LUNA－LCO
LUNA－LSP/SSP

Operation and Maintenance Manual

Thank you for purchasing the LUNA.
Read these instructions thoroughly for proper use of this machine.
Make sure to read "Safety Notes" before you use machine.
This information protects you from possible dangers during use.

Apollo Seiko Ltd.

Rev. 1.40E

Safety Notes

- This manual includes the important information to use machine safely. It also includes useful information to prevent avoiding injury or damaging property. Please read this manual carefully prior to connecting or operating the LUNA.
- Keep this manual nearby the machine all the time.

Supply only specified voltage

- Do not connect to a power supply greater than the specified voltage. If not, electrical shock and /or damage to the unit may occur.
- Make sure that the electrical outlet is properly grounded. If the outlet is not properly grounded, electrical shock and/or damage to the unit may occur.

Working ambient temperature and relative humidity

- This machine have been designed to use between 0 - 40 degree C、10% - 90%.
  Do not use this machine under the condition exceeding here-in.

Handle with care

- This machine is designed to use solder feeder and heating iron for soldering.
- If you touch a heated soldering iron, it will burn yourself. So, make sure the iron is cool down before you are touching it for replacing the iron cartridge.
- Please handle this machine with care. If you drop or make a big impact / vibration, it may cause malfunction.

If you do not use the machine for a long time

- Please turn off the power, remove the power cable and keep it in dry and cool place.

If you note malfunction on machine

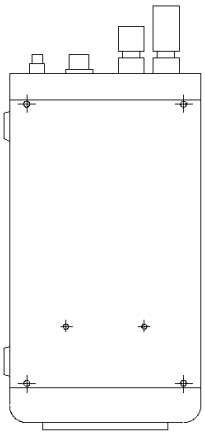
- If the machine become a malfunction, turn off the power immediately and contact a dealer you purchased machine from.

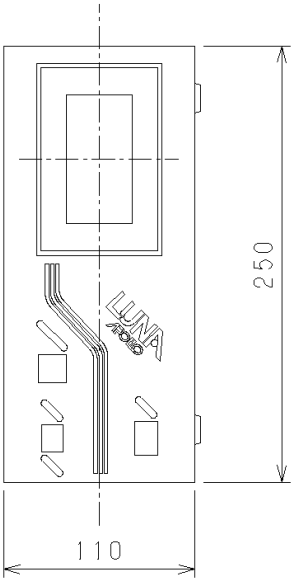
Immunity from responsibility

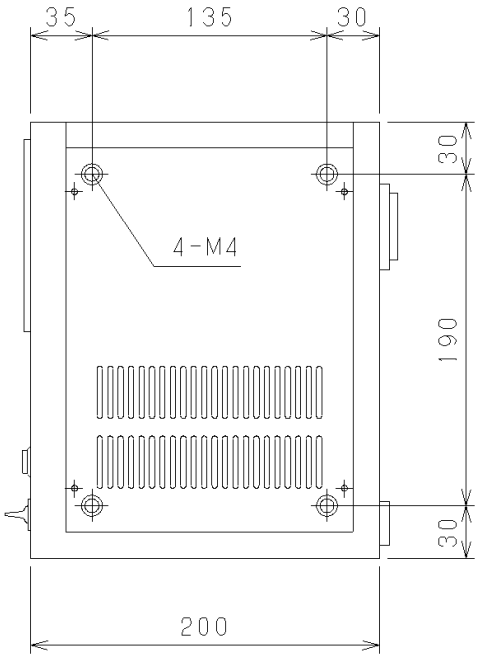
- We do take NO responsibility on a damage caused by misuse, mistake, accident, uses in abnormal condition or natural disaster such as an earthquake, a fire etc.
- We do take NO responsibility on contingency loss（Business loss、Business stop）caused by machine stop.
- We do take NO responsibility on a loss caused by the operation not mentioning on this manual.
- We do take NO responsibility on a loss caused by a wrong connection with other equipment.
- If for any reason the internal circuitry is tampered with altered or repaired without written consent of Apollo Seiko, the warranty is null and void. The customer is allowed to make necessary tooling adjustment, replace solder iron tips and make any necessary adjustments to the temperature controller.

Contents

1. Luna Dimensions







Note:
The fixing side plate for Luna can be set in the opposite side, removing four set screw.

2. Summary of LUNA

The LUNA can be used as a standalone or combined with a robotic system. This LUNA model incorporated of the Touch Panel which achieves user friendly programming and the operation.
The high power bye-polar drive stepping motor ensures high accuracy solder feeding.

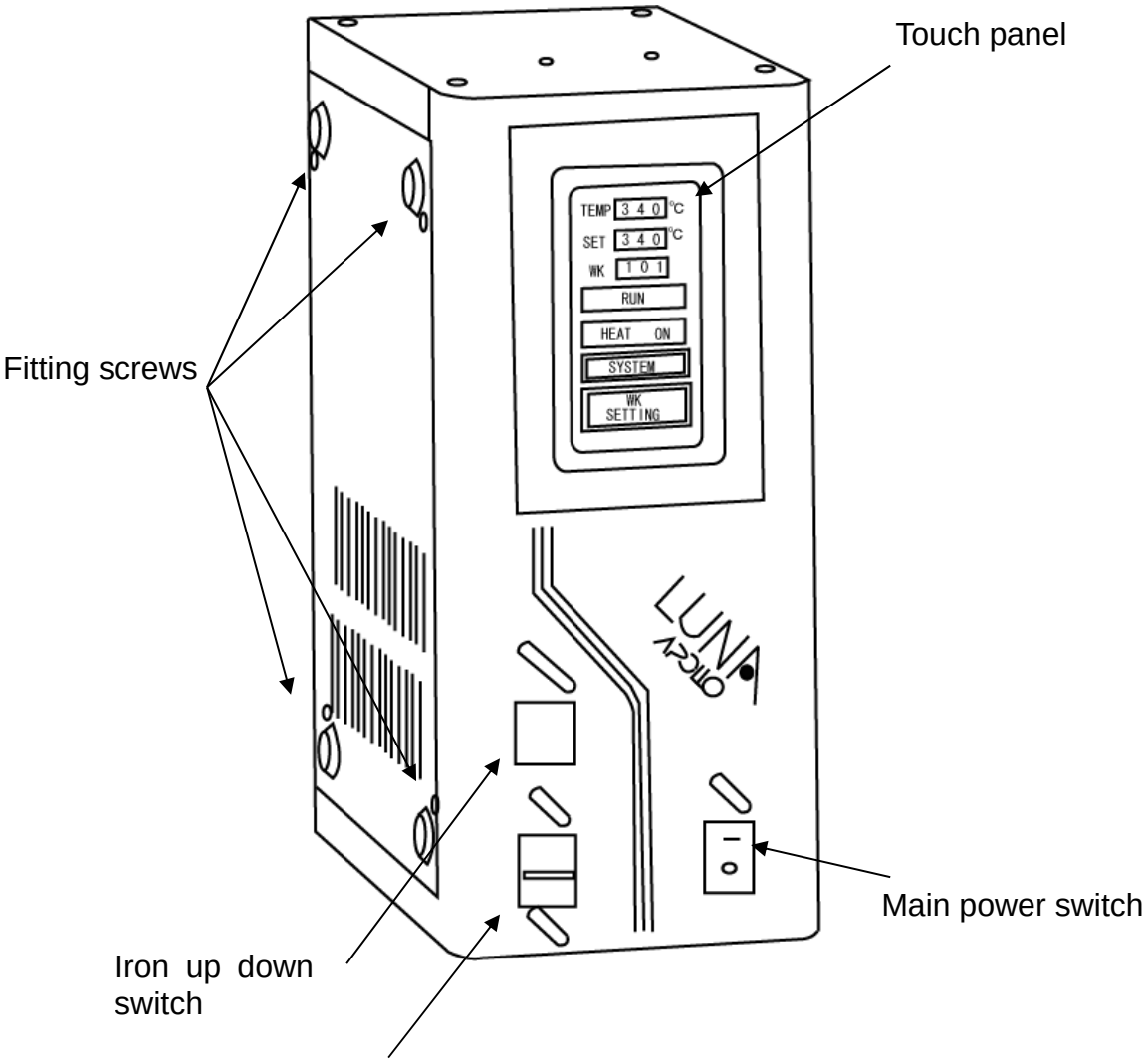
A large selection of iron tip profile is available to address virtually all applications.

Model:

LUNA-LCO	Lengthways display and the feeder combined
LUNA-LSP	Lengthways display and the feeder separate
LUNA-SSP	Sideways display and the feeder separate

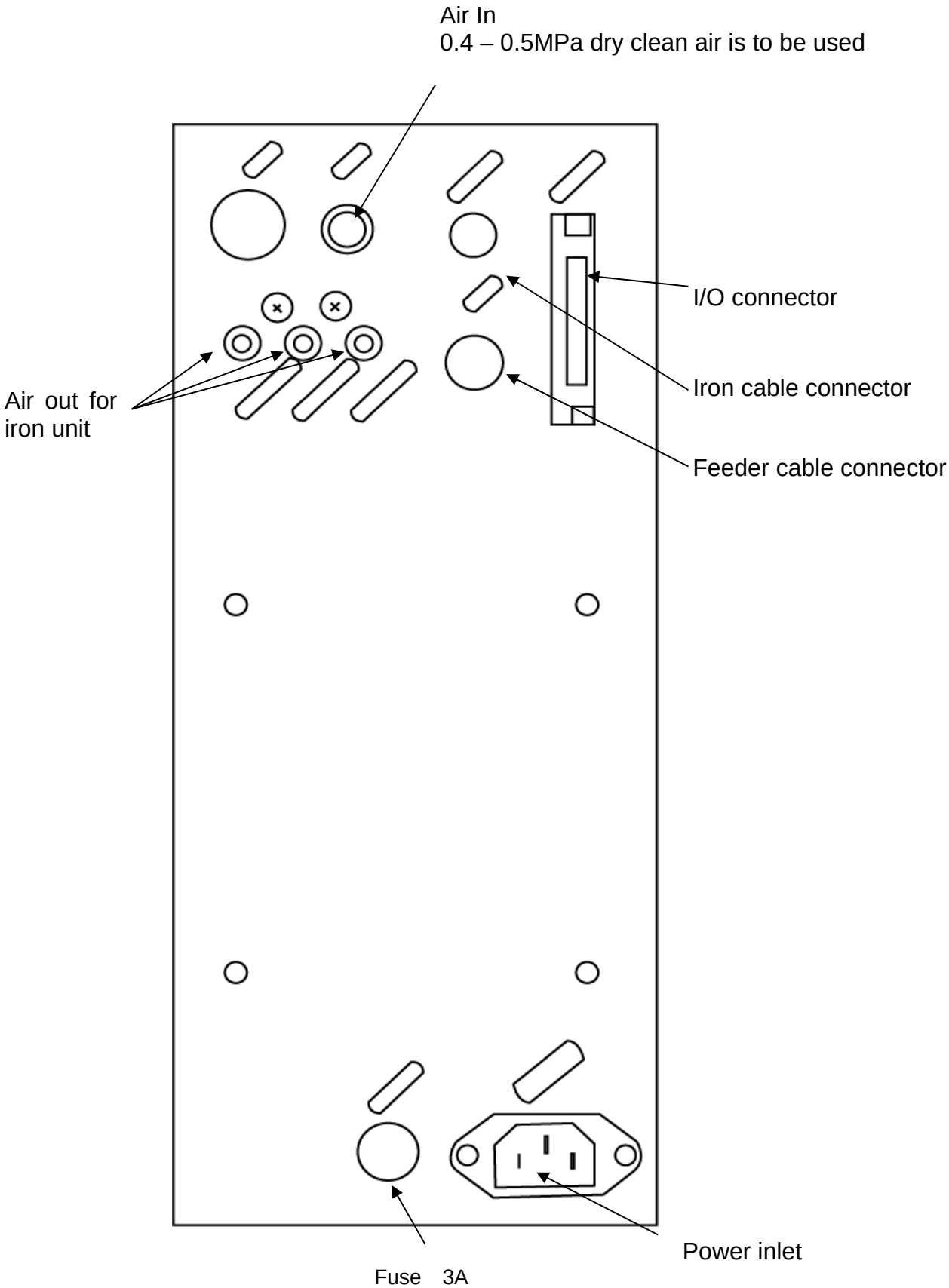
3. Description

Lengthways display:



4. Preparation

A) Connect the power supply, air supply, iron cable, feeder cable and iron unit air hoses to the back pane of Luna unit. Note that supply air must be clean and dry to avoid breaking down. The air pressure should be 0.4 - 0.5MPa.



5. How to program

A) Turn the power on.
B) Please wait a while until the touch screen turns green color of the operation screen. If it does not change to green color, check air supply and the heater.
C) The Wk setting for soldering and the system parameter can be altered from the original screen.
D) Refer to the factory setting and change the value accordingly.

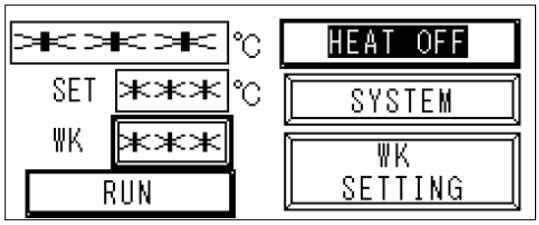
L Type:

Operation Screen

Display	Operation
TEMP	Show the temperature of iron tip
SET	Show the value of preset temperature. It can change by pressing the value
WK	Show the WK No. It can change by pressing the value
RUN / STOP	Running cycle once. When showing “STOP” press it, then cycle operation will stop
HEAT OFF / ON	Turn OFF/ON of iron heater
SYSTEM	Change the display to system parameter setting
WK SET	Change the display to WK setting

S Type :

Operation Screen



WK setting

WK101-104	STEP/Command	Initial setting		Adjustable range	
Point	STEP1 S+	6.0mm	SP50	0-99.9mm	SP0.1-99.9
	STEP2 S-	3.0mm	SP50	0-99.9mm	SP0.1-99.9
	STEP3 CY1	ON	1sec		0-99.9sec
	STEP4 S+	7.0mm	SP10	0-99.9mm	SP0.1-99.9
	STEP S-	3.0mm	SP50	0-99.9mm	SP0.1-99.9
	STEP6 TIM	1.0sec			0-99.9sec
	STEP7 CY1	OFF	0sec		0-99.9sec
	STEP8 S+	0mm	SP50	0-99.9mm	SP0.1-99.9
	STEP9 S-	0mm	SP50	0-99.9mm	SP0.1-99.9

WK201-203	STEP/Command	Ini ial setting		Adjustable range	
Slide	STEP1 S+	6.0mm	SP50	0-99.9mm	SP0.1-99.9
	STEP2 S-	3.0mm	SP50	0-99.9mm	SP0.1-99.9
	STEP3 CY1	ON	1sec		0-99.9sec
	STEP4 ACK	0.5sec			0-99.9sec
	STEP5 S+	20.0mm	SP0.1	0-99.9mm	SP0.1-99.9
	STEP6 S+	0 m	SP10	0-99.9mm	SP0.1-99.9
	STEP7 S-	3.0mm	SP50	0-99.9mm	SP0.1-99.9
	STEP8 TIM	1.0sec			0-99.9sec
	STEP9 CY1	OFF	0sec	0	0-99.9sec

WK100	STEP/Command	Initial setting		Adjustable range	
Cleaning	STEP1 CYON	1.0sec			0-99.9sec
	STEP2 AIR	0 sec			0-99.9sec
	STEP3 TIM	0.5sec			0-99.9sec
	STEP4 CYOFF	0 sec			0-99.9sec

Explanation of soldering WK Command
WK parameter command description
Tip cleaning WK100

Step/ Command	Name	Description
STEP1 CYON	Extend Air cylinder (timer)	Standby time after cylinder extend Normally input is “0”.
STEP2 AIR	Air Blow Timer	Air blow time when the iron tip cleaning is carried out using an air blow nozzle. The size of the tip, the shape varies, typically 0.3sec ~ 1.0sec.
STEP3 TIM	Timer	Standby Time for Used the sponge roller cleaner
STEP4 CYOFF	Retract Air Cylinder (timer)	Standby time after cylinder retract Normally input is “0”.

Point soldering WK101~WK104

Step/ Command	Name	Description
STEP1 S+	1st Solder Forward	Solder feeding Amount and speed with iron tip retracts up Also known pre-solder. This objective is to conduct heat quickly put to work by a small amount of solder to the tip in advance.
STEP2 S-	1st Solder Reverse	Retracts the solder back away from the iron tip after 1st solder feed.
STEP3 CY1	Extend Air cylinder (timer)	Pre-heat time after iron tip extends down.
STEP4 S+	2nd Solder Forward	Solder feeding Amount and speed with iron tip extends down.
STEP5 S-	2nd Solder Reverse	Retracts the solder back away from the iron tip after 2nd solder feed.
STEP6 TIM	Reflow Timer	This tells the robot how long to leave the iron tip down to reflow the solder.
CY1	Retract Air Cylinder (timer)	Cylinder action and cylinder dwell time after retract. “OFF” iron tip retracts up. Normally is “OFF”. ”ON” iron tip never retracts up. Timer is standby time until it moves to the following point.
STEP7 S+	3rd Solder Forward	Solder feeding Amount and speed with iron tip extends down when CY1 setting is “ON”. After the end of solder, when re-flow time is long, the flux contained in solder may become inactivity, and may become solder sticking up. The 3rd solder is set up in order to prevent it.
STEP8 S-	3rd Solder Reverse	Retracts the solder back away from the iron tip after 3rd solder feed.

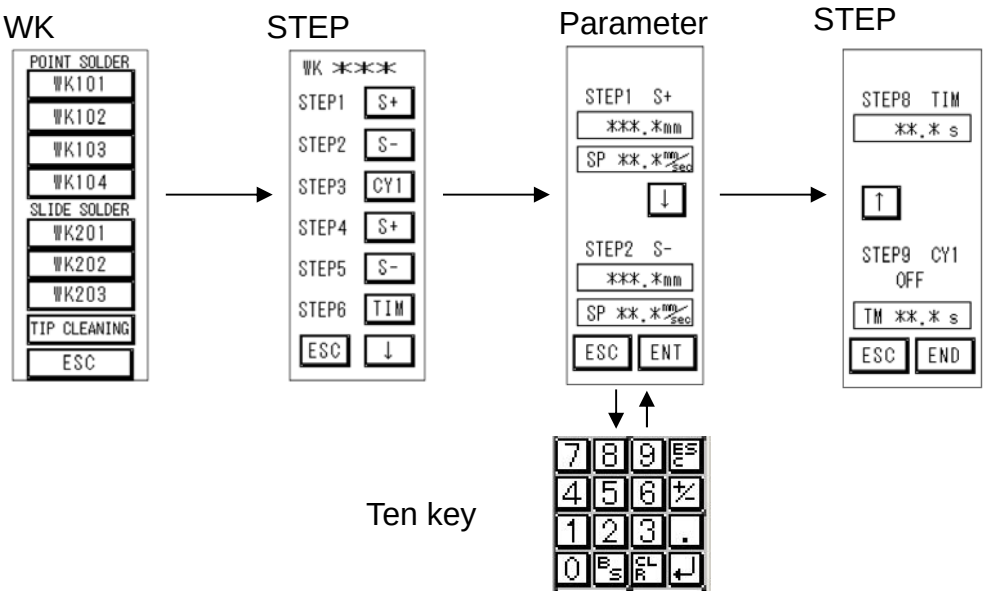
Slide soldering WK201~WK203

Step/ Command	Name	Description
STEP1 S+	1st Solder Forward	Solder feeding Amount and speed with iron tip retracts up Also known pre-solder. This objective is to conduct heat quickly put to work by a small amount of solder to the tip in advance.
STEP2 S-	1st Solder Reverse	Retracts the solder back away from the iron tip after 1st solder feed.
STEP3 CY1	Extend Air Cylinder (timer)	Pre-heat time after iron tip extends down.
STEP4 ACK	Acknowledge	Slide Solder Timing Sequence. Solder reservoir timer before slide soldering. Will Start slide that you enter the time delay.
STEP5 S+	2nd Solder Forward (1)	Solder feeding Amount and speed with iron tip extends down.
STEP6 S+	2nd Solder Forward (2)	Use to change the solder feeding speed on during the slide soldering.
STEP7 S-	2nd Solder Reverse	Retracts the solder back away from the iron tip after 2nd solder feed.
STEP8 TIM	Reflow Timer	This tells the robot how long to leave the iron tip down to reflow the solder.
STEP9 CY1	Retract Air Cylinder	Cylinder action and cylinder dwell time after retract. “OFF” iron tip retracts up. Normally is “OFF”. ”ON” iron tip never retracts up. Timer is standby time until it moves to the following point.

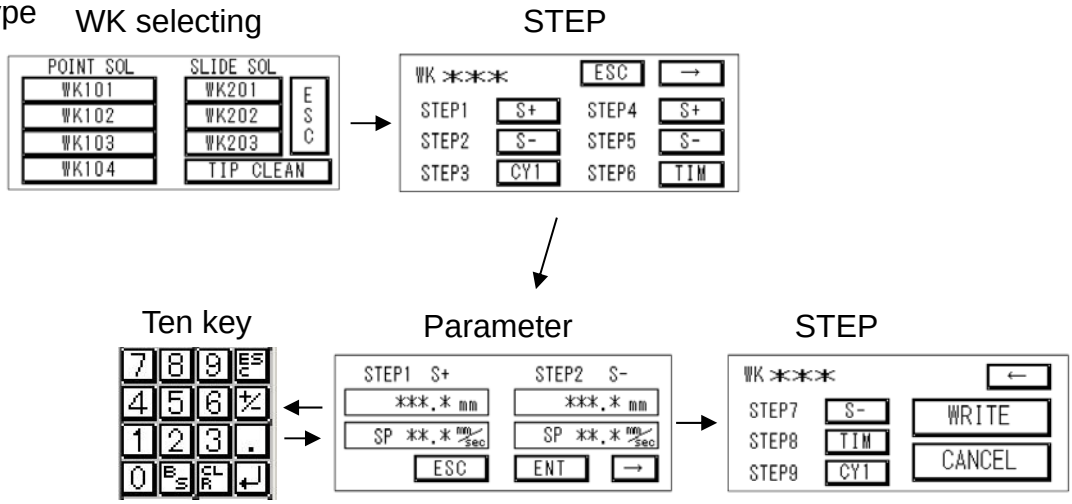
WK Setting

1) Press WK setting key. The WK selecting screen appears.
2) Press WK number key eg.101 and the step selecting screen appears.
3) The parameter shows the entered value.
4) To change, press the box and the ten key screen is displayed.
5) Press numerical key and press ↵ key.
6) Press ENT.
7) Press WRITE key. The writing message appears and the value is registered.

L Type



S Type



Initial value（Factory setting） SYSTEM PARAMATER

Command	Initial setting		Adjustable range		Detail
ALARM H	50		0 - 200		Temp. alarm range High
ALARM L	50		0 - 200		Temp. alarm range Low
TEMP	100		1- 500		Setting temperature
CONT.RUN		OFF		ON/OFF	1 cycle / continuous selecting
WAIT TEMP	100		1 - 300		Stand by temperature setting
FEEDER		ON		ON/OFF	Solder feed : Enable/Void
HEATER		ON		ON/OFF	Heater : Enable/Void
IRON U/D		ON		ON/OFF	Iron up/down sensor: Enable/Void
U/D TIMER	3	ON	0 - 99	ON/OFF	Iron up/down sensor error limit
HEAT AUTO		ON		ON/OFF	Heater auto start when power on.
TEMP LIMIT	500		100 - 500		Maximum temperature
MSSP	250		1 - 250		WK solder feeding speed
FCAL	80		1 - 200		Solder feeding quantity adjust
TIP SELECT	1		1/2		Tip select 1 or 2
TCL1	-30		±100		Tip type 1 temperature calibration
TCL2	-30		±100		Tip type 2 temperature calibration
T1PG	30		1- 200		Tip type 1 Proportion Gain
T1IG	99		0 - 99		Tip type 1 Integral Gain
T2PG	100		1 - 200		Tip type 2 Proportion Gain
T2IG	80		0 - 99		Tip type 2 Integral Gain
WTIM	1	ON	1- 60	ON/OFF	Wait time（min.）Enable/Void
IOS+	200		1 - 250		I/O&Manual FW feeding speed
IOS-	250		1 - 250		I/O&Manual Rev feeding speed
EMR *Note		STA	STA/ROB		EMR. Signal STA: Break contact ROB: Normal contact

Setting should be adjusted by an end user.

1) Press SYSTEM key on the operation screen. Then, the SYSTEM selecting screen appears.
2) Press desired key. Eg. ALH and the “Ten key” screen appears.
3) Press desired number with numerical key and press ↵ key..
4) Press the ESC in the parameter setting screen.
5) Press WRITE key. The writing message appears and the value is registered.

Note:
If the system parameter “EMR” is changed, turn the power off and on again to register the value after WRITE register.

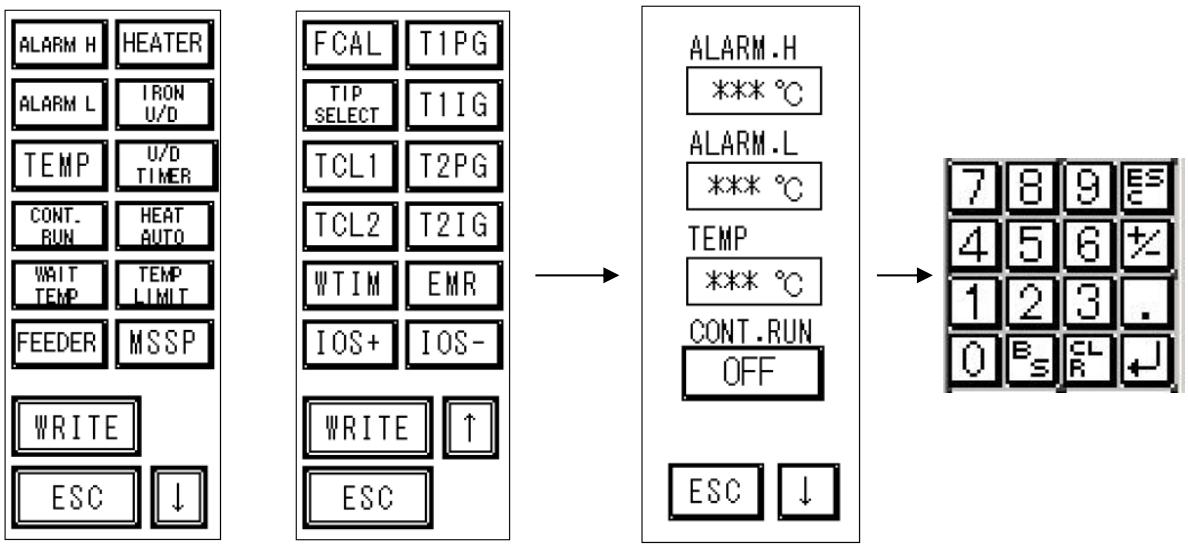
* Input calibration value to TLC1, when measured value differs from display value.
Input value can be calculated by the below formula.

Input value = (Measured value – Display value) + Existing value

e.g) Display value 300℃, Measured value of iron tip 280℃
(280℃ - 300℃) + 0 = -20℃ Input -20℃

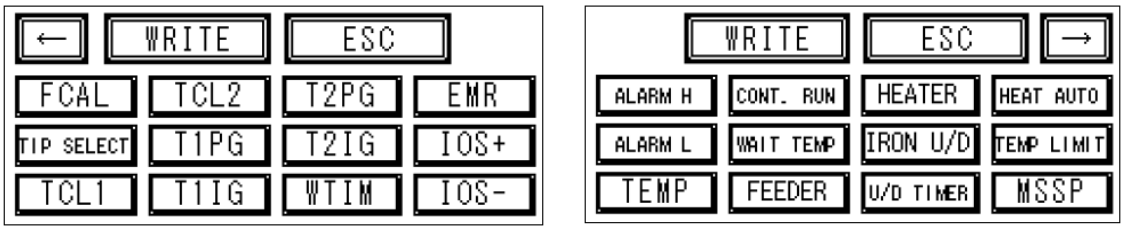
L Type :

System parameter selecting screen　　Parameter setting　　Ten keys

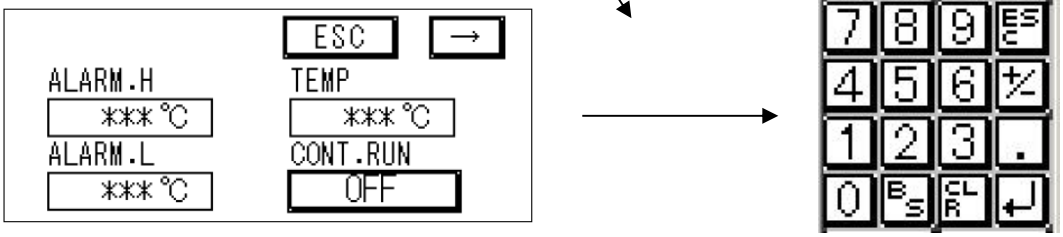


S Type:

System parameter selecting screen



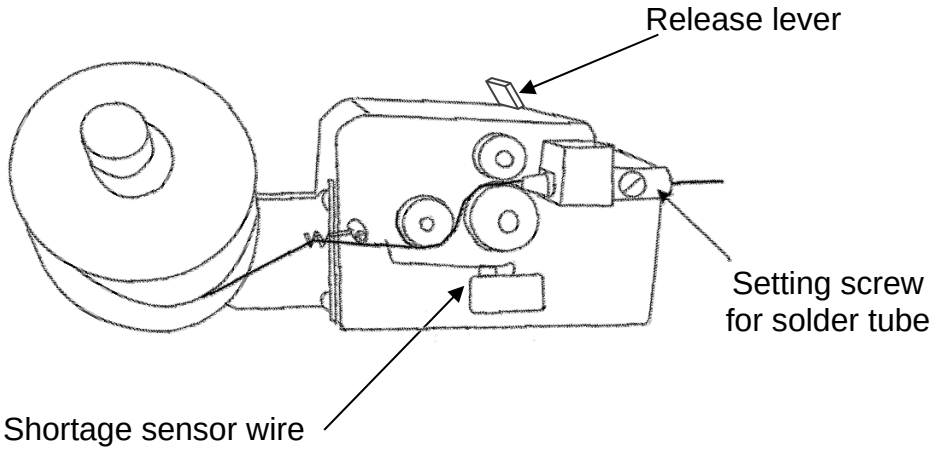
Parameter setting　　Ten keys



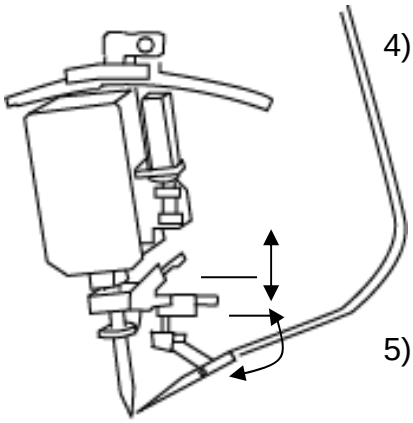
6. Operation

How to set solder wire

1. Loosen the setting screw for the solder tube, and pull out the tube.
2. Lift the lever and pinch roller for solder feeding or lift the cutting blade.
3. Put through the solder wire like below the illustration. Push down the shortage sensor wire, make sure the shortage sensor wire is set under the solder wire.
4. After that push down the release lever, set the solder tube.



How to adjust RSP iron unit



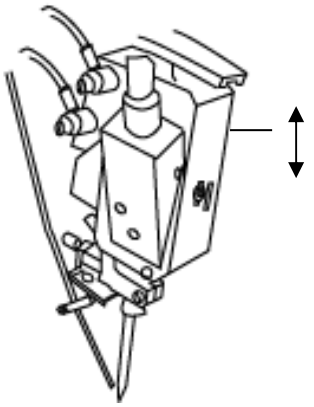
4) Solder wire feeding position can be adjusted.

Upper adjusting screw : Up down direction

Lower adjusting screw: Side way direction

5) Iron up down speed can be adjusted by turning screws after loosen nut.

Upper black screw: Raising speed
Lower white screw: Go down speed



6) Second solder feeding position can be altered by moving this screw. Adjusting the screw position, First solder wire can be put between the iron tip and a solder pattern.

Move it to lower : The same positions of feeding

Move it to upper: The second feeding position become higher and the first solder would be melt down between the iron tip and a solder pattern.

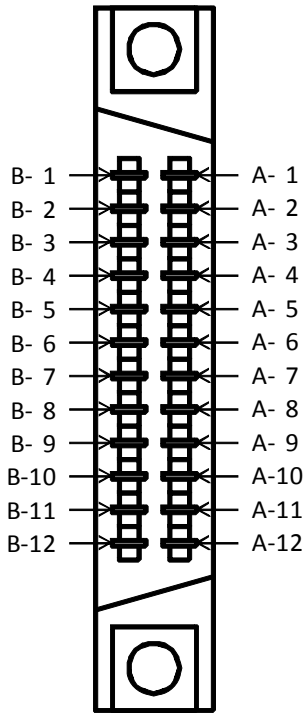
How to manual operating

1. Connect the power supply, air supply, iron unit cable and feeder cable.
2. Make sure the value of the power supply voltage and the air pressure（it should be 0.4～0.5MPa） is properly.
3. Turn on the main power switch. Please wait a while until the color of screen turns green and operation screen appears.
   If it does not turn green, please check air supply and iron cartridge.
4. Press WK setting key. The WK selecting screen appears.
5. If press RUN key on the operation screen, LUNA runs once.

How to External I/O operating

1. Connect the power supply, air supply, iron unit cable and feeder cable.
2. Connect the I/O cable.
3. Make sure the value of the power supply voltage and the air pressure（it should be 0.4～0.5MPa） is properly.
4. Turn on the main power switch. Please wait a while until the color of screen turn green and operation screen appears.
   If it does not turn green, please check air supply and iron cartridge
5. Make sure that on output terminal “READY” sign of I/O No.B-2 indicates “ON”.
6. Give “WKNo” by Binary number to sign SEL1～SEL 4 “IN” of I/O No.A-1～A-4.
7. When give “START” sign “IN” of I/O No.A-5, LUNA operates for once cycle.
8. When LUNA completes the operation,“END” sign of I/O No.B-4 on output terminal will indicate “ON”. Make sure that before next operation.

7. Input / Output diagram



Useable connector
LUNA
FUJITSU; FCN-361J024-AU
Cable
FUJITSU; FCN-361P024-AU

Terminal arrangement

Left side		Right side	
B-1	EMR	A-1	EMR
B-2	READY	A-2	SEL1
B-3	RUNNING	A-3	SEL2
B-4	END	A-4	SEL4
B-5	SOLDER ERROR	A-5	START
B-6	IRON UNIT ERROR	A-6	STOP
B-7	ACK	A-7	RESET
B-8	AUX OUT	A-8	S+
B-9	AIR BROW	A-9	S-
B-10	0V	A-10	IRON U/D
B-11	0V	A-11	24V
B-12	EXT 0V	A-12	EXT 24V

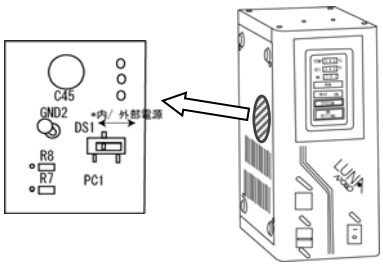
Input signal

Pin No.	Terminal name	Signal name	Function
A-1 B-1	EMR	Emergency stop	Stop the machine in an emergency. This terminal usually is used on the state of being ON with no voltage. If this terminal is released, all of the operation about soldering will stop and also heater will be turn off. For restarting the machine, make a short circuit, and then input the reset signal.
A-2	SEL1	Program select 1	Select the WK No. Set the WK No. with Binary. it can be set by "ON" "0"signifies iron cleaning "WK100" "1～4" signify point soldering "WK101～WK104". "5～7" signify slide soldering "WK201～203" Setting examples If select iron cleaning, All OFF If select point soldering "WK101", The signal of SEL1 is "ON" If select slide soldering "WK201", The signal of SEL1,SEL4 is "ON"
A-3	SEL2	Program select 2	
A-4	SEL4	Program select 4	
A-5	START	START signal	Start the automatic operation Input the signal from a sensor or switch. (The minimum pulse width is more than 100ms) When the output signal for ready is "ON", it can receive an incoming signal.
A-6	STOP	STOP signal	Stop the automatic operation. (The minimum pulse width is more than 100ms)
A-7	RESET	Reset signal	Emergency stop, or restart from the state of being error. Emergency stop, or input it after lifting the cause of error. (The minimum pulse width is more than 100ms)
A-8	S＋	Solder Forward	Feed the solder forward. Set the speed of solder forward on the system parameter IOS+. (Do NOT turn on A-9 at the same time.)
A-9	S－	Solder Reverse	Reverse the solder Set the speed of solder reverse on the system parameter IOS-. (Do NOT turn on A-8 at the same time.)
A-10	IRON U/D	Iron Up / Down	Iron unit extend down or retract up.. When this signal turn OFF, iron go down. When this signal turn ON, iron go up.
A-12	EXT 24V	Input the External Power	It means an input of 24V when using the external power. When using it, first, open the side plate of LUNA, then slide the DIP switch setting on the main board for External power. On the factory setting, it is set the Internal power. If connect to GND, please use an exclusive GND(B-12)
B-9	AIR BLOW	Air Blow	Blow air for cleaning the oxidize iron tip. Turn on this signal, then it starts operation.

Output signal

Pin No.	Terminal name	Signal name	Function
B-2	READY	Ready signal	This signal is “ON” when LUNA can be operated automatically.
B-3	RUNNING	Running signal	This signal is “ON” while LUNA is operating automatically.
B-4	END	Signal of End of operation	This signal is “ON” when LUNA stop the automatic operation.
B-5	SOLDER ERROR	Signal of solder error	This signal is output if the solder is broken or solder clog the solder tube. Replace with a new solder wire, then it restart automatically. Remove the solder from solder tube, after that input the reset signal.
B-6	IRON UNIT ERROR	Signal of iron unit error	This signal is “ON” when iron unit is in normally. If iron unit(temperature, iron unit U/D) has error, this signal is “OFF” Error of temperature: If the temperature over the temperature alarm range setting on the system parameter, this signal is “OFF” The screen turns orange. The temperature returns to proper value, then error will be called off. Error of iron unit U/D: If upper or lower sensor of iron unit does not detect, this signal is “OFF” For restarting operation, remove the causes of error and input the reset signal.
B-7	ACK	ACK output	When slide soldering, this signal gives the machine the slide starting timing. The timing is the setting time on STEP4 ACK of WK setting. (“ON” time is about 100ms)
B-8	AUX OUT1	External output 1	This signal gives the machine for counting iron shot when WK101～WK203 finished in normally. (“ON” time is about 100ms)
A-11	24V	DC24V output	This signal gives DC24V when using the Internal power The maximum supply current is 500mA. If connect to GND, please use an exclusive GND(B-10,B-11)

External/Internal power switch



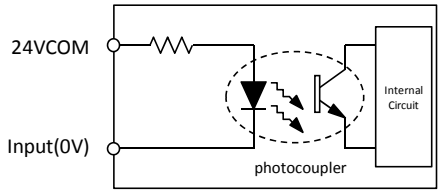
When using External power, first, open the side plate of LUNA, then slide the (DIP switch)setting on the main board for External power.
On the factory setting, it is set the Internal power.

Warning;

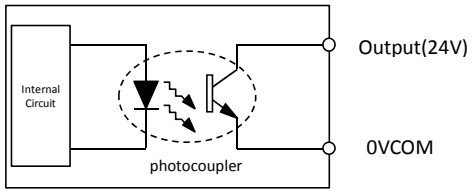
On the factory setting, it is set the Internal power. The machine will be broken, If connect the External power with DIP switch is set Internal power,

Circuit diagram

Input



Output

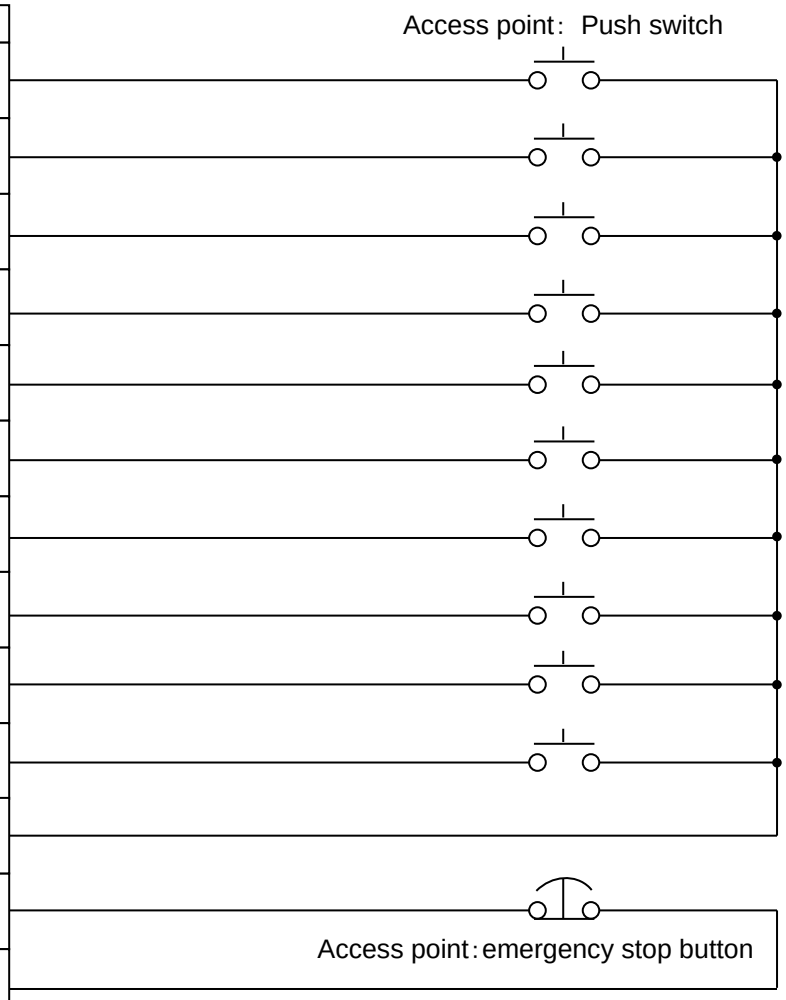


Use the machine with not more than Voltage DC24V and Current 100mA.

Example of I/O connection for LUNA

If connect to Input terminal the push button switch with Internal power.

Terminal name	NO.
PROG SEL 1	A-2
PROG SEL 2	A-3
PROG SEL 4	A-4
START	A-5
STOP	A-6
RESET	A-7
S+	A-8
S-	A-9
IRON U/D	A-10
AIR BLOW	B-9
GND	B-10
EMR	A-1
	B-1



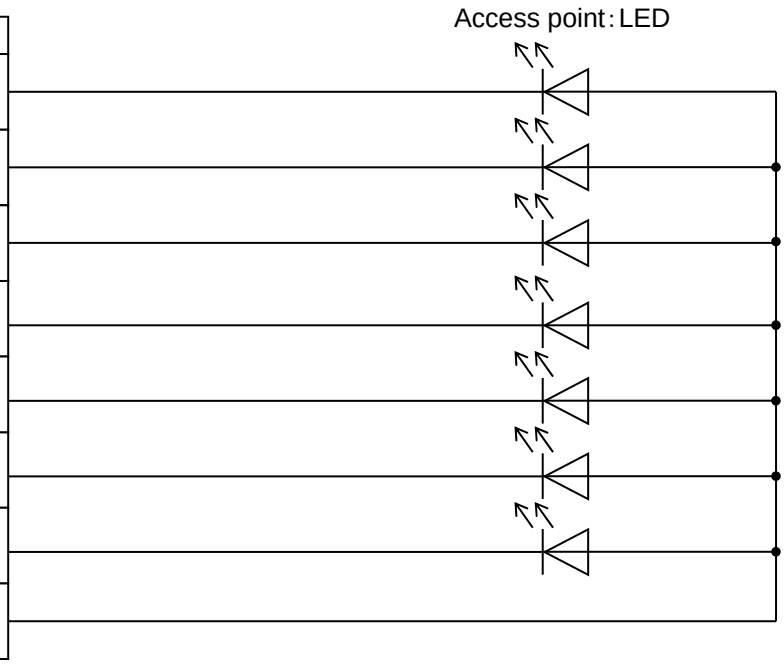
NOTE

1. Throw the External/Internal power switch for Internal power, when using the Internal power.
2. Do NOT connect with A-12, B-12, when using the Internal power.
3. Connectable instruments are NO voltage A contact or open collector.
4. Connectable instrument with EMERGENCY is contact point of NO voltage. (Change the A / B contact on the system parameter.)
5. If NOT using EMERGENCY STOP, short circuit between A-1 and B-1.

Example of I/O connection for LUNA

If connect to Output terminal the LED with Internal power.

Terminal name	NO.
READY	B-2
RUNNING	B-3
END	B-4
SOLDER ERROR	B-5
IRON UNIT ERROR	B-6
ACK	B-7
AUX OUT 1	B-8
24V	A-11

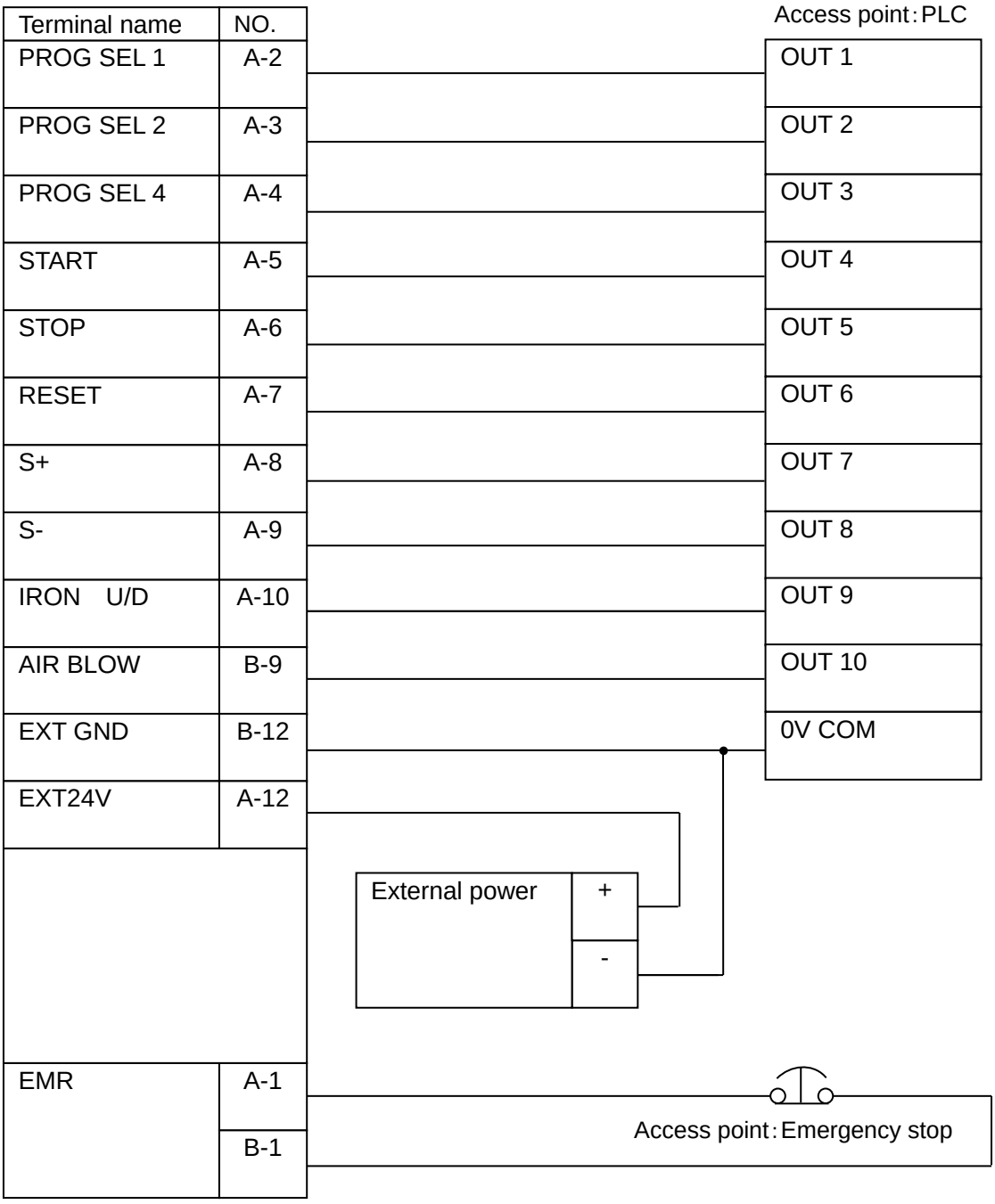


NOTE

1. Throw the External/Internal power switch for Internal power, when using the Internal power.
2. When using the Internal power, Do NOT connect with A-12, B-12.
3. If connect to output terminal the inductive load like a coil, please connect a diode for protection or an instrument which can prevent surge because of the surge will occur.
4. Use the Output terminal in less than “0.1A” per a point.

Example of I/O connection for LUNA

If connect to Input terminal the PLC with External power.

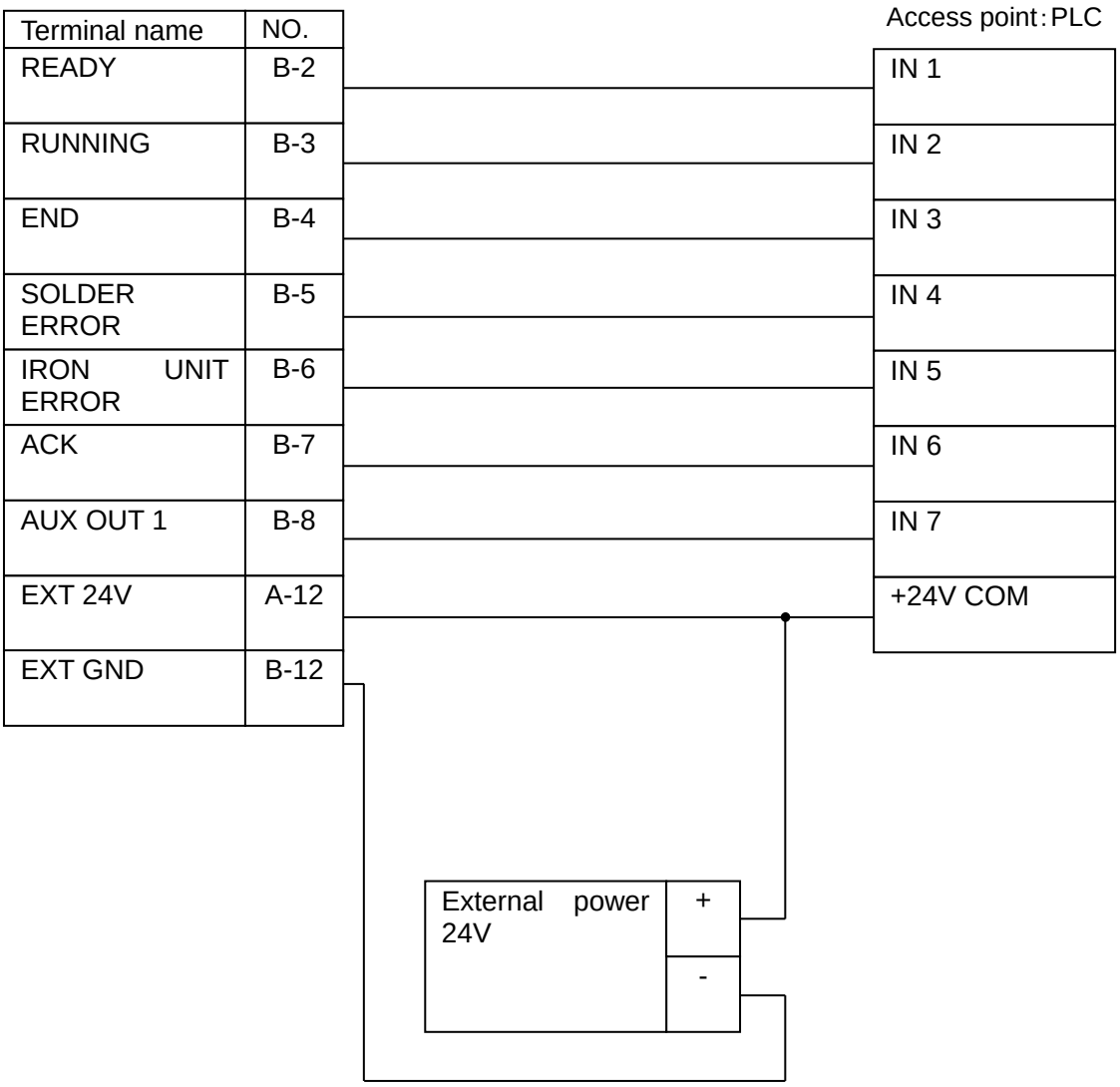


NOTE

1. Throw the External/Internal power switch for External power, when using the External power.
2. Do NOT connect to A-11, B-10, B-11, when using the External power.
3. Connectable instruments with the Input are NO voltage A contact or open collector.
4. Connectable instrument with EMERGENCY is contact point of NO voltage. (Change the A / B contact on the system parameter.)
5. If NOT using EMERGENCY STOP, short circuit between A-1 and B-1

Example of I/O connection for LUNA

If connect to Output terminal the PLC with External power

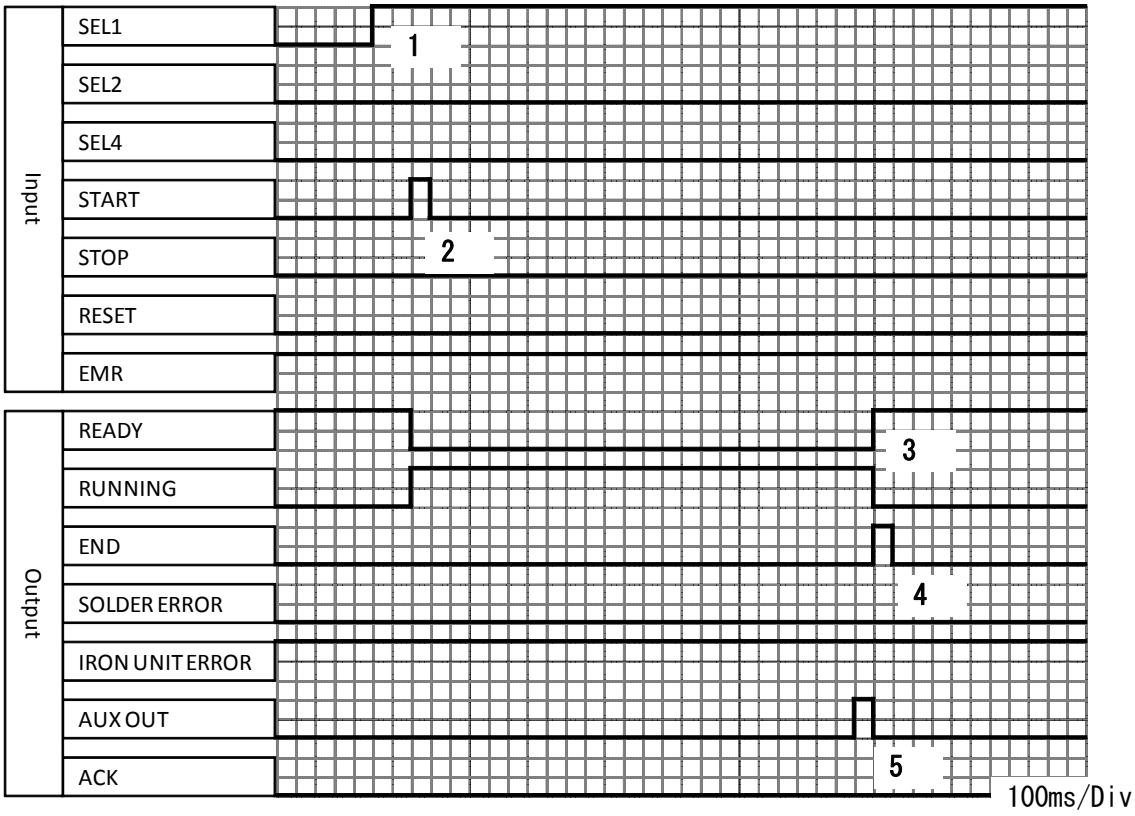


NOTE

1. Throw the External/Internal power switch for External power, when using the External power.
2. Do NOT connect to A-11, B-10,B-11, when using the External power.
3. Use the Output terminal in less than “0.1A” per a point.

8. Timing chart

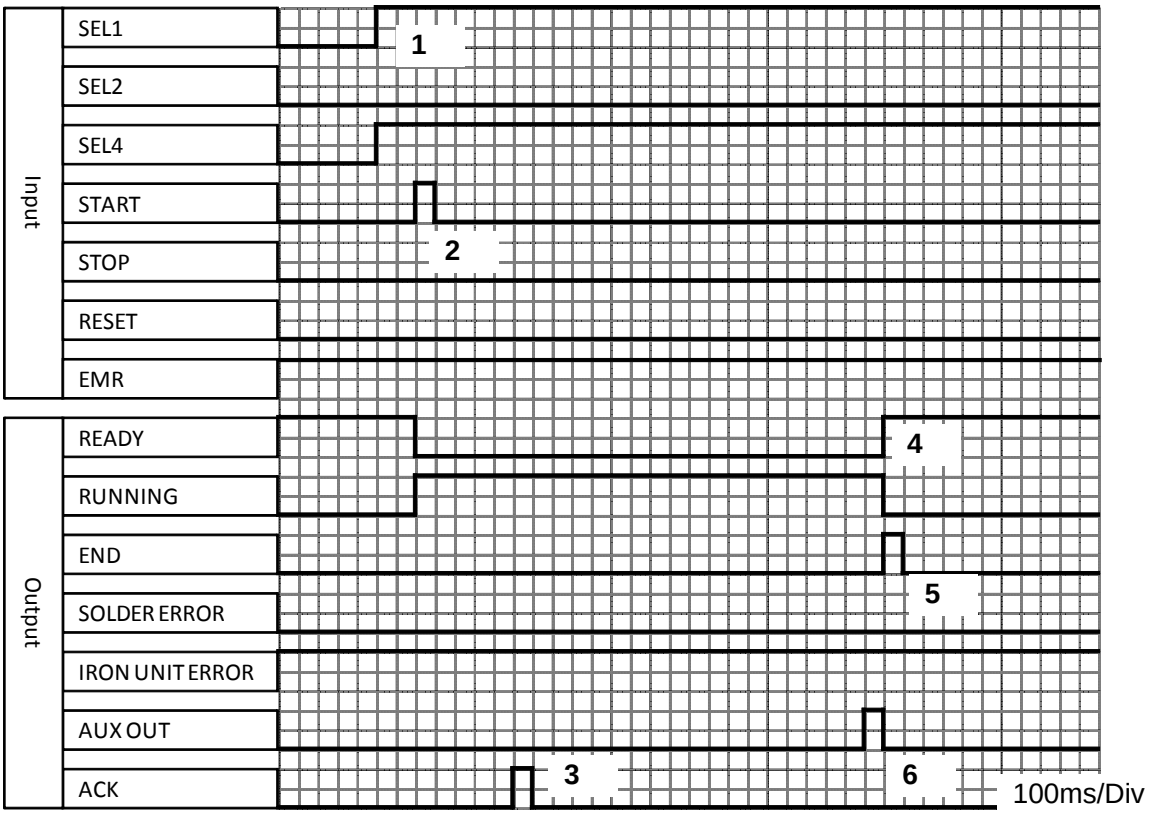
Point soldering



1. First, give the machine the SEL signal before giving START signal. It can be stopped giving after turning ON the RUNNING signal.
2. READY signal will turn OFF after giving START signal, then RUNNING signal turn ON, and start automatically operation with setting WK No. on SEL.
3. When finished automatically operation in normally, READY signal turn ON and RUNNING signal turn OFF.
4. Give END signal as the same time with automatically operation finishes.
5. Give AUXOUT signal just before END signal will turn ON.

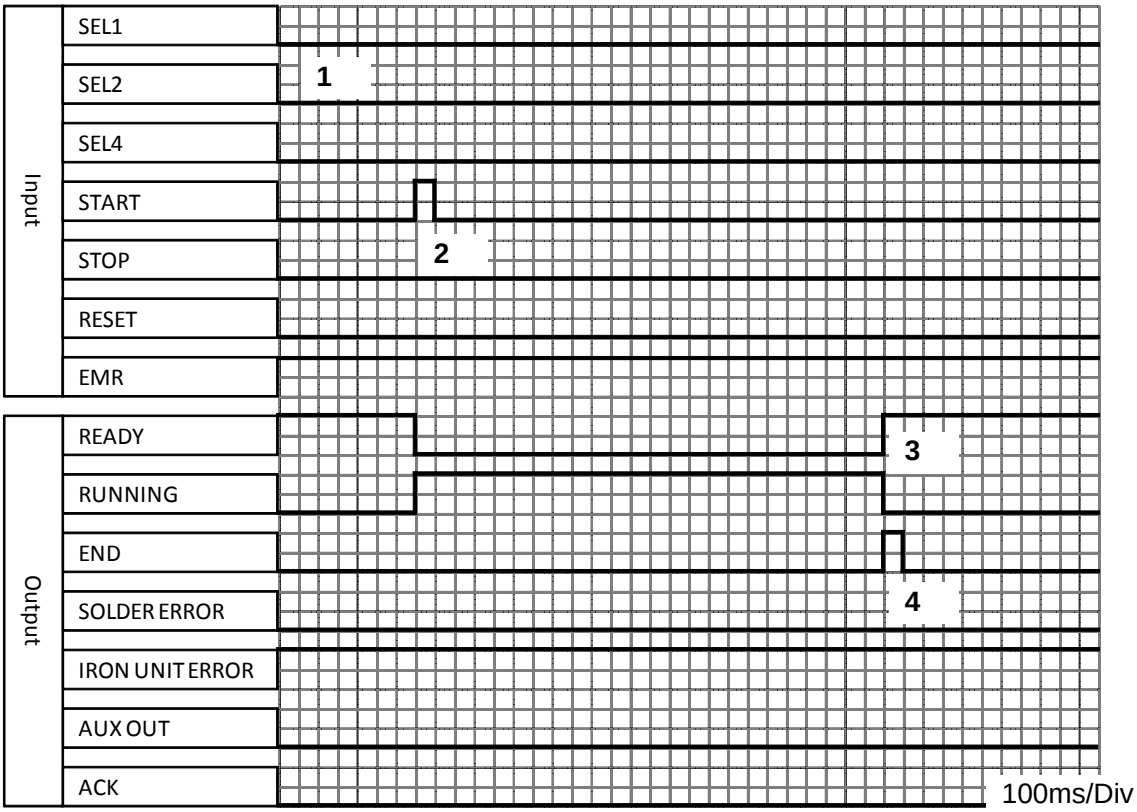
NOTE
When turn ON the sleep mode of iron tip on the system parameter and be in state of sleep mode, RUNNING signal turn ON by input above ①、②, however you need to wait until the temperature of iron tip will raise to preset temperature that on the low value of alarm temperature range on the system parameter.
If being over the temperature alarm range, operates in accordance with preset WK setting by SEL signal.

Slide soldering



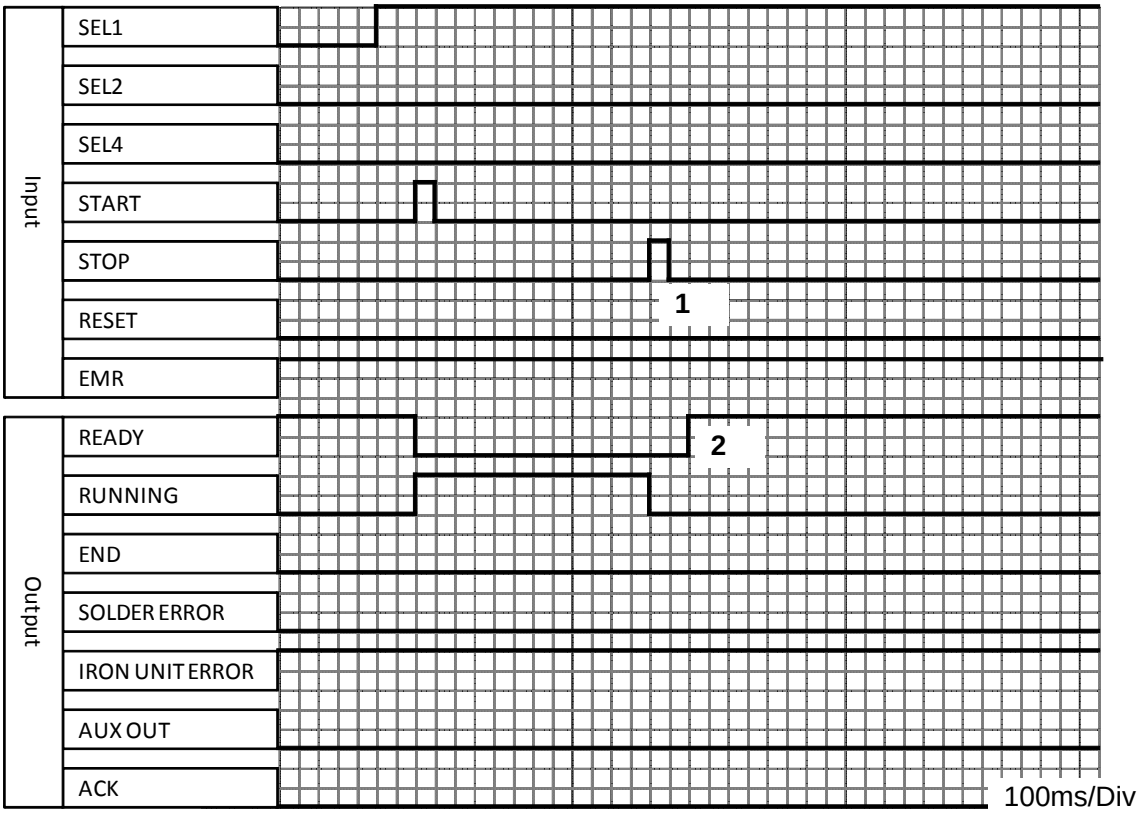
1. First, give the machine the SEL signal before giving START signal.
2. READY signal will turn OFF after giving START signal, then RUNNING signal turn ON, and start automatically operation with setting WK No. on SEL.
3. Turn ON after the time of ACK setting that was set on WK SETTING.
4. When finished automatically operation in normally, READY signal turn ON and RUNNING signal turns OFF.
5. Give END signal as the same time with automatically operation finishes.
6. Give AUXOUT signal just before END signal will turn ON.

Cleaning operation



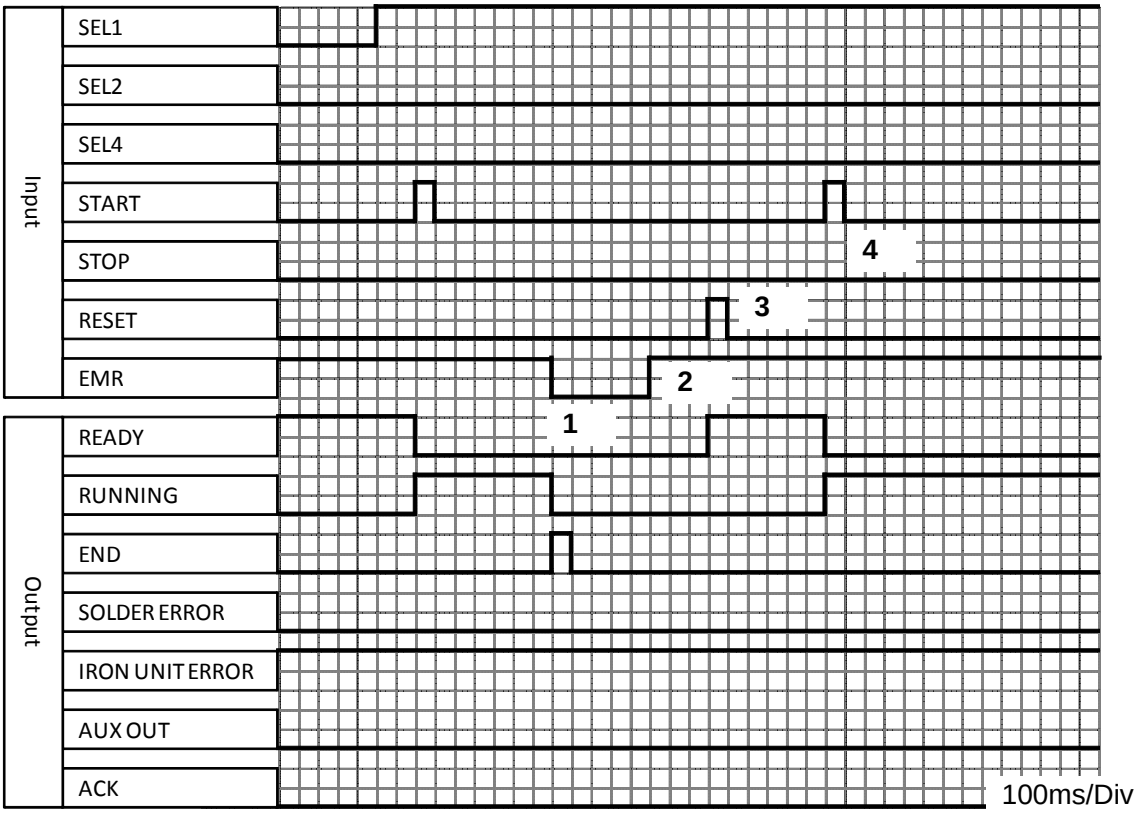
1. Turn OFF all of SEL signal, SEL1～SEL3, when cleaning operation.
2. READY signal will turn OFF after giving START signal, then RUNNING signal turn ON, and start cleaning.
3. When finished cleaning in normally, READY signal turn ON.
4. When finished cleaning, END signal turns ON but AUXOUT signal does NOT turn OFF.

STOP operation



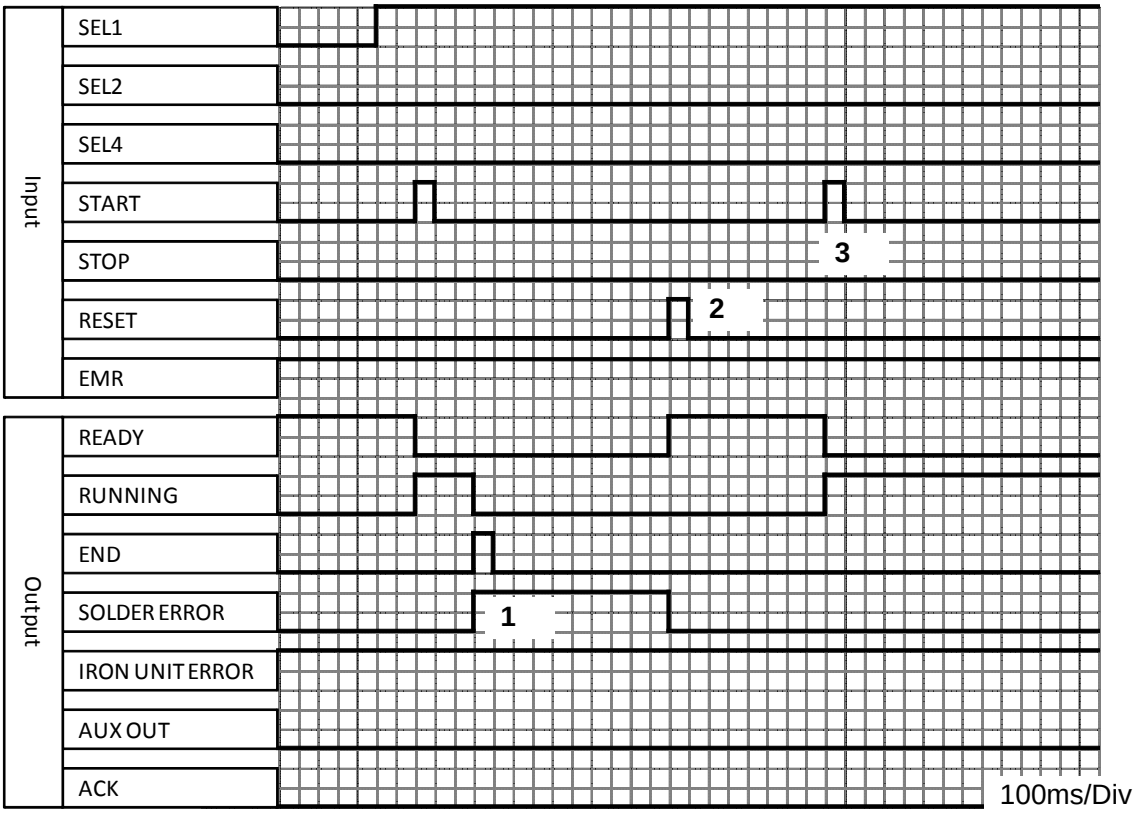
1. If input STOP signal while automatic operation, soldering is interrupted, and then RUNNING signal will turn OFF.
2. READY signal will turn ON after about 200ms.

EMR operation



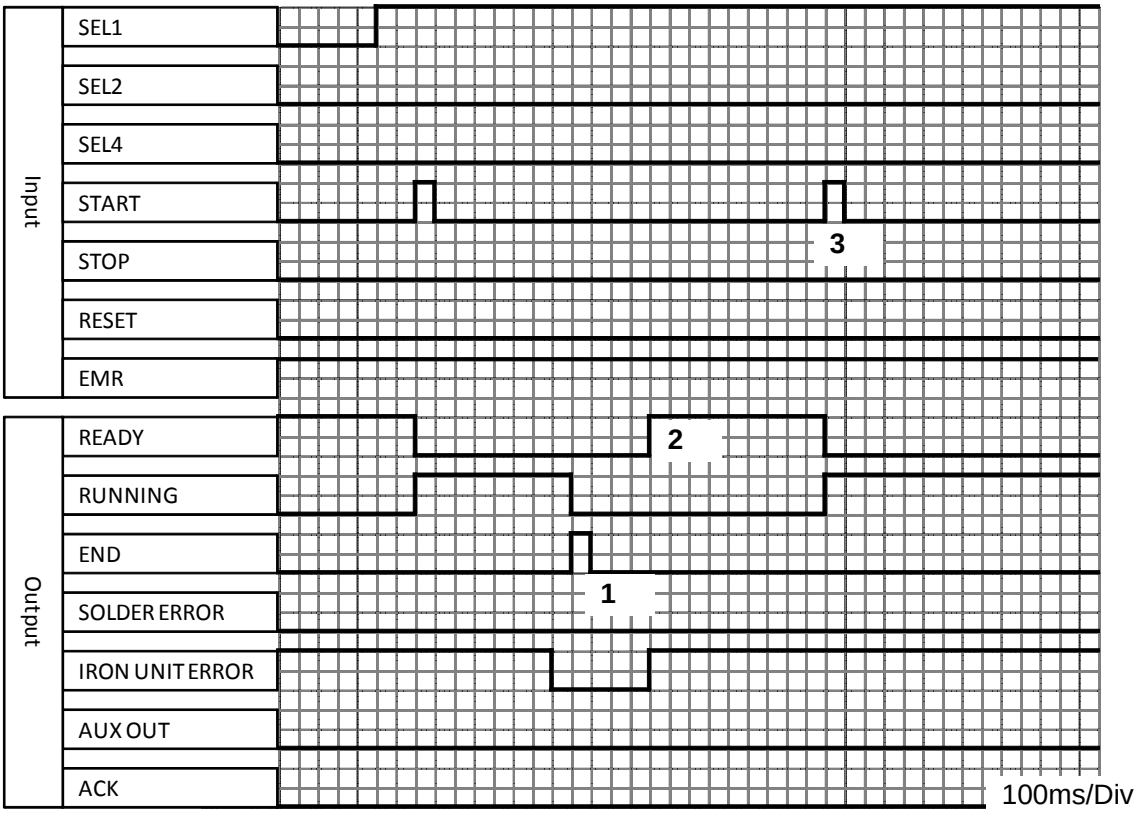
1. If EMR signal turn OFF by Emergency stop switch while automatic operation, RUNNING signal will turn OFF. And END signal will turn ON.
2. Give EMR signal to the machine for restoration.
3. After give RESET signal, make sure all part of the machine is no problem, turn ON READY signal.
4. If READY signal stated that turning ON, start automatically operation by turning ON START signal.

SOLDER ERROR operation



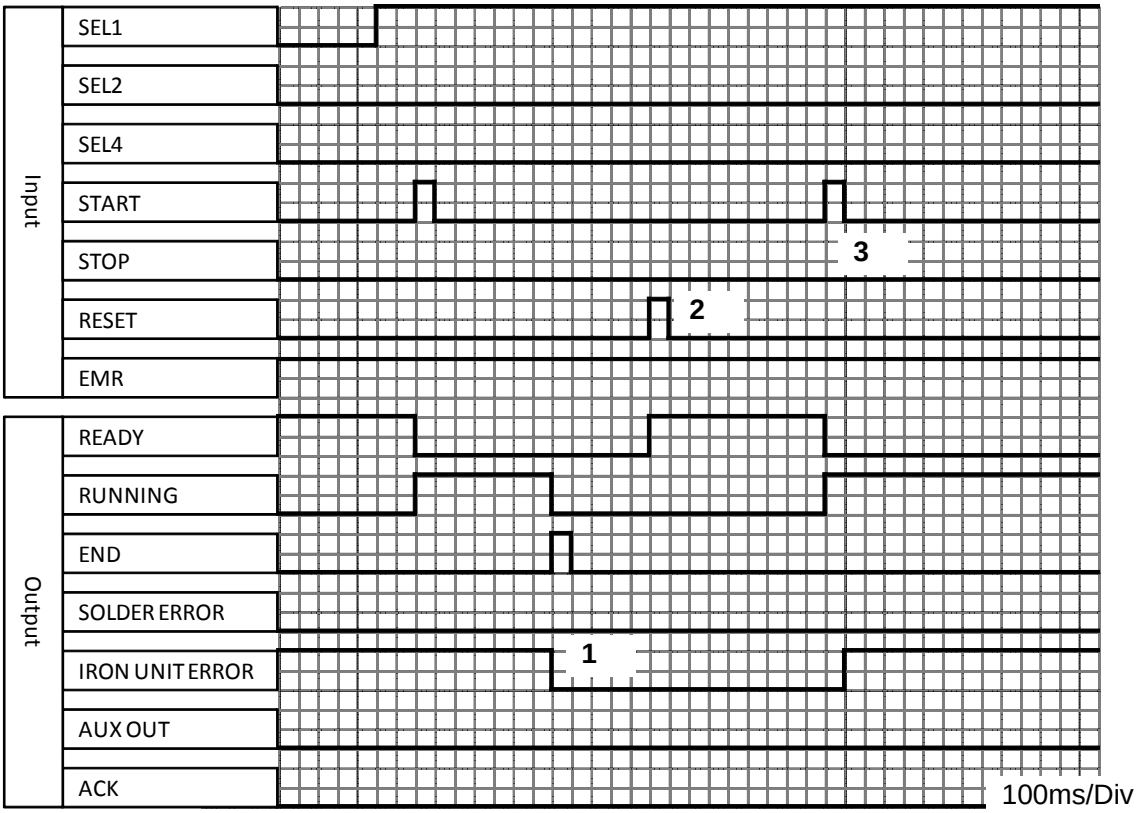
1. SOLDER ERROR signal will turn ON if solder wire is broken or solder tube is clogged while automatic operation. At this time RUNNING signal turn OFF and END signal turn ON.
2. After making sure all part of the machine is no problem, turn ON RESET signal, then READY signal turns ON.
3. If READY signal stated that turning ON, start automatically operation by turning ON START signal.

IRON UNIT ERROR (Iron heater error)



1. If the temperature of iron tip gets over the range of temperature alarm, IRON UNIT ERROR signal turn OFF. At this time RUNNING signal turn OFF and END signal turn ON.
2. The temperature returns to proper value, IRON UNIT ERROR signal turn ON and also READY signal turn ON.
3. If READY signal stated that turning ON, start automatically operation by turning ON START signal.

IRON UNIT ERROR（Sensor error）



1. When running the command for iron extend/retract (CY, CY1, CYON),iron doesn't move, and over the limit time setting on system parameter U/D T ,then IRON UNIT ERROR signal turn OFF. RUNNING signal turn OFF and END signal turn ON.
2. Give RESET signal to the machine for restoration.
3. If READY signal stated that turning ON, start automatically operation by turning ON START signal

9. Maintenance

9-1 Daily inspection requirement items are as follows:

Note: when the inspection, turn off the power and cool down the iron tip.

1) Existence of solder wire:
If the solder wire is not sufficient, please change to new one.

2) Wear of iron tip
If soldering result became unstable, please change it to new one. The life time of the iron tip is depends on the heating time, the solder feeding point and speed.

3) Breaking of heater
The causes of a breaking of heater when the lamp for indication of temperature error is on and the temperature controller is normal are as follows:

(1) The breaking of heater. Change the iron cartridge
(2) The breaking of the relay cord (CC-2F) Change the iron cord.
(3) The iron tip is worn. Change the iron cartridge

4) Air pressure
Make sure the air pressure if it is adequate. (4-5kg/cm2)

5) Clog of the tube set
If the top (exit side) of the tube set clog by a flux or solder wire, please remove it and clean it with alcohol.

6) Up/down movement
Make sure if the up/down movement of iron unit is smooth. Also, make sure if there is no flux sticking in moving parts.

7) Cutting blade and pinch roller for solder wire feeding
Make sure flux or solder does not stick to the above parts. If so, clean it with a soft (brass) wire brush and alcohol.

9-2 After every 5,000 points soldering
Check the solder tip temperature with a thermometer. Refer to the page 7 for thermo-controller temperature display calibration.

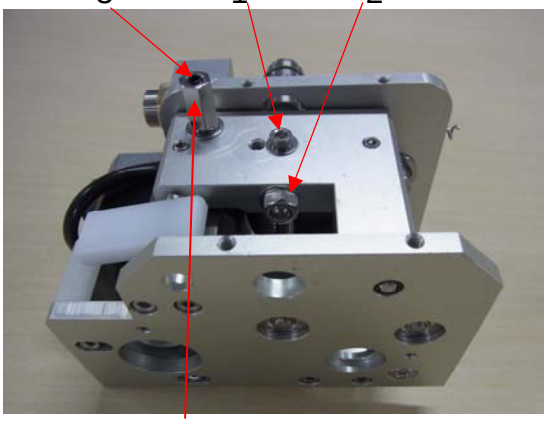
9-3 Every month
Make sure a solder wire run through the solder wire tube. If not, clean the inside of tube or replace.

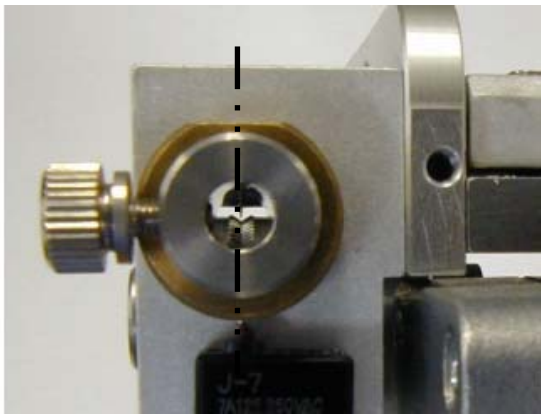
9-4 Every year
Send the thermometer to an authorized agent for the calibration.

ZSB feeder (Option) adjustment and alignment
Adjust the ZSB feeder as follows
The cutting depth of ZSB blade must be adjusted properly to operate properly. Adjust and clean it every time before use.

(1) Remove the cover after loosing five setting screws.

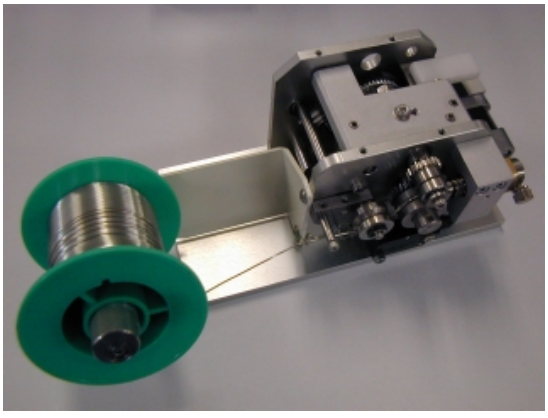

(2) Loosen the set screw “1” for alignment cutting blade shaft and the setting nut “2” to adjust the shaft position. Then move the blade shaft position to match the center of the cutting blade and V grove of the lower roller.



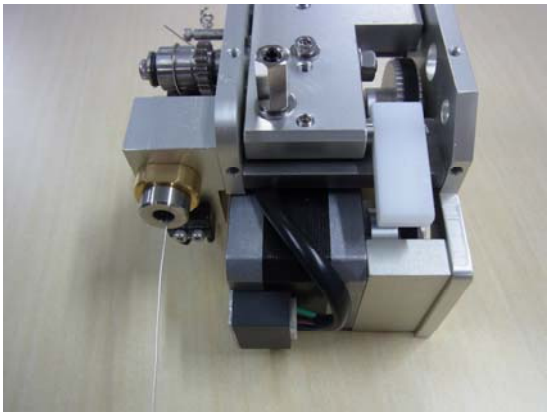


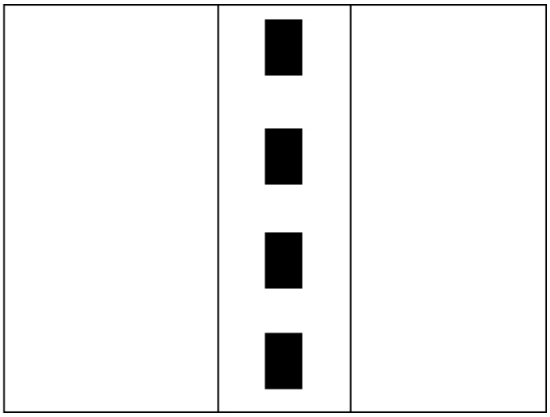
(3) Tighten the set screw “1”.

(4) Attach the reel pin as it stays without the cover, and then set the solder wire.

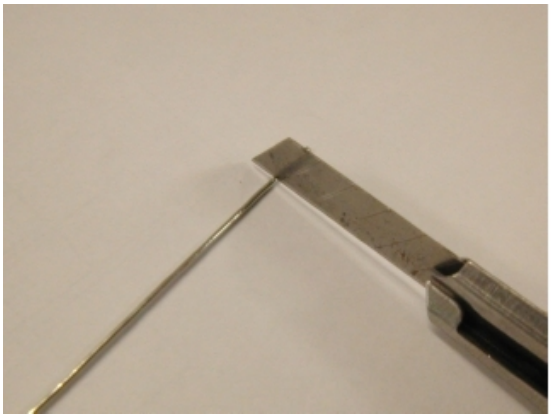


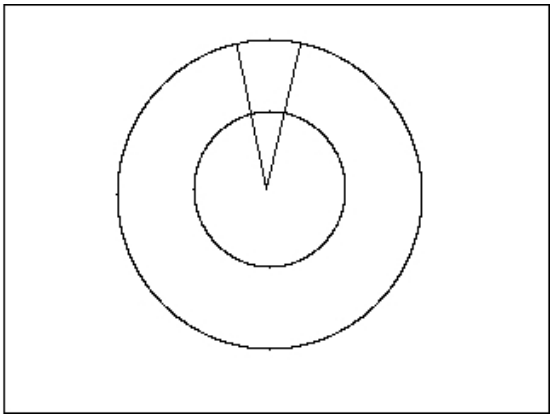
(5) Push down the forward/reverse lever and feed the solder wire, then make sure the cutting blade makes holes on the center of the solder wire. If the holes were not on the center, adjust the cutting blade shaft position, then feed the solder wire and check it.



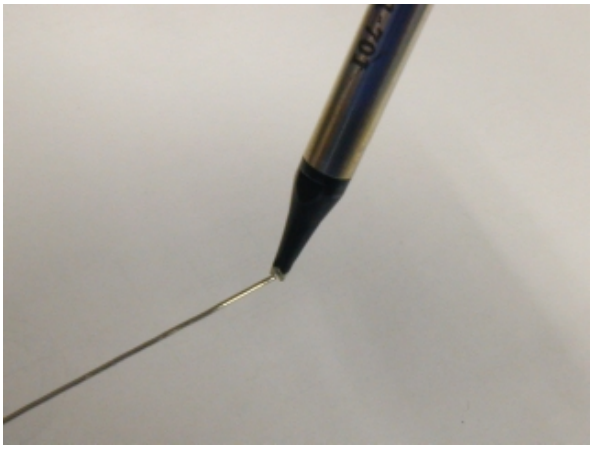


(6) Cut the solder wire with holes perpendicularly and check the cross section. Make sure the cutting blade penetrates into flux core.
If the cutting depth was not enough or too deep, loosen the nut “4” then adjust the adjusting screw “3” for the cutting depth to penetrate into flux core.
After that feed the solder again, cut the wire and check the cross section again.





(7) Complete adjusting the alignment and depth of the cutting blade and increase the temperature of iron tip. Then, melt the solder wire with holes.
And make sure the flux is coming out from the holes.



(8) Put back the cover and tighten five set screws.

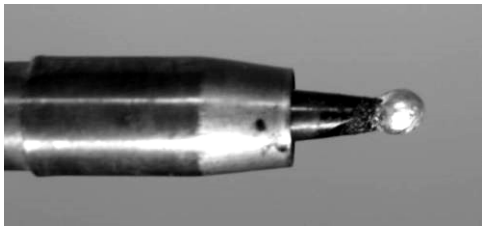
10. Handling of iron tip

Introduction

Soldering is a technique which connects a metal to another metal by alloy reaction.
Solder material melts, but mother material (metal pieces on the work-piece) never melt by soldering.
There are three important factors (Three great factors of soldering) for the alloy reaction as follows:
Cleaning the metal surface
Formation of alloy layer which by melting solder and connecting to metal surface
Heat source which should be maintained in suitable temperature in order to form alloy layer by soldering.
Solder iron tip is related to the formation of alloy layer and the heat source.
So, It is very important for a good care of solder tip to make a stable soldering.

<Handling of iron unit>
Apollo soldering tip, HI-TIP (AS, HQ, TM and DC model) realized the high performance and long life by using oxygen-free copper as a mother material with special iron plating and careful after treatment.
Usually, the life of the tip is about 50,000 points. However, if it is used at more than 400^{o}C or if solder with a bad solder feeding position, the life is shorten extremely to approximately 5,000 points caused by "Iron plate Corrosion". Therefore, please use it with suitable condition. If the condition is proper, the life exceeds 100,000 points.

1. Attach an iron tip, then the vinyl resin coating on the iron tip is cracked and peel off during the temperature rising. Please use it after making pre-soldering by the solder including flux.



2. Iron tip should be placed at iron stand after pre-solder on iron tip. If tip is left at the stand without solder after cleaning, the tip oxidizes and cannot be getting wet with solder.

3. If flux or some oxide residues were left over the iron tip, please remove them with back of a cutting edge like a cutter lightly.

   Do NOT file the iron tip because iron plating may be peeled off, then the iron tip cannot be getting wet with solder.

If a tip is not getting wet with solder…..

Remove pre-solder on tip completely.
Brush the iron tip lightly with a brass wire brush.
Melt a new solder including flux on the tip or dip the iron tip into a soldering pot.
Remove the needless solder with a wet sponge.
Make pre-solder soon
The tip will wet with solder by the above process.

<Care of Iron tip>

1) Check iron tip by eyes every fixed time

Oxide is left on the iron tip.	Study of the number of air blow cleaning.
“Solder rise” exceed the solder plated area.	A malfuction is occurred by leavening a corrosion by chloride element in flux. Replace the iron tip.
Bad solder flow	Remove pre-soldering on the iron tip completely. Cool it to room temperature and remove oxidation by a sand paper. Then turn it on again and make pre-soldering to the iron tip surface during rising temperature.
Transformation of iron tip	Need to change of iron tip by the corrosion of chloride element in flux and wear phoenomenon.

2) Check for soldering defect

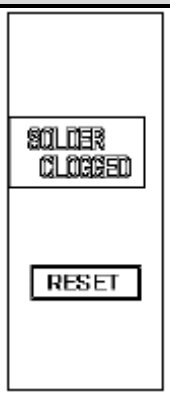
Imperfection of electric connection by of flux membrane.	Clean the surface and make iron tip temperature high and heating longer.
Rough soidering surface	This defect occurs if the heating temperature is high or low. Adjust it to proper temperature.
Soldering removes and comes off because the solder does not melt.	Shortage of heat
Solder flow	A malfuction is occurs if the heating temperature is high, the heating time is long or the exceeding solder feed amount is supplied.

There are many solder defects except the above mentioned as follows:
“Solder shortage”, “Icicle”, “Solder excess”, “Burning film” etc.
Please select suitable condition by seeing through the solder states.

11. Trouble shooting

Error sign

Error sign	Context	Failure reason	Recommended solution
	Input the emergency stop sign.	Operate the emergency stop on the system	Release the emergency stop of the system
			Check “EMR” of I/O connector is wiring ☞ 7.Input/Output
			Check the setting of system parameter and connection of I/O connector ☞ 5.How to Program
	The sensor detects solder shortage	End of the solder feeding	Replace with a new bobbin ☞ 6.Operation
		Braking of solder wire	Remove the solder wire in the solder tube and replace the solder wire. ☞ 6.Operation
		Misdetection of the sensor	Check the solder wire is set properly ☞ 6.Operation
		The sensor of solder feeding is damaged	Contact Apollo Seiko for repair ☞ Back cover
	Detect the error of heater	The iron cartridge doesn’t insert.	Make sure whether the iron cartridge inserts properly. ☞ 13.How to change iron cartridge
		Braking of the heater	Replace with anew iron cartridge. ☞ 13.How to change iron cartridge
		Thermocouple is damaged	
	Error of the temperature while operating automatically	Low/high values of temperature alarm are incorrect	Input the proper value in the system parameter. ☞ 5.How to program

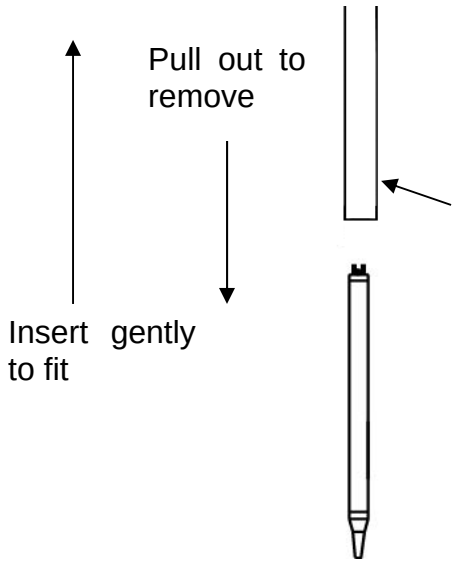
Error sign	Context	Failure reason	Recommended solution
	The sensor detects the solder clogged while it operates automatically.	Solder tube is clogged with solder wire.	Replace a new solder tube. ☞ 6.Operation
		Solder wire doesn't melt skillfully.	Slow down the speed of solder feeding ☞ 5.How to program
			Adjust the position of solder feeding ☞ 6.Operation
	Lower sensor of iron unit or air cylinder doesn't detect properly.	Air leakage or tube is not jointed	Make sure whether there is the air leakage or not from air hoses or a part of connection. ☞ 4.Preparation
		Regulation of the speed controller is not proper.	Regulate the speed controller properly ☞ 6.Operation
		Sensor of air cylinder is damaged	Contact Apollo Seiko for repair ☞ Back cover
	Upper sensor of iron unit or air cylinder doesn't detect properly.	Air is not supplied.	Check the pressure of the air ☞ 4.Preparation
		Air pressure goes down	
		Air leakage or tube is not jointed	Make sure whether there is the air leakage or not from air hoses or a part of connection. ☞4.Preparation
		Regulation of the cylinder speed controller is not proper.	Regulate the speed controller properly ☞6.Operation
		Upper sensor of air cylinder is damaged	Contact Apollo Seiko for repair ☞ Back cover

Trouble shooting

	Failure reason	Recommended solution
The LUNA is not receiving power	The power cable is disconnected	Check the power cable connection.
	The power cable connection is bad	Replace with a new power cable.
	Fuse is blown	Replace with a 3Amp fuse
	The control PCB is not working	Contact Apollo Seiko for repair
The iron tip does not heat properly	Heating element is broken	Replace with a new heater
	Heater connector does not connect properly	Check the connection of connector
	Cable is damaged	Replace with a new cable
	The iron tip is at end of life	Replace with a new iron tip
	The parameter is not set properly	Check the system parameter, set it properly
	The control PCB is damaged	Contact Apollo Seiko for repair
	The temperature remains being on standby	Input RUN signal from I/O or Touch the RUN button on the touch panel
The iron tip does not working	The pressure air is not supplied	Connect the air inlet tube and supply the air
	The parameter is not set properly	Check the system parameter, set it properly
	Trouble of iron unit	Contact Apollo Seiko for repair
	Trouble of the control PCB	Contact Apollo Seiko for repair
Solder is not fed properly	The release lever is opened	Engage the solder release lever
	The solder feeding gear is racing	Adjust the roller gear lever
	The parameter is not set properly	Check the system parameter, set it properly
	The value of speed is set “0”	Check the system parameter.
	The stepping motor is damaged	Contact Apollo Seiko for repair
	The control PCB is damaged	Contact Apollo Seiko for repair
Solder is not fed by the solder wire forward/reverse switch	External/Internal power selection switch is on External or Power cable is disconnected	Check the External/Internal power selection switch or connect the External power supply
Cannot adjust the temperature of heater	The heating element is broken	Replace with a new heater
	The cable is damaged	Replace with a new cable
	The cable does not connect properly	Check the connection
Temperature abnormality does not disappear	Values of low or high temperature alarm limit are incorrect	Check the system parameter, set it properly

12. How to change iron cartridge

DCS-***, DCN-***type

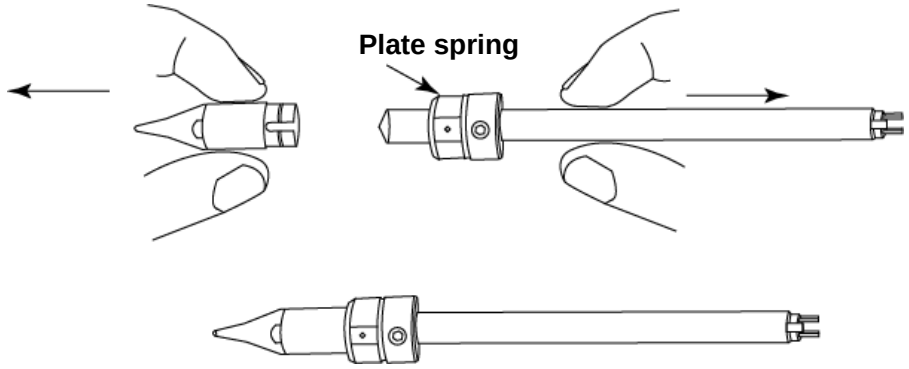


Make sure to turn the power off and cool down the temperature of iron cartrige pipe and pull down the iron cartridge to replace the new one. If it does not come out, using silicone tube pull it down strongly.

To attach a new one, insert it gently until the holder end.
Then turn it until you feel the position key in the position.
When you feel a clicking, insert it firmly.
Do NOT turn the iron cartridge while the key is not in the position or the key is damaged.

DC-X type, X-***

Make sure to turn the power off and cool down the temperature of iron cartridge. Then pull down the iron cartridge. Next pull out the iron tip. At this time, if cannot pull out, pull out with pushing the flat spring as follows.
When replace with the new one, make sure the tip getting a burning inhibitor. Then adjust the position and insert it strongly.



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