



精密微接合电阻焊接机系列

Micro Resistance Welder Series



NIPPON AVIONICS CO.,LTD.

Avio精密电阻焊接机的概要

丰富的产品群和焊接专有技术提供各种接合方案

日本Avio株式会社长年致力于研究电子零件、电子机器、汽车等制造业不可缺少的部品之间的接合技术。其中，在「金属与金属接合」的电阻焊接技术和焊接产品具有半个世纪以上的销售和应用经验，活跃于众多领域并得到高度的评价。

另外，近年以移动终端机器为代表的电子类机器向小型化、高性能化或向清洁能源方向发展得到加速。电阻焊接对象材料在材质、形状、大小等也呈现出多样化。

Avio随着制造业显著的技术革新、针对客户的要求而迅速提供最合适的接合方案。

Outline of Avio Micro Resistance Welder

Avio Offers Welding Solutions Based on Our Wide Product Portfolio and Welding Know-how.

Nippon Avionics Co., Ltd. has been engaged in the technology for joining part to part which is indispensable in "MONOZUKURI (art of manufacturing)" for electronic components, electronic equipment and automobile. Among other things, our resistance welding technology and products which "join metal to metal" that we have accomplishments and experiences over a half century are being used and highly appreciated in various industries.

Furthermore, the recent trend for miniaturization, higher performance and clean energy of the electronic equipment, represented by mobile gears, is accelerated, and as a result, material, shape and size of object for resistance welding are being diversified.

Avio will continue to offer most suitable joining solutions satisfying the customers' requirement in a timely manner in the manufacturing industry where technical innovation is phenomenal.

■ 电阻焊接

「金属与金属接合」的电阻焊接？/为什么金属与金属可以连接在一起？

电阻焊接的电阻类似与行进方向相反的作用力。类似刹车时产生的摩擦及伴随着的摩擦热。

如右侧所示电阻焊接示意图，加压的同时进行通电。

由于金属与金属之间的接触部位的电阻比较大而发热、熔化被焊接在一起。

利用此电阻发热原理实现金属与金属的接合称为电阻焊接。

■ What is Resistance Welding?

What is resistance welding which "joins metal to metal"? How can two metals be joined together?

The word "resistance" in "resistance welding" means to resist against certain movement forward. It is associated with heating as in the case of friction heat when a brake is applied.

As seen in the resistance welder model, figure on the right page, electric current is applied while a pressure is applied.

When the electric current tries to advance in a metal, a heat is generated by the resistance of the metal itself and the resistance at the joining section.

The joining section between two metals, in particular, will generate more heat because of higher resistance, and as a result, the two metals are melted and joined together.

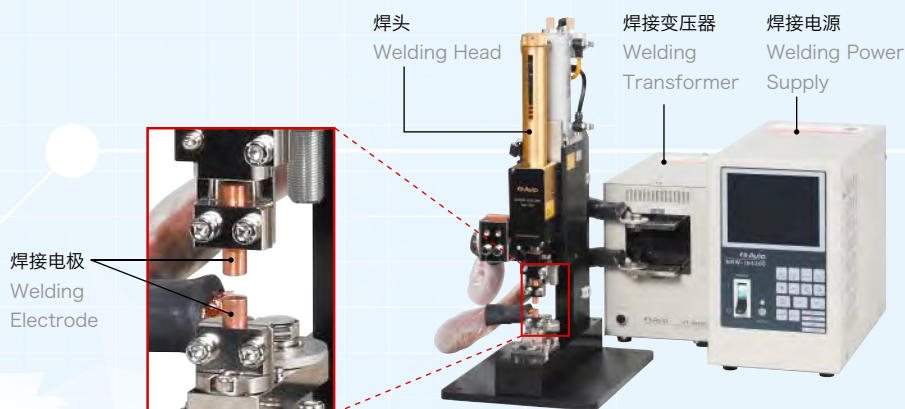
This method of joining two metals utilizing resistance heat is called resistance welding.

■ 电阻焊接机的构成和作用

Basic Configuration of a Resistance Welder and the Role of Each Part.

电阻焊接是将被焊接物用电极挟住后，施加压力的同时进行通电。

Resistance welder sandwiches an object to be welded by the welding electrodes, and applies electric current while applying a pressure.



- 焊接电源: 控制焊接电流的大小、时间、波形。
 - 焊接变压器: 将电源控制的电流转变为大电流。
 - 焊头: 控制压力。
 - 焊接电极: 对被焊接物施加压力并通电。
- Welding Power Supply : It controls the magnitude, time and waveform of electric current
 - Welding Transformer : It converts the electric current from the power supply to a larger current
 - Welding Head : It controls the pressure to be applied
 - Welding Electrode : It contacts the object to be welded to apply pressure and electric current

*其他有多种测量电流和压力的监测仪。

* In addition to the above, we have various monitors which measure electric current or applied pressure

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Lineup of Resistance Welder

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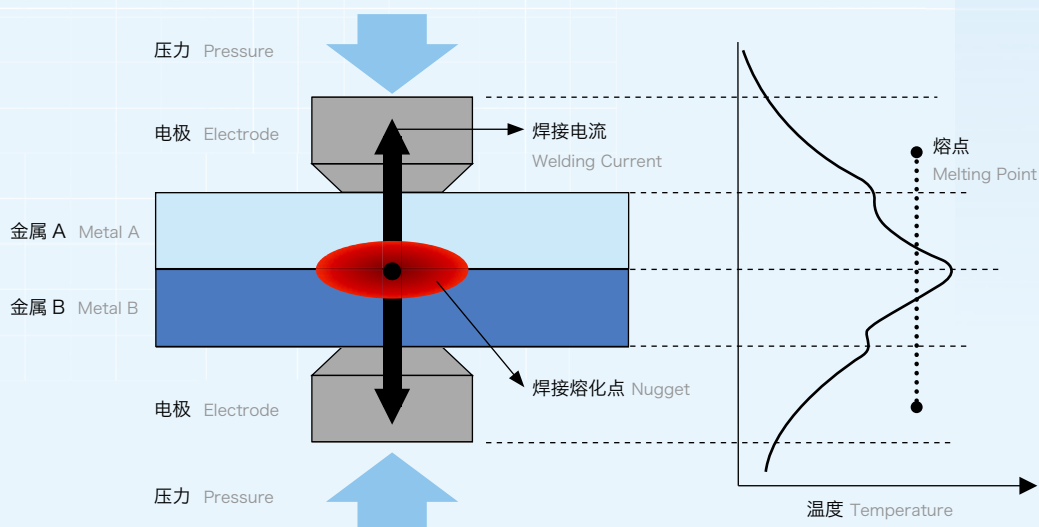
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■ 电阻焊接模式

Resistance Welding Model



■ 电阻焊接时的温度分布


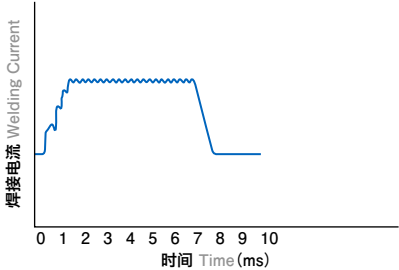

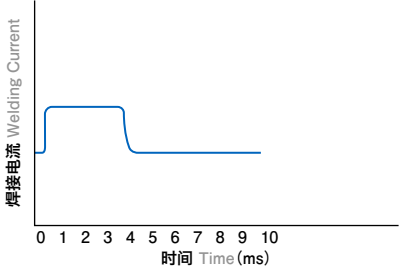

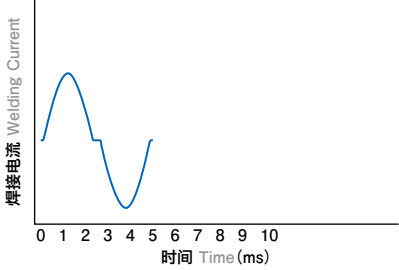

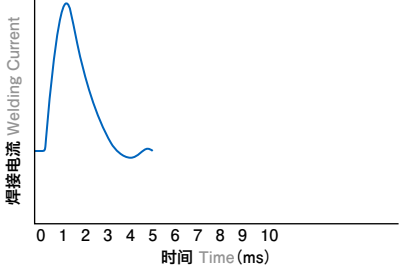

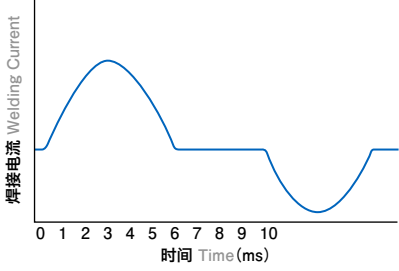
Temperature Distribution at the Welding

电阻焊接机产品系列 *Lineup of Resistance Welder*

焊接电源: 控制方式 *Welding Power Supply : Control Method*

根据被焊接物的材质、形状及所要求的焊接品质来选择焊接电源。Avio的焊接电源根据电流控制方式的不同大致可分为五类, 可利用各自的特长分别使用。

An appropriate welding power supply must be selected based on the material or shape of the object to be welded and the required welding quality. There are five different types in our welding power supplies based on the type of control of the welding current, and each type is selected in a way to best demonstrate its characteristic in welding.

基本组成 Basic System	焊接电流波形 Welding Current Wave Form	特长 Feature
高频式 Inverter Type 		<p>由交流整流至直流。热效率好的高频方式适用于高精密焊接。另外根据电流、电压的反馈控制方式可以得到稳定的焊接品质。适合于连续高速焊接的自动化机器。</p> <p>AC current is rectified into DC current. Because of high frequency, heat efficiency is good and suitable to precision welding. Furthermore, stable welding quality can be expected because of the electric current and voltage feedback control. As high speed repetitive welding can be made, it is suitable for use in automated systems.</p>
晶体管式 Transistor Type 		<p>由晶体管直接控制电流。控制速度快适合于微小部件及极细线材等的超精密焊接。根据电流、电压的反馈控制方式可以得到非常稳定的焊接品质。</p> <p>Electric current is directly controlled by a transistor. Because the control speed is fast and the waveform can be controlled, it is suitable to ultra high precision welding of very small components or extremely fine wires. Stable welding quality can be obtained by the electric current and voltage feedback control.</p>
混合 (高频+静电储能) 式 Hybrid (DC + Inverter) Type 		<p>由功率晶体管高速控制电流并具备极性切换功能。整合直流的高速控制和交流的极性切换功能的混合方式。适合于电池片等不同金属的并行焊接。</p> <p>Polarity of a large current is switched in high speed by a power transistor. It is called hybrid type because it has a high speed feature of DC and polarity switching feature of AC power supplies. It is suitable for welding of battery tabs where different types of metal are series welded.</p>
静电储能 (DC) 式 Capacitor (DC) Type 		<p>电容充电后瞬间放电。瞬间高电流的流动适合于导热性好的铝、铜等焊接困难的材料。放电时间短、热影响小, 也适合小型部件的焊接。</p> <p>Electric is charged into a capacitor and discharged at once. Because a large current can be applied, it is used for material which has good heat dissipation characteristic and difficult to weld, such as aluminum or copper. Furthermore, because of the short welding duration, heat impact is minimized, and as a result, it is suitable for welding of small components.</p>
单相交流 (AC) 式 Single Phase (AC) Type 		<p>由晶闸管控制电流。焊接控制时间长、通用性高。适合于铁制材料等容易焊接的部件。</p> <p>Welding current is controlled by a thyristor. Because the welding duration can be made long, it has a broad application, and it is suitable to a material which is relatively easy to weld, such as iron.</p>

电阻焊机产品系列 *Lineup of Resistance Welder*

焊接电源: 通电能力 *Welding Power Supply : Welding Current Capacity*

控制方式以外根据被焊接物的大小、厚度选择相应通电能力的焊接电源。

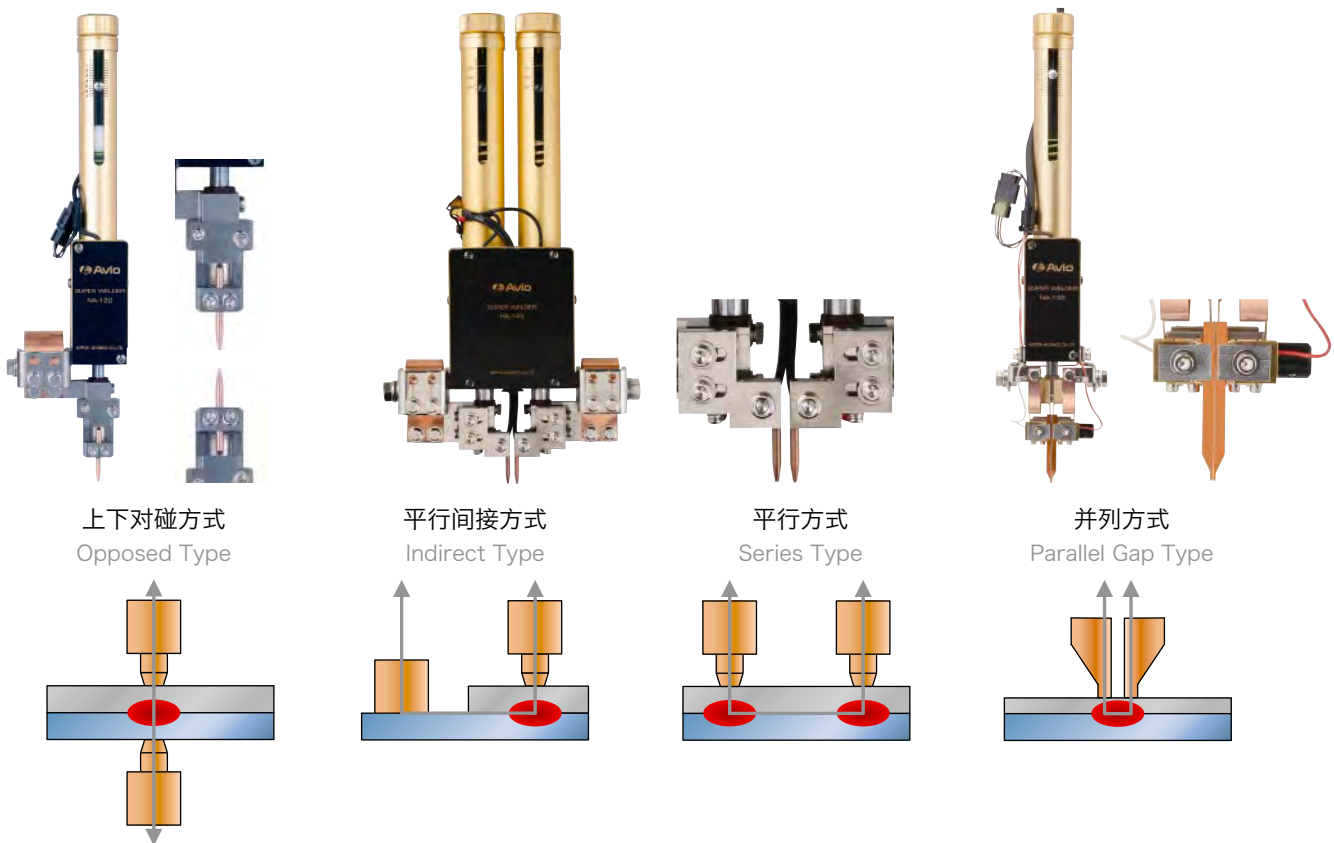
After the consideration for control method, select a suitable welding power supply having the appropriate current carrying capacity depending on the size and thickness of the object to be welded.

方式 Type	电源/变压器 Power Supply/Transformer	0	1kA	2kA	3kA	4kA	5kA	10kA	20kA
高频式 Inverter Type	NRW-IN4200 / NT-IN4400	4kA							
	NRW-IN8400 / NT-IN8400	8kA							
	NRW-IN16K4 / NT-IN16K4	16kA							
晶体管式 Transistor Type	MCW-700 / Built-in	0.5kA							
	MCW-750 / Built-in	1.8kA							
混合式 Hybrid Type	NRW-PS300 / NT-PS300	8kA							
	NRW-PS300 / NT-PS1500	8kA							
静电储能(DC)式 Capacitor (DC) Type	NRW-DC150 / Built-in	5.5kA							
单相交流(AC)式 Single Phase (AC) Type	NRW-5A / NT-5A	5kA							
	NRW-25A / NT-8A	11kA							

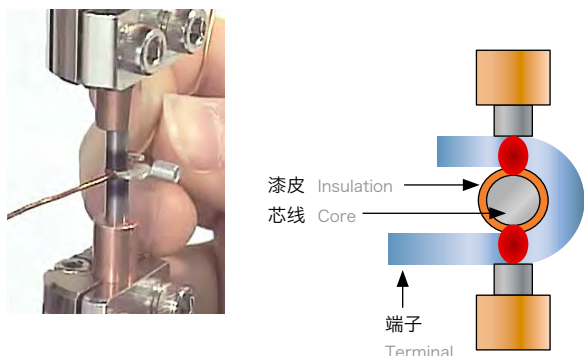
焊头&电极 *Welding Head & Electrode*

根据被焊接物的形状和结构决定电极的加压方式(焊接电流的流动)。另外电极的形状、材质及压力是焊接时的重要因素。

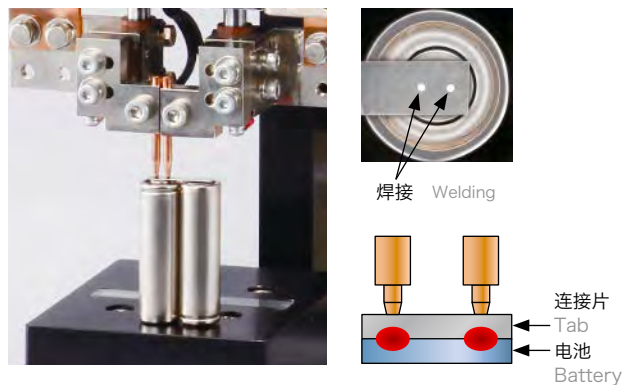
How the electrode contacts the object to be welded (how to apply the current) is determined by the shape or structure of the object. Furthermore, shape and material of the electrode and the applied pressure are also important factors in resistance welding.



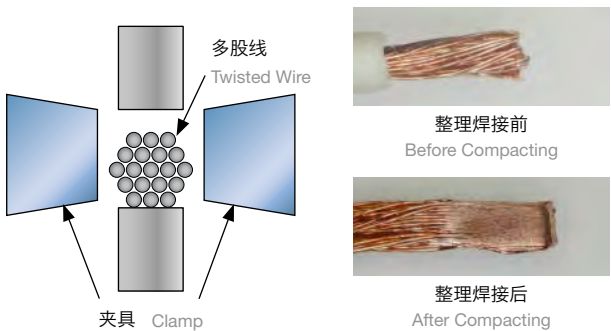
漆包线+U形端子
Insulation Wire + U-Shaped Terminal



电池组 (充电电池+连接片)
Battery Pack (Rechargeable Battery + Tab)

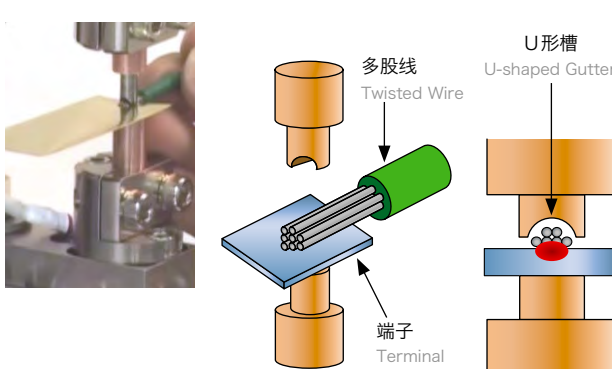


多股线(整理焊接)
Twisted Wire (Compacting)

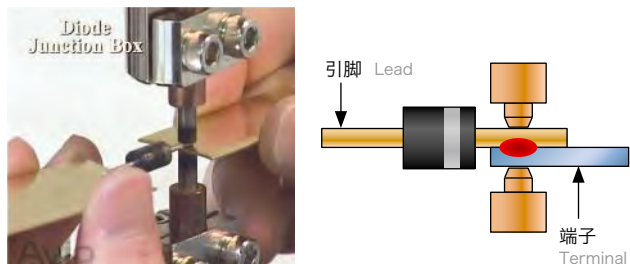


整理焊接: 针对多股线端子加压加热整理成矩形。
Compacting: Perform welding on the terminal of the twisted wire by adding pressure and heat.

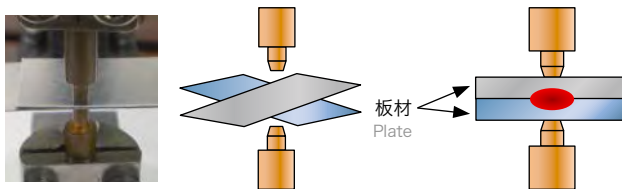
多股线+端子
Twisted Wire + Terminal Plate



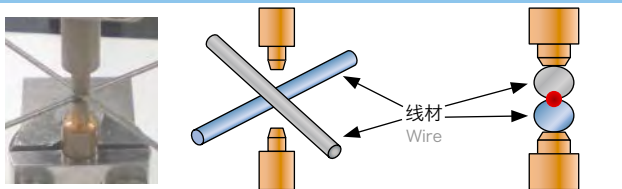
电子部件的引脚+端子
Lead of Electric Part + Terminal Plate



板材+板材
Plate + Plate

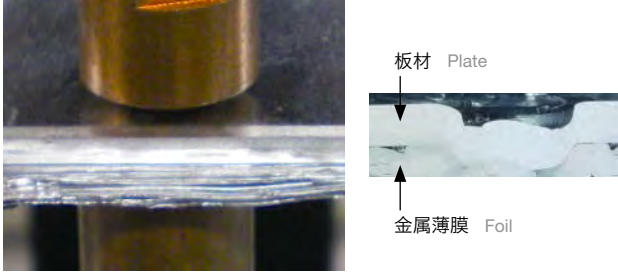


线材+线材
Wire + Wire

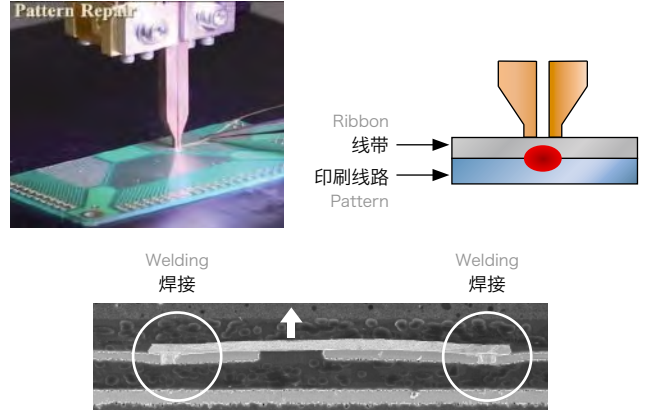


电阻焊接事例 Applications

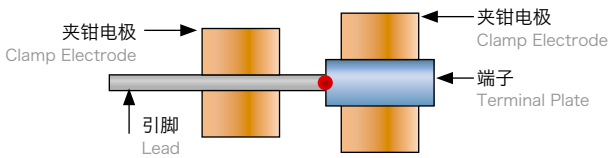
多层膜+板材 (铝·铜) Laminated Foil + Plate (Al, Cu)



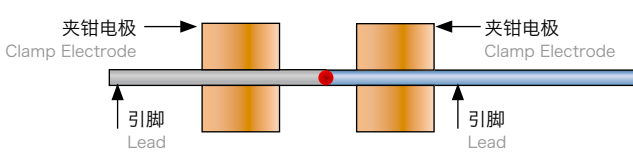
线路板断线维修 Pattern Repair



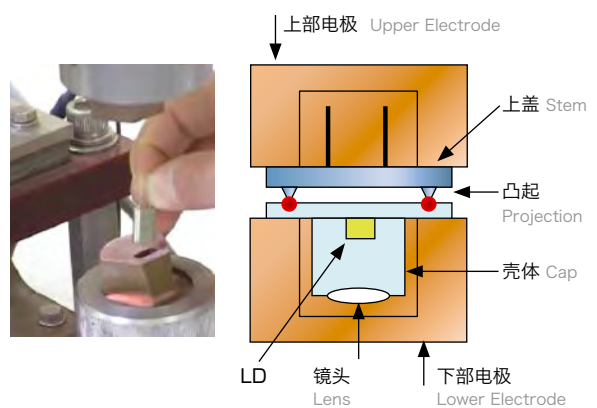
引脚+端子 Lead + Terminal Plate



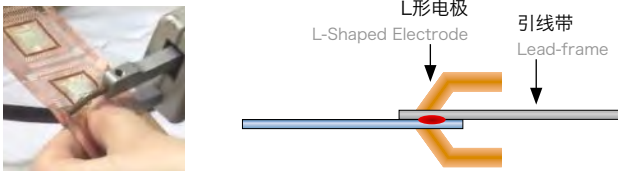
引线线+引线线 Lead + Lead



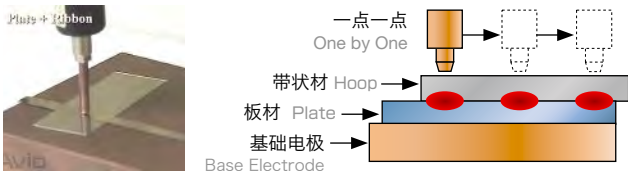
封帽机 Can Seal Welding



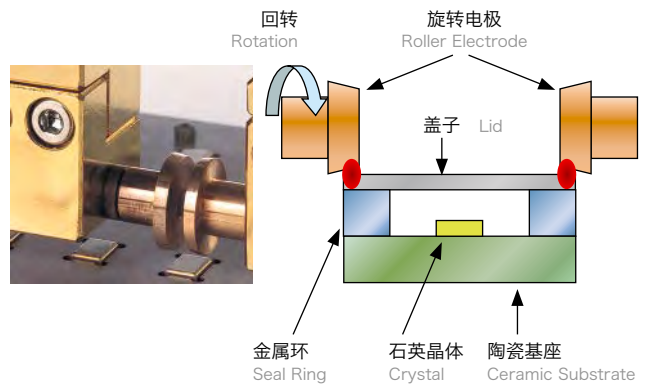
引线带+引线带 Lead-frame + Lead-frame



板材+带状材 Plate + Hoop Material



封焊：平行方式 Seam Welding：Parallel



三相高频电阻焊接机 Inverter Type

高速焊接提高生产效率!

High Productivity by High Speed Welding!

此机器是变频形式的高性能高频焊接电源。快速反馈的瞬时反应, 可以实现高速, 高质量, 高信赖性的精密焊接。

This model is the highly efficient welding power supply that adopted an inverter. It responds to the change during welding at real time by fast feedback. The highly stabilized welding current generated by the power supply is optimal to the resistance welding for precision electronic parts.

NRW-IN4200/NT-IN4400 NRW-IN8400/NT-IN8400 NRW-IN16K4/NT-IN16K4



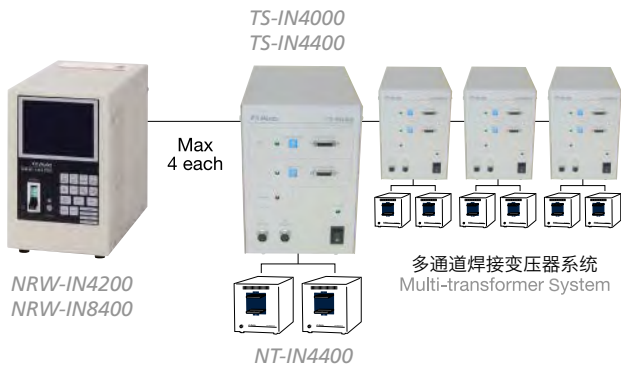
焊接波形的图像化显示

Graphic Display of Welding Wave Form



多通道焊接变压器系统

Multi-transformer System



- 多种控制方式 (定电流、定电压、定功率)
- 预通电焊接判断功能
- 长时间通电功能 (最长可达3秒)
- 大屏幕彩色液晶显示焊接波形的图像
- 多种监测功能
- 焊接波形存储功能
- Multi control mode (constant-current, voltage, power)
- Pre-weld check function
- Long-time welding (maximum 3sec)
- Graphic display of welding wave form on large LCD
- Multi monitoring function
- Welding wave form-memory function

项目	Items	NRW-IN4200	NRW-IN8400	NRW-IN16K4
焊接变压器	Welding Transformer	NT-IN4400	NT-IN8400/NT-IN4400	NT-IN16K4
最大电流	Maximum Current	4000A	8000A/4000A	16000 A (200V Option: 12000A)
控制频率	Control Frequency	2kHz		
控制方式	Control Mode	Constant Current, Constant Voltage, Constant Power, Fixed Pulse Width		
通电时间	Range of Timer Setting	1st, 2nd, 3rd, UP, WELD, DOWN Total Time 0.5~3000ms		
输出设定	Setting Range for Weld Type	Current : 0.4~4.1kA Voltage : 0.4~4.1V Power : 0.2~8.2kW	Current : 0.4~8.2kA / 0.4~4.1kA Voltage : 0.4~6.2V / 0.4~4.1V Power : 0.2~24.6kW / 0.2~8.2kW	Current : 0.4 - 16kA Voltage : 0.4 - 6.2V Power : 0.2 - 49.2kW
电流、电压、功率、电阻、监测功能	Current, Voltage, Power, Resistance, Monitoring	Average / Peak /Profile		
追踪检测功能	Trace Monitoring	Current, Voltage, Power, Resistance		
波形显示	Display of Waveform	Current, Voltage, Power, Resistance		
焊接条件	Number of Condition	31		255
通信接口	Interface	RS232C		
冷却方式	Cooling Method	空气冷却 Forced-air		
电源	Power Source	AC200~230V 3φ	AC380~415V 3φ (Option: AC200~230V 3φ)	AC380~415V 3φ (Option: AC200~230V 3φ)
尺寸、重量	Dimension / Weight	W170×D350×H265mm ≈14kg	W186×D490×H265mm ≈19kg	W280×D410×H470mm ≈35kg
项目	Items	NT-IN4400	NT-IN8400	NT-IN16K4
冷却方式	Cooling Method	空气冷却	Forced-air	水冷 Water
尺寸、重量	Dimension / Weight	W150×D267×H210mm ≈12kg	W210×D342×H210mm ≈18kg	W198×D420×H357mm ≈48kg
项目	Items	TS-IN4000	TS-IN4400	
尺寸、重量	Dimension / Weight	W150×D245×H210mm ≈5kg	W200×D260×H210mm ≈10kg	

三相高频电阻焊接机 *Inverter Type*

最适合U形端子的焊接系统

Optimized System for Fusing

因为有变形量的控制, 从而实现高信赖性的焊接。

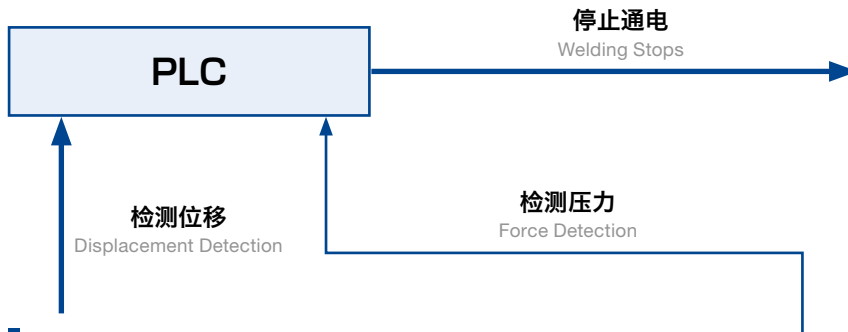
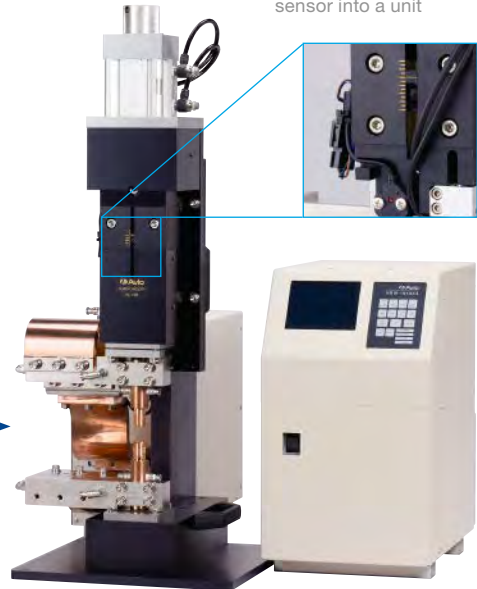
As it is controlled by the amount of deformation, the highly reliable joints can be achieved.

■ 马达线圈和U形铜端子的焊接

Fusing of Large Motor Coil and Cu Terminal



1800N 弹簧加压
组装压力传感器
1800N Spring Pressure
Example of integration of the pressure
sensor into a unit



位移监测仪 Displacement Monitor

QC-200



QC-200

※请参考第14页的详细规格。
Refer to P14 for detail of the specification.

压力监测仪 Force Monitor

QC-100



QC-100

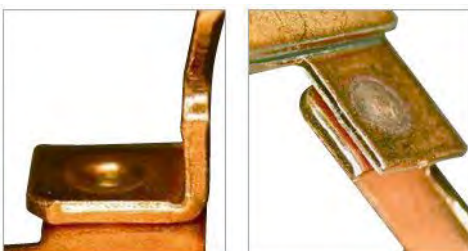
※请参考第14页的详细规格。
Refer to P14 for detail of the specification.

■ 高电导率材料的焊接

For Welding of High Conductivity Materials

铜板配线的焊接

Welding of Copper (Cu) Bus Bar



■ 选项 Option

自动机器用焊接变压器
Transformer for integration
into Equipment



项目	Items	NT-IN12K4
尺寸、重量	Dimension / Weight	W92×D304.5×H164 ≒ 16kg
冷却方式	Cooling Method	水冷 Water

※另外需要电流感应线圈。 / A current sensor is additionally required.

晶体管式电阻焊接机 Transistor Type

精密焊接的希望!

The Favorite of Precise Welding!

晶体管式焊接电源特别适合于微小部件的精密焊接。

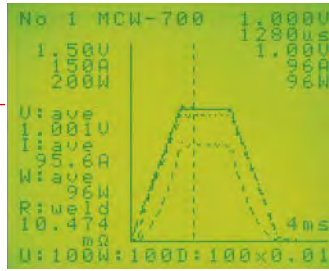
Transistor type welding power supply is suitable for precise welding of superfine wires and micro components.

MCW-700 & MCW-750



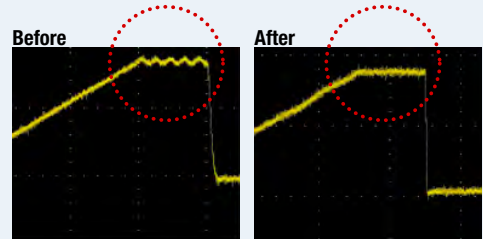
MCW-700

直观的焊接波形
Real Time Welding Waveform Display

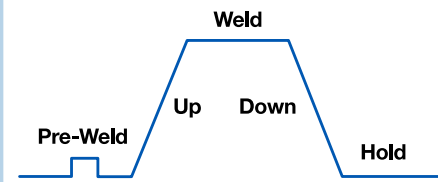


MCW-750

PID调整 PID Adjustment



通电波形 Welding Waveform



- 高速线性制御实现稳定的精密焊接
- 三种控制方式: 定电流、定电压、定功率
- 高速焊接: 5次/秒
- 预通电焊接检测功能防止溅射
- 同时显示电流、电压、功率的波形图像

- Consistent and precise welding by high speed linear control
- 3 control modes: constant current, voltage, and power
- High productivity by high speed welding : 5 shots / sec
- Pre-weld check function reduces spark problem
- Simultaneous graphic display of V, I and W waveform

项目	Items	MCW-700	MCW-750
最大电流	Maximum Current	500A	1800A
最大电压	Maximum Voltage	2V	4V
定电流模式	Constant Current Mode	10~500A (1A STEP)	10~1800A (1A STEP)
定电压模式	Constant Voltage Mode	0.001~2V (1mV STEP)	0.01~4V (10mV STEP)
定功率模式	Constant Power Mode	10~500W (1W STEP)	10~3600W (1W STEP)
通电时间: Up	Weld Time : Up	0~999×0.01ms or ×0.1ms	
通电时间: Weld	Weld Time : Weld	0~999×0.01ms or ×0.1ms	
通电时间: Down	Weld Time : Down	0~999×0.01ms or ×0.1ms	
通电时间: Squeeze&Hold	Weld Time : Squeeze&Hold	9.99s (maximum)	
预通电检测	Pre-check	Resistance / Current	Resistance / Current
焊接次数/秒	Shot / Sec	5shots / sec : 500W 2ms	5shots/sec : 3600W 2ms
监测器: 波形显示	Monitor : Waveform	Current / Voltage / Power	Current / Voltage / Power
监测器: 电流	Monitor : Current	Average / Peak	Average / Peak
监测器: 电压	Monitor : Voltage	Average / Peak	Average / Peak
监测器: 功率	Monitor : Power	Average / Peak	Average / Peak
焊接条件存储	Number of Conditions	15	15
通信接口	Interface	RS-232C, I/O, analog output	RS-232C, I/O, analog output
电源(选项)	Power Source	AC100~120V (Option: AC200~240V) 1φ	AC100~120V (Option: AC200~240V) 1φ
尺寸、重量	Dimension / Weight	W200×D350×H300mm ≒20kg	W200×D350×H400mm ≒27kg

混合型电阻焊接机(高频+静电储能) Hybrid (DC + Inverter) Type

标准配备最适合铝、铜材料焊接时的功能!

Equipped with Advanced Welding Function which is Suitable for Joint of Aluminum or Copper!

NRW-PS300 / NT-PS300

焊接电源
Welding Power Supply
NRW-PS300

焊接变压器
Welding Transformer
NT-PS300

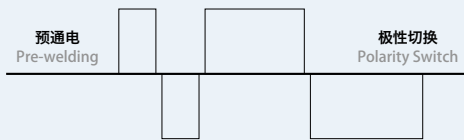


焊接波形的图像化显示
Graphic Display of Welding Waveform

实现稳定焊接的丰富多彩的通电方式

Variety of Welding Modes for Stable Welding

四段波形通电 Example for 4CH Welding

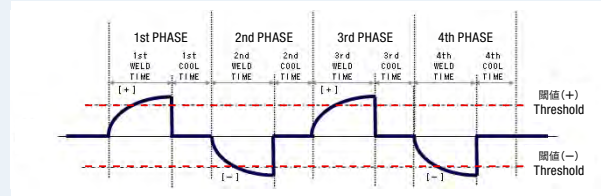


- 反馈跳出功能: 到达设定值(电压、电流、功率、电阻、W·S、外部触发)后, 自动跳转到下一个通电段。
- 高速焊接: 快速电流起动机和高速极性切换的功能可以减少焊接时的热影响得到漂亮的外观。
- 极性切换: 抑制焊接点的不对称, 得到均匀的左右焊接点的强度。另外, 良好的热平衡效果也使电极的寿命延长。
- 四段波形通电: 预通电、主通电时都可以进行极性切换, 取得热平衡得到稳定的焊接。
- 功率(W·S)监视: 时时监测功率。判断达到设定值后自动断电, 防止过度焊接保证良好的焊接质量。
- 焊接波形记忆: 根据此记忆存储功能容易找出焊接条件。
- 最多八段波形通电(选项对应)

反馈跳出功能 Feedback Shift Function

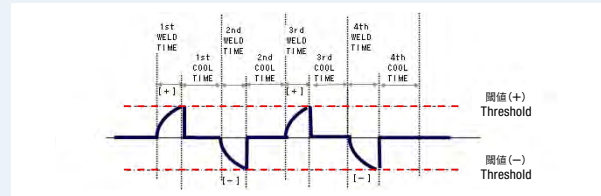
无跳出功能: 按照设定的曲线进行通电

When the Feedback Shift Function is disabled: Welding is performed based on the values set in the profile.



有跳出功能: 到达所设定的阈值时停止通电, 经过所设定的COOL TIME后, 转入下一个通电段。

When the Feedback Shift Function is enabled: Welding stops at the timing when each of the items reaches the setting threshold, and moves to the next welding phase after the COOL TIME elapses.



- Feedback Shift Function: When each of the voltage, current, power, resistance and W·S reaches a set value, or the external trigger becomes active, the welding stops and moves to the next welding phase
- Fast Welding : Good welding performance and less thermal effect with high speed rising time and polarity switch
- Polarity Switch : Well-uniformed welding and improvement of longer electrode lifetime
- 4 Pulse : Pre-weld and other variety of welding modes suitable for many applications
- Energy Monitoring : High quality welding with automatic welding stop function to prevent over-energy
- Welding Waveform Memory : Easy setting of welding condition with welding waveform shown on LCD
- Up to 8 Phases Available (Optional)

项目	Items	NRW-PS300
焊接变压器	Welding Transformer	NT-PS300
控制方式	Control Method	IGBT Control (Polarity Switch)
二次短路电流	Secondary Short-Circuit Current	8000A
最大输出	Maximum Output Power	300W·S相当 Considerable
输出设定	Setting Range	Weld Time
		Transformer Tap
焊接条件	Number of Condition	63
监测功能	Monitoring	V、I、W、R (Average, Peak) W·S (Phase Shift)
I/O接口	I/O Interface	I/O connector (50pin)、EXT_I/O (12pin)
通信接口	Communication	RS232C
电源	Power Source	AC380~415V±5% 3φ (Option: AC200~230V±10% 3φ)
尺寸、重量	Dimension / Weight	Power Supply: W186×D490×H265mm, ≈19kg
		Transformer: W210×D300×H210mm, ≈28kg



其他焊接变压器 The Other Transformer

项目	Items	NT-PS1500	NT-PS1500H
二次短路电流	Secondary Short-Circuit Current	8000A	8000A
最大输出	Maximum Output Power	相当于1500W·S considerable	相当于1500W·S considerable
变压器二次输出	Transformer Tap	2.5V、5.0V、7.1V、10.0V	10.0V、14.1V、20.0V、28.3V
尺寸、重量	Dimension / Weight	W230×H240×D380mm ≈52kg	W230×H240×D380mm ≈53kg

直流储能电阻焊接机 Capacitor (DC) Type

最适合于电池片的焊接和铝、铜等的焊接!

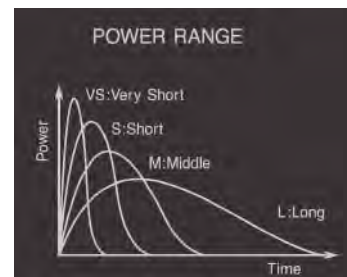
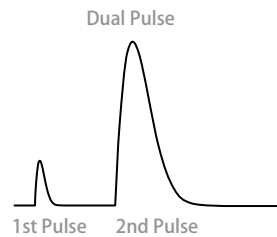
Suitable for Welding of Battery Tab, Aluminum and Copper!

NRW-DC150



NRW-DC150

配置双脉冲功能! Dual Pulse Function



■ 大功率电容器的充电能量瞬间放电的方式

Rapid Release of Energy Using High Capacitance Energy Storage

- 双脉冲通电功能可抑制焊接火花而得到稳定的质量。
- 适合于铝、铜等不同种类焊接困难的金属。
- 短时间通电方式抑制工件的变形、烧损, 适合小型部件的精密焊接。
- 高速充电提高生产效率(焊接速度75W·S时, 120次/分钟)
- VS (Very Short) 模式实现150W·S的设定可得到200W·S的峰值电流。
- Dual Pulse Function Minimizes Welding Spark and Improves Welding Quality
- Suitable for Aluminum, Copper, as well as other Welding Materials
- Deformation and Burning is Minimized due to Short, Concentrated Energy Burst
- Fast charging time improves productivity (Welding Speed 75W · S 120Shots/min)
- VS (Very Short) mode allows to obtain peak welding current same as 200W · S type

项目	Items	NRW-DC150
焊接变压器	Welding Transformer	内置 (Built-in Type)
充电能量	Stored Energy	1-150W · S (0.1Step)
最大输出(W·S)	Maximum Output Power	VS Pulse 5500A 2.1ms S Pulse 4500A 3.2ms M Pulse 3600A 4.3ms L Pulse 2600A 6.2ms
通电次数	Duty Cycle	25W · S 200 shots/min 75W · S 120 shots/min 150W · S 80 shots/min
双脉冲功能	Dual Pulse Function	Standard Specification
通电延迟时间	Squeeze Time	0.01~9.99sec
通电结束保持时间	Hold Time	0.01~9.99sec
电源	Power Source	AC200~230V ±10% 1φ (Option: AC100V)
尺寸、重量	Dimension / Weight	W220×D400×H347mm / ≈31kg



■ 降压变压器 Step Up Transformer

项目	Items	ST-U200
额定功率	Rated capacity	2kVA
输入	Input	AC100V 1φ 50Hz/60Hz 20A
输出	Output	AC200V 1φ 50Hz/60Hz 10A
尺寸、重量	Dimension / Weight	W140×H181×D230mm ≈16kg

单相交流电阻焊接机 Single Phase (AC) Type

适合于大尺寸部件的焊接!

Most Suitable for Welding Large Parts!

单相交流式焊接电源与静电储能式相比通电时间调整范围大，一般适用于厚板、铜卷线的焊接。峰值电流较低，受表面洁净度的影响小。利用预热、上升、下降焊接功能减少或避免焊接时产生的溅射和毛刺。

A single-phase AC type welding machine suits the welding to thick plate and copper stranded cable as it can adjust weld time more wide range than an electrostatic stored energy type. Its characteristic of low peak current gets little effect of dirt or stain on the surface of the work-piece, accordingly it is effective welding process when the derivation of the weld spattering and burrs, that are produced especially in the weld schedule of preheating or up slope welding, cause troubles. Power is demonstrated.

※Burr : A protrusion shaping like hair spring produced during welding, Fin

焊接电源

Welding Power Supply

NRW-5A



NRW-25A



焊接变压器

Welding Transformer

NT-5A



NT-8A



NT-5M



- 小型、多功能适用于自动机器
- 通电延迟、通电后保持功能控制焊头的动作
- 焊接条件自动切换 (2挡)
- 内置电源电压补偿回路

- Most suitable for the automatic machines because small size and various welding function (pre-heating, up-slope, cooling time)
- The actuation control for the welding head is available by squeeze and holding functions
- Automatic switching function for 2 kinds of setting conditions is provided
- A compensation circuit for the power source voltage is built-in

项目	Items	NRW-5A	NRW-25A
控制方式	Control System	同期 (相位角控制) Synchronized	
控制范围	Range of Heat Control	40-100%	
通电时间	Welding Time	0.5-99 cycles	
通电延迟、通电后保持时间	Squeeze, Hold Time	0-99 cycles	
通电功能	Welding Function	预热、倾斜上升、通电间隔时间、两段切换 pre-heating, up slope, cool time, channel switching function	
额定功率	Rated Capacity	3kVA (50%使用率 duty cycle) 9.5kVA (5%使用率 duty cycle)	6kVA (50%使用率 duty cycle) 19kVA (5%使用率 duty cycle)
电源	Power Source	AC200V±10% 50/60Hz 1φ (Option: AC100-120V, 220-240V)	
尺寸、重量	Dimension / Weight	W110×D315×H227mm ≒6kg	W150×D315×H227mm ≒7.8kg

项目	Items	NT-5A	NT-8A	NT-5M
一次输入电压	Primary Input Voltage	200V	200V	200V
额定输入 (50% 使用率)	Rated Input capacity (duty cycle 50%)	3kVA	6kVA	2.8kVA
二次短路电流	Secondary Short-circuit Current	5000A	11000A	2400A
二次开口电压	Secondary Open-circuit Voltage	1.1、1.8、3、5 (V)	1.8、3、5 (V)	6、6.5、7、7.5 (V)
尺寸、重量	Dimension / Weight	W200×D350×H265mm≒29kg	W230×D566×H335mm≒47kg	W200×D350×H265mm≒28kg

降压变压器 Step Down Transformer



项目	Items	ST-100	ST-200
一次输入电压	Primary Input Voltage	115V / 230V	220V / 230V
额定输入	Rated Input Capacity	1kVA	6kVA
二次开口电压	Secondary Open-circuit Voltage	100V	200V
尺寸、重量	Dimension / Weight	W130×D230×H193mm ≒11kg	W130×D260×H193mm ≒12kg

数字式压力计 Digital Force Gauge

小型、轻量、便携

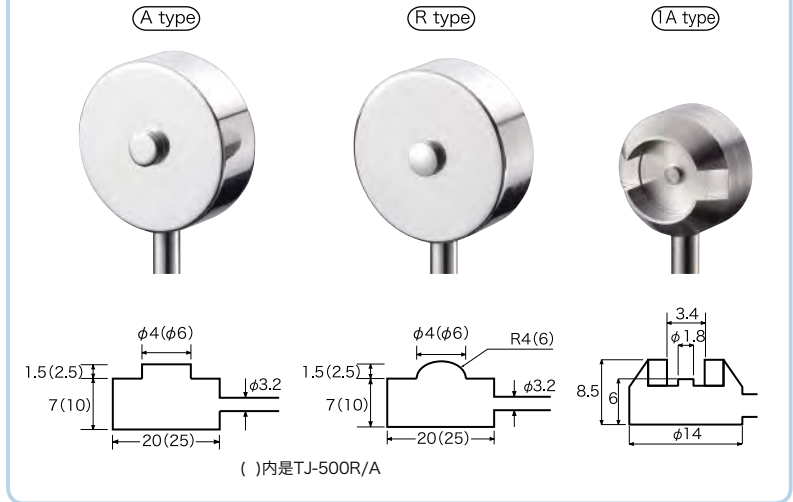
Compact, Light Weight and Handy Type

FG-400 & TJ series



※FG-400与TJ系列分别销售。
FG-400 and TJ series are sold separately.

传感器形状 Sensor Tip Shape



- 小型、轻便
- 三种供电方式
- 显示保持功能
- 简单易行的零位调整
- 自动识别压力传感器的种类
- 判断(上限、下限)功能

- Compact, and light weight
- 3 ways power supply
- Display hold function is equipped
- Easy zero adjustment function
- Automatic recognition of the type of sensor
- Judgement function (Hi & Low) is equipped

项目	Items	FG-400
表示功能	Display	4 digit (0000-9999) N:newton
零位调整	Zeroing Adjustment	使用SW自动调整 Automatic regulation by switching
保持功能	Hold Function	抽样值 / 峰值 sample/peak
信号接口	Interface	RS-232C
电源	Power Source	5号电池、镍氢电池、专用交流电源适配器 (AC100V~240V) 1φ Use by AA type battery, Ni-H type battery or Dedicated AC adapter (AC100V~240V)
尺寸、重量	Dimension / Weight	W77×D140×H27mm ≈300g

※有关FG-400的校对证明书的发行, 需要额外收费对应。/Calibration certificate for FG-400 is not free of charge. Please ask sales representative for quotation.

项目	Items	TJ-1A	TJ-20R or TJ-20A	TJ-100R or TJ-100A	TJ-500R or TJ-500A
测量范围	Measuring Range	0~10N	0~196N	0~980N	0~4900N
极限压力	Critical Load	20N	294N	1470N	7350N
精确度	Accuracy	±2% (of full scale)			

设备组装用压力传感器 Pressure Sensor for Incorporation into Equipment

项目	Items	TJS-1R	TJS-20R	TJS-100R	TJS-100A-NA124	TJS-500A-NA126
测量范围	Measurement Range	0~10N	0~196N	0~980N	0~980N	0~4900N
极限压力	Critical Load	20N	294N	1470N	1470N	7350N
精确度	Accuracy	± 3% (of full scale)				
适配系统焊头	Applicable Welding Head	NA-121,122,123 NA-131,132,142			NA-124 NA-125	NA-126

※组装到系统焊头内时另外需要垫片配件。/A pusher is optionally required for integration into the Welding Head.

系统焊头组装实例

Example for integration of the sensors into the Welding head



焊接监测仪 Welding Monitor

位移·压力监测

Realtime Monitoring of Displacement and Force

压力监测仪 Force Monitor

QC-100



QC-100

位移监测仪 Displacement Monitor

QC-200



QC-200

- 可切换数字显示和图像显示
- 与系统焊头配合容易实现自动化
- 丰富的通信接口便于生产管理 (输出测量值、比较判定结果)
- 传感器安装方便
- 高精度测量焊接物的变形量
- 图示波形解析 (1秒2000次的高速抽样)
- 焊接过程中有两种条件进行测量、判定 (通电前用A 条件, 通电后用B 条件进行测量、判定)
- 可分别进行压力或位移设定的触发

- Selectable Display : Digital or Graphic
- Easy Automation by Combination with System Head
- Easy QC by Enhancement of Communication Function (Output of Measured Value & Monitoring Result)
- Easy Installation of Force Sensor
- High Accuracy Measurement for Displacement of Welding Material
- Wave Analysis by Graphic Display (High Speed Sampling at 2000 times/sec)
- Measurement & Judge by 2 Conditions for Welding Process (Measurement & Judge for Before/After Welding)
- Trigger by Applied Force or Displacement can be Set

项目	Items	QC-100	QC-200
测量范围	Measurement Range	0~1000N	0~7.5mm 分辨率/Resolution : 1 μm
精确度	Accuracy	± 3%(of full scale)	± 1%(of full scale)
抽样时间	Sampling Time	0.5ms(2000times/sec)	
通电延迟时间、保持时间	Squeeze, Hold Time	0~0.9sec	
通信接口	Interface	RS-232C, I/O, analog output	
电源	Power Source	DC24V ±10% 2A	
尺寸、重量	Dimension / Weight	W170×D210×H150mm ≒3.0kg	W170×D210×H150mm ≒3.4kg

※有关QC-100、QC-200的校对证明书的发行, 需要额外收费对应。/ Calibration certificate for QC-100 and QC-200 is not free of charge. Please ask sales representative for quotation.

焊接监测仪 Welding Monitor

QC-440



打印机
Printer

QC-440



■ 环形线圈 Toroidal-coil

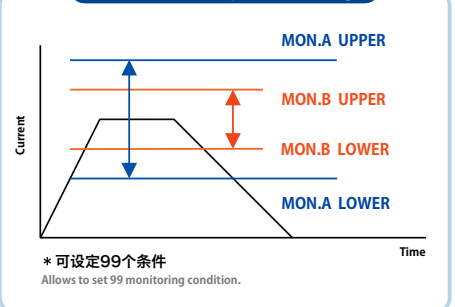
x1(option)

x10(option)

Coil 9

Coil 10

设定例 Example of Setting



项目	Items	QC-440
判定功能	Judgment Items	Current : over, under (3digits) Time : over, under (Cycle : 2digits msec : 3digits) Displacement : over, under (4digits) * With GOOD or NG Signal Output Function
电源	Power Source	AC100~240V±10% 50/60Hz
尺寸、重量	Dimension / Weight	W141×H303×D344mm ≒4.5kg

※有关QC-440的校对证明书的发行, 需要额外收费对应。

Calibration certificate for QC-440 is not free of charge. Please ask sales representative for quotation.

系统焊头 System Head

最适合精密焊接的稳定加压的高性能小型焊头

Stable Pressurizing by the Small and High Performance Head

对碰式类型

Opposed Type



项目	Items	Opposed Type					
		NA-121	NA-122	NA-123	NA-124	NA-125	NA-126
压力 (方式)	Pressure Range (Way)	0.7-5N (Spring)	5-65N (Spring)	20-150N (Spring)	40-300N (Spring)	100-600N (Spring)	300~1800 N (Spring)
驱动方式	Drive Method	选项/Option : Motor, Air, Manual	选项/Option : Motor, Air, Manual	选项/Option : Motor, Air, Manual	选项/Option : Motor, Air	Air	Air
适用电极直径	Diameter of Electrode	Φ1.6mm	Φ3.2mm	Φ6.4mm	Φ8.0mm	专用电极/ Dedicated Electrode Attached (EH-F-02)	专用电极/ Dedicated Electrode Excluded (EH-200)
尺寸、重量	Dimension / Weight	W74×D48×H285mm ≈0.6kg	W82×D50×H301mm ≈0.8kg	W82×D50×H301mm ≈0.8kg	W97.8×D56.6×H326mm ≈1.5kg	W212.2×D204.0×H794.5mm ≈21.5kg	W309×D315×H908mm ≈60kg

并列式类型

Parallel Gap Type



平行式类型

Series Type



项目	Items	Parallel Gap Type			Series Type	
		NA-131	NA-132	NA-141	NA-142	NA-143
压力 (方式)	Pressure Range (Way)	0.7-5N (Spring)	5-65N (Spring)	0.5-5N (Spring)	5-65N (Spring)	40-150N (Spring)
驱动方式	Drive Method	选项/Option : Motor, Air, Manual	选项/Option : Motor, Air, Manual	选项/Option : Motor, Air, Manual	选项/Option : Motor, Air, Manual	选项/Option : Motor, Air
适用电极直径	Diameter of Electrode	□3.2mm	□3.2mm	Φ3.2mm	Φ3.2mm	Φ3.2mm
尺寸、重量	Dimension / Weight	W76×D51×H299mm ≈0.7kg	W76×D51×H299mm ≈0.7kg	W135.2×D49.8×H268mm ≈1.3kg	W152.2×D49.8×H268mm ≈1.6kg	W174.2×D61.8×H302mm ≈2.7kg

驱动方式 Drive Unit

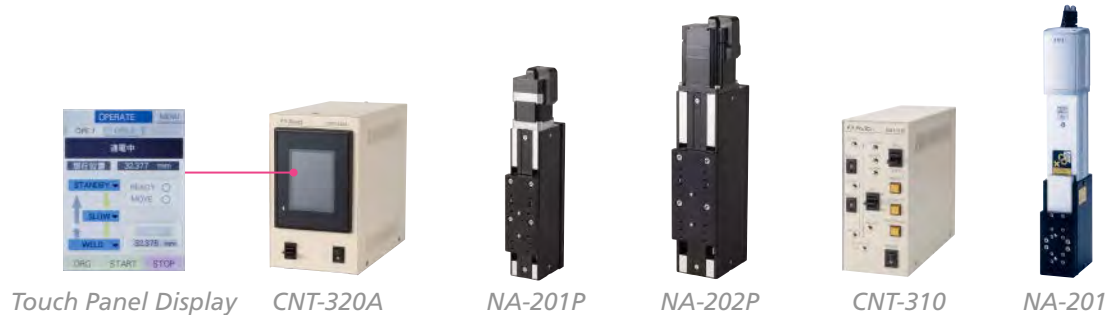
马达驱动、气缸驱动、脚踏驱动

Motor Drive, Air Drive and Manual Drive

马达驱动&控制器

Motor Drive & Controller

- 马达驱动分辨率达到1 μm而支持精密焊接
- 彩色触摸屏和杠杆式旋转开关实现直观的操作
- 0.1 mm/秒的低速移动功能可以实现软接触动作
- 对应最大300N的高压力焊接(使用NA-202P)
- 可保存7种焊接条件
- Motor drive with 1μm resolution supports precise welding
- It provides intuitive operation by color touch panel and lever jog switch
- Soft-landing process with a slow moving speed of 0.1mm/sec is provided
- Compatible to high pressure welding processes up to max. 300 N force (When NA-202P is used)
- Seven operation conditions can be saved



项目	Items	CNT-320A & NA-201P/NA-202P	CNT-310 & NA-201
驱动方式	Drive Method	Motor	
行程	Stroke	Max 50 mm, 1μm Step	Max 50 mm, 10μm Step
电源	Power Source	DC24V±10% 4A Option : AC Adapter AC100~240V	DC24V±10% 2A Option : AC Adapter AC100~240V
尺寸、重量	Dimension / Weight	CNT-320A: W120×D230×H207mm≐3kg NA-201P: W52.5×D78.5×H276.1mm≐2kg NA-202P: W69×D99.5×H336.3mm≐4.2kg	CNT-310: W80×D211×H188mm≐2kg NA-201: W50×D82.5×H320mm≐2kg

气缸驱动

Air Drive

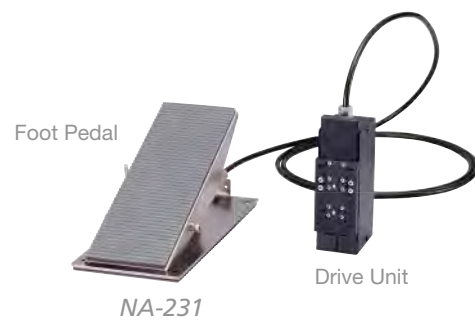


NA-221, 222

项目	Items	NA-221	NA-222
驱动方式	Drive Method	Air	Air
行程	Stroke	Max 50mm	Max 50mm
速度调整	Speed Control	with Speed Controller (Φ4mm Tube)	with Speed Controller (Φ6mm Tube)
气压	Air Pressure	0.05~0.6MPa	0.4~0.6MPa
尺寸、重量	Dimension / Weight	W78×H280×D83mm ≐1.3kg	W86×H289×D85mm ≐2.2kg

脚踏驱动

Manual Drive



NA-231

项目	Items	NA-231	
驱动方式	Drive Method	Manual by Foot Pedal	
行程	Stroke	Max 10mm	
高度调整	Hight Control	Range 40mm	
尺寸、重量	Dimension / Weight	Drive Unit : W51×H192×D79mm ≐1kg	Foot Pedal : W124×H125×D268mm ≐2.2kg

电极配件

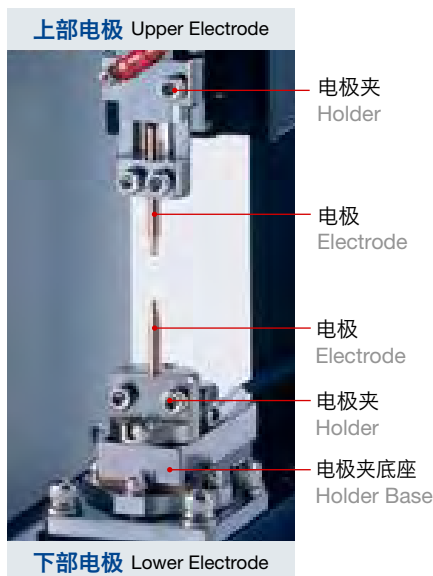
Electrode Accessory

■ 系统焊头的基本构成

System Head Basic Configuration



■ 直接上下加压型 Straight Type



■ 间接上下加压型 Shift Type



■ 上部电极配件 Upper Electrode Accessory

Head	Electrode(CrCu)	Electrode(Mo)	Type	Holder/Horn	Clamp
NA-121	EH-062-02	-	Straight	S121-16THD [※]	-
			Shift	S121-16HORN	S121-CLMP
	EH-125-02	EH-125-00	Straight	S121-32THD	-
			Shift	S121-32HORN	S121-CLMP
NA-122	EH-125-02	EH-125-00	Straight	S122-32THD [※]	-
			Shift	S122-32HORN	S122-CLMP
	EH-250-02S	EH-250-00S	Straight	S122-64THD	-
			Shift	S122-64HORN	S122-CLMP
NA-124	EH-250-02S	EH-250-00S	Straight	S124-64THD	-
	EH-60-C	EH-80-00	Straight	S124-80THD [※]	-

※ 标准附件 / The mark is attached as a part of welding head

■ 下部电极配件 Lower Electrode Accessory

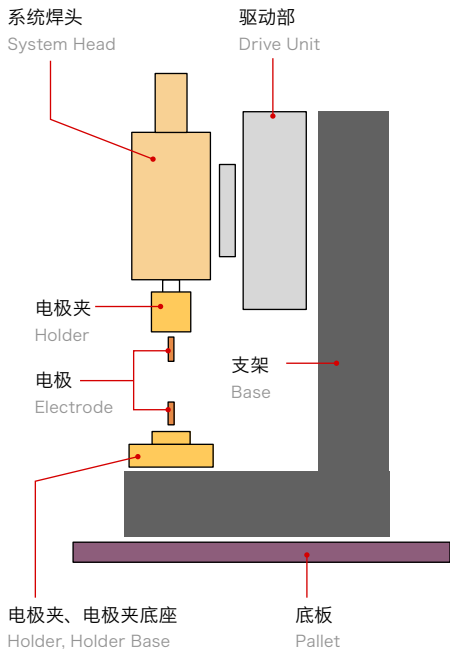
Head	Electrode(CrCu)	Electrode(Mo)	Type	Holder/Horn	Holder Base/Clamp
NA-121	EH-062-02	-	Straight	S12X-16BHD	12X-B-F
			Shift	S12X-16BHORN	12X-BS
	EH-125-02	EH-125-00	Straight	S12X-32BHD	12X-B-F
			Shift	S12X-32BHORN	12X-BS
NA-122	EH-125-02	EH-125-00	Straight	S12X-32BHD	12X-B-F
			Shift	S12X-32BHORN	12X-BS
	EH-250-02S	EH-250-00S	Straight	S12X-64BHD	12X-B-F
			Shift	S12X-64BHORN	12X-BS
NA-124	EH-250-02S	EH-250-00S	Straight	S12X-64BHD	124-B-F
	EH-60-C	EH-80-00	Straight	S12X-80BHD	124-B-F

系统焊头配件

System Head Accessory

■ 系统焊头的基本构成

System Head Basic Configuration



■ 下部电极配件

Lower Holder Accessory

下部电极夹

Lower Holder
S12X-16BHD

下部电极夹底座

Lower Holder Base
12X-B-F



下部电极夹

Lower Electrode Stage
143-B5

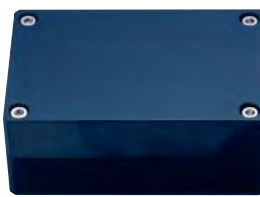


■ 下部工作台

Lower Stage

标准工作台

Stage 11X-BS



平行度调整工作台

Leveling Stage 11X-BS-F



微调功能工作台

11X-BS-F-MM



■ 支架、底板、显微镜

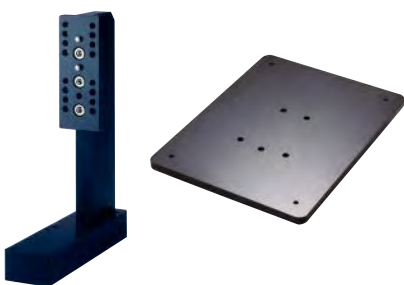
Base, Pallet and Microscope Set

支架 Base

NA-301, 302P

底板 Pallet

S-MP, S302-MP



显微镜、显微镜支架、LED照明

Microscope, Microscope Mounting Stand, LED Light

S-SMS, S-SMS-MS, S-SMS-LED



■ 焊接电缆

Weld Cable

Length: 100mm Step
Material: SFC, WRC, FMC, EFC
Terminal Shape: D, L, DP
例 Ex : SFC - 60 - 500 - DD - 99
Square: 22, 60, 66, 120mmSQ
Hole Size: 7, 9mm



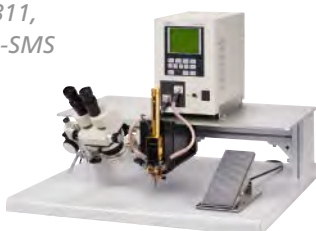
■ 印刷电路板修理装置

PWB Repair Machine

ELP支架、LED显微镜

ELP Type Base, Microscope LED Lighting Set

NA-311,
S311-SMS



■ 压制焊接装置

Compacting Unit



■ 密封碰焊装置

Can Seal Welder

NAW-1099A



※焊接电源、焊头、驱动装置另外销售
Welding power supply, Welding head,
and Drive unit are sold separately.

各种焊头 Welding Head

焊头

Welding Head

通用型 General Purpose Type

NA-60A

- NA-60A被广泛应用于有高信赖、高精度要求的各种电子零件、开关、继电器接点、钟表、照相机和各种机构部件的焊接。是应用最广泛的焊头。
- NA-60A is general purpose weld head which application is widened from various kinds of electronic parts that require reliability and accuracy, that is, switches, relay contacts, watches, components among camera etc. and various kinds of mechanical parts.



高压力型 High Pressurization Type

NA-72

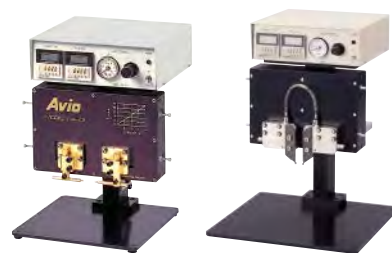
- NA-72的压力比NA-60A要大很多。适用于要求高压力焊接的机构部件、多股线等。
- NA-72 is suited to the welding of the mechanical parts or thick stranded wires that need more strong electrode force.



水平压力型 Horizontal Pressurization Type

NA-43, NA-43B

- NA-43采用坚固的防止偏位的滑动机构，同时配备气动装置。也可以应用于自动机器。
- NA-43 is also used for automation machines due to adoption of a floating system, which rarely does not produce dislocation, and an air drive unit as standard equipment.



项目	Items	NA-60A	NA-72	NA-43	NA-43B
压力	Pressure Range	9.8-132.3N	98-588N	88.2-294N	100~500N or more
电极行程	Electrode Stroke	max12mm	max30mm	max12mm	max 12mm
电极最大间隔	Depth Dimension of Pocket	98mm	160mm	—	—
驱动方式	Driving Method	脚踏/Foot*1 气动/Air*1	气动/Air*2	气动/Air*2	气动/Air*2
适用电极直径	Diameter of Electrode	φ6.4mm/φ3.2mm*1	φ10mm	φ6.4mm	专用电极/Dedicated Electrode
尺寸、重量	Dimension / Weight	W72×D175×H285mm ≒2.8kg	W107×D240×H615mm ≒19kg	W248×D240×H319mm ≒11kg	W300×D360×H320mm ≒15kg

*1 选件 Option

*2 动力电源 Power Source: AC100V 配管选择: 内径φ6mm / Applicable hose: internal diameterφ6mm

手持型 Hand Piece Type

NA-54A, NA-54LA, NA-57A, NA-58A

- 在不能使用固定式焊头的场所，有丰富的手持型焊头供选择使用。有左右不振动的电极构造、小型轻便的特点。
- The welding machine series of various handy types are arranged to weld a difficult object to weld by a fixed type weld head like at a jamming area. No side-to-side rocking motion of electrodes. Operable with light power due to its compact and lightweight size.



NA-54A



NA-54LA



NA-57A



NA-58A

项目	Items	NA-54A	NA-54LA	NA-57A	NA-58A
压力	Pressure Range	7.8-44.1N	7.8-44.1N	9.8-49N	手动加压/manual
电极行程	Electrode Stroke	max10mm	—	—	max1mm
电极最大间隔	Depth Dimension of Pocket	50mm	—	—	75mm
驱动方式	Driving Method	手动/manual	手动/manual	手动/manual	手动/manual
适用电极	Applicable Electrode	EL-125系列 EL-125 series	EL-54L	EL-57A专用 Specialized for NA-57A	EL-58A专用 Specialized for NA-58A
尺寸	Dimension	W30×D195×H47mm	W30×D195×H47mm	36φ×D207mm	W24×D16×H157mm
焊接电缆	Weld Cable	1500mm	1500mm	1500mm	1100mm

焊接电极 Welding Electrode

材料的电阻焊接特性

Weldability by Resistance Welding for Each Material

※本表格只是参考基准不保证焊接的绝对性。请协商进行样品试验。

※电极材料的RWMA为The Resistance Welding Manufacturing Alliance的规格。

* This table is intended to be a guideline only, and it should not be interpreted as guaranteeing the welding result. Please feel free to consult with us as we will be pleased to sample test for you

* RWMA for the electrode material indicates the specifications by The Resistance Welding Manufacturing Alliance

	W Mo	Ni alloy	Ni	SUS	Fe (Ni)	Fe (Zn)	Fe (Sn)	Fe	PB	Ni-Ag	Cu-Zn-Ni	Bs	Cu	Al alloy	Al	Ti
钛 Titanium																A II II 1
铝 Aluminium		E II II ⁵ ₂	E II II ³ _{2,10}	H II II ³ _{4,2}	H II II ³ ₈	D II II ³ _{4,9}	D II II ³ _{4,9}	E II II ³ ₄	D II II ⁵ ₂			E II II ²	H V II ²	C II II ¹	C II II ¹	
铝合金 (ex. Duralumin)		E II II ²	E II II ³ _{2,10}	H II II ³ _{4,2}	H II II ³ ₈	D II II ³ _{4,9}	D II II ³ _{4,9}	E II II ³ ₄	D II II ⁵ ₂			E II II ²	E V II ²	D II II ¹		
铜 Copper	H II V ³	E II V	E II V ³ _{6,10}	H II V ³ _{4,2}	H II V ³ ₄	H II V ³ _{4,9}	H II V ³ _{4,9}	H II V ³ ₄	D II V ⁵ ₆	D II V ⁶	D II V ⁶	E II V ⁶	K V V ²			
黄铜 Brass		D II IV ⁶	D II II ⁶ ₁₀	H II IV	H II IV	E II IV ⁶	E II IV ⁶	E II IV ³ ₄	C II IV ¹	C II IV ¹	C II IV ¹	C II IV ¹				
铜镍合金 Cupronickel		C II II	C VI II	E II II ²	E II II ⁸ ₂	E II II ²	E II II ²	E II II ³	C II II ¹	C II II	C II II ¹	B II II ¹				
镍银 German Silver		C II II	C VI II	E II II ²	E II II ⁸ ₂	E II II ²	E II II ²	E II II ³	C II II ¹	C II II ¹	C II II ¹	B II II ¹				
磷青铜 Phosphor Bronze		D II II	D II II ¹⁰	E II II	E II II ⁸	E II II	E II II	D II II ³	B II II ¹							
低碳钢 Steel	D II II ³	D II II ³	D II II ³ ₁₀	B II III	B II II ⁸	C II II	C II II ⁶	A II II ¹								
低碳钢 Sn Plating	E II II ⁹	D II II ³ ₉	D II II ⁹	C II II	C II II ⁸	C II II ⁶ ₉	D II II ⁶ ₉									
低碳钢 Zn Plating	E II II	D II II ³	D II II ⁹	C II II	C II II ⁸	C II II ⁶										
低碳钢 Ni Plating	D II II ⁸	D II II ⁸	D II II ⁸	B II II ⁸	B II II ⁸											
不锈钢 Stainless Steel	D II II ⁵ ₂	D II II	D III II ¹⁰	A II II ¹												
镍 Nickel	D II II ⁵ _{2,10}	C II II ¹	B II II ¹													
镍合金 ex. Monel Metal	D II II ⁵ _{2,10}	B II II ¹														
钼钨 Molybdenum Tungsten	D II II ⁵ ₂															

焊接特性	电极	Weldability	Electrode
电极	特殊事项	Electrode	Special Note

焊接特性	Weldability
A 极好	Excellent
B 非常好	Very good
C 良好	Good
D 一般	Acceptable
E 不良	No good
H 极不好	Very bad
K 不现实	Unacceptable

电极成份	Alloy Components of Electrode
II 铬铜	Cu-Cr-Zr (相当于 RWMA-2)
III 铍铜	Cu-Ni-Be (相当于 RWMA-3)
IV 钨铜	Cu30%-W70% (相当于 RWMA-11)
V 纯钨 纯钼	W100% (相当于 RWMA-13) Mo100%

特殊事项	Special Note
1 有充分的强度	Having enough welding strength
2 在特殊条件下可以焊接	Possible to weld under a special condition
3 焊接强度低	Not enough welding strength
4 内部焊接点无法形成并产生毛刺	Generating a stick instead of a nugget
5 需要精密调整焊接条件	Welding conditions should be adjusted precisely
6 为了不产生毛刺清洁电极	Clean electrode generates no stick
7 焊接前要充分清洗	Scrubbing before welding
8 防止变形使用平型电极	Flat electrode to prevent deforming
9 有可能熔化或烧掉表面镀层	Coating has a chance to melt or burn
10 要特别注意极性	Pay attention on polarity

焊接电极 Welding Electrode

电极材料和电极形状

Materials and Shape of Electrode

■ 电极材料

根据表面处理和尺寸的不同有变化。以下是可供选择的电极材料。

电极型号	合金成份	电导率 (IACS%)	适用金属
02 (RWMA-2相当)	Cu-Cr-Zr	约80%	铁、镍、钴、及合金
03 (RWMA-3相当)	Cu-Ni-Be	约50%	磷青铜、黄铜
00	纯Mo	约31%	镀锡铜线、焊锡铜线
11 (RWMA-11相当)	Cu (30%) -W (70%)	约46%	贵金属
13 (RWMA-13相当)	纯W	约32%	铜
20	Cu-Al ₂ O ₃	约80%	电池连接片

RWMA: The Resistance Welder Manufacturers' Association. 的简称。
IACS: International Annealed Copper Standard. 的简称。

例: Example EH - 250 - 02

形状 尺寸 材料
Shape Dimension Material

■ 电极形状 Shape of Electrode

电极型号 Electrode Number	形状 Shape	适用焊头 Applicable Weld Head	电极型号 Electrode Number	形状 Shape	适用焊头 Applicable Weld Head
EH-062-02A		NA-121 NA-141	EH-250-02A EH-250-03		
EH-125-02A EH-125-03 EH-125-20			EH-250-00A EH-250-11A EH-250-13A		
EH-125-00A EH-125-11A EH-125-13A		NA-121 NA-122 NA-123 NA-141 NA-142 NA-143 NA-60A	EO-250-02A EO-250-03		
CC合金 (3.2φ) CC Alloy			EO-250-00A EO-250-11A EO-250-13A		NA-122 NA-123 NA-124 NA-142 NA-143 NA-60A NA-43
EP-711-00F EP-711-02F			EH-250-02S		
EP-406-00F EP-406-02FA		NA-131 NA-132 NA-141 NA-142	EH-250-00S EH-250-13S		
钼棒 Molybdenum Square Bar			CC合金 (6.4φ) CC Alloy		

Materials of Electrode

The list below shows rough standards to choose materials for an electrode, though it may be changed according to its surface treatment or dimensions.

Electrode Number	Alloy Components	Electric Conductivity (IACS%)	Applicable Metal
02 (equivalent to RWMA-2)	Cu-Cr-Zr	around 80%	iron, nickel, chrome and their alloys
03 (equivalent to RWMA-3)	Cu-Ni-Be	around 50%	phosphor bronze, brass
00	pure Mo	around 31%	tinned copper wire, solder plating copper wire
11 (equivalent to RWMA-11)	Cu (30%) -W (70%)	around 46%	noble metal
13 (equivalent to RWMA-13)	pure W	around 32%	copper
20	Cu-Al ₂ O ₃	around 80%	Battery Tab

RWMA stands for The Resistance Welding Manufacturing Alliance
IACS stands for International Annealed Copper Standard

电极型号 Electrode Number	形状 Shape	适用焊头 Applicable Weld Head	电极型号 Electrode Number	形状 Shape	适用焊头 Applicable Weld Head
EH-80-00		NA-124	EL-125-02A EL-125-03		NA-54A
EH-60C			EL-125-00A EL-125-11A EL-125-13A		
EH-F-00		NA-125 NA-72	EL-54LA		NA-54LA
EH-F-02			EH-57A-02A		NA-57A
EH-200-00A		NA-126	EH-58A-02		NA-58A
EH-200-02A			EHC-F		NA-72 Water Cooling Shank
EH-125-02E EH-125-20E		NA-141 NA-142 NA-143	EHM-72		NA-72 Water Cooling Shank Set

公司设有实验室。

针对所提供的样品进行试验后返还并提供实验报告作为机型选择和性能评价的依据。

We will be pleased to test your sample with our proposed joining method, and return it with a report.

● **实验室所在地**

〒224-0053

日本AVIONICS株式会社 新横浜事业所

地址:横滨市都筑区池田町4206番地

● **交通**

从JR横浜铁路鸭居车站徒步7分钟

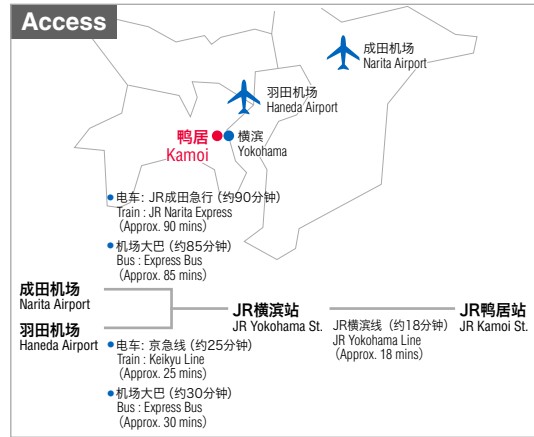
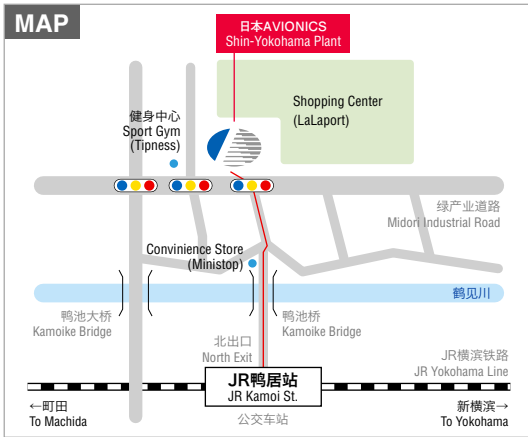
● **Evaluation Laboratory**

Nippon Avionics Co., Ltd. Shin-Yokohama Plant

Address: 4206, Ikonobe-cho, Tsuzuki-ku, Yokohama, 224-0053, JAPAN

● **Direction**

7 minutes on foot from JR Kamoi Station



⚠ **产品使用注意**

为了正确安全使用, 使用之前一定要阅读「操作说明书」。请不要设置在水、湿气、蒸气、油烟等多的场所。有可能引发火灾、触电、故障等。

※产品图片仅供参考, 以实物为准。如外观及技术参数发生变化, 恕不另行通知。

⚠ **CAUTION**

To operate a unit correctly, read the operation manual carefully. The Unit should be situated away from the place filled with water, moisture, steam, dust or soot, which may cause a fire, an electric shock, troubles etc.

The appearance and specifications are subject to change without notice.

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