



XC-H Series

Technical Manual (USA Version)

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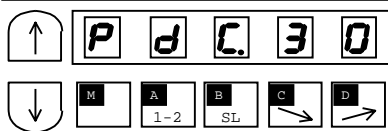
Numeral	0	1	2	3	4	5	6	7	8	9
Digital display	<i>0</i>	<i>1</i>	<i>2</i>	<i>3</i>	<i>4</i>	<i>5</i>	<i>6</i>	<i>7</i>	<i>8</i>	<i>9</i>
Characters	A	B	C	D	E	F	G	H	I	J
Digital display	<i>A</i>	<i>b</i>	<i>C</i>	<i>d</i>	<i>E</i>	<i>F</i>	<i>G</i>	<i>H</i>	<i>I</i>	<i>J</i>
Characters	K	L	M	N	O	P	Q	R	S	T
Digital display	<i>k</i>	<i>L</i>	<i>M</i>	<i>n</i>	<i>o</i>	<i>P</i>	<i>q</i>	<i>r</i>	<i>S</i>	<i>T</i>
Characters	U	V	W	X	Y	Z				
Digital display	<i>U</i>	<i>v</i>	<i>W</i>	<i>X</i>	<i>Y</i>	<i>Z</i>				

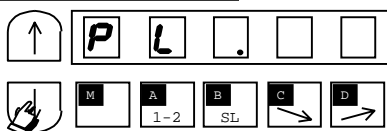
16 How to use the setting of the position detectorless control

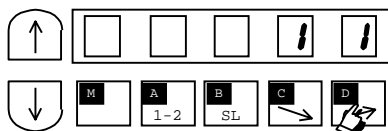
1. To set the stop position [UP] by the position detectorless control

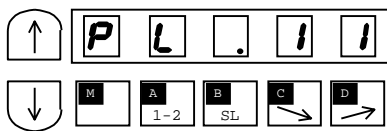
(Ex. when the pulley ratio of the Sewing machine shaft to the Motor shaft is 1 to 1.)

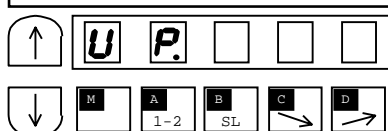
..... function setting [A] mode [PL.11] + [L] mode [UP.***]

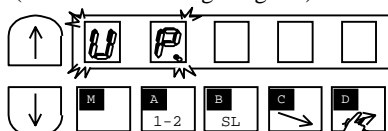
- 1) Enter program mode [A] PRESS AND HOLD IN THE DOWN ARROW AND THE A KEY
- 2) 

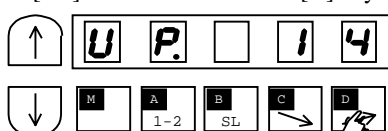
* Program mode [A] will be entered.
- 3) 

* Set function to [PL].
- 4) 

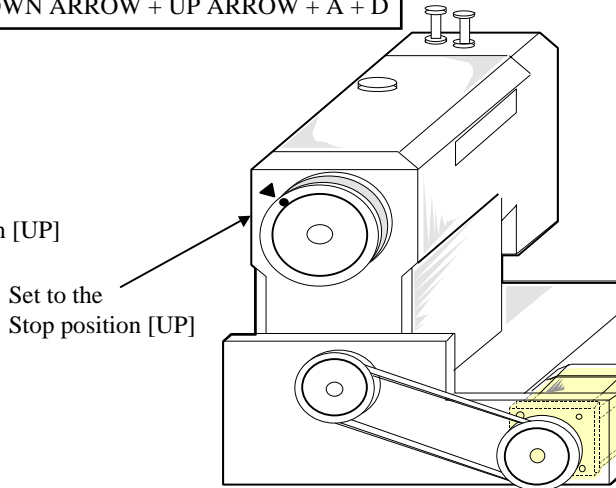
* Set to [11].
- 5) 

* Complete the [PL] function setting.
- 6) Return to the normal mode (DOWN ARROW + UP ARROW)
- 7) Enter program mode [L] (PRESS AND HOLD IN THE DOWN ARROW + UP ARROW + A + D)
- 8) 

* Program mode [L] will be entered.
- 9) Set the position of sewing machine shaft to the stop position [UP] by rotating the sewing machine pulley. (Ex. Refer to the right figure.)
- 10) 

* [UP] will flicker when the [D] key is pressed.
- 11) 

* Press the [D] key for 2 seconds or more. [UP. 14] will be displayed and this setting is completed.
- 12) Return to the normal mode (DOWN ARROW + UP ARROW)



The setting position of the stop position [UP] is stop position, and the display will be [14].
 The true UP position is the position that have been returned the coasting angle from setting position.
 After this function has been set, if you rotate the pulley, the display will be the angle from UP position (not stop position). (0 ~ 359 degree)
 The coasting angle can be set the function [U8] of the [P] mode.

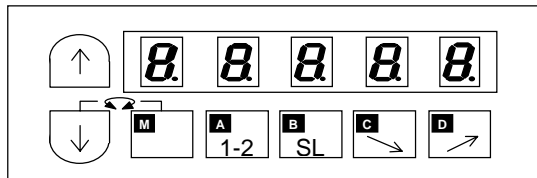
Description

- A. For using of the position detectorless control, set the function [PL] of the [A] mode to [11] , [12] or [LE].
 - Function setting [PL] of the program mode [A]
 PL= OF : Auto setting of the pulley ratio. (with the position detector.)
 ON : Manual setting of the pulley ratio. (with the position detector.)
 11 : Setting of the position detectorless control. (Motor shaft : Sewing machine shaft = 1 : 1)
 12 : Setting of the position detectorless control. (Motor shaft : Sewing machine shaft = 2 : 1)
 LE : Setting of the position detectorless control. (Pulley ratio is [MR] to [SR]. Set to the [MR] and [SR] value.)
- B. For the adjustment of the DOWN position, it can be set with [K] in the [P] mode. (Factory setting is 180 degree.)
- C. If you have changed the rotation direction (if you have set the [2] mode) after above setting of the stop position [UP], you must to re-set the stop position [UP].

Note 1. When the function [PL] is [11] or [12], if you have replaced the control box, you don't have to re-set the stop position [UP]. Because the data of the stop position [UP] is memorized to the encoder of the motor.
 2. When the function [PL] is [LE], if you have replaced the control box, you must to re-set the stop position [UP]. Because the data of the stop position [UP] is memorized to the control box.

11.Operation of the Operation Panel Keys

PRESS THE UP AND DOWN ARROW KEYS TO RETURN TO THE NORMAL MODE

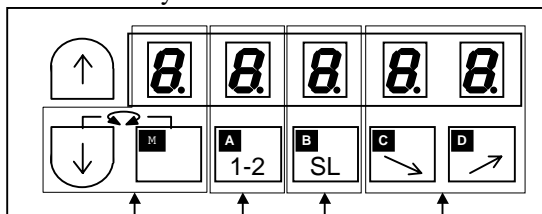


Mode mane	Key operation	Digital display
Tacking type setting mode	PRESS THE UP ARROW KEY 1 TIME	*The tacking setting mode will be entered.
No. of tacking stitch setting mode	PRESS THE UP ARROW KEY 2 TIMES	*The tacking stitches setting mode will be entered.
Preset stitching setting mode	PRESS THE UP ARROW KEY 3 TIMES	*The preset stitching setting mode will be entered.
Pattern No. selection mode	PRESS THE UP ARROW KEY 4 TIMES	*The pattern No. selection mode will be entered.
Program mode [P]	PRESS AND HOLD IN THE DOWN AND UP ARROW KEYS UNTIL THE DISPLAY STOPS FLASHING	*The display will flicker. *The program mode [P] will be entered.
Program mode [A]	PRESS AND HOLD IN THE DOWN ARROW AND THE A KEY UNTIL THE DISPLAY STOPS FLASHING	*The display will flicker. *The program mode [A] will be entered.
Program mode [B]	PRESS AND HOLD IN THE DOWN ARROW AND THE B KEY UNTIL THE DISPLAY STOPS FLASHING	*The display will flicker. *The program mode [B] will be entered.
Program mode [C]	PRESS AND HOLD IN THE DOWN ARROW AND THE C KEY UNTIL THE DISPLAY STOPS FLASHING	*The display will flicker. *The program mode [C] will be entered.
Program mode [D]	PRESS AND HOLD IN THE DOWN ARROW AND THE D KEY UNTIL THE DISPLAY STOPS FLASHING	*The display will flicker. *The program mode [D] will be entered.
Program mode [E]	PRESS AND HOLD IN THE DOWN AND UP ARROW AND THE A KEY UNTIL THE DISPLAY STOPS FLASHING	*The display will flicker. *The program mode [E] will be entered.
Program mode [L]	PRESS AND HOLD IN THE DOWN AND UP ARROW AND THE A AND THE D KEYS UNTIL THE DISPLAY STOPS FLASHING	*The display will flicker. *The program mode [L] will be entered.
Program mode [R]	PRESS THE DOWN ARROW AND THE B AND C KEYS UNTIL THE DISPLAY STOPS FLASHING	*The display will flicker. *The program mode [R] will be entered.
Program mode [2]	PRESS AND HOLD IN THE DOWN ARROW AND THE C AND D KEYS UNTIL THE DISPLAY STOPS FLASHING	*The display will flicker. *The program mode [2] will be entered.
Program mode [3]	PRESS AND HOLD IN THE DOWN ARROW AND THE A AND D KEYS UNTIL THE DISPLAY STOPS FLASHING	*The display will flicker. *The program mode [3] will be entered.

11.Operation of the Operation Panel Keys

3. How to use the normal mode

(1) Display during normal mode and function of each key



Change motor rotation direction

By operating these two keys (DOWN ARROW + M KEY) simultaneously, the rotation direction of the sewing machine can be changed. THE ROTATING CIRCLE IS THE DIRECTION OF MOTOR ROTATION

Speed adjustment

BY PRESSING THE [C] KEY THE TOP SPEED GETS LOWER
BY PRESSING THE [D] KEY THE TOP SPEED GETS HIGER
THE DISPLAY IS A PERCENTAGE OF THE TOP SPEED SET IN THE P-MODE

Slow start ON/OFF

By operating this [B] key, slow start ON/ OFF can be selected.
Turned ON THE MOTOR ROTATES FOR 2 REVOLUTIONS AT SLOW SPEED.
AMOUNT OF REVOLUTIONS AND SPEED CAN BE SET IN THE P-MODE
After the power is turned ON or after thread trimming, the sewing will start with a slow start.
Slow start ON/ OFF is displayed on LED.B.

 is OFF  is ON

Change 1 position / 2 position

By operating this [A] key, 1 position / 2 position can be selected for the needle position during stopping. 1 position or 2 position is displayed on LED.A.
At the time of 1 position, the needle is stopped at Up position.
At the time of 2 position, the needle is stopped at Down position.
After thread trimming, the needle is stopped at up position.

 is Up position  is Down position

12 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) PRESS AND HOLD IN THE DOWN ARROW AND THE C KEY AND THE D KEY

2)

FIRST MACHINE TYPE IN LIST

3)

PRESS THE DOWN ARROW KEY TO SELECT THE MACHINE TYPE

4)

PRESS AND HOLD IN THE D KEY UNTIL THE DISPLAY STOPS FLASHING

5)

6)

NORMAL MODE

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

2. Simple setting table for chain stitch sewing machine

Function	Sewing machine maker	Model name of sewing machine and device	I/ O signals of connectors	J unction 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	I/ 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	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	200	1400	1400
YU5	YAMATO	Solenoid-operated under thread trimmer with solenoid wiper	Fig.1	Fig.50	30V	12V			2	6000	200	200	200	1400	1400
NO1	PEGASUS	W500, 600, 700 / UT207, UT434 Solenoid-operated under thread trimmer with solenoid wiper without top cover thread trimmer	Fig.4	Fig.53	24V	5V	Sewing machine stops when switch:open		1	6000	200	200	200	1400	1400
NO2	PEGASUS	W500, 600, 700 / UT207, UT434 Solenoid-operated under thread trimmer with solenoid wiper and top cover thread trimmer	Fig.4	Fig.53	24V	5V			2	6000	200	200	200	1400	1400
NO3	PEGASUS	W500, 600, 700 / UT103, 104, 109, 111 Solenoid-operated under thread trimmer with solenoid wiper without top cover thread trimmer FX series	Fig.4	Fig.53	24V	5V			1	4500	200	200	200	1400	1400
NO4	PEGASUS	UT335 Super tack solenoid-operated under thread trimmer with air wiper	Fig.4	Fig.54	24V	5V			1	4000	200	200	200	1400	1400
NO5	PEGASUS	----	Fig.5	----	24V	5V			1	6000	200	200	200	1400	1400
NO6	PEGASUS	W562-82UT Angled stitch	Fig.5	Fig.53	24V	5V			2	6000	200	200	200	1400	1400
NO7	PEGASUS	W600 / UT / MS Solenoid-operated under thread trimmer with solenoid wiper and condensed stitch, without top cover thread trimmer	Fig.6	Fig.53	24V	5V			1	6000	200	200	200	1400	1400
NO8	PEGASUS	W600 / UT / MS Solenoid-operated under thread trimmer with solenoid wiper and condensed stitch and top cover thread trimmer	Fig.6	----	24V	5V			2	6000	200	200	200	1400	1400
NOB	PEGASUS	----	Fig.7	----	24V	5V			1	8000	200	200	200	1400	1400
NOC	PEGASUS	----	Fig.8	----	24V	5V			1	4000	200	200	200	1400	1400
KA1	KANSAI	M, RX series Automatic thread trimmer with solenoid wiper	Fig.9	Fig.55	24V	12V			2	6000	250	250	250	1400	1400
KA2	KANSAI	D series Automatic thread trimmer with air wiper	Fig.9	Fig.55	24V	12V			2	6000	250	250	250	1400	1400
KA3	KANSAI	F series Air-operated under thread trimmer with air wiper	Fig.10	Fig.55	24V	12V	2	6000	250	250	250	1400	1400		
KA4	KANSAI	DX series Air-operated under thread trimmer with air wiper	Fig.9	Fig.55	24V	12V	2	6000	250	250	250	1400	1400		

Function	Sewing machine maker	Model name of sewing machine and device	I/ O signals of connectors	J unction 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
UN1	UNION SPECIAL	33700, 34500 class Solenoid-operated under thread trimmer	Fig.11	Fig.56	30V	12V	Sewing machine stops when switch:open	Always set J 1 : SLOW J 2 : FAST J 7 : SLOW	2	4000	200	200	1400	2999
UN2	UNION SPECIAL	34800skcc class Solenoid-operated under thread trimmer	Fig.12	Fig.56	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.12	Fig.57	30V	12V			2	4000	200	200	1400	2999
U345	Do not use !!													
U346	Do not use !!													
U348	Do not use !!													
U347	Do not use !!													
BR1	BROTHER	FD3, FD4 series	Fig.13	----	24V	5V	Sewing machine stops when switch:short	*Note 6	2	6000	200	200	1400	1400
RM1	RIMOLDI	----	Fig.14	----	24V	5V			1	6000	200	200	1400	1400
SRB1	SIRUBA	----	Fig.15	----	24V	5V			2	6000	200	200	1700	1700
J MH	J UKI	MH-481-4-4, MH-484-4-4 class	Fig.16	----	30V	5V			2	5500	200	200	1700	1900

MOST COMMONLY USED FUNCTIONS IN THE P AND A MODES

P-MODE

PRESS AND HOLD IN THE ↓ + ↑ ARROW KEYS UNTIL THE DISPLAY STOPS FLASHING

- H HIGH SPEED (0-8999)
- T TRIM SPEED (0-499)
- N START BACKTACKING SPEED (0-2999)
- V END BACKTACKING SPEED (0-2999)
- M MEDIUM SPEED (0-8999)
- PSU MACHINE STOP WITH NEEDLE UP AND TRIM WITH SENSOR (0-99)
- PSD MACHINE STOP WITH NEEDLE DOWN AND NO TRIM WITH SENSOR (0-99)
- FUM PRESSER FOOT REMAINS UP AFTER TRIM (OF/ON)
- S6L INTERNAL THREAD TRIMMER SAFETY CIRCUIT (HI/LO)
- AT CANCEL VARIABLE SPEED WITH TREADLE (OF/ON)
- RU REVERSE AFTER TRIM (OF/ON)
- R8 DEGREE OF REVERSE AFTER TRIM (0-360)

MOST COMMONLY USED FUNCTIONS IN THE A-MODE

A-MODE

PRESS AND HOLD IN THE ↓ + A KEYS UNTIL THE DISPLAY STOPS FLASHING

- GA TORQUE GAIN FOR SEWING MACHINE (H, L, LL) HIGH, LOW, VERY LOW
- BK WEAK BREAK AFTER STOP (OF/ON)
- BKM BRAKE FORCE (E, H) E=LIGHT BRAKE H=STRONG BRAKE

MOST COMMONLY USED FUNCTIONS IN THE J AND R-MODES

J-MODE

PRESS AND HOLD IN THE ↓ + ↑ + A + B KEYS UNTIL THE DISPLAY STOPS FLASHING

PSW PANEL LOCK OUT (OF/ ON)

R-MODE (CONTROL BOX RESET)

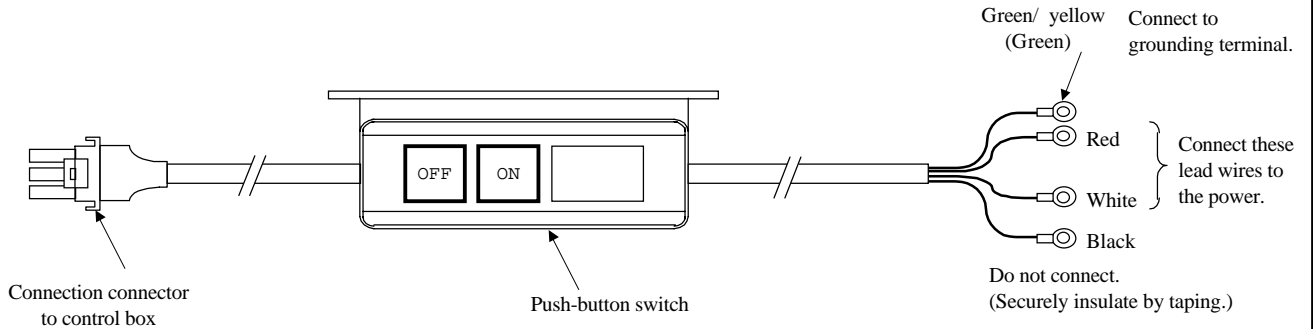
R-MODE

1. PRESS AND HOLD IN THE ↓ + B + C KEYS UNTIL THE DISPLAY STOPS FLASHING
2. PRESS AND HOLD IN THE D-KEY UNTIL THE DISPLAY STOPS FLASHING

7. Wire and Grounding

4. When using the 3-phase 200V class Limiservo X with single phase 200~220V class

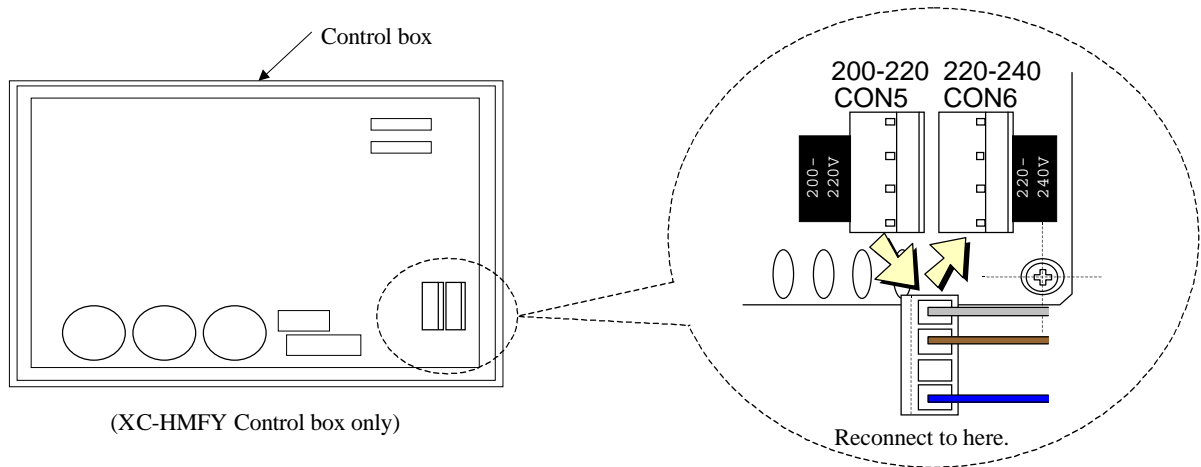
- Connect the " red" and " white" lead wires from the push-button switch to the power.G
The black wire is not used.
Tape it with insulation tape, etc., to insulate securely.
Always ground the green/ yellow (green) grounding wire.



5. When using the 3-phase 200~220V Limiservo X with 3-phase 220V~240V

- (1) Remove the cover.
- (2) Reconnect the connector from [CON5] to [CON 6] (220-240V).
- (3) After change, always set the cover of control box.
- (4) Change the mark " ? " display on the factory shipment voltage~nameplate on the side of the control box.

(XC-HMFY Control box only)



For safety, turn the power switch OFF before opening cover.

6. To change solenoid voltage

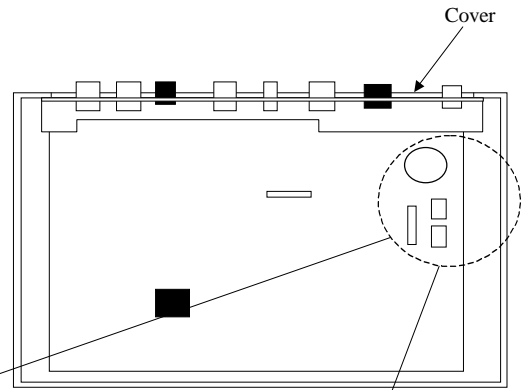
(XC-HMFY Control Box only)

To change solenoid voltage from 24V to 30V.

- (1) Remove the cover.
- (2) Reconnect the connector from [CON11] to [CON12] (30V).
- (3) After change, always set the cover to the control box.

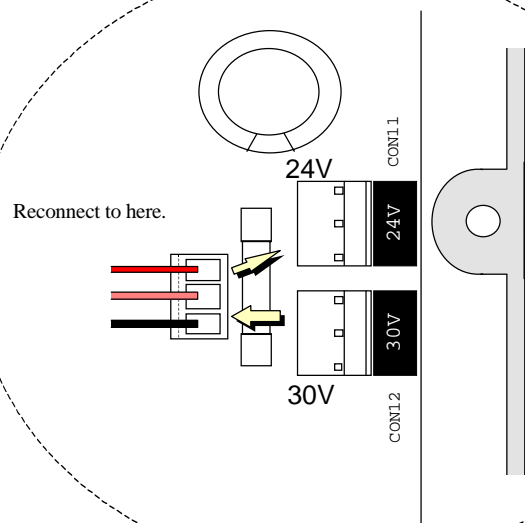
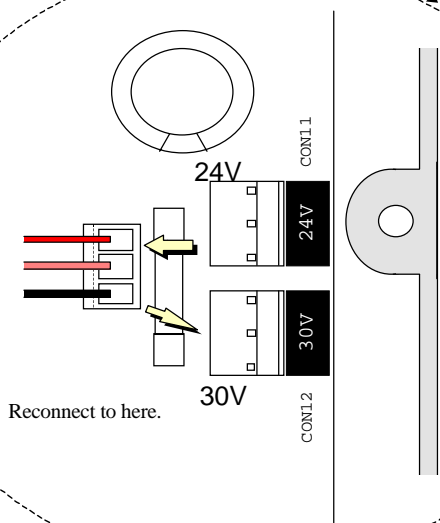
To change solenoid voltage from 30V to 24V.

- (1) Remove the cover.
- (2) Reconnect the connector from [CON12] to [CON11] (24V).
- (3) After change, always set the cover to the control box.



From 24V to 30V

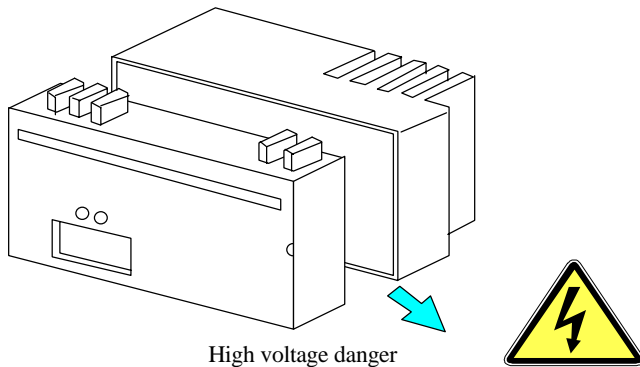
From 30V to 24V



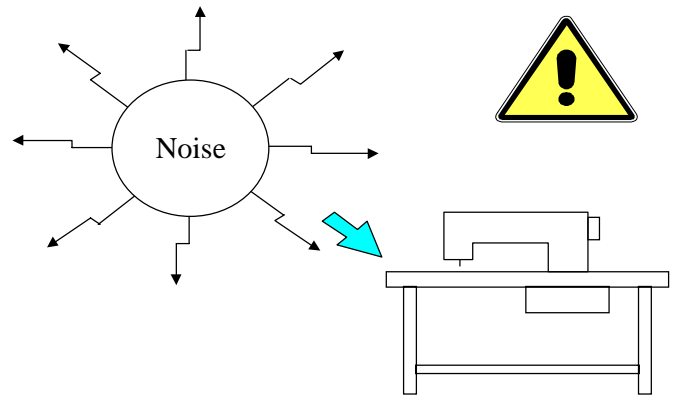
For safety, turn the power switch OFF before opening cover.

3.Points of Caution

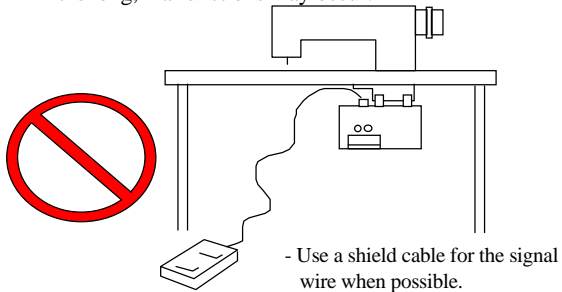
11. A high voltage is applied inside the machine, so wait 10 minutes after turning the power switch OFF before opening the cover.



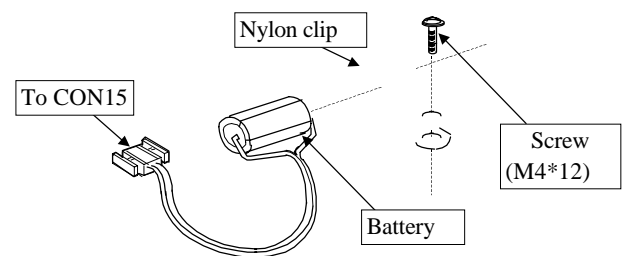
12. Use the machine away from sources of strong noise such as a high frequency welder.



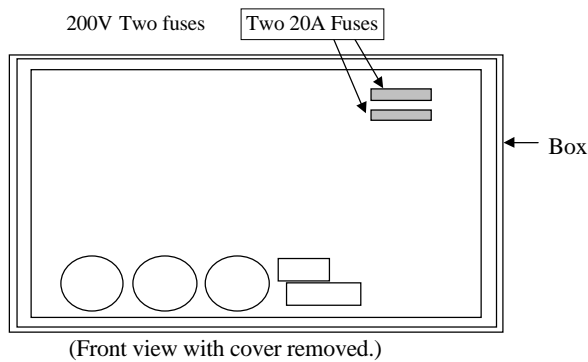
13. When connecting the external switch to the option connector, etc., keep the signal wire as short as possible. If it is long, malfunctions may occur.



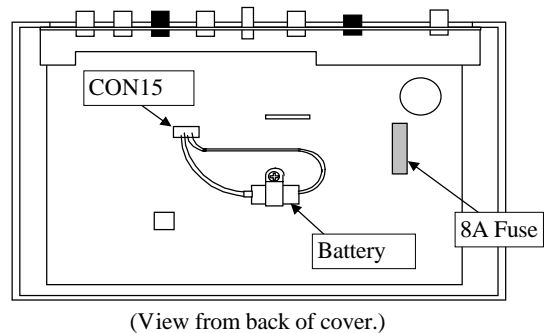
14. When the battery error code M-56, M-57 is flickered on the operation panel display, please replace the battery. When the error code M-56 is displayed, please re-set the stop position [UP] after replacing battery.



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



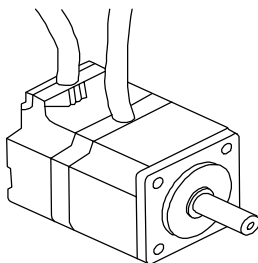
- ? The above fuses is for protection of the control box power supply section.



- ? The above 8A fuse is for protection of the solenoid output power supply (24V) section.



Wait 10 minutes after turning the power switch OFF before opening the cover



16. Do not carry the motor by the cables or shaft.
17. Securely attach the servo motor to the machine. If attach insecurely, the servo motor may come off during operation.
18. For safety of personnel, always cover rotating and moving parts.
19. During power-on or for some time after power-off, do not touch the servo motor. The temperature of the servo motor surface may be high and you may get burnt. For safety of personnel, always cover the servo motor.
20. Never hit the servo motor or shaft, especially when coupling the servo motor to the machine. The encoder may become faulty.
21. Do not subject the servo motor shaft to more than the permissible load. Otherwise, the shaft may break.
22. Do not drop or strike servo motor. Isolate from all impact loads.

14 How to change voltage of panel connector and solenoid return speed

1. To change Solenoid voltage 24V/30V. (Refer to page 17.)

2. How to change the output voltage DC5V/12V or DC12V/(24V/30V).

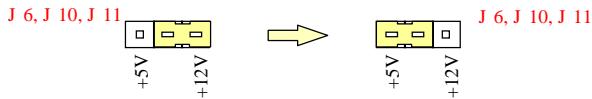
(1) Remove the cover.



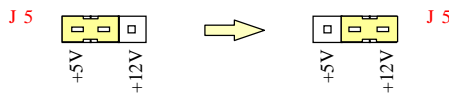
Caution : Wait over 10 minutes after turning the power switch OFF before opening cover.

(2) The DC5V/ 12V can be changed with the J 5, J 6, J 10 and J 11 connector on the printed circuit board on the cover side as shown next page.

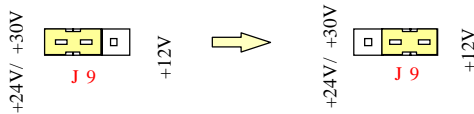
- This is set to 12V when shipped from the factory. To change from 5V to 12V, pull out the connector and reinsert it into the 5V side.



- This is set to 5V when shipped from the factory. To change from 12V to 5V, pull out the connector and reinsert it into the 12V side.



(3) This is set to (24V/ 30V) when shipped from the factory. To change from (24V/ 30V) to 12V, pull out the connector and reinsert it into the 12V side.



(4) The power supply (+12V) voltage will change form 12V to 5V by changing the J 10 connector from 12V to 5V.

Position detector

0V		1
---		2
Ground		3
UP		4
DOWN		5
+12V/ (+5V)		6

(5) The power supply (+12V) voltage will change form 12V to 5V by changing the J 11 connector from 12V to 5V.
(When wanting to make change gears of the sewing machine possibly at variable speed command of 5 V, set the setting value of pedal curve function setting <PDC> by the A mode.)

Lever (white connector)

0V		1
S1 : Run (Variable speed)	IG	2
S2 : Tread trimming	IH	3
S3 : Presser foot lifter	II	4
VC : Variable speed command		5
+12V		6

...12V ==> 5V

(6) The power supply (+12V) voltage will change form 12V to 5V by changing the J 6 connector from 12V to 5V.

Option A

0V		1
PSU: Up position stop input	IA	2
+12V		3
PSD: Down position stop input	IB	4
CKU : Up position output		5
S0: Low speed input	IC/ CKD	6

...12V ==> 5V

14.How to change voltage of panel connector and solenoid return speed

(7) The output of pin number 5, 13 and the power supply (+5V : Pin number 7) voltage will change from 5V to 12V by J 5 connector from 5V to 12V.

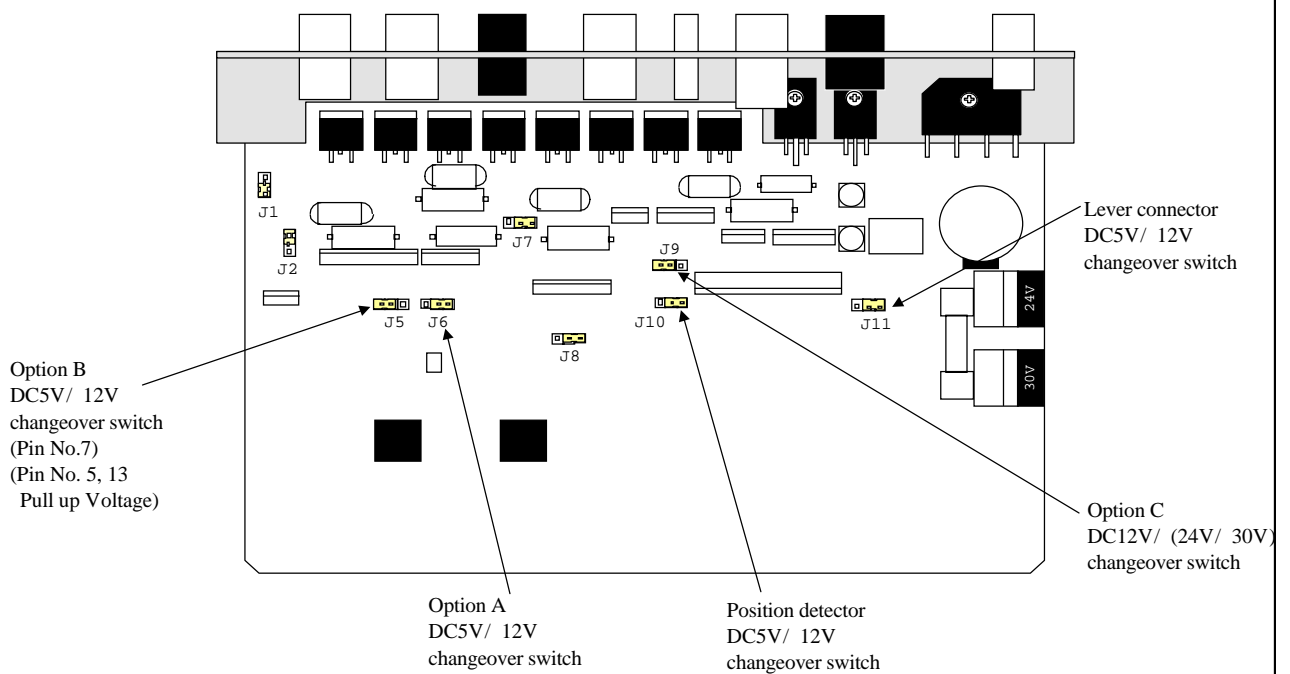
Option B

0V		1	
No setting	I4	2	
OT1 : Virtual output	O1	3	
VC2 : Variable speed command		4	
No setting	O5/ I5	5	...5V ==> 12V
IO1:Virtual input	I1	6	
+5V		7	...5V ==> 12V
+24V/ +30V		8	
U: Needle lift signal	I2	9	
0V		10	
+24V/ +30V		11	
NCL : Needle cooler output	O2	12	
No setting	O7/ I7	13	...5V ==> 12V
No setting	I6	14	
TF : " TF" output	O3	15	

(8) The power supply (+24V/ 30V : Pin number 6, 7, 8, 9) voltage will change from (24V/ 30V) to 12V by J 9 connector from (24V/ 30V) to 12V.

Option C

No setting	OK	1	
No setting	OO	2	
No setting	OJ	3	
No setting	O6	4	
No setting	O4	5	
+24V/ +30V		6	...(24V/ 30V) ==> 12V
+24V/ +30V		7	...(24V/ 30V) ==> 12V
+24V/ +30V		8	...(24V/ 30V) ==> 12V
+24V/ +30V		9	...(24V/ 30V) ==> 12V



14.How to change voltage of panel connector and solenoid return speed

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

(1) Remove the cover.



Caution : Wait over 10 minutes after turning the power switch OFF before opening cover.

(2) The solenoid return speed can be increased with the setting of the J 1, J 2, J 7 connector on the printed circuit board on the cover side as shown on the last page.

(3) Connector factory settings and solenoid return

Connector	Connector factory setting	Output during simple setting	Solenoid return	Output
J 1	FAST	Sewing machine connector 11-12 pin output.	Fast	OC
J 2	SLOW	Sewing machine connector 3-4 pin output.	Normal	OA
J 7	SLOW	Sewing machine connector 7-8 pin output.	Normal	OD

(4) Set the connector setting from SLOW to FAST increase the solenoid return speed.



Caution

The solenoid return speed cannot be increased if solenoid output chopping duty OAC, ODC and O3C is return ON in the program mode [C].

The resistance on the printed circuit board will be burnt out if the solenoid return speed is increased.

This connector must always be turned ON.

If "UNION SPECIAL" [UN1], [UN2] and [UN3] are set in program mode [2], always use J1 and J7 set at SLOW (solenoid return is normal), J2 set at FAST (solenoid return is fast).

TROUBLESHOOTING

LOCATED IN THE E-MODE

PRESS AND HOLD IN THE ↓ + ↑ + A KEYS UNTIL THE DISPLAY STOPS FLASHING

ERROR CODES

- 1 LAST ERROR CODE
- 2 SECOND TO LAST ERROR CODE
- 3 THIRD TO LAST ERROR CODE
- 4 FOURTH TO LAST ERROR CODE

POWER DURATION

- P POWER ON TIME X 10
- M MOTOR ON TIME X 10

INPUT SWITCHES

- IG RUN INPUT
- IH TRIMMER INPUT
- II PRESSER FOOT INPUT

SYNCHRONIZER

- UP SYNCHRONIZER UP POSITION
- DN SYNCHRONIZER DOWN POSITION

VARIABLE RESISTERS

- PD VC1 (TREADLE UNIT)

SOLENOID OUTPUTS (PRESS THE D-KEY TO CHECK)

- OAO TRIMMER
- OBO WIPER
- OCO CONDENSED STITCH
- ODO TENSION RELEASE
- OFO PRESSER FOOT

OTHER

- WT WATTAGE DISPLAY
- VL VOLTAGE DISPLAY
- TP TYPE OF CONTROL BOX
- T DISPLAY OF CURRENT MACHINE TYPE SELECTED

21 Error Display

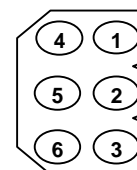
When the control box detects an error, the error code is flickered on the operation panel display. Confirm the error code, and investigate with the following table.

Error code	Probable cause	Inspection
P8rof	8A fuse in control box broken. Is the power voltage too low? Is the power supply capacity too small? <div style="border: 1px solid black; padding: 2px; margin-top: 5px;">Note : It does this display when power supply is turned OFF, but this is not an error.</div>	Replace the 8A fuse. Check the power voltage. Check the power supply capacity.
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	Is the power voltage too high? Is the sewing machine inertia too high?	Check the power voltage. Lengthen the deceleration time. (Refer to DC in [A] mode.)
E3	Is the sewing machine locked? Is the motor locked?	Check the sewing machine. Check the motor.
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. Removes a noise source.
E8	Is the position detector connector securely inserted? Are the signals from the detector correct? (UP/ DOWN signal interruption)	Check the detector connector insertion. Check the detector UP/ DOWN signals. (Refer to [E] mode.)
E9	Is the solenoid wiring short-circuited? Solenoid defect (coil defect)	Check the solenoid wiring. Replace the solenoid.
E50	It is a CPU error of the encoder.	Replace the motor.
E52	It is a data error of the encoder.	Replace the motor.
M53	It is temperature error of the encoder. (When the temperature of the encoder becomes 100••10 second or more.) e	Reduce the load of motor. Replace the motor.
M58	The encoder connector is not firmly inserted. The signal from the encoder is disconnected.	Check the insertion of the connector. Check the signal of the encoder.
M5	A error of the copy mode using the control panel. Is the control panel connector securely inserted? The voltage or the type of control panel is difference.	Check the connector insertion. Check the voltage and the type are right.
M56	It is a battery error for the encoder. (The function [PL] is only at the time of the LE setting.) (When the battery residual quantity becomes 2.5±0.1V or less.) n <div style="border: 1px solid black; padding: 2px; margin-top: 5px;">Note : Being long, when a control box and a motor aren't connected, even if the battery voltage is normal, this error is sometimes displayed. Before battery exchange, re-set a stop position [UP] by the L mode. After re-setting, too, when this error is displayed, exchange a battery.</div>	Check the installation of the battery. Replace the battery. (When this error is displayed, the stop position [UP] setting data becomes invalid. Once again, set a stop position [UP] by the L mode.)
M57	It is a battery alarm for the encoder. (The function [PL] is only at the time of the LE setting.) (When the battery residual quantity becomes 2.9±0.1V or less.) n	Check the installation of the battery. Replace the battery.
Others	Probable cause	Inspection
The sewing does not run when the pedal pressed.	Is the lever unit connector securely inserted? Are the operation signals (S1) from the lever unit broken?	Check the lever unit connector insertion. Check the lever unit signal. (Refer S1 signal, [E] mode.)
The sewing machine does not run at the high speed.	It does not displayed 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 item 9.3.)
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 ON?	Check the signal S2. (Refer [E] mode.) Set S2L to OFF. (Refer [P] mode.)
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.)

OPTION CONNECTORS FOR XC-HMFY

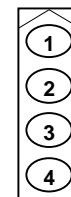
LEVER

SIGNAL NAME	FACTORY SETTING	PIN
0V	0V	1
IN-G	S1 : Run (Variable speed)	2
IN-H	S2 : Thread trimming	3
IN-I	S3 : Presser foot lifter	4
VC	VC : Variable speed command	5
+12V/(5V)	+12V	6



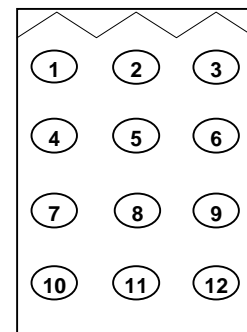
PRESSER FOOT

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



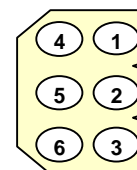
SEWING MACHINE

Ground	Ground	1
OUT-B	W : Wiper output	2
+24V/ +30V	+24V/ +30V	3
OUT-A	T : Thread trimming output	4
0V	0V	5
IN-D	TL : Thread trimmer cancel input	6
OUT-D	L : Thread release output	7
+24V/ +30V	+24V/ +30V	8
IN-E	S7 : Backstitch input	9
0V	0V	10
+24V/ +30V	+24V/ +30V	11
OUT-C	B : Backstitch output	12



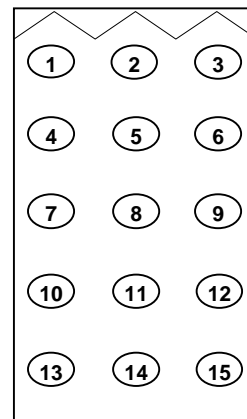
OPTION A

0V	0V	1
IN-A	PSU: Up position stop input	2
+12V/(+5V)	+12V	3
IN-B	PSD: Down position stop input	4
CKU	CKU : Up position output	5
IN-C/(CKD)	S0: Low speed input	6



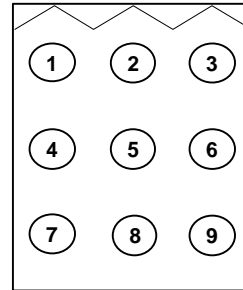
OPTION B

0V	0V	1
IN-4	No setting	2
OUT-1	OT1 : Virtual output	3
VC2	VC2 : Variable speed command	4
OUT-5/ IN-5	No setting	5
IN-1	IO1:Virtual input	6
+5V(12V)	+5V	7
+24V/ +30V	+24V/ +30V	8
IN-2	U: Needle lift signal	9
0V	0V	10
+24V/ +30V	+24V/ +30V	11
OUT-2	NCL : Needle cooler output	12
OUT-7/ IN-7	No setting	13
IN-6	No setting	14
OUT-3	TF : " TF" output	15



NOTE: PIN NUMBER 3, 12, AND 15 ARE FOR SOLENOID OUTPUT.

OPTION C		PIN
OK	NO SETTING	1
OO	NO SETTING	2
OJ	NO SETTING	3
O6	NO SETTING	4
O4	NO SETTING	5
24V 30V 12V	24V 30V	6
24V 30V 12V	24V 30V	7
24V 30V 12V	24V 30V	8
24V 30V 12V	24V 30V	9

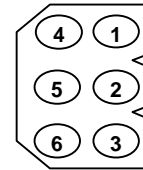


THESE OUTPUTS ARE FOR AIR VALVE TYPE. MAX. 300MA

OPTION CONNECTORS FOR XC-HMFY

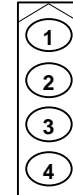
LEVER

SIGNAL NAME	FACTORY SETTING	PIN
0V	0V	1
IN-G	S1 : Run (Variable speed)	2
IN-H	S2 : Thread trimming	3
IN-I	S3 : Presser foot lifter	4
VC	VC : Variable speed command	5
+12V/ (5V)	+12V	6



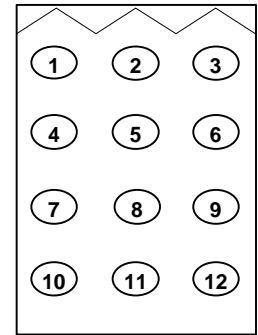
PRESSER FOOT

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



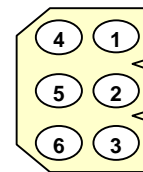
SEWING MACHINE

Ground	Ground	1
OUT-B		2
+24V/ +30V	+24V/ +30V	3
OUT-A		4
0V	0V	5
IN-D		6
OUT-D		7
+24V/ +30V	+24V/ +30V	8
IN-E		9
0V	0V	10
+24V/ +30V	+24V/ +30V	11
OUT-C		12



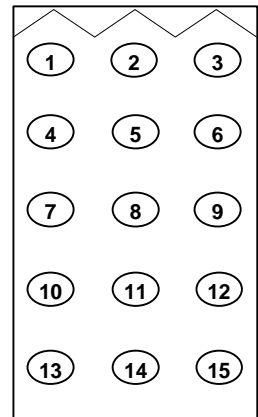
OPTION A

0V	0V	1
IN-A		2
+12V/ (+5V)	+12V	3
IN-B		4
CKU		5
IN-C/ (CKD)		6



OPTION B

0V	0V	1
IN-4		2
OUT-1		3
VC2	VC2 : Variable speed command	4
OUT-5/ IN-5		5
IN-1		6
+5V(12V)	+5V	7
+24V/ +30V	+24V/ +30V	8
IN-2		9
0V	0V	10
+24V/ +30V	+24V/ +30V	11
OUT-2		12
OUT-7/ IN-7		13
IN-6		14
OUT-3		15

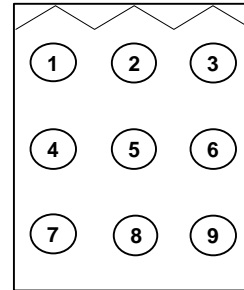


NOTE: PIN NUMBER 3, 12, AND 15 ARE FOR SOLENOID OUTPUT.

OPTION C

PIN

OPTION C		PIN
OK		1
OO		2
OJ		3
O6		4
O4		5
24V 30V 12V	24V 30V	6
24V 30V 12V	24V 30V	7
24V 30V 12V	24V 30V	8
24V 30V 12V	24V 30V	9



THESE OUTPUTS ARE FOR AIR VALVE TYPE. MAX. 300MA

HOW TO TURN ON AN OUTPUT AT TREADLE TOE DOWN

THE CONTROL BOX IS ALREADY SET UP TO DO THIS FUNCTION WITHOUT ANY CHANGES

FOR THE WIRING, PUT THE 2 WIRES FROM THE SOLENOID YOU ARE USING INTO PINS 11 AND 12 ON THE OPTION B PLUG.

REFER TO THE CONNECTOR LAY-OUT PAGE

HOW TO WIRE UP A SENSOR TO STOP THE MOTOR

THE INPUTS ON THE CONTROL BOX ARE A SINKING TYPE, MAX. 40MA, 5 OR 12 VDC

ALL SENSORS WILL USUALLY HAVE 3 WIRES

POWER WILL USUALLY BE A RED OR BROWN WIRE
0-VOLT WILL USUALLY BE A BLACK OR BLUE WIRE
SIGNAL WILL USUALLY BE A WHITE OR BLACK WIRE

MOST SENSORS HAVE THE COLOR CODES AND OPERATING VOLTAGES ON THEM

ON THE OPTION A PLUG

0-VOLT TO PIN 1
SIGNAL TO PIN 2
POWER TO PIN 3

REFER TO THE CONNECTOR LAY-OUT PAGE

IN THE P-MODE, SET PSU TO THE NUMBER OF STITCHES YOU WANT (0-99) UNTIL THE MOTOR STOPS

NOTE: IF THE SENSOR WORKS IN REVERSE, YOU MAY HAVE A LIGHT OR DARK OPERATE MODE SWITCH ON YOUR SENSOR, IF NOT GO TO THE C-MODE (↓ + C) AND CHANGE IAL FROM OF TO ON

BACKUP OF PARAMETER DATA

1. WITH THE POWER OFF, PRESS AND HOLD IN THE ↓- KEY AND THEN POWER UP
 2. PRESS AND HOLD IN THE ↓ + A + B + D- KEYS UNTIL THE DISPLAY STOPS FLASHING
DISPLAY WILL SHOW “BAKUP”
 3. PRESS AND HOLD IN THE D-KEY UNTIL THE DISPLAY STOPS FLASHING
- NOW WHEN DOING A CONTROL BOX RESET, THE BACKED UP PARAMETERS WILL BE READ

XC-E500-Y

TO MAKE THE XC-E500-Y DISPLAY THE SAME AS THE XC-HMFY

1. PRESS AND HOLD THE STEP-KEY

STEP
↓

 THEN PRESS THE F-KEY

F

2. **NOTE:** INPUT LAMP

INPUT

 MUST BE OFF

TO RETURN TO THE NORMAL XC-E500-Y DISPLAY

1. PRESS AND HOLD THE F-KEY

F

 THEN THE STEP KEY

STEP
↓

TO TRANSFER DATA FROM THE XC-HMFY TO THE XC-E500-Y

1. WHILE PRESSING THE ABCD-KEY

ABCD

 TURN ON THE POWER
2. DISPLAY WILL SHOW (READ)
3. PRESS THE F-KEY

F

4. TRANSFER IS COMPLETE WHEN THE NORMAL DISPLAY OF THE XC-E500-Y APPEARS

TO TRANSFER DATA FROM THE XC-500-Y TO THE XC-HMFY

1. WHILE PRESSING THE N-KEY

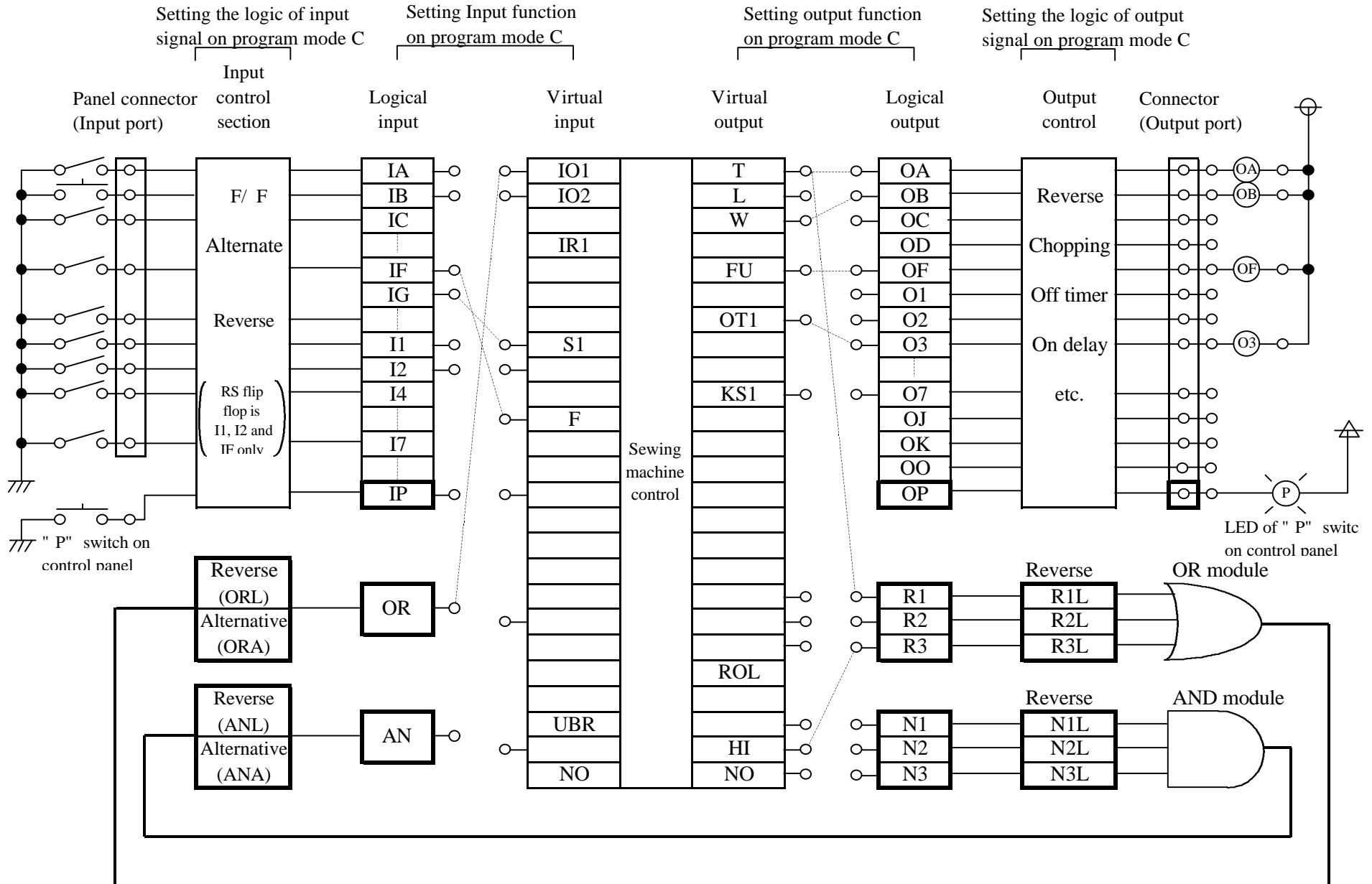
↑
N

 TURN ON THE POWER
2. DISPLAY WILL SHOW (WRITE)
3. PRESS THE F-KEY

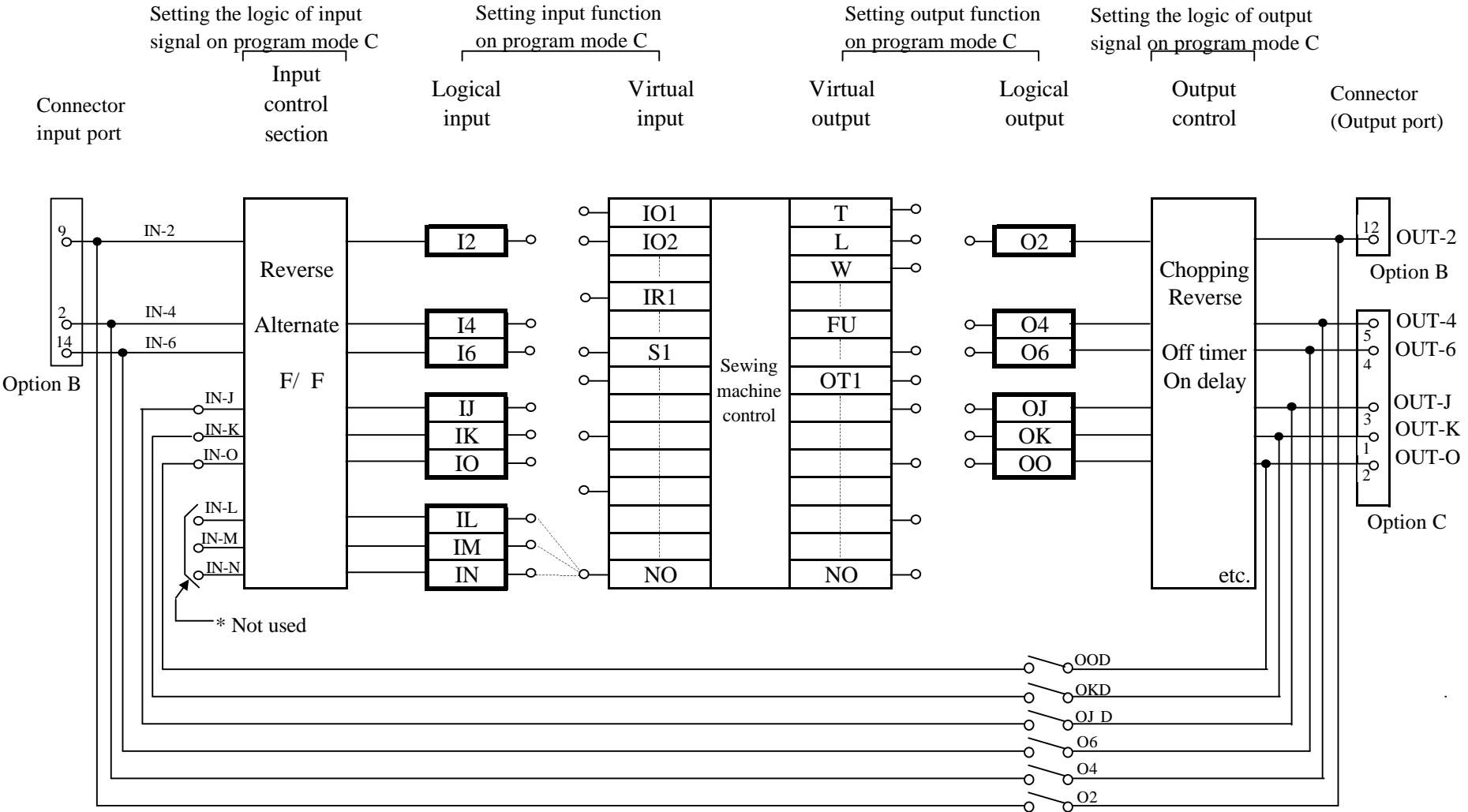
F

4. TRANSFER IS COMPLETE WHEN THE NORMAL DISPLAY OF THE XC-E500-Y APPEARS

1. Input and output customization



2. Coupling output signal with input inside control unit function



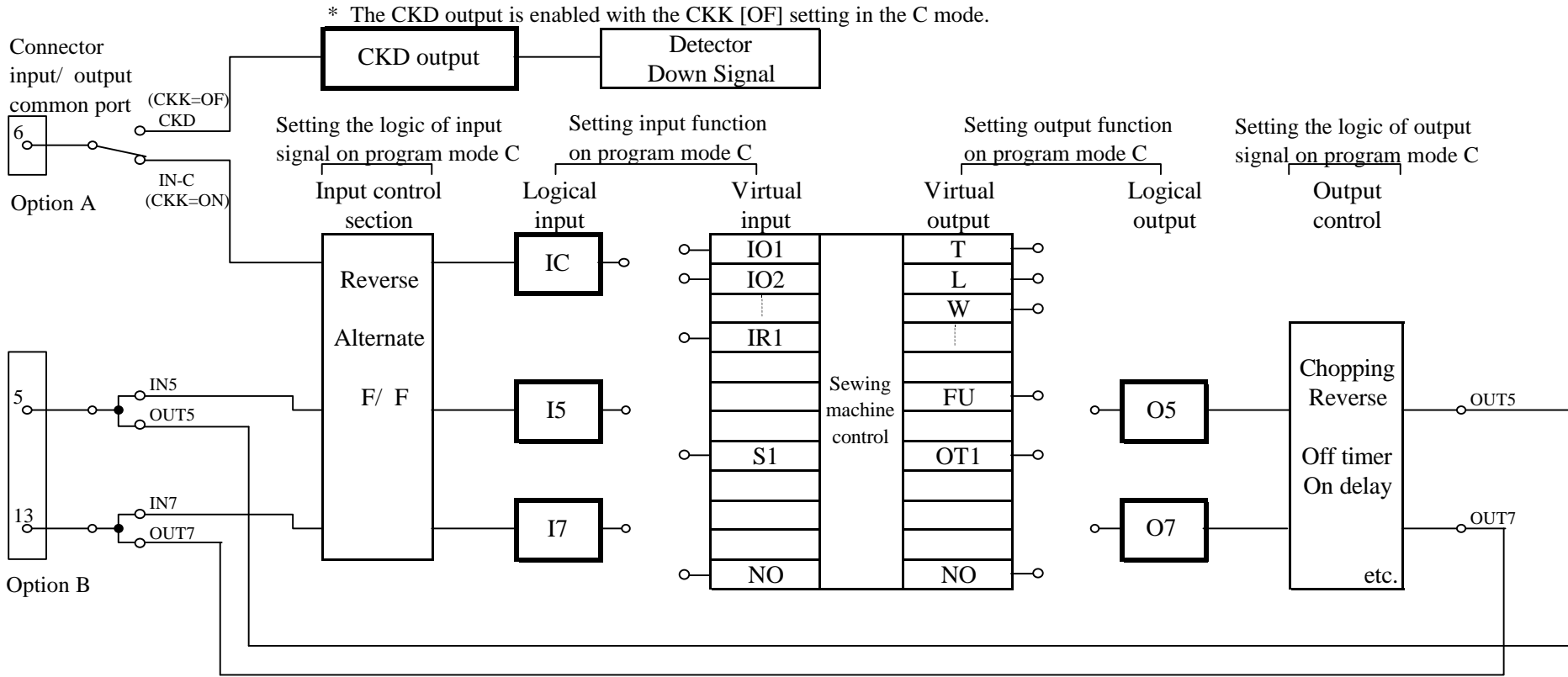
* The factory settings of the input function settings [I4], [I6], [IJ], [IK], [IO] and [IL], [IM], [IN] are all [NO].

* The factory setting of the output function settings [O4], [O6], [OJ], [OK], [OO] are all [NO].

* The input function settings [IL], [IM], [IN] must not be used with the default setting [NO].

* It can be set with the O*D [ON] setting in the **S mode**.
(Refer to the **TECHNICAL INRORMATION MANUAL.**)

3. Connector input/output common port



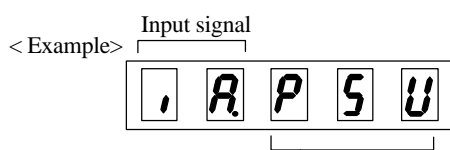
Note) Option B connector input/ output common port

When changing the input/ output, set the output side to [NO] to use the port for inputs and set the input side to [NO] to use the port for outputs. The default settings are all [NO].
 (For example, if the option B connector No.5 pin is to be set to input, set the OUT5, or [O5] function to [NO], and set the required input function in IN5, or [I5] function.)

The above input/ output common port is connected internally, so if a function other than [NO] is set on both the input side and output side, the output side setting will affect the input side.

18 Table of input/ output function for signal on C mode

C mode input signal setting table



No.	Setting name	Setting value		Specification
			Digital display	
1	Nothing signal	NO	⏏	The sewing machine will do nothing even if input NO is turned ON.
2	Low speed run signal	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	⏏	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 operation panel when the automatic operation AT is ON input S1 at the time of ON.
4	Medium speed run signal	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	⏏	If input S4 is turned ON, the sewing machine will run at the speed set in high speed H.
6	Stop position random run signal	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	⏏	If input COR is turned ON, correction stitching will be performed at the speed set in low speed L.
8	Thread trimmer signal	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	⏏	If input S01 is turned ON, 1 stitch operation will start.
10	Needle lift signal	U	⏏	If input U is turned ON, the needle lift operation will start.
11	Half-stitch signal	UD	⏏	If input UD is turned ON, half-stitch operation will start.
12	Constant angle [reverse run/ forward run] signal	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	⏏	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 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	⏏	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	⏏	If input UF is turned ON, the presser foot will lift after needle lifting.

Note 1
↓

↑
Note 2

Note 1. 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.

18. Table of input/ output function for signal on C mode

No.	Setting name	Setting value		Specification
			Digital display	
	Presser foot lifter signal	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 92 page.
Note 1	Presser foot lifter signal	F	☐ ☐	If input F is turned ON, the presser foot lifter operation will start.
	Needle UP position priority stop signal	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 91 page.
	Needle DOWN position priority stop signal	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 PSD the [P] mode of 91 page.
	Emergency stop signal	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.
	One shot signal	SH	☐ ☐ ☐	If input SH is turned ON, one shot operation will start. The operation mode set in [P] mode SHM function will be entered .
	Reverse run signal	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.
	Thread trimmer protection signal	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.
Note 2	Thread trimmer cancel signal	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 TL of [D] mode signal is turned ON a little time and TLS setting is ON, next thread trimming is prohibited at once.
	Low speed signal	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.
	Medium speed signal	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.
	End tacking speed signal	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.
	High speed signal	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.
	Variable speed signal	SPV	☐ ☐ ☐ ☐	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.
	Tacking cancel signal	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 at once.
	Start tacking cancel signal	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 at once.

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

18. Table of input/ output function for signal on C mode

No.	Setting name	Setting value		Specification
			Digital display	
32	End tacking cancel signal	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 at once.
33	Backstitching during run signal	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	Ⓔ Ⓒ Ⓔ	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	Ⓔ Ⓔ	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	Ⓔ Ⓔ Ⓕ	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	Ⓔ Ⓒ Ⓕ	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.
38	Backstitching signal when running	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	Signal output to virtual output 1	IO1	Ⓕ Ⓒ Ⓕ	If input IO1 is turned ON, output OT1 will always be turned ON.
40	Signal output to virtual output 2	IO2	Ⓕ Ⓒ Ⓖ	If input IO2 is turned ON, output OT2 will always be turned ON.
41	Signal output to virtual output 3	IO3	Ⓕ Ⓒ Ⓔ	If input IO3 is turned ON, output OT3 will always be turned ON.
42	Signal output to virtual output 1 during operation	IR1	Ⓕ Ⓕ Ⓕ	If input IR1 is turned ON, output OT1 turns ON only when the sewing machine is running.
43	Signal output to virtual output 2 during operation	IR2	Ⓕ Ⓕ Ⓖ	If input IR2 is turned ON, output OT2 turns ON only when the sewing machine is running.
44	Signal output to virtual output 3 during operation	IR3	Ⓕ Ⓕ Ⓔ	If input IR3 is turned ON, output OT3 turns ON only when the sewing machine is running.
45	Signal output to virtual output 1 when stopped	IS1	Ⓕ Ⓔ Ⓕ	If input IS1 is turned ON, output OT1 turns ON only when the sewing machine is stopped.
46	Signal output to virtual output 2 when stopped	IS2	Ⓕ Ⓔ Ⓖ	If input IS2 is turned ON, output OT2 turns ON only when the sewing machine is stopped.
47	Signal output to virtual output 3 when stopped	IS3	Ⓕ Ⓔ Ⓔ	If input IS3 is turned ON, output OT3 turns ON only when the sewing machine is stopped.
48	Thread trimmer output confirmation signal	TON	Ⓕ Ⓒ Ⓕ	The thread trimmer output T can be turned ON or OFF only when the sewing machine is stopped. (Thread trimmer solenoid confirmation signal)
49	Needle cooler output during rotation forced [OFF] signal	NCL	Ⓕ Ⓒ Ⓕ	If input NCL is turned ON, the needle cooler output NCL during sewing machine rotation will forcibly be turned OFF.

Note 1

Note 2

Note 1. 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.

18. Table of input/ output function for signal on C mode

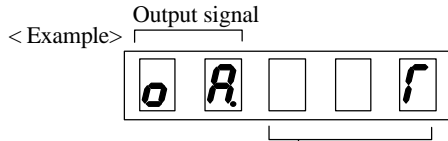
No.	Setting name	Setting value		Specification
			Digital display	
50	1 position priority signal	P12	1 2	1 position will be set forcibly.
51	Weak brake [ON] signal	BK	1 2	If input BK is turned ON, the weak brake will turn ON. Use this with the BK of the [D] mode set to [OF].
52	Sensor input signal	SEN	1 2 3	This is the cloth edge sensor input.
53	Wiper output cancel signal	WL	1 2	If input WL is turned ON, the wiper output W will not be output.
54	Slow start signal	SL	1 2	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].
55	Preset stitching forced [ON] signal	N	1 2	If input N is turned ON, preset stitching will start forcibly from that point.
56	Continuous tack stitching forced [ON] signal	CBT	1 2 3	If input CBT is turned ON, continuous backstitching will start forcibly from that point.
57	Non-stitching feed input	FWD	1 2 3	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.
58	End tacking speed run signal	S5V	1 2 3	If input S5V is turned ON, the sewing machine will run at the speed set in end tacking speed V.
59	Up counter clear signal	CCU	1 2 3	If input CCU is turned ON, it clears an up counter in [0].
60	Thread break detector input signal	THI	1 2 3	It is possible to use as the input signal of thread break detector.
61	Signal output to virtual output 4	IO4	1 2 3	If input IO4 is turned ON, output OT4 will always be turned ON.
62	Signal output to virtual output 5	IO5	1 2 3	If input IO5 is turned ON, output OT5 will always be turned ON.
63	Down counter clear signal	CCD	1 2 3	If input CCD is turned ON, it clears an down counter in [the setting value].
64	Signal output to virtual output 6	IO6	1 2 3	If input IO6 is turned ON, output OT6 will always be turned ON.
65	Signal output to virtual output 7	IO7	1 2 3	If input IO7 is turned ON, output OT7 will always be turned ON.
66	Signal output to virtual output 8	IO8	1 2 3	If input IO8 is turned ON, output OT8 will always be turned ON.
67	Signal output to virtual output 9	IO9	1 2 3	If input IO9 is turned ON, output OT9 will always be turned ON.

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18. Table of input/ output function for signal on C mode

C mode output signal setting table



No.	Setting name	Setting value		Specification
			Digital display	
	Output for slow start	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.
Note 1	Run output 1	OP		OP output is turned ON while the sewing machine is running (not including needle lifting during thread trimming) .
	Run output 2	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.
	Run output 3	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.
	Output for run signal	S1		S1 output is turned ON when the run signal is ON except during on 1 stitch sewing.
	Output for blower	VAC		VAC output is turned ON during pedal full heeling or while thread trimmer signal S2 is ON.
	Output for needle cooler	NCL		NCL output is turned ON while the sewing machine is running (including needle lifting).
	Output for vacuum signal	VCM		VCM output is turned ON during pedal full heeling or while thread trimmer signal S2 is ON while the sewing machine is stopped.
	Output for signal during tacking	BT		BT output is turned ON during tacking.
	Roller lift output	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.
	Thread trimmer output	T		Thread trimming starts.
	Thread release output	L		Thread release operation starts.
	Wiper output	W		Wiper operation starts.
Note 2	Backstitch output (Condensed stitch)	B		Backstitching (reverse feed) starts. (Condensed stitch)
	[CH2] output	CH		CH2 output for chain stitches.
	[TF] output	TF		TF output for chain stitches. Refer to page 130 for the output timing.
	[KS1] output	KS1		Behind operation signal ON, KS1 output is turned ON after the setting delay time. Refer to " Output KS1, KS2, KS3 timing" .
	[KS2] output	KS2		After the motor stopped, KS2 output is turned ON after the setting delay time. Refer to " Output KS1, KS2, KS3 timing" .
	[KS3] output	KS3		After trimming and stopped up position, KS3 output is turned ON after setting delay time. Refer to page 130 for the output timing.
	[TB] output	TB		TB output for chain stitches. Refer to " Output TB, TF timing" .
	Presser foot lifter output	FU		Presser foot lifter operation starts. The operation mode set in the [P] mode FUM function and FU function will be entered.

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18. Table of input/ output function for signal on C mode

No.	Setting name	Setting value		Specification
			Digital display	
22	Output for UP position when stopped	UC	U C	UC output is turned ON if at the needle UP position when the sewing machine is stopped.
23	Needle UP position output	UPW	U P W	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.
24	Needle DOWN position output	DNW	D N W	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.
25	Virtual output 1	OT1	O T 1	OT1 output is turned ON according to each input specifications while inputs IO1, IR1 and IS1 are ON.
26	Virtual output 2	OT2	O T 2	OT2 output is turned ON according to each input specifications while inputs IO2, IR2 and IS2 are ON.
27	Virtual output 3	OT3	O T 3	OT3 output is turned ON according to each input specifications while inputs IO3, IR3 and IS3 are ON.
28	Output for error occurrence confirmation	ERR	E R R	This is output when an error occurs. (Note that this is not output when error code E9 occurs.)
29	Output for power [OFF] confirmation	IPF	I P F	Not used.
30	[OT4]output	OT4	O T 4	OT4 output is turned ON according to each input specification while input IO4 is ON.
31	[OT5]output	OT5	O T 5	OT5 output is turned ON according to each input specification while input IO5 is ON.
32	Puller output	PUL	P U L	PUL output is turned ON during the presser foot lifter operation, during the IO2 output is ON.
33	Count up output	CUP	C U P	When +1 up counter does, the [CUP] output is turned on.
34	Thread break detector output	THO	T H O	When detecting thread break detector, THO output is turned ON. (When re-operation, the signal is turned off.)
35	Vacuum output for holding thread	FUW	F U W	FUW output is turned ON during the presser foot lifter operation or during wiper operation.
36	Always ON output	HI	H I	In case of the power on, [HI] output is always ON.
37	[NO] output	NO	N O	Nothing is output.
38	[CUE] output	CUE	C U E	This output becomes ON when Up-counter becomes end. This output becomes OFF when "CCU" input is turned on.
39	[CDE] output	CDE	C D E	This output becomes ON when Down-counter becomes end. This output becomes OFF when "CCD" input is turned on.
40	[OT6]output	OT6	O T 6	OT6 output is turned ON according to each input specification while input IO6 is ON.
41	[OT7]output	OT7	O T 7	OT7 output is turned ON according to each input specification while input IO7 is ON.
42	[OT8]output	OT8	O T 8	OT8 output is turned ON according to each input specification while input IO8 is ON.
43	[OT9]output	OT9	O T 9	OT9 output is turned ON according to each input specification while input IO9 is ON.

Note 1



Note 2

- Note 1. 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.

