + C	Logic [AND] module A2 Alternate	**A2A.**	0486	X	OF	-	-	A2A.	on oF	ON OF	[A2] of the [AND] module is set to alternative.
	Logic [AND] module N3 output function selection	**N3.**	0487	X	NO	-	-	n3.	***	***	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.	on 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.	***	***	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.	on oF	ON OF	[N4] logic of the [AND] module is set to opposite.
	Logic [AND] module A3 input function selection	**A3.**	0491	X	NO	-	-	A3.	***	***	Input function selection of the [A3] of the logic [AND] module.
	Logic [AND] module A3 setting of Hi /Low logic	**A3L.**	0492	X	OF	-	-	A3L.	on oF	ON OF	[A3] logic of the [AND] module is set to opposite.
	Logic [AND] module A3 Alternate	**A3A.**	0493	X	OF	-	-	A3A.	on oF	ON OF	[A3] of the [AND] module is set to alternative.
	Logic [AND] module N5 output function selection	**N5.**	0494	X	NO	-	-	n5.	***	***	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.	on 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.	***	***	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.	on oF	ON OF	[N6] logic of the [AND] module is set to opposite.
	Logic [OR] module input function selection	**OR.**	0498	X	NO	-	-	or.	***	***	Input function selection of the [OR] of the logic [OR] module.
	Logic [OR] module setting of Hi /Low logic	**ORL.**	0499	X	OF	-	-	orL.	on oF	ON OF	[OR] logic of the [OR] module is set to opposite.
	Logic [OR] module Alternate	**ORA.**	0500	X	OF	-	-	orA.	on oF	ON OF	[OR] of the [OR] module is set to alternative.
	Logic [OR] module R1 output function selection	**R1.**	0501	X	NO	-	-	r1.	***	***	Output function selection of the [R1] of the logic [OR] module.
	Logic [OR] module R1 setting of Hi /Low logic	**R1L.**	0502	X	OF	-	-	r1L.	on oF	ON OF	[R1] logic of the [AND] module is set to opposite.
	Logic [OR] module R2 output function selection	**R2.**	0503	X	NO	-	-	r2.	***	***	Output function selection of the [R2] of the logic [OR] module.
	Logic [OR] module R2 setting of Hi /Low logic	**R2L.**	0504	X	OF	-	-	r2L.	on oF	ON OF	[R2] logic of the [AND] module is set to opposite.
	Variable speed command for digital input	**CSP.**	0505	X	OF	-	-	CSP.	on oF	ON OF	Set variable speed command for digital input. (IOC, IOD, IOE, IOF) High speed is set to [H] on program mode "P". (CSP=ON, CSG=OFF)

Mode name	Function name	Direct call number	Operability	Factory setting	Unit	Setting range	Function name	Setting		Specification
				GMFY			Digital display			
C mode	Variable speed command for digital input **CSG.**	0506	X	OF	-	-	CSG.	oF	ON OF	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) = (I6, I7, I2, I1). (CSP=ON, CSG=ON)

Code table of speed command input

Note 1:
The speed command becomes an analog speed by which the variable speed command voltage input VC2 of the No. 4 pin of the option B connector is divided into 16.

Note 2:
This function is a function to input the speed command by the code in a right table.
It is necessary to input the S1 signal to run.

Note 3:
Please set the operation mode function of [VC2] of Q mode to [VS] to run only in a virtual input IOC, IOD, IOE and IOF.
It is possible to begin to run without S1 signal.

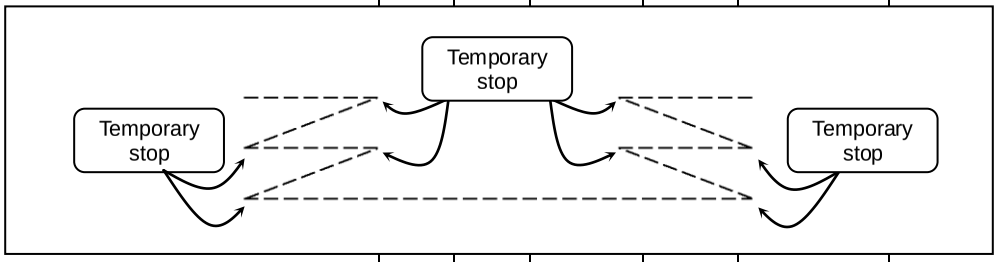
Hexadecimal numbaer	CSP setting (CSP=ON, CSG=OF)				CSG setting (Gray code) (CSP=ON, CSG=ON)				Decimal number	Speed command (rpm)
	IOF	IOE	IOD	IOC	IOF	IOE	IOD	IOC		
0	OF 0	OF 0	OF 0	OF 0	OF 0	OF 0	OF 0	OF 0	1	VC2= [Small]
1	OF 0	OF 0	OF 0	**ON 1**	OF 0	OF 0	OF 0	**ON 1**	2	
2	OF 0	OF 0	**ON 1**		OF 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**	**ON 1**	OF 0	**ON 1**	OF 0	OF 0	8	
8	**ON 1**	OF 0	OF 0	OF 0	**ON 1**	**ON 1**	OF 0	OF 0	9	
9	**ON 1**	OF 0	OF 0	**ON 1**	**ON 1**	**ON 1**	OF 0	**ON 1**	10	
A	**ON 1**	OF 0	**ON 1**	OF 0	**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**	**ON 1**	OF 0	OF 0	**ON 1**	OF 0	**ON 1**	OF 0	1	
D	**ON 1**	**ON 1**	OF 0	**ON 1**	**ON 1**	OF 0	**ON 1**	**ON 1**	3	
E	**ON 1**	**ON 1**	**ON 1**	OF 0	**ON 1**	OF 0	OF 0	**ON 1**	14	
F	**ON 1**	**ON 1**	**ON 1**	**ON 1**	**ON 1**	OF 0	OF 0	OF 0	15	VC2= [Large]

Mode name	Function name		Direct call number	Operability	Factory setting GMFY	Unit	Setting range	Function name Digital display	Setting		Specification
C mode ↓ + C	Thread release + backstitch output	**LB.**	0507	O	OF	-	-	LB.	on oF	ON OF	Backstitch output B will turn ON even while thread release output L is ON.
	Virtual output OT1 forced OFF function	**T1C.**	0508	O	OF	-	-	r 1C.	on oF	ON OF	Virtual outputs OT1 will be turned OFF forcibly after the OFF timer set time has passed. The OFF timer set time can be set with the virtual output OFF timer setting function [T1T].
	Forced OFF timer setting function for virtual output OT1	**T1T.**	0509	O	99	X10 msec	0 ～ 99	r 1r.	**	**	The timer time for forcibly turning OFF virtual outputs OT1 can be set.
	Virtual output OT2 forced OFF function	**T2C.**	0510	O	OF	-	-	r2C.	on oF	ON OF	Virtual outputs OT2 will be turned OFF forcibly after the OFF timer set time has passed. The OFF timer set time can be set with the virtual output OFF timer setting function [T2T].
	Forced OFF timer setting function for virtual output OT2	**T2T.**	0511	O	99	X10 msec	0 ～ 99	r2r.	**	**	The timer time for forcibly turning OFF virtual outputs OT2 can be set.
	Virtual output OT3 forced OFF function	**T3C.**	0512	O	OF	-	-	r3C.	on oF	ON OF	Virtual outputs OT3 will be turned OFF forcibly after the OFF timer set time has passed. The OFF timer set time can be set with the virtual output OFF timer setting function [T3T].
	Forced OFF timer setting function for virtual output OT3	**T3T.**	0513	O	99	X10 msec	0 ～ 99	r3r.	**	**	The timer time for forcibly turning OFF virtual outputs OT3 can be set.
	ON delay time setting function for virtual output OT1	**D11.**	0514	X	0	X10 msec	0 ～ 99	d 1 1.	**	**	The delay time (ON delay) to when the virtual output OT1 is started can be set.
	OFF delay time setting function for virtual output OT1	**D12.**	0515	X	0	X10 msec	0 ～ 99	d 12.	**	**	The delay time (OFF delay) to when the virtual output OT1 is OFF can be set.
	ON delay time setting function for virtual output OT2	**D21.**	0516	X	0	X10 msec	0 ～ 99	d2 1.	**	**	The delay time (ON delay) to when the virtual output OT2 is started can be set.
	OFF delay time setting function for virtual output OT2	**D22.**	0517	X	0	X10 msec	0 ～ 99	d22.	**	**	The delay time (OFF delay) to when the virtual output OT2 is OFF can be set.
	ON delay time setting function for virtual output OT3	**D31.**	0518	X	0	X10 msec	0 ～ 99	d3 1.	**	**	The delay time (ON delay) to when the virtual output OT3 is started can be set.
	OFF delay time setting function for virtual output OT3	**D32.**	0519	X	0	X10 msec	0 ～ 99	d32.	**	**	The delay time (OFF delay) to when the virtual output OT3 is OFF can be set.
	Feed pulse output (CP) cancel function	**CPK.**	0520	O	ON	-	-	CPt.	on oF	ON 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	**CP.**	0521	O	32	-	1 ～ 99	CP.	**	**	Setting the number of pulse [CP]. After changing this number, turns on power switch again.

Mode name	Function name		Direct call number	Operability	Factory setting GMFY	Unit	Setting range	Function name Digital display	Setting		Specification
	Prohibited angle of output CP pulse	**CPC.**	0522	O	OF	-	-	CPC.	on oF	ON 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).
C mode ↓ + C	Panel switch operation prohibit	**PSW.**	0523	O	OF	-	-	PSW.	on oF	ON OF	Panel switch operation ([M], [A,1-2], [B,SL], [C,<==], [D,==>] key operations) during the normal mode, tacking mode and pattern mode will not be possible. However, changeover into each mode will be possible.
	O4, O5 output cancel during back tack term	**CKB.**	0524	O	OF	-	-	CKb.	on oF	ON OF	Output signal O4 and O5 are prohibited during back tack term.
	CP output cancel during back tack term	**CPB.**	0525	O	OF	-	-	CPb.	on oF	ON OF	Output signal "CP" is prohibited during back tack term.
	Speed setting for the [SPC] output	**C.**	0526	X	1000	rpm	0 ～ 8999	C.	****	****	SPC output is turned ON when reached setting speed [C].
	Speed setting for the [SPD] output	**D.**	0527	X	2000	rpm	0 ～ 8999	d.	****	****	SPD output is turned ON when reached setting speed [D].
	Speed setting for the [SPE] output	**E.**	0528	X	3000	rpm	0 ～ 8999	E.	****	****	SPE output is turned ON when reached setting speed [E].
	F key function on control panel	**CNF.**	0529	O	SE	-	-	CnF.			Selection F key function
									UP	UP	Display Up counter amount
									dn	DN	Display Down counter amount
									SE	SE	Display stitch amount of sensor
									SP	SP	Display routine speed of sewing machine
	Variable speed pedal changeover	**PDS.**	0530	O	OF	-	-	PdS.	on oF	ON OF	When the changeable velocity pedal etc, are uesd by the standing sewing machine making, it sets it.
	Speed insrtuction VC2 cancellation	**V2C.**	0531	X	OF	-	-	u2C.	on oF	ON OF	Speed instruction VC2 is canceled.

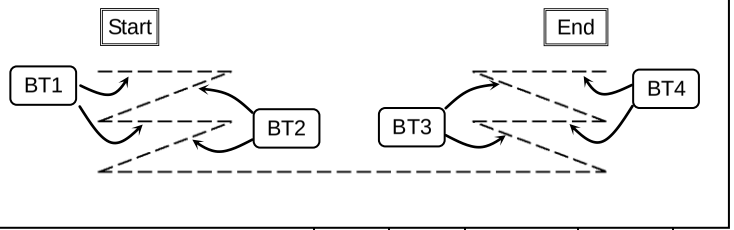
Mode name	Function name	Direct call number	Operability	Factory setting GMFY	Unit	Setting range	Function name (Digital display)	Setting		Specification
D mode	Operation mode during tacking **D1.**	0600	O	M	-	-	d1.			The operation mode during tacking is determined.
								n	M	During start tacking, even if the pedal is returned to neutral or the external run signal (S1) is turned OFF, the stitching will continue to the last tack process, and then will stop. Stitching will continue in the same manner for end tacking, and the needle will be lifted after thread trimming.
								d	D	The tacking speed will change according to the pedal toe down amount only during start tacking. (the maximum speed is the start tacking speed N.) The sewing machine will stop if the pedal is returned to neutral or external signal turned OFF during start tacking.
								n	N	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].
								CSt	CST	The sewing machine will stop for a set time at each tack corner even with pedal toe down or if the external run signal (S1) is ON. The stop time can be adjusted with [CT]. This is used to accurately tack.
								CSU	CSU	The sewing machine will stop for a set time at each tack corner even with pedal toe down or if the external run signal (S1) is ON. The sewing machine stops at the UP position irrespective of the position. The stop time can be adjusted with [CT]. This is used to accurately tack.
								CSd	CSD	The sewing machine will stop for a set time at each tack corner even with pedal toe down or if the external run signal (S1) is ON. The sewing machine stops at the DOWN position irrespective of the position. The stop time can be adjusted with [CT]. This is used to accurately tack.
	Operation mode during start tack completion **D2.**	0601	O	CON	-	-	d2.			The operation mode during the completion of start tack is determined.
								Con	CON	If the pedal is toed down or the external run signals (S0, S1) are ON when start tacking is completed, the next straight line stitching will begin.
								StP	STP	Even if the pedal is toed down or the external run signals (S1) turned ON when start tacking is completed, the sewing machine will stop. The next straight line stitching will start when the pedal is toed down for neutral again, or when the external run signals (S1) is turned OFF to ON.
								trn	TRM	The thread is trimmed when start tacking is completed. This is used for continuous tack stitch.
	Stop time at each corner during start and backtacking **CT.**	0602	O	5	X10 msec	0 ～ 99	Ct.	**	**	The stop time at each corner during tacking can be set when [CST] in operation mode D1 is set. [CSU],[CSD]
	Tack alignment **BM.**	0603	O	OF	-	-	bM.			The backstitch solenoid operation timing can be set to align the tacking.
								on	ON	Tacking speed less than 1000 rotations
								oF	OF	Tacking speed 1000 rotations or more
	No. of stitch compensation for start tacking alignment **BT1.**	0604	O	0	-	0 ～ F	bt1.	*	*	By finely adjusting the backstitch solenoid operation timing of start tacking from forward to reverse, the no. of stitches can be compensated. The relation of the setting value and no. of stitch compensation is as shown below.

Caution
Set the start and end tack type, and number of stitches in the tacking mode before setting the functions in the D mode.



Caution
If the operation mode during tacking D1 is set to [CST], [CSU] and [CSD], the tacking alignment functions BM, BT1, BT2, BT3 and BT4 will be invalid.

Mode name	Function name		Direct call number	Operability	Factory setting GMFY	Unit	Setting range	Function name Digital display	Setting		Specification
D mode ↓ + D+	No. of stitch compensation for start tacking alignment	**BT2.**	0605	O	0	-	0 ～ F	bT2.	*	*	By finely adjusting the backstitch solenoid operation timing of start tacking from reverse to forward, the no. of stitches can be compensated. The relation of the setting value and no. of stitch compensation is as shown below.
	No. of stitch compensation for end tacking alignment	**BT3.**	0606	O	0	-	0 ～ F	bT3.	*	*	By finely adjusting the backstitch solenoid operation timing of end tacking from reverse to forward, the no. of stitches can be compensated. The relation of the setting value and no. of stitch compensation is as shown below.
	No. of stitch compensation for end tacking alignment	**BT4.**	0607	O	0	-	0 ～ F	bT4.	*	*	By finely adjusting the backstitch solenoid operation timing of end tacking from forward to reverse, the no. of stitches can be compensated. The relation of the setting value and no. of stitch compensation is as shown below.
	No. of tacking stitches (+) 15 stitches function	**BTP.**	0608	O	OF	-	-	bTP.	on oF	ON OF	15 stitches are added to the set No. of start and end tacking stitches. For example, if the set No. of start tacking stitches is 4 stitches, the actual No. of start tacking stitches will be 19 stitches (4 + 15).
	No. of tacking stitches addition stitches function	**BTO.**	0609	O	0	-	0 ～ 99	bTo.	**	**	[BTO] setting stitches are added to the set No. of start and end tacking stitches. For example, if the set No. of start tacking stitches is 4 stitches and [BTO] setting value is 20 stitches, the actual No. of start tacking stitches will be 24 stitches (4 + 20).
	Full heeling function immediately after start tacking stop	**BTT.**	0610	O	ON	-	-	bTT.	on oF	ON OF	If full heeling is performed immediately after start tacking stops, end tacking will not be performed, and the sewing machine will stop after thread trimming.
	Not used.	**CSJ.**	0611	O	OF	-	-	CSJ.	on oF	ON OF	Not used.
	The speed operation mode when both the medium speed signal and S5V signal is ON	**SPN.**	0612	O	OF	-	-	SPn.			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.
									on	ON	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.
									oF	OF	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.



Relation of no. of compensated stitches and setting value

Setting value	9	8	7	6	5	4	3	2
Compensated stitches	$-2\frac{1}{4}$	-2	$-1\frac{3}{4}$	$-1\frac{2}{4}$	$-1\frac{1}{4}$	-1	$-\frac{3}{4}$	$-\frac{2}{4}$
Setting value	1	0	A	B	C	D	E	F
Compensated stitches	$-\frac{1}{4}$	0	$+\frac{1}{4}$	$+\frac{2}{4}$	$+\frac{3}{4}$	+1	$+1\frac{1}{4}$	$+1\frac{2}{4}$

Mode name	Function name		Direct call number	Operability	Factory setting	Unit	Setting range	Function name	Setting		Specification
					GMFY			Digital display			
D mode ↓ + D+ −	Set table types of tacking	**BTM.**	0613	O	6	-	1 ～ 7	bTM.			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	1	Once tacking (V tacking)
									2	2	Double tacking (N tacking)
									3	3	Triple tacking (M tacking)
									4	4	4 repeat tacking (W tacking)
									5	5	5 repeat tacking
									6	6	6 repeat tacking
									7	7	7 repeat tacking
	Input signal S7 operation mode during preset stitching	**S7M.**	0614	O	OF	-	-	S7M.	on oF	ON OF	If the backstitch related inputs are turned ON during preset stitching, the backstitch solenoid will turn ON.
	Manual backstitch ON timing 1	**S7U.**	0615	O	OF	-	-	S7U.	on oF	ON OF	The backstitch solenoid drive timing by the backstitch signal S7 is synchronized with the UP position. (When this function setting is [OF] setting, it will be synchronized with the random position.)
	Manual backstitch ON timing 2	**S7D.**	0616	O	OF	-	-	S7d.	on oF	ON OF	The backstitch solenoid drive timing by the backstitch signal S7 is synchronized with the DOWN position. (When this function setting is [OF] setting, it will be synchronized with the random position.)
	The OFF timing setting of output B when the backstitching signal (S7) is OFF setting.	**7BD.**	0617	O	OF	-	-	7bd.	on oF	ON OF	When the manual backstitching signal (S7) is OFF setting, the OFF timing of the backstitching output B will be synchronized with the UP position. (When this function setting is [OF] setting, it will be synchronized with the DOWN position.)
	The maximum tacking stitches (maximum stitches is 99 stitches)	**BTN.**	0618	O	OF	-	-	bTn.			The maximum tacking stitches can be set.
									on	ON	The No. of maximum tacking stitches will be 99 stitches. The No. of start and end tacking stitches will be the same stitches, the No. of start and end tacking stitches A and D can be set by the 2 figures of [A] and [B] of the operation panel, and the No. of start and end tacking stitches B and C can be set by the 2 figures of [C] and [D] of the operation panel.
									oF	OF	The No. of maximum tacking stitches is 15 stitches.
	No. of end tacking stitches during direct heeling	**BCC.**	0619	O	OF	-	-	bCC.	on oF	ON OF	The No. of end tacking stitches with direct heeling will be the No. of stitches C + 1 stitch when operation mode D1 is set to [D][M] during tacking.
	Operation mode during thread trimmer cancel signal [TL] setting	**TLS.**	0620	O	OF	-	-	rLS.	on oF	ON OF	The operation mode for when the thread trimmer cancel signal (TL) is input will be set.
	Input signal BTL quick pressing operation	**BTS.**	0621	O	ON	-	-	bTS.	on oF	ON OF	The tacking cancel signal [BTL] operation is set. [ON] The tacking operation is prohibited once after one pushing (OFF-ON-OFF) of the tacking cancel signal [BTL]. [OF] Tacking is prohibited while the tacking cancel signal [BTL] is ON.

Mode name	Function name		Direct call number	Operability	Factory setting GMFY	Unit	Setting range	Function name Digital display	Setting		Specification
D mode ↓ + D	Input signal SB and EB quick pressing operation	**BS.**	0622	O	OF	-	-	bS.	on oF	ON 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.**	0623	O	OF	-	-	bFd.	on oF	ON 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.**	0624	O	OF	-	-	bd.	on oF	ON 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.**	0625	O	OF	-	-	PnE.	on oF	ON 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.**	0626	O	ON	-	-	bZ.	on oF	ON OF	The buzzer of control panel will be validated.

Mode name	Function name		Direct call number	Operability	Factory setting GMFY	Unit	Setting range	Function name Digital display	Setting		Specification
E mode ↓ + ↑ + A	Error code (The last error code)	**1.**	0700	O	E--	-	-	1.	E--	E--	The last error code is displayed.
	Error code (The second to last code)	**2.**	0701	O	E--	-	-	2.	E--	E--	The second to last code is displayed.
	Error code (The third to last code)	**3.**	0702	O	E--	-	-	3.	E--	E--	The third to last code is displayed.
	Error code (The fourth to last code)	**4.**	0703	O	E--	-	-	4.	E--	E--	The fourth to last code is displayed.
	Total integration time of power on	**P.**	0704	O	0	X10 hours	0 ～ 9999	P.	****	****	Display total integration time of power on
	Total integration time of motor run	**M.**	0705	O	0	X10 hours	0 ～ 9999	n.	****	****	Display total integration time of motor run
	Input signal IA display	**IA.**	0706	O	-	-	-	iA.	on oF	ON OF	The input status (ON/OFF) of the input signal IA.
	Input signal IB display	**IB.**	0707	O	-	-	-	ib.	on oF	ON OF	The input status (ON/OFF) of the input signal IB.
	Input signal IC display	**IC.**	0708	O	-	-	-	iC.	on oF	ON OF	The input status (ON/OFF) of the input signal IC.
	Input signal ID display	**ID.**	0709	O	-	-	-	id.	on oF	ON OF	The input status (ON/OFF) of the input signal ID.
	Input signal IE display	**IE.**	0710	O	-	-	-	iE.	on oF	ON OF	The input status (ON/OFF) of the input signal IE.
	Input signal IF display	**IF.**	0711	O	-	-	-	iF.	on oF	ON OF	The input status (ON/OFF) of the input signal IF.
	Input signal IG display	**IG.**	0712	O	-	-	-	iG.	on oF	ON OF	The input status (ON/OFF) of the input signal IG.
	Input signal IH display	**IH.**	0713	O	-	-	-	iH.	on oF	ON OF	The input status (ON/OFF) of the input signal IH.
	Input signal II display	**II.**	0714	O	-	-	-	i i.	on oF	ON OF	The input status (ON/OFF) of the input signal II.
	Input signal IJ display	**IJ.**	0715	O	-	-	-	iJ.	on oF	ON OF	The input status (ON/OFF) of the input signal IJ.
	Input signal IK display	**IK.**	0716	O	-	-	-	ik.	on oF	ON OF	The input status (ON/OFF) of the input signal IK
	Input signal IL display	**IL.**	0717	O	-	-	-	iL.	on oF	ON OF	The input status (ON/OFF) of the input signal IL.
	Input signal IP display	**IP.**	0718	O	-	-	-	iP.	on oF	ON OF	The input status (ON/OFF) of the input signal IP.

Mode name	Function name		Direct call number	Operability	Factory setting	Unit	Setting range	Function name	Setting		Specification
					GMFY			Digital display			
E mode (↓ + ↑ + A)	Input signal IQ display	**IQ.**	0719	O	-	-	-	iQ.	on oF	ON OF	The input status (ON/OFF) of the input signal IQ.
	Input signal IR display	**IR.**	0720	O	-	-	-	ir.	on oF	ON OF	The input status (ON/OFF) of the input signal IR.
	Input signal I1 display	**I1.**	0721	O	-	-	-	i1.	on oF	ON OF	The input status (ON/OFF) of the input signal I1.
	Input signal I2 display	**I2.**	0722	O	-	-	-	i2.	on oF	ON OF	The input status (ON/OFF) of the input signal I2.
	Input signal I4 display	**I4.**	0723	O	-	-	-	i4.	on oF	ON OF	The input status (ON/OFF) of the input signal I4.
	Input signal I5 display	**I5.**	0724	O	-	-	-	i5.	on oF	ON OF	The input status (ON/OFF) of the input signal I5
	Encoder signal display (A phase)	**ECA.**	0725	O	-	-	-	ECA.	on oF	ON OF	The input status (ON/OFF) of the motor encoder A phase is displayed.
	Encoder signal display (B phase)	**ECB.**	0726	O	-	-	-	ECb.	on oF	ON OF	The input status (ON/OFF) of the motor encoder B phase is displayed.
	Detector signal display (UP signal)	**UP.**	0731	O	-	-	-	UP.	on oF	ON OF	The input status (ON/OFF) of the detector UP signal is displayed.
	Detector signal display (DN signal)	**DN.**	0732	O	-	-	-	dn.	on oF	ON OF	The input status (ON/OFF) of the detector DN signal is displayed.
	Display the angle from down position	**DR.**	0733	O	-	X2 degree	0 ～ 180	dr.	***	***	Display the angle of current position from down position.
	Display the voltage of VC	**VC.**	0734	O	-	-	0 ～ 3FF	uC.	***	***	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	**V2.**	0736	O	-	-	0 ～ 3FF	u2.	***	***	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	-	-	-	oAd.	on oF	ON OF	The output status (ON/OFF) of the output signal OA.
	Output signal OB display	**OBD.**	0738	O				obd.	on oF	ON OF	The output status (ON/OFF) of the output signal OB.
	Output signal OC display	**OCD.**	0739	O				oCd.	on oF	ON OF	The output status (ON/OFF) of the output signal OC.
	Output signal OD display	**ODD.**	0740	O				odd.	on oF	ON OF	The output status (ON/OFF) of the output signal OD.
	Output signal OF display	**OFD.**	0741	O				oFd.	on oF	ON OF	The output status (ON/OFF) of the output signal OF.
	Output signal O1 display	**O1D.**	0742	O				o1d.	on oF	ON OF	The output status (ON/OFF) of the output signal O1.

Mode name	Function name	Direct call number	Operability	Factory setting GMFY	Unit	Setting range	Function name Digital display	Setting		Specification
E mode ↓ + ↑ + A	Output signal O2 display **O2D.**	0743	O				o2d.	on oF	ON OF	The output status (ON/OFF) of the output signal O2.
	Output signal O3 display **O3D.**	0744	O				o3d.	on oF	ON OF	The output status (ON/OFF) of the output signal O3.
	Output signal O4 display **O4D.**	0745	O				o4d.	on oF	ON OF	The output status (ON/OFF) of the output signal O4.
	Output signal O5 display **O5D.**	0746	O				o5d.	on oF	ON OF	The output status (ON/OFF) of the output signal O5.
	Output signal O6 display **O6D.**	0747	O				o6d.	on oF	ON OF	The output status (ON/OFF) of the output signal O6.
	Output signal O7 display **O7D.**	0748	O				o7d.	on oF	ON OF	The output status (ON/OFF) of the output signal O7.
	Output signal OP display **OPD.**	0749	O				oPd.	on oF	ON OF	The output status (ON/OFF) of the output signal OP.
	Output signal OQ display **OQD.**	0750	O				oqd.	on oF	ON OF	The output status (ON/OFF) of the output signal OQ.
	Output signal OR display **ORD.**	0751	O				ord.	on oF	ON OF	The output status (ON/OFF) of the output signal OR.
	Solenoid output of output signal OA **OAO.**	0752	X	-	-	-	oAo.	on oF	ON OF	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.
	Solenoid output of output signal OB **OBO.**	0753	X	-			obo.	on oF	ON OF	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.**	0754	X	-			oCo.	on oF	ON OF	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.**	0755	X	-			odo.	on oF	ON OF	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.**	0756	X	-			oFo.	on oF	ON OF	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 **O1O.**	0757	X	-			o1o.	on oF	ON OF	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 **O2O.**	0758	X	-			o2o.	on oF	ON OF	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 **O3O.**	0759	X	-			o3o.	on oF	ON OF	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.

Mode name	Function name		Direct call number	Operability	Factory setting GMFY	Unit	Setting range	Function name Digital display	Setting		Specification
E mode ↓ + ↑ + A	Output for small signal of output signal O4	**O4O.**	0760	X	-			o4o.	on oF	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	**O5O.**	0761	X	-			o5o.	on oF	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	**O6O.**	0762	X	-			o6o.	on oF	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	**O7O.**	0763	X	-			o7o.	on oF	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.**	0764	X	-			oPo.	on oF	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.**	0765	X	-			oqo.	on oF	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.**	0766	X	-			oro.	on oF	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.
	Rated output display	**WT.**	0767	O	**	watt	-	WT.			The motor's rated output value is displayed.
									75	75	Refers to 750W.
									55	55	Refers to 550W.
	Voltage display	**VL.**	0768	O	***	volt	-	uL.			The rated input voltage value in the control box is displayed.
									100	100	Refers to 100V class.
									200	200	Refers to 200V class.
	Model display	**TP.**	0769	O	-	-	-	tP.			The control box model name is displayed.
									MFY	MFY	XC-GMFY
	Data version No.	**DV.**	0770	O	***	-	-	du.	***	***	The data version No. (3-digit alpha-numeral) of the EEPROM is displayed.
	Software version No.	**RV.**	0771	O	***	-	-	ru.	***	***	The version No. (3-digit alpha-numeral) of the software is displayed.
	Display previous simple setting selected.	**T.**	0772	O	-	-	-	t.	****	****	Display previous simple setting selected.

Mode name	Function name		Direct call number	Operability	Factory setting GMFY	Unit	Setting range	Function name / Digital display	Setting		Specification
F mode ↓ + ↑ + B	Set No. of stitches A for cutter output (Setting the delay time during chain-off output ON)	**COA.**	0800	O	0	stitches	0 ～ 99	CoA.	**	**	The No. of stitches A (delay during chain-off output ON) for 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)	**COB.**	0801	O	0	stitches	0 ～ 99	Cob.	**	**	The No. of stitches B (delay during chain-off output OFF) for chain- off output operation can be set. When CTR = ON, the No. of stitches for cutter output ON can be set.
	Set No. of stitches C for cutter output	**COC.**	0802	O	0	stitches	0 ～ 99	CoC.	**	**	The No. of stitches C (delay during cutter output ON) during cutter output operation can be set.
	No. of stitches for BT output ON after sensor OFF setting	**X.**	0803	O	0	stitches	0 ～ 99	X.	**	**	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.
	No. of stitches for sewing machine stops after BT output ON setting	**Y.**	0804	O	0	stitches	0 ～ 99	Y.	**	**	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.
	No. of stitches for BT output OFF after start of stitching setting	**Z.**	0805	O	12	stitches	1 ～ 99	Z.	**	**	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.
	Delay time to when SL output turns from OFF to ON	**SD.**	0806	O	0	msec	0 ～ 508	Sd.	***	***	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	**ED.**	0807	O	0	msec	0 ～ 508	Ed.	***	***	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	**SLH.**	0808	O	OF	-	-	SLH.			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).
									on	ON	Setting HOF function in G mode.
									oF	OF	Setting SLN function in P mode.
	SL output start position setting	**SLK.**	0809	O	OF	-	-	SLK.	on oF	ON OF	The output of SL for thread dislocation prevention starts when the needle lift operation (US, U, UF) is completed.
	SL output start position during SLS function ON setting	**SLT.**	0810	O	OF	-	-	SLT.	on oF	ON 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.
	Speed limit M except tacking and SL on	**SLL.**	0811	O	OF	-	-	SLL.	on oF	ON 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.
	SL output operation during motor stopping	**SLS.**	0812	O	OF	-	-	SLS.	on oF	ON OF	The output SL is ON even when the motor is stopped.

Mode name	Function name		Direct call number	Operability	Factory setting GMFY	Unit	Setting range	Function name Digital display	Setting		Specification
F mode ↓ + ↑ + B	OT1 output blower output setting	**O1B.**	0813	O	OF	-	-	o 1b.	on oF	ON OF	Virtual output OT1 will be set to blower output of cutter function.
	OT2 output chain-off output setting	**O2M.**	0814	O	OF	-	-	o2M.	on oF	ON OF	Virtual output OT2 can be used as the chain-off output.
	OT3 output cutter output setting	**O3M.**	0815	O	OF	-	-	o3M.	on oF	ON OF	Virtual output OT3 can be used as the cutter output.
	Mesh judgment control with I*2 input	**I2M.**	0816	O	OF	-	-	i2M.	on oF	ON OF	The mesh judgment control of cutter specification is added to chain-off output. Refer to the section for details on the IO2, IR2 and IS2 signal function.
	Setting I*3 signal for manual cutter output	**CTY.**	0817	O	OF	-	-	CtY.	on oF	ON OF	When the IO3, IR3 and IS3 signals are ON, the output is set to the manual cutter output. Refer to the section for details on the IO3, IR3 and IS3 signal function.
	Status of cutter output photo switch (I*2) signal according to OT3 output	**CTM.**	0818	O	OF	-	-	CtM.			The change status of the IO2, IR2 signal photo switch that outputs the cutter output by the virtual output OT3 can be selected. Refer to the section for details on the IO2, IR2 signal function. The OT3 output time is SD. It is possible to set it by the function.
									on	ON	The cutter output by the OT3 is output at both changes (OFF=>ON) (ON=>OFF) of the IO2, IR2 signal photo switch.
									oF	OF	The cutter output by the OT3 is output at only the (ON=>OFF) change of the IO2, IR2 signal photo switch.
	Turn OT3 output ON/OFF per set No. of stitches when I*3 signal is ON	**CTR.**	0819	O	OF	-	-	CtR.	on oF	ON OF	When the IO3, IR3 and IS3 signals are ON, the virtual output OT3 is turned ON/OFF per set No. of stitches. (When this is turned ON, the cutter specifications by the sensor will be invalidated.) The set No. of stitches can be set with the cutter specifications No. of stitches A (non-stitching chain ON delay) setting COA function, cutter specifications No. of stitches B (non-stitching chain ON delay) setting COB function and the cutter specifications No. of stitches C (non-stitching chain ON delay) setting COC function. Refer to the section for details on the IO3, IR3 and IS3 signal function.
	Automatic cutter output prohibit during sensor ON	**CSC.**	0820	O	OF	-	-	CSC.	on oF	ON OF	The output of the automatic cutter output is prohibited while the sensor is ON.
	Automatic cutter output prohibit during sensor OFF	**CEC.**	0821	O	OF	-	-	CEC.	on oF	ON OF	The output of the automatic cutter output is prohibited while the sensor is OFF.
	Cutter output prohibit when sensor is ON while stopped	**CTS.**	0822	O	OF	-	-	CtS.	on oF	ON OF	The output of the automatic cutter output is prohibited when the sensor input is ON while the sewing machine is stopped.
	Automatic thread trim setting after cutter sensor is turned off	**CAT.**	0823	O	OF	-	-	CAt.	on oF	ON OF	Automatic stops and trim setting, after the cutter sensor is turned off and then the number of stitch "C" set by "COC" function is run.

Mode name	Function name		Direct call number	Operability	Factory setting GMFY	Unit	Setting range	Function name Digital display	Setting		Specification
F mode ↓ + ↑ + B SL	Set I*1 input, OP1 output to cutter BT specifications input/output	**CTL.**	0824	O	OF	-	-	CTL.	on oF	ON OF	The IO1, IR1 and ISI 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	-	-	nMd.	on oF	ON OF	Only the preset No. of stitches is stitched after the operation signal (S1) is turned OFF.
	ROL output mode	**RLM.**	0826	O	OF	-	-	rLM.	on oF	ON OF	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	stitches	0 ～ 99	rLn.	**	**	The roller lower No. of stitches is set for the auxiliary feeding rear roller.
	Not used.	**CTG.**	0828		OF	-	-	CTG.	on oF	ON OF	Not used.
	Not used.	**CGD.**	0829		OF	-	-	CGd.	on oF	ON OF	Not used.
	Not used.	**EDT.**	0830		OF	-	-	EdT.	on oF	ON OF	Not used.
	Not used.	**EDS.**	0831		0	stitches	0 ～ 99	EdS.	**	**	Not used.
	Not used.	**CAS.**	0832		OF	-	-	CAS.	on oF	ON OF	Not used.
	Not used.	**ESC.**	0833		OF	-	-	ESC.	on oF	ON OF	Not used.

Mode name	Function name		Direct call number	Operability	Factory setting GMFY	Unit	Setting range	Function name / Digital display	Setting		Specification
G mode ↓ + ↑ + C	Thread trimming mode	**TR.**	0900	O	M1	-	-	rr.	***	***	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	-	-	trn.			The motor operation mode during thread trimming can be set when thread trimming mode TR is set to [PRG].
									LK	LK	The motor will run for the lockstitch thread trimming sewing machine.
									rk	RK	The motor will run for reverse thread trimming.
									tA	KA	Not used.
									tb	KB	Not used.
									UP	UP	Not used.
									dn	DN	Not used.
	Thread trimming output (T) output mode	**LTM.**	0902	O	T1	-	-	ltn.			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.
									t1	T1	Please refer to the LTM setting of string swithing off output T which has been described to the technical information.
									t2	T2	Please refer to the LTM setting of string swithing off output T which has been described to the technical information.
									t3	T3	Please refer to the LTM setting of string swithing off output T which has been described to the technical information.
									t4	T4	Please refer to the LTM setting of string swithing off output T which has been described to the technical information.
									tk	TK	Not used.
									ts	TS	Not used.
									t7	T7	Please refer to the LTM setting of string swithing off output T which has been described to the technical information.
	Thread release output (L) output mode	**LLM.**	0903	O	L1	-	-	llm.			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.
									L1	L1	Please refer to the LLM setting of string loosening output L which has been described to the technical information.
									L2	L2	Please refer to the LLM setting of string loosening output L which has been described to the technical information.
									L3	L3	Please refer to the LLM setting of string loosening output L which has been described to the technical information.

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Mode name	Function name	Direct call number	Operability	Factory setting GMFY	Unit	Setting range	Function name Digital display	Setting		Specification
G mode ↓ + ↑ + C	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.
								LK	LK	Not used.
								LS	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	O	0	degree	0 ～ 360	rS.	***	***	When the thread trimming mode TR is set to [PRG], the output start angle of the thread trimming output (T) can be set. Set according to the thread trimming output (T) timing chart.
	Thread trimming output angle **TE.**	0905	O	90	degree	0 ～ 360	rE.	***	***	When the thread trimming mode TR is set to [PRG], the output end angle of the thread trimming output (T) can be set. Set according to the thread trimming output (T) timing chart.
	Thread release output start angle **LS.**	0906	O	0	degree	0 ～ 360	LS.	***	***	When the thread trimming mode TR is set to [PRG], the output start angle of the thread release output (L) can be set. Set according to the thread release output (L) timing chart.
	Thread release output angle **LE.**	0907	O	90	degree	0 ～ 360	LE.	***	***	When the thread trimming mode TR is set to [PRG], the output end angle of the thread release output (L) can be set. Set according to the thread release output (L) timing chart.
	Thread trimming output start time **T1.**	0908	O	20	msec	0 ～ 998	r1.	***	***	The output start time of the thread trimming output (T) for chain stitch sewing machine can be set. When the thread trimming mode TR is set to [PRG], the output start time of the thread trimming output (T) for lock stitch sewing machine can be set. Set according to the thread trimming output (T) timing chart.
	Thread trimming output time **T2.**	0909	O	90	msec	0 ～ 998	r2.	***	***	The output time of the thread trimming output (T) for chain stitch sewing machine can be set. When the thread trimming mode TR is set to [PRG], the output time of the thread trimming output (T) for lock stitch sewing machine can be set. Set according to the thread trimming output (T) timing chart.
	Thread release output start time **L1.**	0910	O	150	msec	0 ～ 998	L1.	***	***	The output start time of the thread release output (L) for chain stitch sewing machine can be set. The output start time of the thread release output (L) during chain stitching thread trimming timing A can be set. The chain stitching thread trimming timing B is invalid at this time. When the thread trimming mode TR is set to [PRG], the output start time of the thread release output (L) for lock stitch sewing machine can be set. Set according to the thread release output (L) timing chart.
	Thread release output time **L2.**	0911	O	70	msec	0 ～ 998	L2.	***	***	The output time of the thread release output (L) for chain stitch sewing machine can be set. The output time of the thread release output (L) during chain stitching thread trimming timing A can be set. The chain stitching thread trimming timing B is invalid at this time. Set according to the thread release output (L) timing chart. When the thread trimming mode TR is set to [PRG], the output time of the thread release output (L) for lock stitch sewing machine can be set. Set according to the thread release output (L) timing chart.

Mode name	Function name		Direct call number	Operability	Factory setting GMFY	Unit	Setting range	Function name Digital display	Setting		Specification
G mode ↓ + ↑ + C	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	r2.	***	***	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 stiching start time (Stop time before thread trimming)	**R3.**	0914	O	50	msec	0 ～ 508	r3.	***	***	The time to when the sewing machine begins condensed stiching after the condensed stiching(CH) turn ON during start/end condensed stiching can be set. However, during the end condensed stiching in the chain stiching thread trimming timing B, this time [R3] will be the time for end condensed stiching after the thread release output (L) turns OFF. (If end condensed stiching 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.)
	Wiper output start time	**W1.**	0915	O	10	msec	0 ～ 998	W 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	W2.	***	***	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	-	-	WMd.			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.
									W	W	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.
									or	OR	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 when the S2 signal turns OFF.
									An	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.
									CH	CH	Not used.
									FW	FW	Not used.

Mode name	Function name		Direct call number	Operability	Factory setting GMFY	Unit	Setting range	Function name Digital display	Setting		Specification
G mode ↓ + ↑ + C	Presser foot lifting output start time	**F1.**	0918	O	140	msec	0 ～ 998	F 1.	***	***	When the thread trimming mode TR is set to [PRG], the output start time for the presser foot lifting output (FU) is set. Set according to the presser foot lifting output (FU) timing chart.
	Time to motor drive after presser foot lifter bring down	**FD.**	0919	O	176	msec	0 ～ 998	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.
	Interlock time during thread trimming	**IL.**	0920	O	140	msec	0 ～ 998	iL.	***	***	The interlock time that prohibits operation during thread trimming can be set. Manual calculation will be used during the [P] mode thread trimming (TR) timing [PRG], [KA3], [KA4], [KB3], [KB4], so the setting is valid. [KA1], [KA2], [KB1], [KB2] are for automatic calculation and cannot be set
	Interlock time during no thread trimming	**IT.**	0921	O	0	msec	0 ～ 510	iT.	***	***	The interlock time during the no thread trimming timing can be set. This is valid when the [P] mode thread trimming timing [NO] or thread trimming release signal (TL) is turned ON.
	Motor rotation after motor stop before thread trimming	**TDS.**	0922	O	OF	-	-	Tds.	on oF	ON OF	After the motor stops, it will start rotating after the thread trimming output T turns ON and the delay time has passed. The delay time can be set by the [TD] function.
	Motor stop time during lockstitch and R output time during chain stitch	**TD.**	0923	O	50	msec	0 ～ 508	Td.	***	***	The motor stop time before thread trimming during lock stitch can be set in 2msec intervals. The output R output time during chain stitch can be set in 2msec. When the chain stitch mode is set, it is possible to set to the delay time of the motor "R3".
	Delay setting before reverse run during RU setting	**RUS.**	0924	O	OF	-	-	rUS.	on oF	ON OF	Delay time before reverse run (RU operation) after thread trimming is completed can be set with RT when the thread trimming reverse needle lift RU is set to ON.
	Delay time before reverse run during RU setting	**RT.**	0925	O	76	msec	0 ～ 508	rT.	on oF	ON OF	When reverse needle lift after thread trimming RU is ON and RUS is ON, the delay time before the motor reverse run after thread trimming can be set in 2msec intervals.
	Reverse run needle lifting [RU] after output T, L and W	**RUM.**	0926	O	OF	-	-	rUn.	on oF	ON OF	Change [RU] function for chain stich type. "OF" is factory setting for lock stich (Reverse run after T) "ON" is for chain stich (Reverse run after T, L and W)
	Wiper output OFF trimming with (S1) signal	**WS1.**	0927	O	OF	-	-	WS 1.	on oF	ON OF	If the pedal is toed down or external output signal (S1) is turned ON during the wiper output time [W2] (after thread trimming interlock time), the wiper output time [W] will turn OFF. The presser foot lifting output (FU) will also turn OFF simultaneously, and the sewing machine will run after the [FD] time. Use this for the air type wiper. This is effective for standing operation (automatic machine operation).
	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	-	-	S2T.			If the sewing machine pulley is rotated by hand and set to 1 position while the sewing machine is stopped before thread trimming, if the needle UP position is 2 position, the needle DOWN position will shift. To return to the original stop position after that, fully heel the pedal, or set the operation mode by turning thread trimming signal (S2) ON. The same operation as then next [S2P] setting value ([NO], [TR], [PS]) is executed. The thread trimming operation is executed according to the thread trimming mode TR setting value ([KA1], [KA2], etc.).
									on	ON	
									oF	OF	

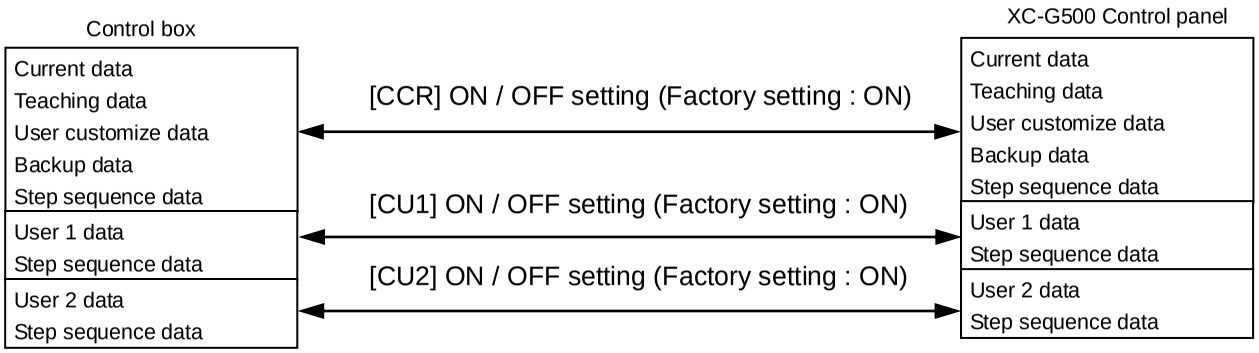
Mode name	Function name		Direct call number	Operability	Factory setting GMFY	Unit	Setting range	Function name Digital display	Setting		Specification
G mode ↓ + ↑ + C	Operation mode with thread trimming signal when shifting the needle stop position before the thread trimming signal	**S2P.**	0929	O	TR	-	-	S2P.			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.
									Tr	TR	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.
									PS	PS	The presser foot lifting operation will be executed after the needle is lifted. The thread trimming operation will not be executed.
									no	NO	The sewing machine does not rotate or perform thread trimming, and only the presser foot lifting operation is executed.
	Solenoid output OT1 manual/automatic change	**MAN.**	0930	O	ON	-	-	MAn.	on oF	ON OF	The change of the solenoid output [OT1] manual/automatic output is selected. The solenoid output [OT1] will be set to manual. The solenoid input signal IO1 is validated. The solenoid output [OT1] will be set to automatic. The solenoid input signal IO1 is invalidated.
	Setting of no. of stitches during MAN [OFF] setting	**HOF.**	0931	O	7	stitches	0 ～ 99	HoF.	**	**	This is valid when the solenoid output [OT1] manual/automatic output change is set to automatic. If the pedal is toed down or the external run signal (S00, S1, SH) is turned ON while the solenoid output [OT1] is ON, the OT1 output will turn OFF after the set No. of stitches.
	Weak brake ON simultaneously with wiper output (W)	**WB.**	0932	O	OF	-	-	Wb.	on oF	ON OF	The weak brake will turn ON when the wiper output (W) turns ON.
	Motor rotation operation when LTM function is set to T1, T2 or T3	**TDT.**	0933	O	OF	-	-	rdr.	on oF	ON OF	When the thread trimming output T mode LTM for lockstitch is set to [T1], [T2] or [T3], after the motor stops, it will start again after the thread trimming output T turns ON and the delay time has passed. Set time can be set by the [TD] function.
	Not used	**C1.**	0934	O	0	-	0 ～ 99	C1.	**	**	Not used.
	Not used	**C2.**	0935	O	0	-	0 ～ 99	C2.	**	**	Not used.
	Not used	**C3.**	0936	O	0	-	0 ～ 99	C3.	**	**	Not used.
	Not used	**T3.**	0937	O	0	-	0 ～ 998	r3.	***	***	Not used.
	Not used	**T4.**	0938	O	0	-	0 ～ 998	r4.	***	***	Not used.
	Not used	**T5.**	0939	O	0	-	0 ～ 998	r5.	***	***	Not used.
	Not used	**PET.**	0940	O	OF	-	-	PEr.	on oF	ON OF	Not used.
	Not used	**P9U.**	0941	O	OF	-	-	P9U.	on oF	ON OF	Not used.
	Not used	**HHC.**	0942	O	OF	-	-	HHC.	on oF	ON OF	Not used.

Mode name	Function name		Direct call number	Operability	Factory setting GMFY	Unit	Setting range	Function name Digital display	Setting		Specification
G mode ↓ + ↑ + C	Not used	**PAA.**	0943	O	OF	-	-	PAA.	oN oF	ON OF	Not used.
	Not used	**STL.**	0944	O	OF	-	-	StL.	oN oF	ON OF	Not used.
	Not used	**L8.**	0945	O	0	-	-98 ～ 98	L8.	***	***	Not used.
	Not used	**PEK.**	0946	O	OF	-	-	PEt.	oN oF	ON OF	Not used.
	Setting A which can be used by step sequence	**PPA.**	0947	O	OF	-	-	PPA.	oN oF	ON OF	Setting A which can be used by step sequence
	Setting B which can be used by step sequence	**PPB.**	0948	O	OF	-	-	PPb.	oN oF	ON OF	Setting B which can be used by step sequence
	Setting C which can be used by step sequence	**PPC.**	0949	O	OF	-	-	PPC.	oN oF	ON OF	Setting C which can be used by step sequence
	Setting D which can be used by step sequence	**PPD.**	0950	O	OF	-	-	PPd.	oN oF	ON OF	Setting D which can be used by step sequence
	Setting E which can be used by step sequence	**PPE.**	0951	O	OF	-	-	PPE.	oN oF	ON OF	Setting E which can be used by step sequence
	Setting F which can be used by step sequence	**PPF.**	0952	O	OF	-	-	PPF.	oN oF	ON OF	Setting F which can be used by step sequence
	Setting G which can be used by step sequence	**PPG.**	0953	O	OF	-	-	PPG.	oN oF	ON OF	Setting G which can be used by step sequence
	Setting H which can be used by step sequence	**PPH.**	0954	O	OF	-	-	PPH.	oN oF	ON OF	Setting H which can be used by step sequence

Mode name	Function name		Direct call number	Operability	Factory setting GMFY	Unit	Setting range	Function name / Digital display	Setting		Specification
H mode ↓ + ↑ + D	Upper limit of maximum speed [H]	**LHH.**	1000	O	90	X100 rpm	0 ～ 99	LHH.	**	**	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	LHL.	**	**	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	LLH.	**	**	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	LLL.	**	**	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].
	Upper limit of thread trimming speed [T]	**LTH.**	1004	O	5	X100 rpm	0 ～ 99	LTH.	**	**	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	LTL.	**	**	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	LnH.	**	**	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	LnL.	**	**	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	LMH.	**	**	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	LML.	**	**	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	LSH.	**	**	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	LSL.	**	**	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		Direct call number	Operability	Factory setting / GMFY	Unit	Setting range	Function name (Digital display)	Setting (Digital display)	Setting	Specification
I mode ↓ + ↑ + B + C	Save function 1 of the setting data	**SAVE1.**	-	X	-	-	-	SAvE 1.	-	-	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.**	-	X	-	-	-	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	-	-	CCr.	on oF	ON OF	[ON]：All data but user 1 and 2 are copied.
	User 1 data is copied	**CU1.**	-	O	ON	-	-	CU 1.	on oF	ON OF	[ON]：User 1 data is copied.
	User 2 data is copied	**CU2.**	-	O	ON	-	-	CU2.	on oF	ON OF	[ON]：User 2 data is copied.

The explanation of [CCR], [CU1], and [CU2].

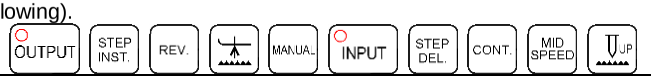


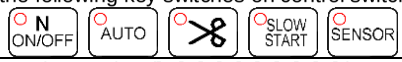
LED corresponding to the setting lights while displaying the value in the control box.

[CCR]=ON 

[CU1]=ON 

[CU2]=ON 

Mode name	Function name		Direct call number	Operability	Factory setting GMFY	Unit	Setting range	Function name (Digital display)	Setting	Specification
J mode ↓ + ↑ + A + B	Simple setting mode for [1],[2],[3] prohibit	**MAC.**	1100	O	OF	-	-	nAC.	on / oF ON OF	The simple setting mode (program mode [1]) cannot be entered.
	[P],[G] mode thread trimmer mode TR prohibit	**TRC.**	1101	O	OF	-	-	trC.	on / oF ON OF	The [P] mode thread trimmer mode, TR cannot be entered program mode P will be possible.) The thread trimmer mode [G] cannot be entered.
	Rotation direction changeover prohibit	**CWC.**	1102	O	OF	-	-	CWC.	on / oF ON OF	Rotation direction changeover during the normal mode will not be possible.
	1-2 position changeover prohibit	**12C.**	1103	O	OF	-	-	12C.	on / oF ON OF	1-2 position changeover ([A] key operation) during the normal mode will not be possible.
	Slow start changeover prohibit	**SLC.**	1104	O	OF	-	-	SLC.	on / oF ON OF	Slow start validity changeover ([B] key operation) during the normal mode will not be possible.
	Speed setting key changeover prohibit	**SPC.**	1105	O	OF	-	-	SPC.	on / oF ON OF	Speed setting operation of normal mode ([C] key and [D] key operation) will not be possible.
	Not used	**JKC.**	1106	O	OF	-	-	JtC.	on / oF ON OF	Not used.
	Start tacking validity changeover prohibit	**SBC.**	1107	O	OF	-	-	SbC.	on / oF ON OF	Start tacking validity changeover ([A] key operation) during the tacking mode will not be possible.
	No. of start tacking stitches changeover prohibit	**SNC.**	1108	O	OF	-	-	SnC.	on / oF ON OF	The No. of start tacking stitches setting ([A], [B] key operations) during the tacking mode will not be possible.
	End tacking validity changeover prohibit	**EBC.**	1109	O	OF	-	-	EbC.	on / oF ON OF	End tacking validity changeover ([C] key operation) during the tacking mode will not be possible.
	No. of end tacking stitches changeover prohibit	**ENC.**	1110	O	OF	-	-	EnC.	on / oF ON OF	The No. of end tacking stitches setting ([C], [D] key operations) during the tacking mode will not be possible.
	Start tacking type changeover prohibit	**SKC.**	1111	O	OF	-	-	StC.	on / oF ON OF	Start tacking type setting ([B] key operation) during the tacking mode will not be possible.
	End tacking type changeover prohibit	**EKC.**	1112	O	OF	-	-	EtC.	on / oF ON OF	End tacking type setting ([D] key operation) during the tacking mode will not be possible.
	Pattern stitching validity changeover prohibit	**TSC.**	1113	O	OF	-	-	rSC.	on / oF ON OF	Preset stitching validity and back tacking validity changeover operation ([M] key operation) in the pattern mode will not be possible.
	Pattern stitching No. of stitches and times changeover prohibit	**TNC.**	1114	O	OF	-	-	rnC.	on / oF ON OF	No. of preset stitching stitches and No. of back tacking times setting operation ([C], [D] key operations) in the pattern mode will not be possible.
	Pattern mode pattern changeover prohibit	**MDC.**	1115	O	OF	-	-	ndC.	on / oF ON OF	Preset stitching, back tacking and control switch panel data play mode changeover ([D] key operation) in the pattern mode will not be possible.
	Prohibit the all of key switches on control switch panel	**BAC.**	1116	O	OF	-	-	bAC.	on / oF ON OF	Prohibit the [Stop needlework, Learning input relation] key switches on control switch panel.
	Prohibit the teaching mode key switches on control switch panel	**BPC.**	1117	O	OF	-	-	bPC.	on / oF ON OF	Prohibit the teaching mode key switches on control switch panel (refer to following). 

Mode name	Function name		Direct call number	Operability	Factory setting GMFY	Unit	Setting range	Function name Digital display	Setting		Specification
J mode ↓ + ↑ + A + B	Prohibit the following key switches on control switch panel	**BSC.**	1118	O	OF	-	-	bSC.	on oF	ON OF	Prohibit the following key switches on control switch panel. 
	Operation prohibition of set value change key	**PSW.**	1119	O	OF	-	-	PSW.	on oF	ON OF	Control panel operation ([M], [A], [B], [C], [D] key operations) during the normal mode, tacking mode and pattern mode will not be possible. However, changeover into each mode will be possible.
	Prohibit the key switches on the control switch panel before thread trimming	**BKC.**	1120	O	OF	-	-	btC.	on oF	ON OF	The key switch operation on the control switch panel will be possible before thread trimming.
	Prohibit the key switches on the control switch panel before thread trimming	**NSV.**	1121	O	OF	-	-	nSu.	on oF	ON OF	The display when the parameter setting key is pushed can be selected. [ON]:The number set last time is displayed. [OF]:The 0th is displayed.
	It blinks compared with a set value.	**CMP.**	1122	O	ON	-	-	CMP.	on oF	ON OF	[ON]:The dot is blinked when differing than the data set with CMS.
	At the comparison when it compares and it blinks destination.	**CMS.**	1123	O	BK	-	-	CMS.			It compares it with the shipment setting value.
									bt	BK	It compares it with the BACKUP setting value.
									S1	S1	It compares it with the SAVE1 setting value.
									S2	S2	It compares it with the SAVE2 setting value.
	Prohibit "parameter setup (ABCD) key" during the normal mode	**PKC.**	1124	O	OF	-	-	PtC.	on oF	ON OF	The parameter setup (ABCD) key is invalidated during the normal mode.
	Not used	**NTM.**	1125	O	OF			nrn.	on oF	ON OF	Not used
	Not used	**UDC.**	1126	O	OF			UdC.	on oF	ON OF	Not used

Mode name	Function name	Direct call number	Operability	Factory setting GMFY	Unit	Setting range	Function name (Digital display)	Setting (Digital display)	Setting	Specification
K mode ↓ + ↑ + A + C	Operation during 2 - 1 position changeover **P21.**	1200	O	OF	-	-	P21.	on oF	ON OF	When changeover from the 2 position to the 1 position with the [A] key during the normal mode, the needle will rise to the UP position when not in the UP position, when turned ON.
	Sewing machine speed during solenoid input signal [IO1] setting **IO1.**	1201	X	NO	-	-	io1.			The speed for when the signal IO1 output to the virtual output 1 can be selected.
								no	NO	The speed designation when the IO1 signal is input is invalidated.
								0	0	The speed will be approximately proportional to the variable speed command VC or VC2 voltage of the lever connector.
								L	L	The speed will be at the speed set in low speed [L].
								u	V	The speed will be at the speed set in condensed stitching speed [V].
								n	M	The speed will be at the speed set in medium speed [M].
								H	H	The speed will be at the speed set in high speed [H].
								r0	R0	The sewing machine will run at the variable speed command VC or VC2 command of the lever connector. The sewing machine will stop when the IO1 signal turns OFF.
								rL	RL	The sewing machine will run at the speed set in low speed [L]. The sewing machine will stop when the IO1 signal turns OFF.
								ru	RV	The sewing machine will run at the speed set in condensed stitching speed [V]. The sewing machine will stop when the IO1 signal turns OFF.
								rn	RM	The sewing machine will run at the speed set in medium speed [M]. The sewing machine will stop when the IO1 signal turns OFF.
								rH	RH	The sewing machine will run at the speed set in high speed [H]. The sewing machine will stop when the IO1 signal turns OFF.
	Speed specification when COR input is ON **COR.**	1202	O	L	-	-	Cor.			The sewing machine speed for when the correction stitching signal COR is ON.
								0	0	The speed will be approximately proportional to the variable speed command VC or VC2 voltage of the lever connector.
								L	L	The speed will be at the speed set in low speed [L].
								u	V	The speed will be at the speed set in condensed stitching speed [V].
								n	M	The speed will be at the speed set in medium speed [M].
								H	H	The speed will be at the speed set in high speed [H].

Mode name	Function name		Direct call number	Operability	Factory setting GMFY	Unit	Setting range	Function name / Digital display	Setting		Specification
K mode ↓ + ↑ + A + C	Speed specification when RND input is ON	**RND.**	1203	O	L	-	-	rnd.			The sewing machine speed for when the input signal RND is ON.
									0	0	The speed will be approximately proportional to the variable speed command VC or VC2 voltage of the lever connector.
									L	L	The speed will be at the speed set in low speed [L].
									V	V	The speed will be at the speed set in condensed stitching speed [V].
									M	M	The speed will be at the speed set in medium speed [M].
									H	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.**	1204	O	OF	-	-	nrL.	on oF	ON 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.**	1205	O	OF	-	-	CnM.	on oF	ON OF	The speed will decelerate at each step when Continuous is set with the control panel XC-G500-Y.
	DN signal is valid during the virtual DOWN control	**KD2.**	1206	O	OF	-	-	Kd2.	on oF	ON 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.
	Validity of operation delay when IO1 signal is input	**IOD.**	1207	O	OF	-	-	iod.	on oF	ON 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 [R0], [RL], [RV], [RM], [RH].
	Delay to motor drive after B output ON	**S7B.**	1208	O	5	X10 msec	1 ～ 99	S7b.	**	**	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.
	Delay when S2 signal is U or UF	**UFD.**	1209	O	OF	-	-	UFd.	on oF	ON 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	**E8R.**	1210	O	OF	-	-	E8r.	on oF	ON OF	Not used.
	Not used	**MRA.**	1211	O	OF	-	-	MrA.	on oF	ON OF	Not used.
	UP position needle lifting at the power is turned ON	**PAP.**	1212	O	OF	-	-	PAP.	on oF	ON 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		Direct call number	Operability	Factory setting	Unit	Setting range	Function name	Setting		Specification
					GMFY			Digital display			
K mode ↓ + ↑ + A + C	One stitch operation mode during UCR setting	**ST1.**	1213	O	OF	-	-	SF 1.			One stitch operation starts from the needle position when the input signal UCR is input during the sewing machine stopped.
									on	ON	Regardless of the position switch (1-2), one stitch operation starts to the next UP position when stopped at the needle UP position, or to the next DOWN position when stopped at the needle DOWN position.
									oF	OF	The sewing machine will rotate to the next position designated with the position switch (1-2).
	Setting one stitch operation, when "S01" signal is set	**IT1.**	1214	O	OF	-	-	iF 1.	on oF	ON OF	The "I1"signal ON becomes one stitch operation from that position, when No. 6 pin of the option connector "B" (I1 input signal) is set to "S01 " function.
	Operation mode during thread trimming protection signal (S6) input/release	**S6M.**	1215	O	PO	-	-	S6M.			The sewing machine stopping state when the thread trimming protection signal (S6) is input during sewing machine operation, and restarting methods after turning (S6) OFF are selected.
									Po	PO	The sewing machine stopping state will follow the settings of the [A] key in the normal mode, and will stop at the UP or DOWN position. If the thread trimming protection signal (S6) is released when the external operation signal (S0, S1, SH) is ON, operation can be resumed when released.
									ES	ES	The sewing machine stopping state will be random. When the thread trimming protection signal (S6) is released, operation will not be possible if the external operation signal (S0, S1, SH) is ON. Turn the operation signal (S0, S1, SH) OFF, and then turn the operation signal (S0, S1, SH) ON to resume operation.
	Thread trimming protection signal (S6) operation mode	**S6A.**	1216	O	OF	-	-	S6A.			If input S6 turns ON during sewing machine operation, all operation states will be canceled, including thread trimming operation, and the sewing machine will stop.
									on	ON	If signal S6 turns ON in all cases, including thread trimming, all operations will be canceled and the sewing machine will stop.
									oF	OF	If signal S6 turns ON during thread trimming, the thread trimming will be continued and the sewing machine will stop when completed.
	End tacking mode when TR function is set to chain stitch	**KTM.**	1217	O	OF	-	-	tTM.			End tacking operation when thread trimming mode TR in the mode [P] or the thread trimming mode TR in the mode [G] is set to chain stitch.
									on	ON	The end tacking operation for the lock stitch system will be applied.
									oF	OF	The end tacking operation for the chain stitch system will be applied.
	Lock stitch tacking menu display	**KDM.**	1218	O	OF	-	-	tdM.	on oF	ON OF	The lock stitch tacking menu is displayed if the end tacking mode KTM is ON when the thread trimming mode TR is set to chain stitch, and the TR function is set to chain stitch.
	U, UF signal needle lift prohibit at position other than set position	**UFP.**	1219	O	OF	-	-	UFP.	on oF	ON OF	The needle lifting operation is prohibited when the set position is deviated from and the needle lift signal U, needle lift and presser foot lift signal UF are ON.
	Weak brake validity when UP signal is ON	**UPB.**	1220	O	OF	-	-	UPb.	on oF	ON OF	The weak brakes are validated when the needle UP position signal UP is ON. This is valid when the function BK in A mode is [ON].
	Weak brake forced OFF when stopped with ES signal	**ESB.**	1221	O	OF	-	-	ESb.	on oF	ON OF	The weak brakes are forcibly turned OFF when stopped with the emergency stop signal ES.

Mode name	Function name		Direct call number	Operability	Factory setting GMFY	Unit	Setting range	Function name Digital display	Setting		Specification
K mode ↓ + ↑ + A + C	UP position detection stop	**UPS.**	1222	O	OF	-	-	UPS.			Stop control when needle UP position is detected.
									on	ON	The stop control of low speed detection control is applied. This is valid when the function NAN in K mode is [ON].
									oF	OF	The stop control of high speed positioning is applied.
	Stop status after low speed detection	**UP2.**	1223	O	OF	-	-	UP2.	on oF	ON OF	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].
	Low speed detection speed	**K.**	1224	X	280	rpm	0 ～ 2999	K.	*****	*****	The low speed detection speed can be set.
	Deceleration mode	**NAN.**	1225	O	OF	-	-	nAn.	on oF	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.
	Presser foot lifter operation during emergency stop	**ESF.**	1226	O	OF	-	-	ESF.	on oF	ON OF	The presser foot lifter can be operated during emergency stop by the emergency stop signal (ES) is turned ON.
	OP output and OP1 output prohibit at restart	**PRC.**	1227	O	OF	-	-	PrC.	on oF	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].
	S2 signal validity when S6 signal is ON.	**TS6.**	1228	O	OF	-	-	rS6.	on oF	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.
	Speed loop stopping control when the machine is overrun with the preset stitching	**PNC.**	1229	O	OF	-	-	PnC.	on oF	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.) When this function setting is [OF], it will be the needle position priority stop. (It may be one rotation.)
	Input port IL, I1 and I2 software noise filter validity	**MFN.**	1230	O	OF	-	-	MFn.	on oF	ON OF	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.
	All input port software noise filter validity	**PFN.**	1231	O	OF	-	-	PFn.	on oF	ON OF	The software noise filters for all input ports are invalidated.
	No. of stitches for noise removal during sensor input setting	**SEF.**	1232	O	0	stitches	0 ～ 99	SEF.	**	**	The No. of stitches for removing the noise during sensor input can be set.
	Deceleration state during PSU, PSD signal ON	**PSM.**	1233	O	OF	-	-	PSn.	on oF	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.
	Low stitching speed validity when the preset stitching is two stitches	**2ST.**	1234	O	OF	-	-	2SF.	on oF	ON OF	The stitching speed must not be set to the low speed L when tacking or preset stitching is two stitches or less.
	No. of set stitch stitching speed when PSU, PSD, SEN signal is ON	**PSS.**	1235	O	OF	-	-	PSS.			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.
									on	ON	The stitching speed of the setting No. of stitches is set to the middle speed M.
									oF	OF	The speed when PSU, PSD, SEN signal turn ON is continued.

Mode name	Function name		Direct call number	Operability	Factory setting	Unit	Setting range	Function name	Setting		Specification
					GMFY			Digital display			
K mode ↓ + ↑ + A + C	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.
									on	ON	The speed before the PSU, PSD, SEN signal was turned ON is maintained.
									oF	OF	The speed is set to the variable speed.
	No. of stitches for removing noise when PSU signal is ON	**PUF.**	1237	O	0	stitches	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	stitches	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	-	-	Cdr.	on oF	ON OF	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	stitches	0 ～ F	ZnC.	*	*	The No. of stitches of zigzag stitching (sway width) can be set. (No. of stitches of thinning)
	BCR operation after thread trimming	**BRC.**	1241	O	OF	-	-	brC.	on oF	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 USR up to the set angle.
									on	ON	Can be executed any number of times.
									oF	OF	Can be executed only once.
	W output mode during S2R=OFF setting	**2RW.**	1243	O	ON	-	-	2rW.	on oF	ON OF	If the P mode S2 signal operation mode S2R is set to OF, the wiper output (W) will be output even if the motor is not revolving with full heeling at the needle UP position stop.
	O1 output prohibit during tacking and thread trimming	**BTC.**	1244	O	OF	-	-	brC.	on oF	ON OF	O1 output is prohibited during tacking and thread trimming.
	OP output prohibit/permit changeover with input I1 during operation	**PR.**	1245	O	OF	-	-	Pr.			The operation output OP prohibit/permit changeover is executed when input I1 turns ON during sewing machine operation.
									on	ON	OP output is prohibited during sewing machine operation.
									oF	OF	OP output is permitted during sewing machine operation.
	OP1 output prohibit/permit changeover with input I1 during operation	**P1R.**	1246	O	OF	-	-	P1r.			The operation output OP1 prohibit/permit changeover is executed when input I1 turns ON during sewing machine operation.
									on	ON	OP1 output is prohibited during sewing machine operation.
									oF	OF	OP1 output is permitted during sewing machine operation.
	B output OFF prohibit mode during thread trimming	**TBC.**	1247	O	OF	-	-	rbC.	on oF	ON OF	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.	on oF	ON OF	The KS3 output and TF output are invalidated when thread trimming cancel signal TL is ON.

Mode name	Function name		Direct call number	Operability	Factory setting	Unit	Setting range	Function name	Setting		Specification
					GMFY			Digital display			
K mode (↓ + ↑ + A + C)	Presser foot operation of F, S2, S3 signal is OFF when FUM function is ON, FU function is M or C.	**FLC.**	1249	O	OF	-	-	FLC.			The presser foot operation mode when the presser foot output FU stays ON and the full heeling (presser foot lift signal F, thread trimming signal S2, presser foot lift signal S3) is OFF.
									on	ON	The FU output turns OFF (lowers) when the full heeling (F, S2, S3 signals) is OFF.
									oF	OF	The FU output does not turn OFF when the full heeling (F, S2, S3 signals) is OFF.
	T output, L output protection function	**SPT.**	1250	O	ON	-	-	SPT.	on oF	ON OF	The thread trimming solenoid T and thread release solenoid L are protected. (Solenoid damage prevention)
	Wiper output W ON simultaneously with presser foot lifting output FU	**FW.**	1251	O	OF	-	-	FW.	on oF	ON OF	The wiper output W will turn ON when the presser foot lifting output FU turns ON.
	Input signal check function when power is turned on	**PS1.**	1252	O	OF	-	-	PS1.			If the input signal is 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.
									on	ON	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.
									oF	OF	It is not confirmed about the "S01", "BC", "BCR" and "USR", when main power switch is turned ON.
	Setting program stitch of the control switch panel	**B2O.**	1253	X	OF	-	-	b2o.			Setting the backstitch (reverse feed) output of control switch panel in each step of program stitching.
									on	ON	Backstitch (reverse feed) output of step set to virtual output "OT1" in program stitching.
									oF	OF	Backstitch (reverse feed) output of step set to output. "B" in program stitching.
	Setting "OT1" output while "B" output is ON	**TOB.**	1254	O	OF	-	-	Tob.			Setting virtual output "OT1" when the backstitch (reverse feed) output "B" is turned ON.
									on	ON	"OT1" output is turned ON when "B" output is turned ON.
									oF	OF	"OT1" output is not turned ON even if "B" output is turned ON.
	Special specification setting of limit control.	**2SL.**	1255	O	OF	-	-	2SL.	on oF	ON OF	The speed limit which uses special specification of input signal "SPB" and "SPM". [ON]:The speed limit function by an external input signal is valid. [OF]:The speed limit function by an external input signal is invalidated.
	Setting output at FWD input ON	**NCK.**	1256	O	ON	-	-	nCt.			Setting output action when non-stitch feed input "FWD" is turned ON. (Union Special correspondence specification)
									on	ON	Output "OT3" and "FU" are ON while "FWD" input is ON.
									oF	OF	Output "OT3", "FU" and "NCL" are ON while "FWD" input is ON.
	Needle lift function is invalidated, excluding the needle down position.	**UDN.**	1257	O	OF	-	-	Udn.	on oF	ON OF	Needle lift function is prohibited, excluding the needle down position.
	The set value of full speed	**FSL.**	1258	O	90	%	1 ～ 98	FSL.	**	**	The value of full speed (standard value) can be set by percentage.

Mode name	Function name		Direct call number	Operability	Factory setting	Unit	Setting range	Function name	Setting		Specification
					GMFY			Digital display			
K mode ↓ + ↑ + A + C	Not used	**UPR.**	1259	O	OF	-	-	UPr.	oF	ON OF	Not used.
	Operation gain for the big inertia sewing machine	**HWG.**	1260	O	OF	-	-	HWG.	oF	ON 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	ON 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 heeling 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.
	Not used	**TQT.**	1263	O	0	%	0 ～ 99	rqr.	**	**	Not used.
	Not used	**E8T.**	1264	O	0	X100 msec	0 ～ 99	E8r.	**	**	Not used.
	Not used	**WBO.**	1265	X	OF	-	-	Wbo.	oF	ON OF	Not used.
	Not used	**R3D.**	1266	O	OF	-	-	r3d.	oF	ON OF	Not used.
	Not used	**MEA.**	1267	O	OF	-	-	MEA.	oF	ON OF	Not used.
	Not used	**OCS.**	1268	O	OF	-	-	oCS.	oF	ON OF	Not used.
	Step ON/OFF	**STP.**	1269	O	OF	-	-	StP.	oF	ON OF	The step sequence is started.
	Number of step execution lines.	**STS.**	1270	O	1	-	1 ～ 4	StS.	*	*	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.
	Not used	**1ST.**	1272	O	OF	-	-	1St.	oF	ON OF	Not used.
	The unit of the display time is selected.	**TMI.**	1273	O	OF	-	-	tM.	oF	ON 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		Direct call number	Operability	Factory setting GMFY	Unit	Setting range	Function name Digital display	Setting		Specification
Q mode ↓ + A + C	Virtual S1 operation with VC levels	**VCS.**	1400	X	OF	-	-	uCS.	on oF	ON OF	The virtual operation signal S1 is turned ON when the variable speed voltage VC1 and VC2 exceeded the set voltage level.
	Setting of VC1 and VC2 where virtual S1 turns ON	**VCL.**	1401	X	24	-	1 ～ 99	uCL.	**	**	The voltage level of the variable speed voltage VC1 and VC2 where virtual run signal S1 turns ON.
	Input voltage hysteresis during virtual S1 signal ON/OFF by VC and VC2 level	**VCD.**	1402	X	4	-	0 ～ 99	uCd.	**	**	The voltage level hysteresis width for judging the ON/OFF of the virtual S1 signal when VCS turns ON can be set.
	VC curve reversal mode	**V1R.**	1403	X	OF	-	-	u 1r.	on oF	ON OF	The voltage curve of the variable speed voltage VC1 is reversed.
	VC input 5V/12V changeover mode	**V15.**	1404	X	OF	-	-	u 15.			The VC1 input range is set to 0~5V.
									on	ON	VC1 maximum input voltage is set to 5V
									oF	OF	VC1 maximum input voltage is set to 12V
	VC2 operation mode	**VC2.**	1405	X	VC	-	-	uC2.			The external analog input VC2 function is set.
									uC	VC	Speed command input
									uS	VS	The virtual S1 signal turns on with the input voltage, and the sewing machine runs. This also acts as the speed command input.
									ur	VR	The VC2 input acts as the variable resistor on the control box panel, and the variable resistor is invalidated.
									bC	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.
									LM	LM	The speed control input for reciprocal stroke change.
									Md	MD	The value set in the program P mode M is invalidated, and the middle speed is controlled with the VC2 input voltage.
									1	1	Virtual input IO1 is selected
	VC2 curve reversal mode	**V2R.**	1406	X	OF	-	-	u2r.	on oF	ON OF	The external analog input VC2 curve is reversed.
	VC2 input 5V/12V changeover mode	**V25.**	1407	X	ON	-	-	u25.	on oF	ON OF	The VC2 input range is set to 0~5V. [ON]VC2 maximum input voltage is set to 5V [OF]VC2 maximum input voltage is set to 12V
	Speed limiter curve inflection point 1 percentage	**VL1.**	1408	O	67	-	1 ～ 99	uL 1.	**	**	The inflection point is set when using the reciprocal stroke change specification speed limiter process (VC2 = LM).
	Speed limiter curve inflection point 1 point	**VP1.**	1409	O	40	-	1 ～ 99	uP 1.	**	**	Setting inflection point 1
	Speed limiter curve inflection point 2 point	**VP2.**	1410	O	70	-	1 ～ 99	uP2.	**	**	Setting inflection point 2

Mode name	Function name		Direct call number	Operability	Factory setting	Unit	Setting range	Function name	Setting		Specification
					GMFY			Digital display			
Q mode ↓ + ↑ + A + C	Operation speed limit specification mode 1	**FLM.**	1411	O	OF	-	-	FLn.	on oF	ON OF	Operation speed limit is valid when all the below condition are met. 1. "VC2" operation mode" is set to "LM or LIM, 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.**	1412	O	OF	-	-	2Ln.	on oF	ON OF	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.**	1413	O	OF	-	-	Lnd.	on oF	ON OF	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.**	1414	O	OF	-	-	Hnd.	on oF	ON OF	The speed during stitching other than tacking is limited by the digital speed setting (LED.C and D) on operation panel.
	Ignore detector error	**E8C.**	1415	O	OF	-	-	E8C.			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.
									on	ON	
									oF	OF	
	Thread break sensor valid	**TH.**	1416	O	OF	-	-	rH.	on oF	ON OF	The thread break detector is validated.
	Operation after thread break sensor detection	**TST.**	1417	O	TR	-	-	rSr.			The operation after the thread break is detected (thread break sensor detection) is set.
									no	NO	The operation continues, and the thread break sensor output THO turns ON.
									rr	TR	The sewing machine stops after the thread trimming, and then the thread break sensor output THO turns ON.
									Sr	ST	The sewing machine stops normally, and then the thread break sensor output THO turns ON.
	Speed to ignore thread break sensor	**B.**	1418	O	600	rpm	0 ～ 8999	b.	****	****	The speed to ignore the thread break sensor can be set.
	No. of stitches to ignore thread break sensor after starting stitching	**THS.**	1419	O	7	stitches	0 ～ F	rHS.	*	*	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.**	1420	O	0	stitches	0 ～ F	rHF.	*	*	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.**	1421	O	OF	-	-	rFU.	on oF	ON OF	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 S3 is invalid during sewing machine operation.

Mode name	Function name		Direct call number	Operability	Factory setting	Unit	Setting range	Function name	Setting		Specification
					GMFY			Digital display			
Q mode ↓ + ↑ + A + C	Output of back tacking output (B) during OT1 output ON inhibited	**S7C.**	1422	O	OF	-	-	S7C.	on oF	ON OF	The output of the backstitching output (B) with input S7 is inhibited while the virtual output (OT1) is ON.
	Medium speed (M) limit mode during OT1 output ON	**LIM.**	1423	O	OF	-	-	LIM.	on oF	ON OF	The speed will be limited to that set in medium speed M while virtual output (OT1) is ON.
	Simultaneously ON of OP1 output during OT1 output ON	**O1P.**	1424	O	OF	-	-	o1P.	on oF	ON OF	OP1 output will turn ON simultaneously when virtual output (OT1) is ON.
	Disregard of S3 signal of Lever Unit	**LVB.**	1425	O	ON	-	-	Lvb.	on oF	ON OF	When the lever unit run signal S1 is ON, the presser foot lift signal S3 will be ignored even when received.
	1 step heeling setting for the internal lever unit	**PD1.**	1426	O	OF	-	-	Pd1.	on oF	ON OF	The heeling operation of the pedal will be 1 step heeling operation.
	Adjustment mode for the internal lever unit	**VCSET.**	1427	X	-	-	-	vCSEt.			The neutral of the internal lever unit, toe down, and the heeling position can be adjusted.
	Not used.	**MTJ.**	1428	O	OF	-	-	nrJ.	on oF	ON OF	Not used.
	Not used.	**MOA.**	1429	O	7	stitches	0 ～ 99	noA.	**	**	Not used.
	Not used.	**MOB.**	1430	O	7	stitches	0 ～ 99	nob.	**	**	Not used.
	Not used.	**MOC.**	1431	O	7	stitches	0 ～ 99	noC.	**	**	Not used.
	VC assistance ON/OFF	**VCA.**	1432	O	OF	-	-	vCA.	on oF	ON OF	The speed curve to the amount of depressing changes depending on the pedal stepping speed.
	Strength of VC assistance	**VCP.**	1433	O	50	-	0 ～ 99	vCP.	**	**	The amount of the changes by the depressing speed can be set.

Mode name	Function name	Direct call number	Operability	Factory setting GMFY	Unit	Setting range	Function name (Digital display)	Setting		Specification
R mode + B + C	RESET **RESET.**	-	X	-	-	-	rESEt.	-	-	The EEPROM data is returned to the EEPROM back up state. This is used return the function setting to the factory settings.

Mode name	Function name		Direct call number	Operability	Factory setting GMFY	Unit	Setting range	Function name Digital display	Setting		Specification
S mode ↓ + B SL + D	KS1, KS2 output run mode	KSM.	1500	O	OF	-	-	tSM.			This is the virtual output KS1 and KS2 run mode.
									on	ON	The KS1 and KS2 output swill turn ON only during normal operation.
									oF	OF	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	-	-	SQS.			The simple sequence start conditions are set.
									no	NO	The simple sequence will not start.
									in	IN	When the virtual input IO4 is ON.
									T	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.)
									Tr	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.
	Simple sequence forced end conditions	SQE.	1502	O	NO	-	-	SQE.			The simple sequence forced end conditions are set.
									no	NO	The simple sequence will not forced end.
									Lv	LV	When the virtual input IO5 is ON level.
									in	IN	When the virtual input IO5 is ON.
									T	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.)
									Tr	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	-	-	nS1.			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	OF	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	-	-	nE1.			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	OF	Time is counted till OFF (10 mill-second per each)

Mode name	Function name		Direct call number	Operability	Factory setting GMFY	Unit	Setting range	Function name Digital display	Setting		Specification
	Output beginning standard of simple sequence output KS1	S1S.	1505	O	KS	-	-	S 1S.			The simple sequence output starting point setting [S1S] can be set.
									tS	KS	Linked output. (ON edge of the front output)
									in	IN	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.)
									rr	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].)
	Output end standard of simple sequence output KS1	S1E.	1506	O	KS	-	-	S 1E.			The simple sequence output end point setting [S1E] can be set.
									tS	KS	Linked output. (Each output starting point)
									oF	OF	Virtual input OFF point. (KS1:IO6, KS2:IO7, KS3:IO8, KS4:IO9)
									in	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.)
									rr	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 KS2 output beginning is time or the number of stitch is selected	NS2.	1507	O	OF	-	-	nS2.			Selection stitch amount and time till ON for simple sequence output "KS2". (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 KS2 output is time or the number of stitch is selected	NE2.	1508	O	OF	-	-	nE2.			Selection stitch amount and time till OFF for simple sequence output "KS2". (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		Direct call number	Operability	Factory setting GMFY	Unit	Setting range	Function name Digital display	Setting		Specification
S mode ↓ + B + D	Output beginning standard of simple sequence output KS2	S2S.	1509	O	KS	-	-	S2S.			The simple sequence output starting point setting [S2S] can be set.
									tS	KS	Linked output. (ON edge of the front output)
									in	IN	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.)
									rr	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].)
	Output end standard of simple sequence output KS2	S2E.	1510	O	KS	-	-	S2E.			The simple sequence output end point setting [S2E] can be set.
									tS	KS	Linked output. (Each output starting point)
									oF	OF	Virtual input OFF point. (KS1:IO6, KS2:IO7, KS3:IO8, KS4:IO9)
									in	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.)
									rr	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 KS3 output beginning is time or the number of stitch is selected	NS3.	1511	O	OF	-	-	nS3.			Selection stitch amount and time till ON for simple sequence output "KS3". (Amount have to be set at "K31")
									on	ON	Stitch amount is counted till ON
									oF	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")
									on	ON	Stitch amount is counted till OFF
									oF	OF	Time is counted till OFF (10 mill-second per each)

Mode name	Function name		Direct call number	Operability	Factory setting GMFY	Unit	Setting range	Function name Digital display	Setting		Specification
S mode (↓ + B SL + D)	Output beginning standard of simple sequence output KS3	S3S.	1513	O	KS	-	-	S3S.			The simple sequence output starting point setting [S3S] can be set.
									tS	KS	Linked output. (ON edge of the front output)
									in	IN	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.)
									rr	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].)
	Output end standard of simple sequence output KS3	S3E.	1514	O	KS	-	-	S3E.			The simple sequence output end point setting [S3E] can be set.
									tS	KS	Linked output. (Each output starting point)
									oF	OF	Virtual input OFF point. (KS1:IO6, KS2:IO7, KS3:IO8, KS4:IO9)
									in	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.)
									rr	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 KS4 output beginning is time or the number of stitch is selected	NS4.	1515	O	OF	-	-	nS4.			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		Direct call number	Operability	Factory setting GMFY	Unit	Setting range	Function name / Digital display	Setting		Specification
S mode ↓ + B + D	Output beginning standard of simple sequence output KS4	S4S.	1517	O	KS	-	-	S4S.			The simple sequence output starting point setting [S4S] can be set.
									tS	KS	Linked output. (ON edge of the front output)
									in	IN	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.)
									rr	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].)
	Output end standard of simple sequence output KS4	S4E.	1518	O	KS	-	-	S4E.			The simple sequence output end point setting [S4E] can be set.
									tS	KS	Linked output. (Each output starting point)
									oF	OF	Virtual input OFF point. (KS1:IO6, KS2:IO7, KS3:IO8, KS4:IO9)
									in	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.)
									rr	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].)
	KS1 output start [Time]/[No. of Stitches] setting	K11.	1519	O	7	X10 msec stitches	0 ～ 99	t11.	**	**	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) x 10 = 70 msec. When using No. of stitches, the setting value will be (7) x 1 = 7 stitches.
	KS1 output [Time]/[No. of Stitches] setting	K12.	1520	O	7	X10 msec stitches	0 ～ 99	t12.	**	**	The output time/output start No. of stitches for the simple sequence output KS1 can be set. When using time, the setting value will be (7) x 10 = 70 msec. When using No. of stitches, the setting value will be (7) x 1 = 7 stitches.
	KS2 output start [Time]/[No. of Stitches] setting	K21.	1521	O	7	X10 msec stitches	0 ～ 99	t21.	**	**	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) x 10 = 70 msec. When using No. of stitches, the setting value will be (7) x 1 = 7 stitches.
	KS2 output [Time]/[No. of Stitches] setting	K22.	1522	O	7	X10 msec stitches	0 ～ 99	t22.	**	**	The output time/output start No. of stitches for the simple sequence output KS2 can be set. When using time, the setting value will be (7) x 10 = 70 msec. When using No. of stitches, the setting value will be (7) x 1 = 7 stitches.
	KS3 output start [Time]/[No. of Stitches] setting	K31.	1523	O	7	X10 msec stitches	0 ～ 99	t31.	**	**	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) x 10 = 70 msec. When using No. of stitches, the setting value will be (7) x 1 = 7 stitches.

Mode name	Function name		Direct call number	Operability	Factory setting	Unit	Setting range	Function name	Setting		Specification
					GMFY			Digital display			
S mode ↓ + B SL + D	KS3 output [Time]/[No. of Stitches] setting	K32.	1524	O	7	X10 msec stitches	0 ～ 99	t32.	**	**	The output time/output start No. of stitches for the simple sequence output KS3 can be set. When using time, the setting value will be (7) x 10 = 70 msec. When using No. of stitches, the setting value will be (7) x 1 = 7 stitches.
	KS4 output start [Time]/[No. of Stitches] setting	K41.	1525	O	7	X10 msec stitches	0 ～ 99	t41.	**	**	The output start time/output start No. of stitches for the simple sequence output KS4 can be set. When using time, the setting value will be (7) x 10 = 70 msec. When using No. of stitches, the setting value will be (7) x 1 = 7 stitches.
	KS4 output [Time]/[No. of Stitches] setting	K42.	1526	O	7	X10 msec stitches	0 ～ 99	t42.	**	**	The output time/output start No. of stitches for the simple sequence output KS4 can be set. When using time, the setting value will be (7) x 10 = 70 msec. When using No. of stitches, the setting value will be (7) x 1 = 7 stitches.
	KS1 output run mode	K1M.	1527	X	ON	-	-	t1M.			This is the output KS1 run mode for when the simple sequence start conditions [SQS] are set to NO.
									on	ON	The KS1 output is output each time the start conditions are established.
									oF	OF	The KS1 output is output only when the start conditions are established after thread trimming.
	Run prohibit during KS1 output ON	K1D.	1528	O	OF	-	-	t1d.	on oF	ON OF	Running is prohibited while the output KS1 is ON. (This is valid only when the simple sequence start conditions [SQS] are set to NO.)
	K11, K12 time clear during KS1 output ON	K1C.	1529	O	OF	-	-	t1C.	on oF	ON OF	The K11 and K12 timers will be cleared and the KS1 output will be turned OFF when the sewing machine stops (motor turns OFF) even when the output KS1 timer is continuing. (This is valid only when the simple sequence start conditions [SQS] are set to NO.)
	K21, K22 time clear during KS2 output ON	K2C.	1530	O	OF	-	-	t2C.	on oF	ON OF	The K21 and K22 timers will be cleared and the KS2 output will be turned OFF when the sewing machine stops (motor turns OFF) even when the output KS2 timer is continuing. (This is valid only when the simple sequence start conditions [SQS] are set to NO.)
	K31, K32 time clear during KS3 output ON	K3C.	1531	O	OF	-	-	t3C.	on oF	ON OF	The K31 and K32 timers will be cleared and the KS3 output will be turned OFF when the sewing machine stops (motor turns OFF) even when the output KS3 timer is continuing. (This is valid only when the simple sequence start conditions [SQS] are set to NO.)
	Increase the number of K11 through K42 by ten	KSL.	1532	O	OF	-	-	tSL.	on oF	ON OF	Increase the number of K11, K12, K21, K22, K31, K32, K41, K42 by ten. (ex. 10mS =>100mS , note: Stitch number is not changed.)
	Sequence output time setting/No. of stitch setting each by ten times setting	KL1.	1533	O	OF	-	-	tL1.	on oF	ON OF	Sequence output [KS1] [KS2] [KS3] [KS4] time setting/No. of stitch setting each by ten times. [ON]Time setting/No. of stitch setting by ten times ([K11][K12]x10,) [OF]Time setting/No. of stitch setting ([K11][K12])
	Sequence output time setting/No. of stitch setting each by ten times setting	KL2.	1534	O	OF	-	-	tL2.	on oF	ON OF	Sequence output [KS1] [KS2] [KS3] [KS4] time setting/No. of stitch setting each by ten times. [ON]Time setting/No. of stitch setting by ten times ([K21][K22]x10,) [OF]Time setting/No. of stitch setting ([K21][K22])
	Sequence output time setting/No. of stitch setting each by ten times setting	KL3.	1535	O	OF	-	-	tL3.	on oF	ON OF	Sequence output [KS1] [KS2] [KS3] [KS4] time setting/No. of stitch setting each by ten times. [ON]Time setting/No. of stitch setting by ten times ([K31][K32]x10,) [OF]Time setting/No. of stitch setting ([K31][K32])
	Sequence output time setting/No. of stitch setting each by ten times setting	KL4.	1536	O	OF	-	-	tL4.	on oF	ON OF	Sequence output [KS1] [KS2] [KS3] [KS4] time setting/No. of stitch setting each by ten times. [ON]Time setting/No. of stitch setting by ten times ([K41][K42]x10,) [OF]Time setting/No. of stitch setting ([K41][K42])

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

<Example>

Input signal setting table

No.	Setting name	Setting value	Digital display	Specification
1	Nothing signal	NO	no	The sewing machine will do nothing even if input NO is turned ON.
2	Low speed run signal	S0	S0	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	S1	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	S5	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	S4	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	S2	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	S01	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	S3	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	PSU	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

Note2

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	Digital display	Specification
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	ES	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	CW	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.
23	Thread trimmer protection signal	S6	S6	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.
24	Thread trimmer cancel signal	TL	TL	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	SPM	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 ↓

↑ Note2

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	Digital display	Specification
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	Ton	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	P12	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].
43	Sensor input signal	SEN	SEn	This is the cloth edge sensor input.
44	Wiper output cancel signal	WL	WL	If input WL is turned ON, the wiper output W will not be output.
45	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].
46	Preset stitching forced [ON] signal	N	n	If input N is turned ON, preset stitching will start forcibly from that point.
47	Continuous tack stitching forced [ON] signal	CBT	CbT	If input CBT is turned ON, continuous backstitching will start forcibly from that point.
48	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.
49	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	ir1	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	ir2	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	ir3	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	iS1	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	iS2	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	iS3	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	io1	If input IO1 is turned ON, output OT1 will always be turned ON.
58	Signal output to virtual output 2	IO2	io2	If input IO2 is turned ON, output OT2 will always be turned ON.
59	Signal output to virtual output 3	IO3	io3	If input IO3 is turned ON, output OT3 will always be turned ON.
60	Signal output to virtual output 4	IO4	io4	If input IO4 is turned ON, output OT4 will always be turned ON.
61	Signal output to virtual output 5	IO5	io5	If input IO5 is turned ON, output OT5 will always be turned ON.

Note1 ↓ Note2 ↑

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.

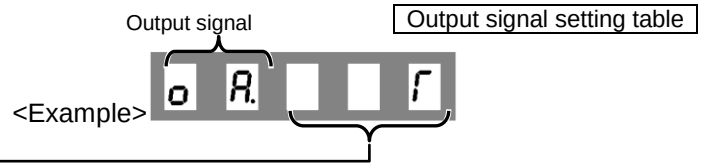
No.	Setting name	Setting value	Digital display	Specification
62	Signal output to virtual output 6	IO6		If input IO6 is turned ON, output OT6 will always be turned ON.
63	Signal output to virtual output 7	IO7		If input IO7 is turned ON, output OT7 will always be turned ON.
64	Signal output to virtual output 8	IO8		If input IO8 is turned ON, output OT8 will always be turned ON.
65	Signal output to virtual output 9	IO9		If input IO9 is turned ON, output OT9 will always be turned ON.
66	Signal output to virtual output A	IOA		If input IOA is turned ON, output OTA will always be turned ON.
67	Signal output to virtual output B	IOB		If input IOB is turned ON, output OTB will always be turned ON.
68	Signal output to virtual output C	IOC		If input IOC is turned ON, output OTC will always be turned ON.
69	Signal output to virtual output D	IOD		If input IOD is turned ON, output OTD will always be turned ON.
70	Signal output to virtual output E	IOE		If input IOE is turned ON, output OTE will always be turned ON.
71	Signal output to virtual output F	IOF		If input IOF is turned ON, output OTF will always be turned ON.
72	Signal output to virtual output G	IOG		If input IOG is turned ON, output OTG will always be turned ON.
73	End tacking speed run signal	S5V		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		It is possible to use as the input signal of thread break detector.
75	Sensor stop input signal 1	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		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		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		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		When needle down signal D is turned ON, needle down operation will start.
80	Thread trimmer signal after reverse needle lift	URT		Not used.

Note1 ↓

↑ Note2

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

No.	Setting name	Setting value	Digital display	Specification
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	uAC	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	uCM	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	tS1	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	tS2	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	tS3	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	tS4	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 ↓

↑ Note2

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	Digital display	Specification
	25	Needle DOWN position output	DNW	dnU	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	iPF	Not used.
Note1 ↓	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.
Note2 ↑	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.

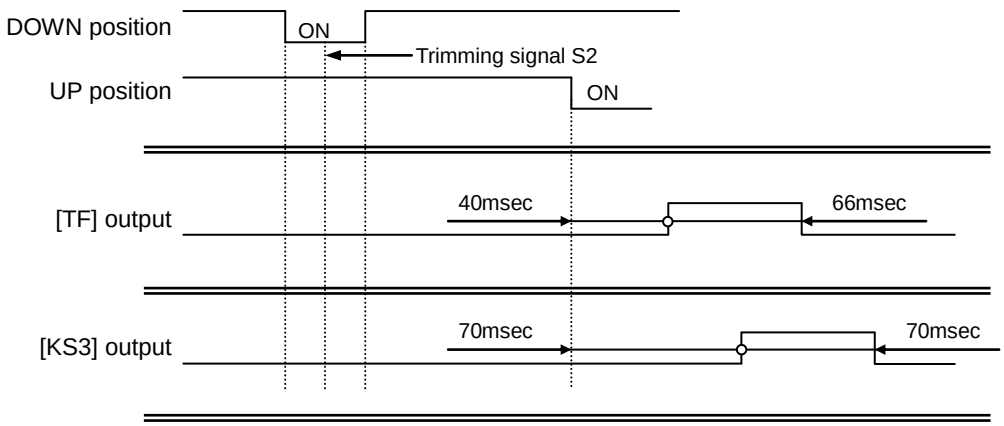
2. The setting name will display in the ascending order with each press of the [C] key.

Output signal setting table

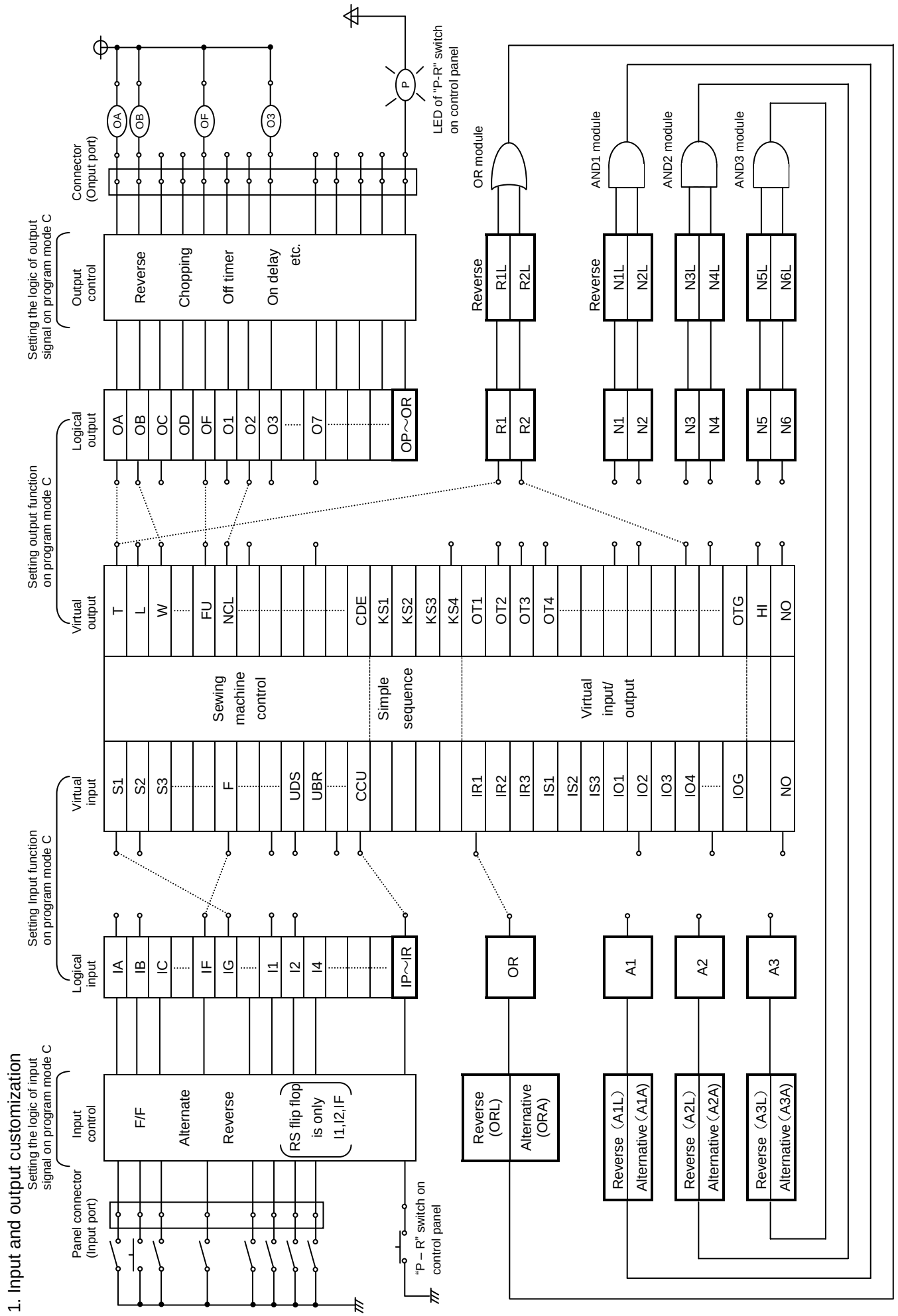
	No.	Setting name	Setting value	Digital display	Specification
Note1 ↓	50	[CDE] output	CDE	CdE	This output becomes ON when Down-counter becomes end. This output becomes OFF when "CCD" input is turned on.
	51	Output for the PSU counting	PSU	PSU	Output signal for the during PSU counting. PSU output will 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.
Note2 ↑	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	HI	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.

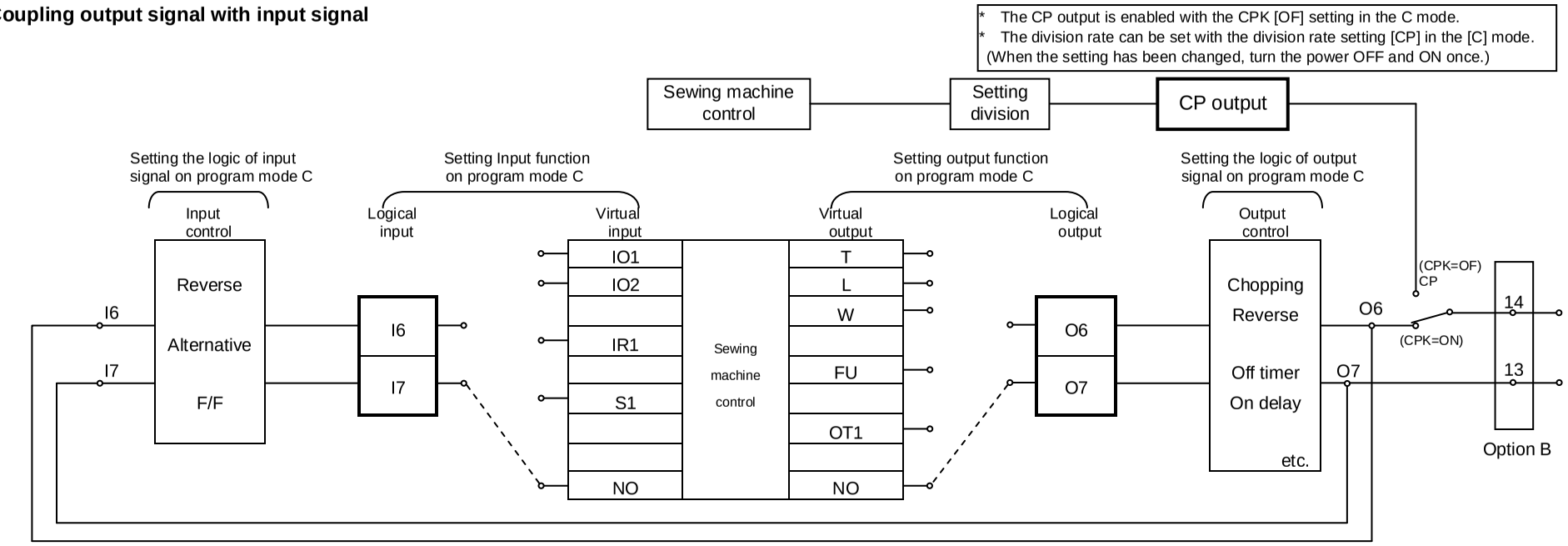
Notice The TF output and KS3 output timings are as shown below.



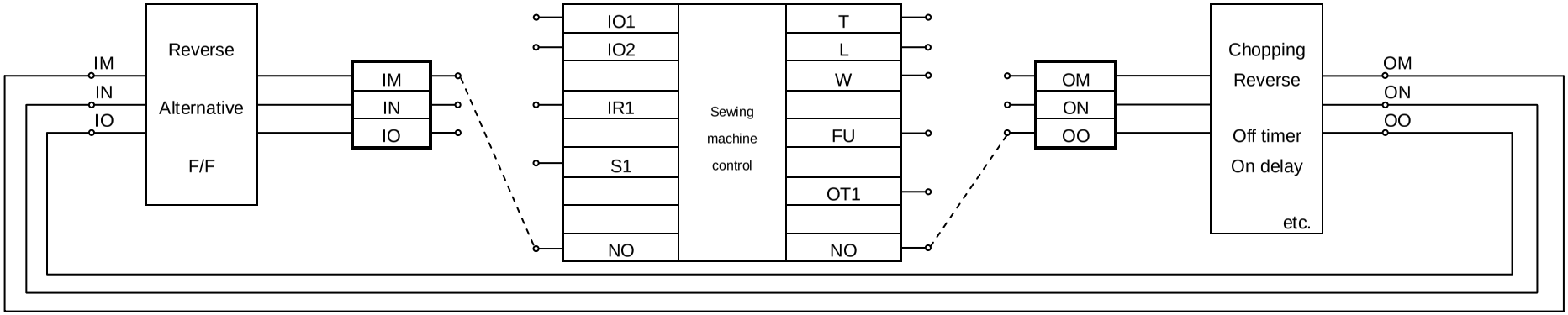
1. Input and output customization



2. Coupling output signal with input signal



* 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].

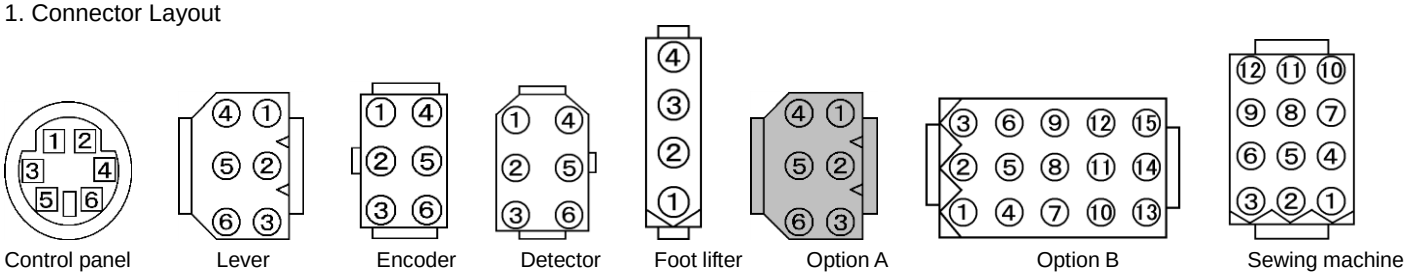


* The factory settings of the input function settings [IM], [IN], [IO] are all [NO].
* The factory setting of the output function settings [OM], [ON], [OO] are all [NO].
* The input function settings [IM], [IN], [IO] are coupled to each the output function setting [OM], [ON], [OO] by software.

27 How to Use the Option Connector

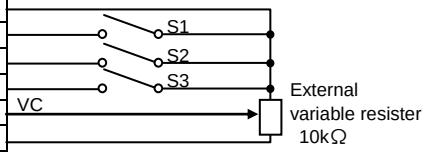
Variable operation are possible by adding external signals to the option connector. A current of approximately 1.5 mA flows through the switches used

1. Connector Layout



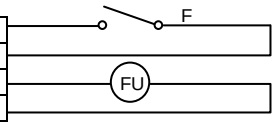
Lever (White)

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



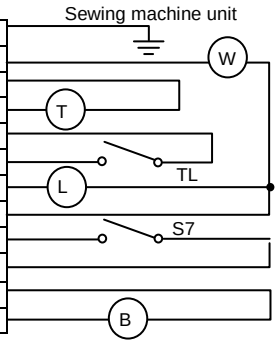
Presser foot lifter

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



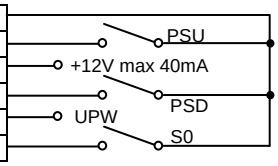
Sewing machine

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



Option A (Black)

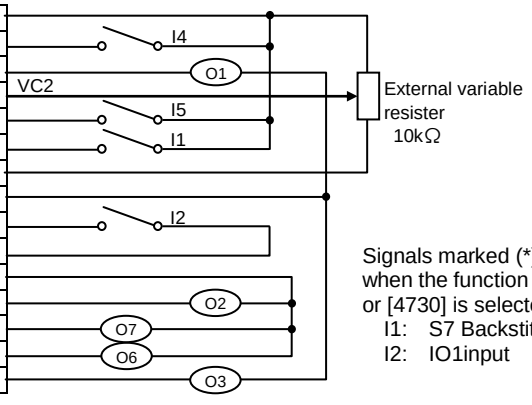
0V	0V	1
IA	PSU : Up position stop input	2
+12V/(+5V)	+12V	3
IB	PSD : Down position stop input	4
O4	UPW : Needle Up position output	5
IC	S0 : Low speed input	6



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

Option B

0V	0V	1
I4	No setting	2
O1	OT1 : 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



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

I1: S7 Backstitch input

I2: IO1input

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

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

Communication / Control panel (Note 4)

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

Encoder (Note 4)

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

Detector (Note 4)

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

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

2. 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 out put.
Sewing machine connector	2	Wiper output	W	OB	Wiper operation starts.
	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)
Presser foot lifter	2	Presser foot lifter signal	F	IF	If input F is turned ON, the presser foot lifter operation will start.
	3	Presser foot lifter output	FU+	OF	Presser foot lifter operation starts. The operation mode set in the [P] mode FUM function and FU function will be entered.
	4		FU-		
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].
Option B connector	2	Nothing signal	NO	I4	Factory setting is NO setting. Refer to the [C mode input signal setting table].
	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.

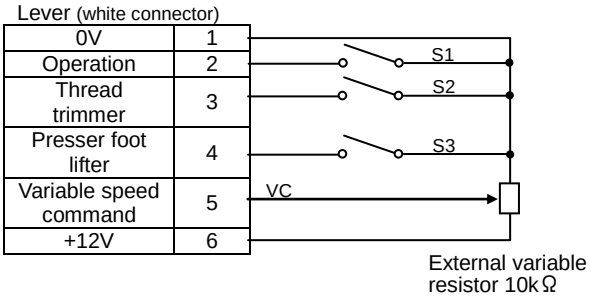
【Note: Procedure for changing the lever connector】

- 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")

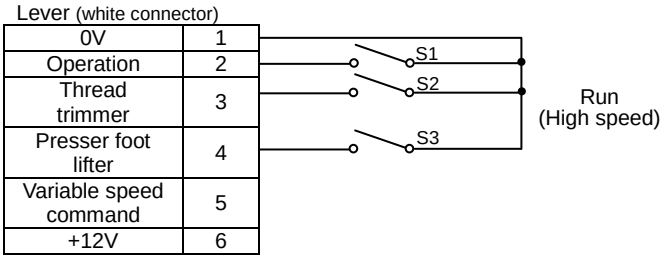
［Basic procedure］

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

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

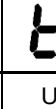
Rated output current of value output

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

<Reference> Table of digital display

No.	0	1	2	3	4	5	6	7	8	9
Digital display										

No.	A	B	C	D	E	F	G	H	I	J
Digital display										

No.	K	L	M	N	O	P	Q	R	S	T
Digital display										

No.	U	V	W	X	Y	Z
Digital display						

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.)

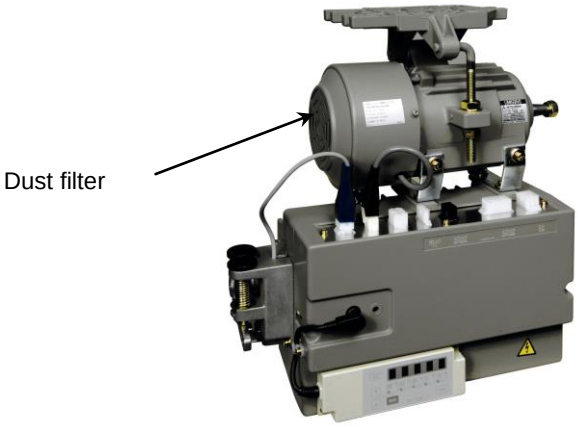


Fig. 1 Dust filter

(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)

Fig. 2 Cover mounting screw

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.

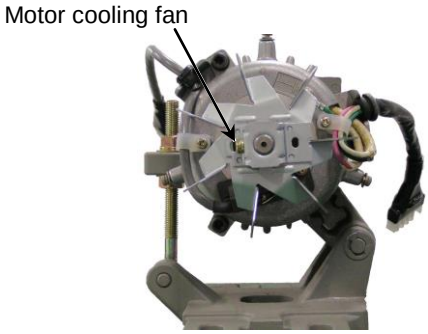


Fig. 3 Motor cooling fan mounting screw

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.

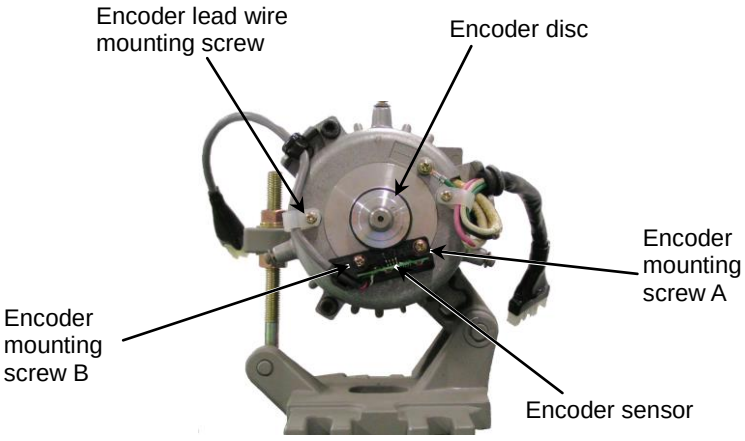


Fig. 4 Encoder

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.

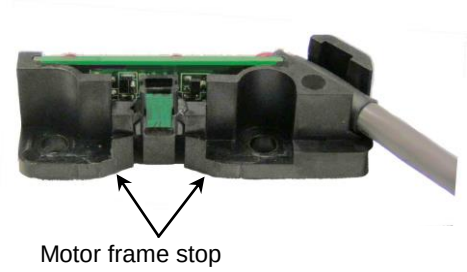


Fig. 5 Encoder sensor

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.

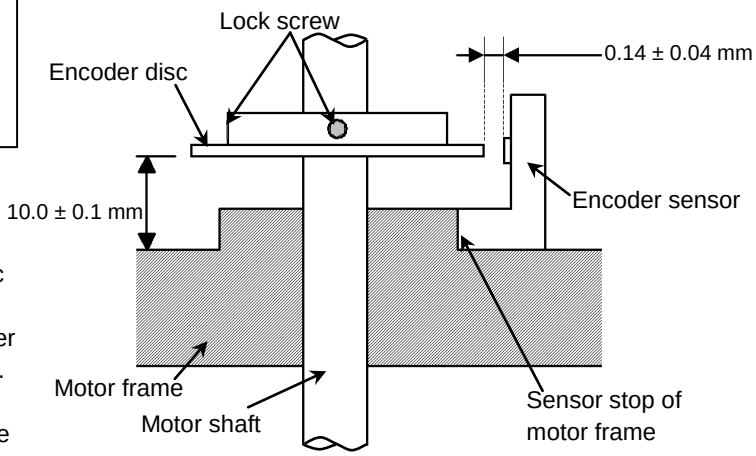


Fig. 6 Installation of encoder disc

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.

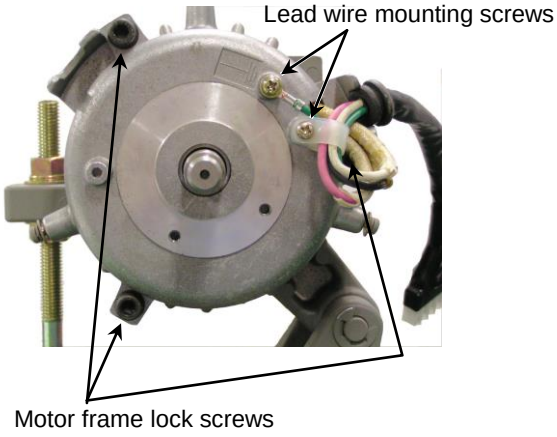


Fig. 7 Disassembly of motor

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.

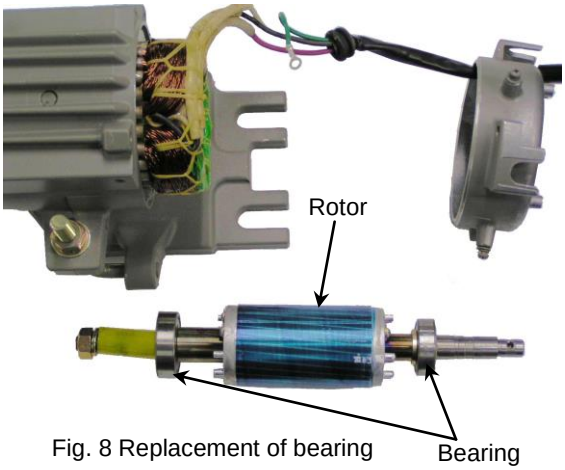
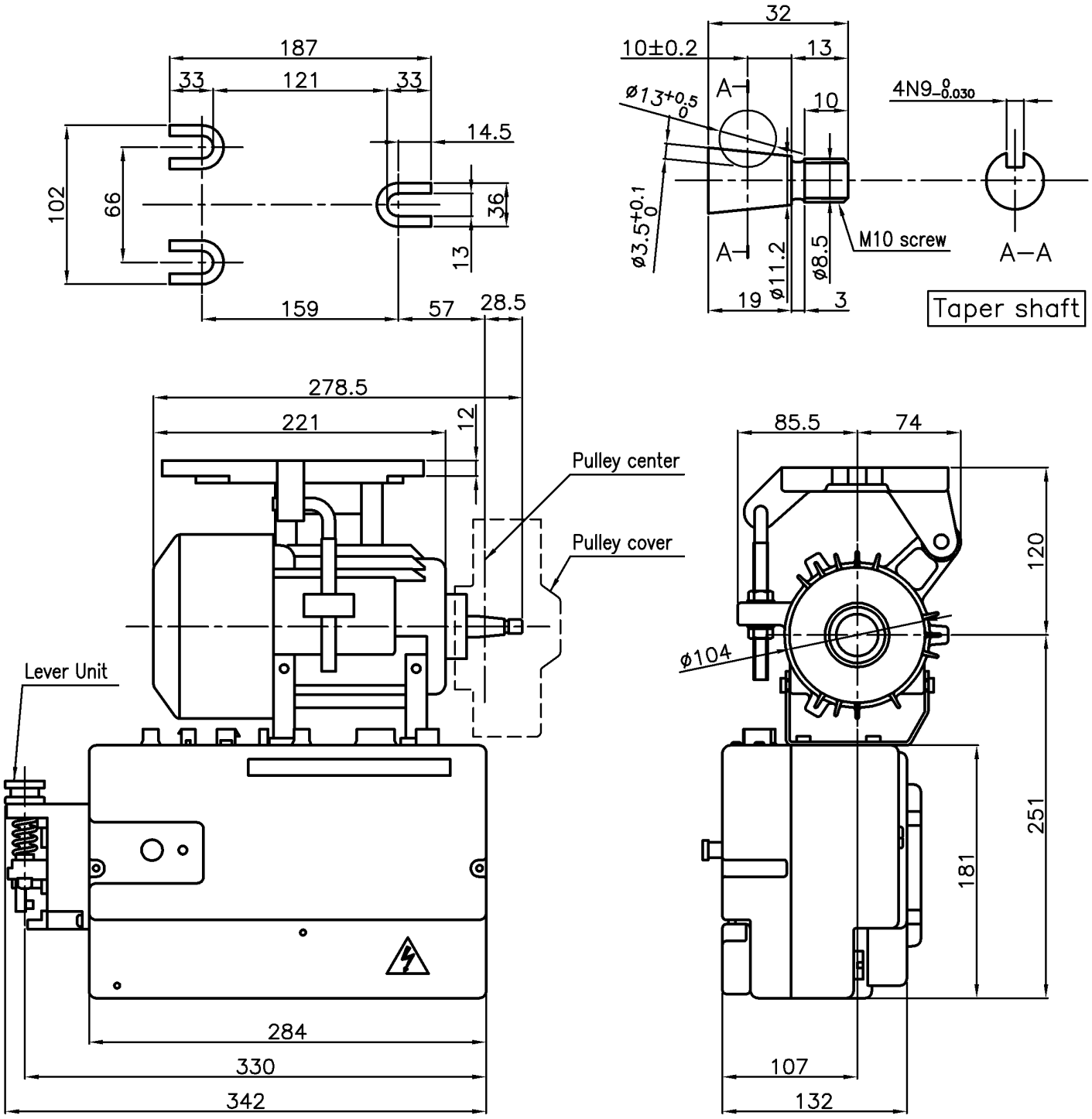


Fig. 8 Replacement of bearing

<Reference> Dimensions
*MOTOR and CONTROL BOX



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