Kiwami

MR1-LS-90
(MR2-LS-90)
LA type soldering iron controller

Instruction manual

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The 3rd edition

JAPAN BONKOTE CO., LTD.

BONKOTE®

Table of contents

1 Preface

Read all precautions and instructions in this manual before using this equipment.

Save this manual for future reference.

2. Important precautions

 WARNING   **To reduce the risk of burns, fire, electric shock, or injury to persons, read the following important precautions and information before operating MR-1/2-LS-90**

・ Do not take apart or attempt to modify , it may cause fire, malfunction or electric shock.

・ Be sure to use the power supply with the specified voltage   (MR1=100V MR2 = 220V)

・ Your total current (obtained by adding the draw of all the controllers) should not exceed 3 Amps.

・ Plug the power code completely into the outlet.

・ To prevent electrical hazards including fatal shocks, do not put MR-1/2 into the water.

・ Do not touch MR-1/2 with wet hands.

・ Remove any accumulated dust on the plug by wiping with a clean dry cloth.

・ Making sure the cord is clear of any and all objects.

・ Don't tighten, twist, fold or damage the cord in any way.

・ If the power cord or plug become damaged in any way, stop using them immediately.

・ Do not put the controller on a shaky or unstable place.

・ Turn off the power when the controller won't be used for a while.

・ Before clean the soldering iron unit or replace the tips, turn off the controller and unplug, and allow sufficient time for the tips to cool down.

・ Use genuine parts for replacement. The use of imitation parts may cause your MR-1/2 to malfunction.

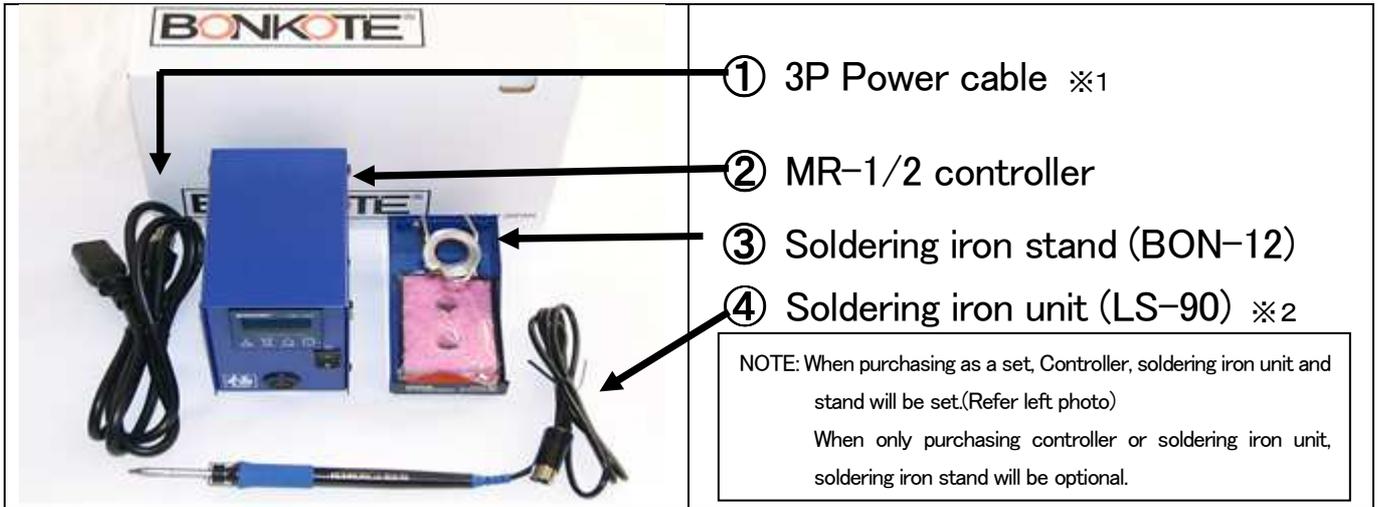・ For soldering purpose only.

3. Caution

⚠ CAUTION

・ This machine is designed with earth specification.　For safety, be sure to use an earth-quipped receptacle.
 (If you do not have such receptacle, install an earth separately.)

・ For surrounding conditions, use this machine on neat bench on which a conductive mat is put.

・ Refrain from place where the machine would be exposed too much moisture, direct sunshine, much dust and vibration.

・ In order to prevent static electricity, it is recommended using a static electricity removal device, wrist strap etc.

・ Odor is generated due to the use of solder and flux.　Be sure to ventilate work places.
 (ex : fitting of ventilator etc.)

・ Be sure to pull out the power plug, when the machine is not used.

・ Be sure to grab the power plug instead of cable, when inserting and pulling out the plug.

・Tighten all bolts and screws securely before beginning soldering operation.

4．　Recommendation of Auto-tuning before use

・ It is recommendable to do Auto-tuning before use, to operate with good effect for each conditions (iron tip temperature, shape of iron tip, etc.) and each environment, although each parameter has been set with the standard parameter value before the shipment.
※Auto-setting is simple keypad operation. (Please refer P.6)

5. How to use MR-1/2 controller

(A) Contents

① 3P Power cable ※1

② MR-1/2 controller

③ Soldering iron stand (BON-12)

④ Soldering iron unit (LS-90) ※2

NOTE: When purchasing as a set, Controller, soldering iron unit and stand will be set.(Refer left photo)

When only purchasing controller or soldering iron unit, soldering iron stand will be optional.
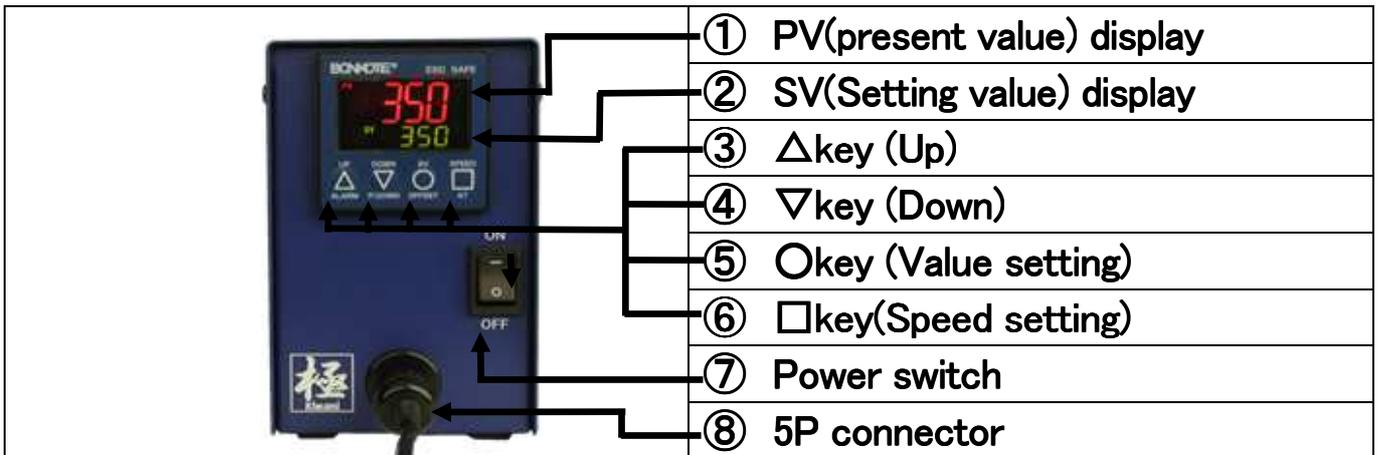
※1 MR-1 with 3PCHI cable, MR-2 with 3EPV cable will be attached.

※2 For the detail of the iron unit(LS-90), please refer the instruction manual for LS-90.

(B) Parts names

《 Front 》

① PV(present value) display

② SV(Setting value) display

③ △key (Up)

④ ▽key (Down)

⑤ ○key (Value setting)

⑥ □key(Speed setting)

⑦ Power switch

⑧ 5P connector

《 Back 》

⑨ Fuse holder
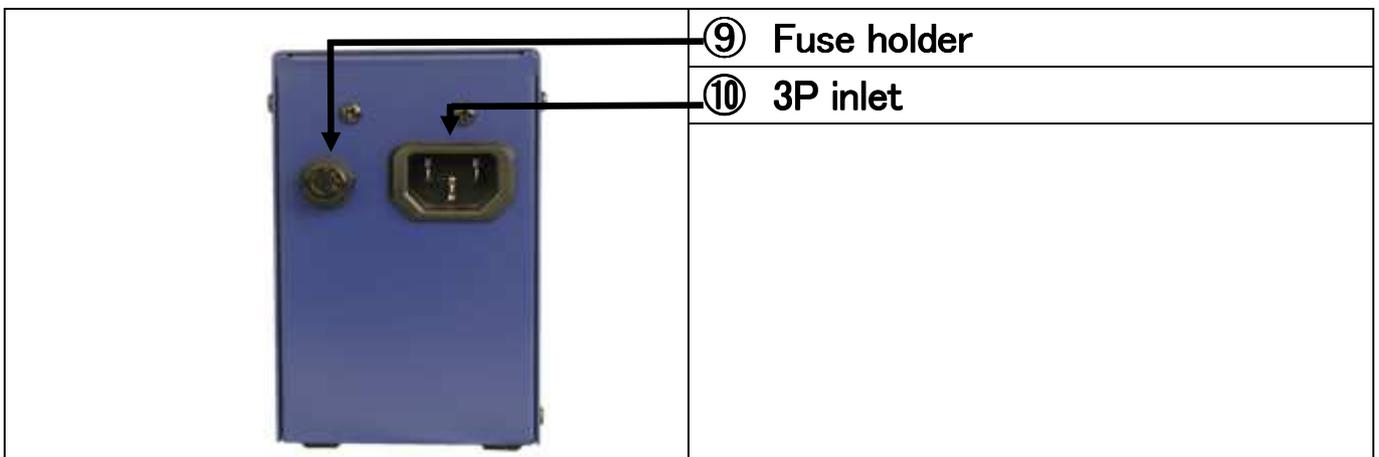
⑩ 3P inlet

(C) How to assemble

① Insert the power cable into 3P inlet.	
② Connect the soldering iron unit (LS-90) to the 5P connector at front.	
③ Set the soldering iron unit (LS-90) on the iron stand (BON-12).	

4

(D) How to use MR-1/2

① **Plug in the power code and turn the power on.**

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② **Set the temperature**

Initial temp.：350℃   Setting range：0 ~ 450℃

Ⅰ：At the operation mode, press ○key once to indicate ✑ on the PV screen.
Ⅱ：Input the temperature by △ or ▽ key.
Ⅲ：Press ○key to return to the normal operation mode.

Operation mode		Temp. setting mode		Operation mode
PV **350** SV **350**	⇒	**ᔕ** **350**	⇒	PV **350** SV **350**

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③ **Compensation of temperature differences**

Initial setting: 0℃   Setting range：－100.0℃ ~ 100.0℃

Ⅰ： At the operation mode, press ○key approx. 3 seconds to indicate ✑▱ on the PV screen.
Ⅱ： Input the compensate value by using △ or ▽ key on the SV screen.
Ⅲ： After input the value, push ○key once to return to the normal operation mode.

Operation mode		Temp. compensation		Operation mode
PV **350** SV **350**	⇒	**ᔐo** **0.0**	⇒	PV **350** SV **350**

How to calculate the compensation value by Standard measurement instrument

Example:
　　Temperature instruments indicates : 345℃　　Controller indicates : 350℃
　　Set the compensation value as －5

　　The compensation value
　　＝Standard measurement instrument indication－Controller indication ⇒345－350＝－5

④ Make the "Auto-tuning" after reaches to a set temperature

□ : At the normal operation mode, press □key for 3seconds.
□ : The"AT"lamp starts blinking.
□ : Auto-tuning is done in around 1minute. (The AT lamp will stop blinking)

Auto-tuning: It automatically calculates suitable PID value which controls soldering iron.
Be sure to make the Auto-tuning, otherwise, soldering iron may not perform well.

⚠**Attention**⚠
Make sure to make the Auto-tuning **after reaches to a set temperature.**
Do not touch the soldering iron during the Auto-tuning (while the AT lamp is blinking on the right bottom of the screen).　PID value is automatically calculated by repeating temperature Up and Down (about 1minute).　Touching the soldering iron during the repeating temperature Up and Down, causes incorrect PID value calculation and soldering iron may not perform well.

Above ③ ④ should be done only when the iron tip is replaced or the setting temperature is changed.
※The Auto-tuning is not done before the shipment. Please make sure to make the Auto-tuning before use.

6. Optional setting

(A) Alarm function Upper limit setting

Set the upper limit alarm of soldering temperature.

　　Initial setting: 100℃

Ⅰ : At the normal operation mode, press △key for 3sec. to indicate 🄰1 on the PV screen.
Ⅱ : Input the value by △ or ▽ key on the SV screen.
Ⅲ : Push ○key 2 times to return to the normal operation mode.

Operation mode	Upper limit alarm function	Operation mode
PV **350** SV **350**	**A1** **100**	PV **350** SV **350**

⇒ ⇒

Upper limit alarm: It alarms when the temperature exceed the range of the set temperature.
Example:
　　　The upper limit is set as 100℃.　Input temperature is 350℃.
　　　It alarms when the temperature becomes over 450℃
　　　Set 0 if the alarm function is unnecessary.

(B) Alarm function Lower limit setting

Set the lower limit alarm of soldering temperature

　　Initial setting：－100℃

Ⅰ : At the normal operation mode, press △key for 3sec. to indicate 🄰1 on the PV screen.
Ⅱ : Push ○key once to indicate 🄰2 on the PV screen.
Ⅲ : Input the value by △ or ▽ key on the SV screen.
Ⅳ : Push ○key once to return to the normal operation mode.

Operation mode	Upper limit alarm function	Lower limit alarm function	Operation mode
PV **350** SV **350**	**A1** **100**	**A2** **- 100**	PV **350** SV **350**

⇒ ⇒ ⇒
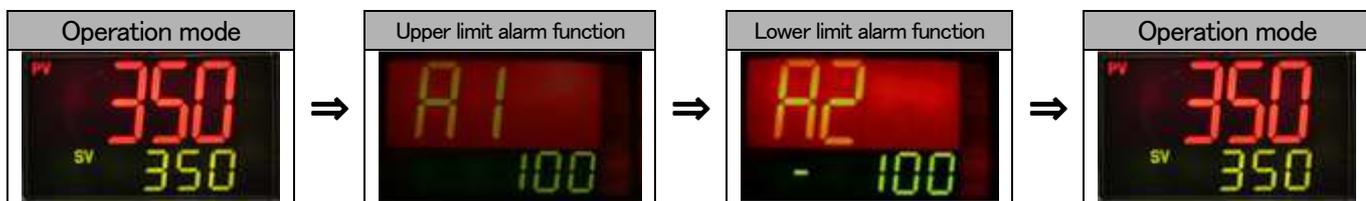
Lower limit alarm: It alarms when the temperature falls below the range of the set temperature.
Example:
　　　The upper limit is set as -100.　Input temperature is 350℃..
　　　It alarms when the temperature becomes under 250℃.
Set 0 if the alarm function is unnecessary.

(C) Speed setting

Control the recovery speed to the set temperature.
Initial setting：4.0   Setting range：1.0 ～ 10.0

Ⅰ：At the operation mode, push □ key once to indicate �5PEd on the PV screen.

Ⅱ：Input suitable value by △ or ▽ key on the SV screen.

Ⅲ：After input the value, push □ key once to return to the normal operation mode.

Operation mode	Speed setting mode	Operation mode
350 / 350	⇒ 4PEd / 4.0 ⇒	350 / 350

Ex.) Set 1.0 : Recovery speed is fast, and overshooting becomes large.
　　 Set10.0 : Recovery speed is slow, and overshooting becomes less.

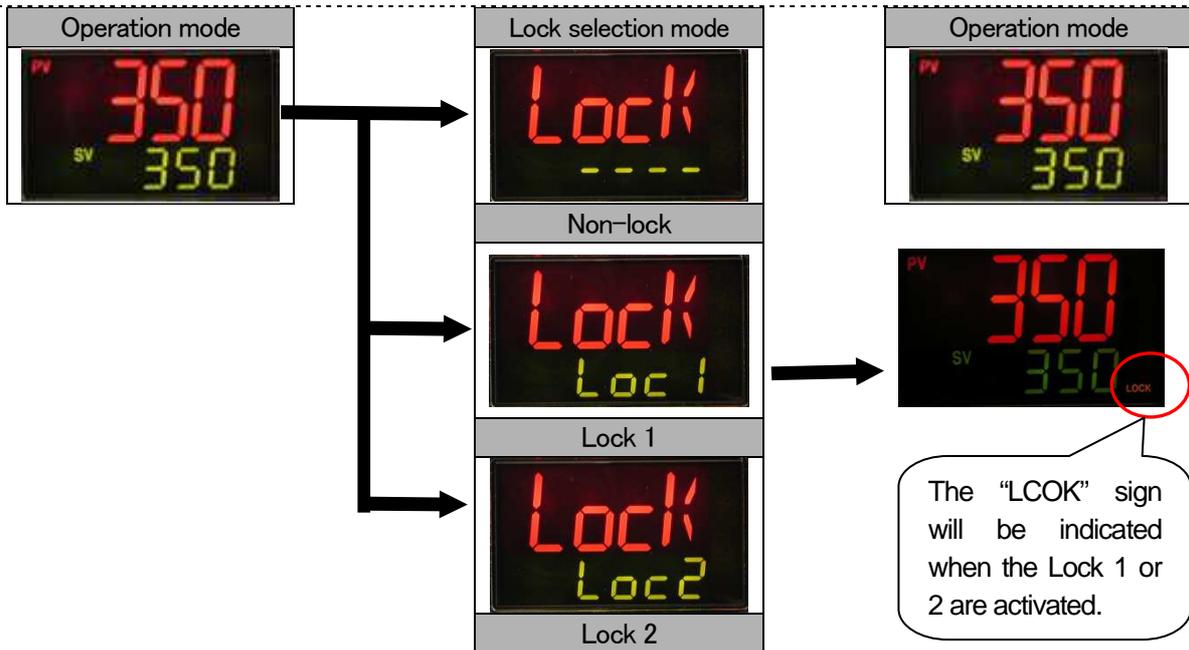## (D) Keypad lock function

It prevents accidental key operation and tampering.
Initial setting：Non-lock

Ⅰ：At the operation mode, press both △key and ○key at the same time for 5sec. to indicate Lock on the PV screen.

Ⅱ：Select the type of lock by △ or ▽ key, then push ○key once to return to the normal operation mode.

Operation mode	350 / 350
Lock selection mode	Lock / ---- — Non-lock
	Lock / Loc1 — Lock 1
	Lock / Loc2 — Lock 2
Operation mode	350 / 350

350 / 350 LOCK

The "LCOK" sign will be indicated when the Lock 1 or 2 are activated.

- - - -　　 :　Non-lock

Loc1　　 :　Lock all the setting except the lock function

Loc2　　 :　Lock all the setting except lock and temperature setting function.

5PEd

(E)　Auto power down / power off function

．（1）　Setting of parameter value

Prevent from Deterioration and Oxidization of the iron tip, the soldering iron tip temperature is lowered (Power Down) and supplying electric power to the heater is stopped (Power Off) automatically when the iron tip temperature is no changed during the specified time(available to set the time).
This function is also effective for saving energy and safety.

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①　Setting of Auto-Power Down Time

Initial setting　：30 minutes　　　Setting range：0　〜　120 minutes

Ⅰ：At the operation mode、press ▽key for 3sec. to indicate 𝖯𝖽𝖦𝖬 on the PV screen.
Ⅱ：Set the value by △▽key on the SV screen. Then, press ○key 3times to return to the normal operation mode.

Operation mode	Power-down time set mode	Operation mode
PV **350** SV **350**	**PdFM** **30**	PV **350** SV **350**
	⇒	⇒
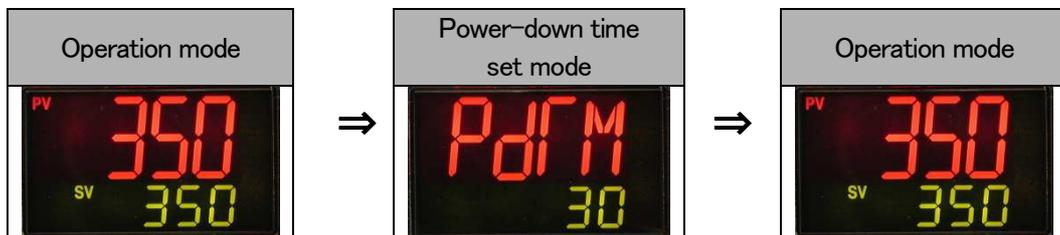
About Auto-Power Down Time:

e.g. : set value: 30 minutes

No fluctuation in the temperature of iron tip during stand-by mode for more than **30 minutes**, the decline in temperature will start automatically

During the process, "𝖯𝖽𝖶𝖭"and the setting value of auto-power down will be indicated alternately.

Set the value "0"　if you want to cancel this mode

《How to return to the normal operation mode》
　When the temperature has already reached to the lowest setting temp., change the temp. of iron tip
　（e.g.. Wipe the iron tip with a wet sponge), then it returns to the normal operation mode automatically.
　When the temperature has NOT reached to the lowest setting temp., press both △key and □key at the same time for 3sec..

《How to activate the power down mode manually》
　At the operation mode, press both △key and □key at the same time for 3sec.

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②　Setting of the lowest temperature for Auto-power down mode

Initial setting：150℃　　Setting range：0　〜　450℃

Ⅰ　At the operation mode、press ▽key for 3sec. to indicate 𝖯𝖽𝖦𝖬 on the PV screen.
Ⅱ　Push ○key once to indicate 𝖯𝖽𝖫𝖵 on the PV screen.
Ⅲ　Set the value by △▽key on the SV screen.
　Then, press ○key twice to return to the normal operation mode.

Operation mode	Lowest temp. set mode	Operation mofr
PV **350** SV 350	**PdⅣ** 150	PV **350** SV 350

⇒ ⇒

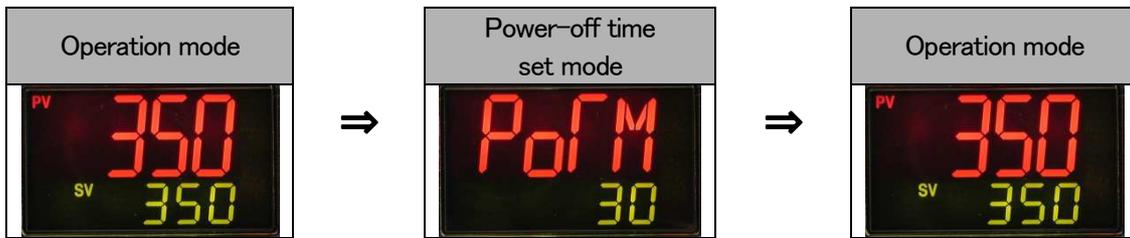About Auto-Power Down Temperature::

e.g. : set value: 150℃

During NO operation, the controller stands by in the temperature (150℃) which is set at this mode.

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③ Setting of Auto-Power Off time

Initial setting：30 minutes　　Setting range：0～120 minutes

Ⅰ　At the operation mode、press ▽key for 3sec. to indicate　$PdⅠM$ on the PV screen.
Ⅱ　Push ○key twice to indicate $PoⅠM$ on the PV screen.
Ⅲ　Set the value by △▽key on the SV screen.
　　Then, press ○key once to return to the normal operation mode.

Operation mode	Power-off time set mode	Operation mode
PV **350** SV 350	**PoⅠM** 30	PV **350** SV 350

⇒ ⇒

About Auto-Power Off Time:

e.g. : set value: 30 minutes

No fluctuation in the temperature of iron chip during the Auto-power down mode ("$PdⅢN$"blinks on the SV screen) for more than **30 minutes**, the power of controller goes off automatically and "$PoFF$"will be indicated on the PV screen.
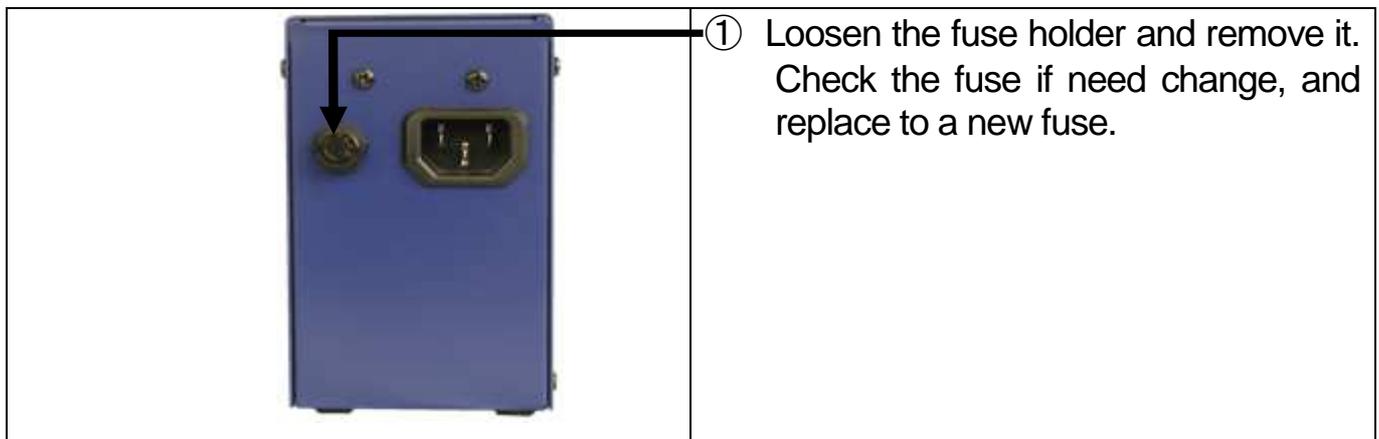
Set the value "0"　if you want to cancel this mode

《How to restart the normal operation》
　To restart the normal operation, switch off the MR-1/2 once, then switch it on again.

7．How to maintenance

Maintenance of MR1/MR2

(1) Replacement of fuse

	① Loosen the fuse holder and remove it. Check the fuse if need change, and replace to a new fuse.

Model No.	Specification
Fuse 3A	Glass fuse 250V 3A（φ5.2×20mm）

8．Specifications

MR1（MR2）Controller

	MR1	MR2
Input valtage	AC100V	AC220V
Output to Soldering iron	AC24V	
Temperature range	0〜450℃（Initial Set: 350℃）	
Power cord	3PCHI	3EPV
Dimention	76W×121H×128D mm	
Weight	About 2．2Kg(except 3P Power code)	
Fuse	3A	
Temp. control method	PID control（Auto-tuning）	
Temp. indication	Present value：LED（ red ）、Setting value：LED（ green ）	
Error indication	" ‾ ‾ ‾ ‾ " Over scale ：Temperature exceeds the limit （ Indication ） 　　　　　　　　　　　　　Ex) sensor trouble	
Power consumption	Less than 20VA （Controller only） Around 110W （When MR1/2 are connected with LS-90）	

1 1

9. How to use LS－90

(A) Attention

・LS-90 is only compatible with MR-1/2 controller. It can not use with the patriot series
(ex: M50/M12/M18).

(B) Parts names

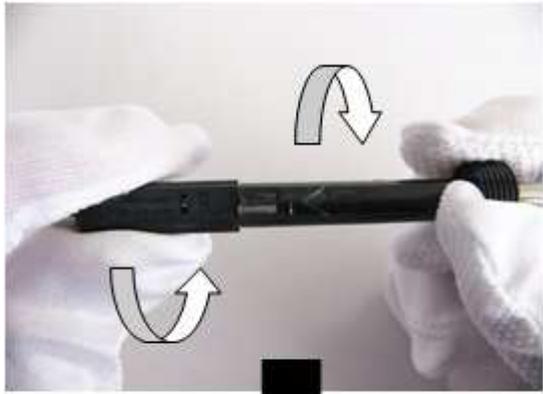| ①	Soldering iron tip		BK5 series
②	Heater element	24V-90W	CEA-24-90
③	Grip		LS-90

10. Maintenance of LS-90

Replacement of the iron tip and heater element

① Turn off the controller and wait until the iron tip cools down.

② Unlock the slip-resistant stopper.

③ Hold the plastic area of the iron tip and pull it out from the grip.

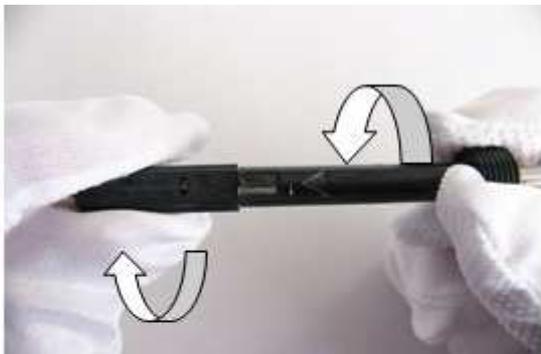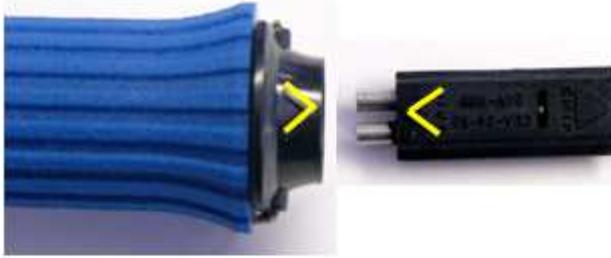|	
	④ Securely hold the heater part with your left hand. ⑤ With your right hand, rotate the iron tip 45degrees in a clockwise motion, and pull out. ＊ Be careful to handle the heater element.
	⑥ Prepare a new iron tip or heater element.
	⑦ To replace, reverse the step ④,⑤. * Be sure to align both the iron tip and the heater's triangle marks so that they are pointing towards each other.

⑧ Reinsert the "Tip & heater " parts to the grip, making sure the arrows align and point towards each other.

* Push it in the grip completely.

⑨ Finally, fasten the lock.

1 5

11. Specifications

(A) ＬＳ－９０

Soldering iron unit	ＬＳ－９０
Heater out put	９０Ｗ
Heater voltage	２４Ｖ
Iron tip	ＢＫ５series
Heater element	Alumina ceramic
Leak voltage	Less than ２．０ｍＶ （Initial value）
Ground resistance	Less than ２．０Ω (Initial value）
Power cable lenght	１．２ｍ
Size	Max.φ１８　Gripφ１５　Total length２０６ｍｍ
Weight	２５ｇ (without cable)

12. Trouble shooting & Guarantee

(A)Trouble shooting

Troubles	Detail	How to fix?	Reference
Soldering iron is not heated	It doesn't turn on at all	Check to see if it's plugs in tightly	P4
		Check the fuse	P11
	It turns on but doesn't heat up	Check the soldering iron is connected to the controller securely.	P4
		Check the iron tip is inserted to the soldering iron unit completely.	LS-90 manual
		Check the heater element	LS-90 manual
Unstable temperature		Proceed Auto-tuning	P6
Slow temp. recovery		Check the speed setting	P8
Excessive over-shoot			
Keypads don't respond		Check the keypad lock function	P8

(B)Guarantee

Our products are shipped after several factory tests & inspections. But if you find malfunctions or defects due to problems in workmanship or transportation, please contact with your dealer or us.
The guarantee period of your system is one year after your purchase, except for replacement parts.

(C)After service

If the products do not operate properly, read this manual again.
If the troubles are not still solved, please contact with your dealer or us.

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