ISO 9001 Registered

OTC
CREATING METAL ARTISTS

# SPOT WELDING MACHINE

## Micron control type with constant current timer

- Alternating current SL-AJ Series
- High efficient timer VX Series

**Alternating current SL-AJ Series**







- Alternating current depends on thickness (SL-AJ) Series
- Save energy, high quality and easy to operate.

DAIHEN
Member of DAIHEN Group

# Spot welding Quality at reasonable price! Direct current inverter

## The environment of work will change!

Improvement in operation environment and power supply!

### Save energy and reduce flicker!

Direct inverter

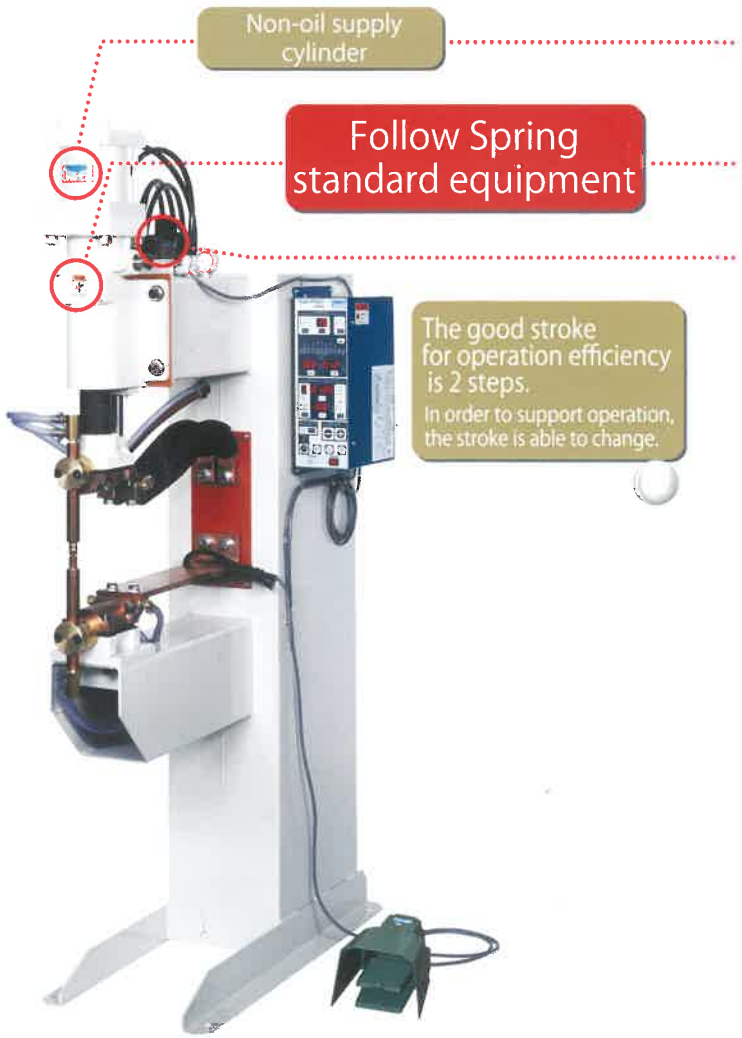
Compared to single phase input current the Direct current instant start requirement is half of alternating current, minimizes voltage flicker and has a high power factor of 80-90%.

| | 単相交流 SLAJ 50 |
|---|---|
| Rated current | 18,000A |
| Maximum welding input power | 150kVA |
| Equivalent sequence current (Target of electricity fee) | 176A (Ratio：1) |
| 1 line of moment current | 750A |

Half save!

### No oil supply cylinder required

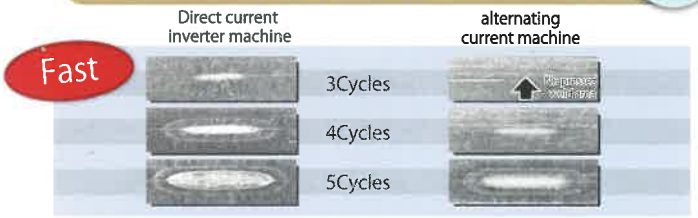
Easy maintenance, and the elimination of oil mist exhaust contributes to a better work environment




## Quality will change

### Fast heat generation means able to weld in short time!

Direct inverter

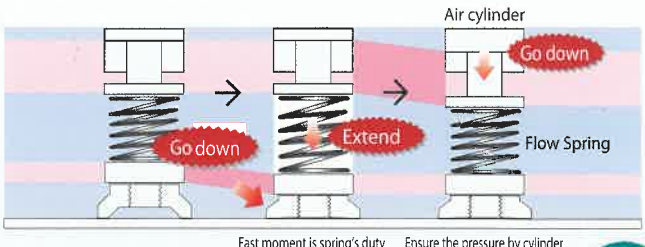



Welding specification : SPCC 0.8t 2 sheets layer7,500A 2kn

### Super safety with Follow Spring equipment.

#### Is Follow Spring in side?

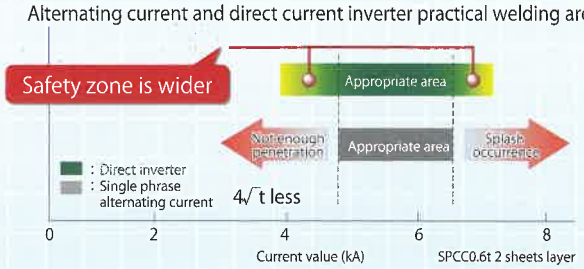
Such kind of nut projection, while the welding thing is under electric welding the penetration phenomenon will be appeared. This phenomenon shows tracking that pressure welding done or not. It may impact the quality of welding stabilization.




### The welded area becomes wider improving quality!

Direct inverter

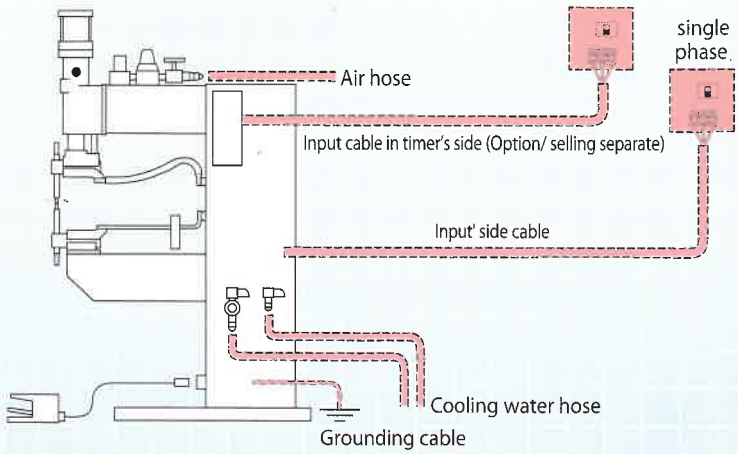
Alternating current and direct current inverter practical welding area




## Welding figure

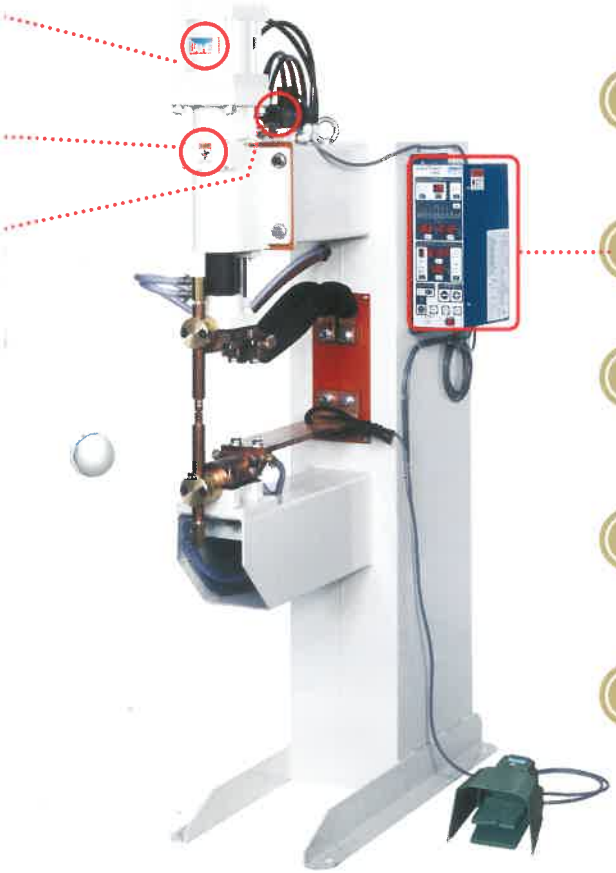
Preparation for customer

### Alternating current SL-AJ Series



# Current Professional Support all needs by Projection line-up

## The apex of spot welding technology in one machine



Alternating current

### Save energy (SL-AJS type)

- At unbelievable depth as 400mm, by optimization welding transformer can save energy

### Microcomputer control timer VX-300K

※Please refer detail at timer's page.

### Enlargement of pressure gauge (Type 601 only)

- Enlarge air pressure gauge from 40 to 50 to drastically improve operation efficiency and visibility.



### Utilization of Ball valve (Type 601 only)

- During electrode changing time, water cooling and operation must stop. Considerably faster than a conventional stop valve.

### Equipped with a power supply connection cover (Type 601 only)

- The attached terminal cover ensures operator safety to drastically improve operation efficiency.



## *It's time for options!*

| | |
|---|---|
| Large size part | ▶ long frame 800-1000 |
| Electrode grinding | ▶ electrode automatic dropping |
| Pipe welding | ▶ C-type horn |
| Supply water, draining water by one touch | ▶ strengthening draining valve |
| Checking water cooling | ▶ visible gauge |
| First step, point to position, 2nd step welding | ▶ 2nd step welding by foot switch pushing |

### Alternative current timer standard specification

| Machine \ Type | | R-50T |
|---|---|---|
| No. of control line-No. of step | | 1 line-1 step current |
| Control power supply voltage | | AC 100V 50/60Hz |
| Control type | | Synchronization |
| Standard time (Cycle) | Squeeze | 3~120 |
| | Welding | 1~99 |
| | Hold | 3~60 |
| | Stop | 3~60 |
| | Upslope | 1~5 |
| Welding current adjustment range | | 15~100% |

# Just change to Super Timer, get amazing efficiency

Super Timer

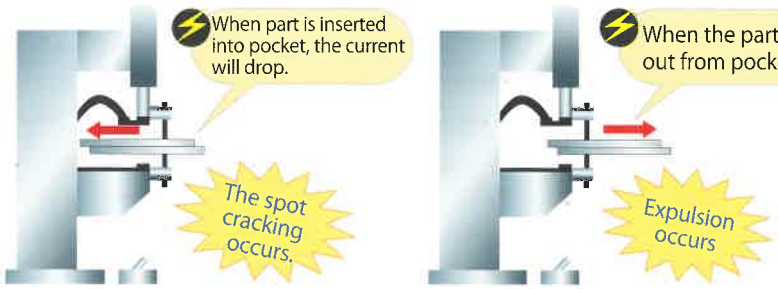
## VX Series creates a new standard! Leave weld results quality control to the Super timer

### Current change due to part insert direction in pocket volume timer to Super Timer

**Just change your standard volume timer to the Super timer...**
**...and transform to high quality production!**
**Improve your yield rate!**

### Point 1 Current change due to part insert direction in pocket

Standard volume timer is







### Point 2 Current change due to part insert direction in pocket
### For Super Timer VX-300K, it is safe and stable

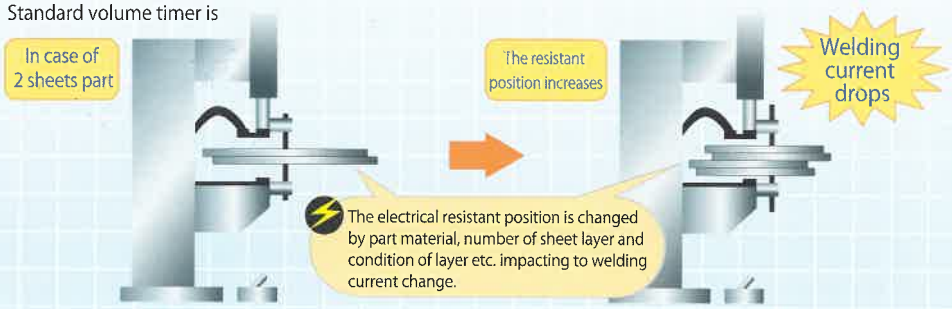
Standard volume timer is

The fluctuation of primary side power input voltage keeping this fluctuation of welding current with same setting, there will be crack and expulsion




### Point 3 Current change due to resistant position of electrode
### For Super Timer VX-300K, it is safe and stable

Standard volume timer is




**Option** VX-400K is possible to connect with computer!



The connection with computer is to help manufacturing control also to record data about welding condition

※For more detail, please contact to our sales and marketing department.

- Objective for able to record welding history

① Group/ welding condition
② Valve No.
③ Welding current
④ Welding time
⑤ Control angle
⑥ Power supply input voltage
⑦ Defect number
⑧ Welding date

# SUPER TIMER · VX-300K / VX-400K

For Alternating current

Just change from standard volume timer to Super Timer

## (Change from difficulty to easy! Make high quality easily) can be remove by setting



Horizontal setting type **VX-400K**




As display of front setting side is connected with same specification of control box (PB501), it is able to control from different command location

### Abundance of 60 conditions

In order to support various type of material, recording capacity can be expanded from 15 conditions up to 60 conditions.
According to 15 conditions multiply with 4 groups equal to 60 conditions, materials and commands management get better in efficiency.

### Abundance of 60 conditions

Abundance of counter function

- **Abundance of counter function**
  Able to display present production volume
  Flexible to control the progression of production
- **Part lighting counter**
  Able to control by lighting up welding number of each part
  The power will show to avoid missing welding

### Addition function standard equipment

Able to additionally install counter for welding slippage and necessary extend welding.

### How to use counter effectively

Set production lighting counter referred to the necessary light for 1 piece of work. Only when the extended welding is necessary, push addition button to keep process progressively. Every normal button is pushed "Production counter" will calculate and display the number of completed work.




### Utilization of large scale LED

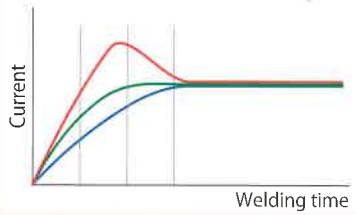
Set importance to visibility and operability, use large scale of LED for 13 mm characteristic height. (Actual size)



### Start current setting function

The value of slope area and welding time are set individually. The high current gives big impact to quality of high tensile material welding. It shows the stability of projection welding.

- **Various start images**




**Able to set start current freely**

### Able to set start current freely

Use password to lock in order to avoid changing welding condition




Same display of production part display light

from unpreparedness except control person.

## Our product is able to install in other company former spot welding machine!

From installation of VX-300K to our company former spot welding machine and other brand spot welding machine, the function-up can be attempted as the same time as quality and stability.

<Necessary part to change timer>

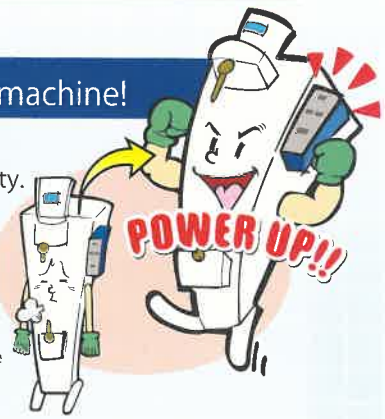
① Toroidal coil Part number STVX30-09001



② Bracket part number :STVX-80BKT
Necessary for our company alternating current spot welding machine (SL-AJ (S) 600, 610)Series

③ Connecting cables
- Cable with main spot machine body part number : STVX30-20000
- Input output signal cable (Preparation part for customer)

※ The connecting cable is subject to change due to machine, please contact our sale and marketing department.
※ Please be informed that the installation cost is separated payment.



# Standard specification

● is alternating current spot projection welding machine

| Specification / Type | | Rated capacity | Maximum capacity (at 50%) | Secondary short circuit current (MAX) Platen position | Secondary short circuit current (MAX) Tip position | Maximum welding current Platen position | Maximum welding current Tip position | Rated electrode force (at 0.49MPa) | Throat depth Platen position | Throat depth Tip position | Throat gap | Rated duty cycle | Freqency | Rated supply voltage (Direct current/ Three phrase /Alternating current/ Single phrase) | Platen diameter | Electrode stroke | Electrode taper | Electrode diameter | Electrode holder Diameter | Electrode holder Length | Diameter of electrode horn | Weight | Timer type | Power supply control |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | | kVA | kVA | A | A | A | A | kN (kgf) | mm | mm | mm | % | Hz | V | mm | mm | | φmm | φmm | mm | φmm | kg | | V |
| SLAJ30-601 | Spot | 30 | 60 [66.7] | | 13,400 | | 12,000 | 5.6 (570) | | 600 | 212 | 12.0 [10] | 380V 50Hz | 200 or 400 | | 20/60 convert type | 1/10 | 16 | 25 | 180 | 60 | 256 | VX-300K or R-50T | 100 |
| SLAJ35-601 | | 35 | 85 [96] | | 16,000 | | 14,400 | | | | | 8.3 [6.6] | | | | | | | | | | 265 | | |
| SLAJS35-601 | | | 72 [80] | | 16,000 | | 14,400 | | | 400 | | 11.8 [9.5] | | | | | | | | | | 247 | | |
| SLAJ50-601 | | 50 | 129 [150] | | 20,000 | | 18,000 | | | 600 | | 7.5 [5.5] | | | | | | | | | | 281 | | |
| SLAJS50-601 | | | 104 [117] | | 19,500 | | 17,550 | | | 400 | | 11.7 [9.1] | | | | | | | | | | 255 | | |
| SLAJ50-610 | | | 129 [150] | | 20,000 | | 18,000 | 9.3 (950) | | 600 | | 7.5 [5.5] | | | | 20/80 convert type | | 18 | 32 | 220 | 70 | 385 | | |
| SLAJS50-610 | | | 104 [117] | | 19,500 | | 17,550 | | | 400 | | 11.7 [9.1] | | | | | | | | | | 349 | | |
| SLAJS75-610 | | 75 | 161 [188] | | 25,000 | | 22,500 | | | | 210 | 10.0 [8.0] | | | | | | | | | | 365 | | |
| SLAJ90-610 | | 90 | 196 [225] | | | | | | | 600 | | | | | | | | | | | | 420 | | |
| SLAJS90-610 | | | 235 [270] | | 30,000 | | 27,000 | | | 400 | | 7.2 [5.5] | | | | | | | | | | 400 | | |
| SLAJMS50-610※ | Spot projection | 50 | 138 [156] | 26,000 | 21,000 | 23,400 | 18,900 | | 290 | 400 | 170 | 6.6 [5.1] | | | □150 | | | | | | | 376 | | |
| SLAJMS75-610※ | | 75 | 209 [244] | 32,500 | 26,500 | 29,300 | 23,900 | | | | | 6.4 [4.7] | | | | | | | | | | 393 | | |
| SLAJMS90-610※ | | 90 | 305 [351] | 39,000 | 31,500 | 35,100 | 28,400 | | | | | 4.3 [3.3] | | | | | | | | | | 422 | | |
| SLAJM50-610※ | | 50 | 156 [182] | 24,000 | 20,500 | 21,600 | 18,500 | | 490 | 600 | | 5.2 [3.8] | | | | | | | | | | 413 | | |
| SLAJM90-610※ | | 90 | 237 [272] | 30,000 | 26,000 | 27,000 | 23,400 | | | | | 7.3 [5.5] | | | | | | | | | | 442 | | |

※Remark production part

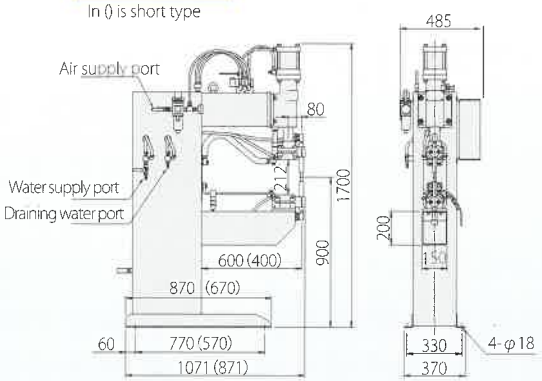
- Maximum short circuit is measured when the throat is displayed
- [ ] is 60Hz time
- Alternating current・projection welding machine weight is not included attached equipment weight
- Direct inverter spot・ projection welding machine weight is not included inverter power supply weight.

# External dimension figure

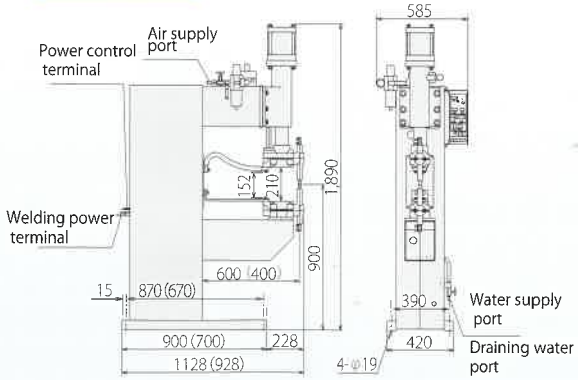
※There is no power terminal control in inverter power supply machine.

**SL-AJ-601**

In () is short type

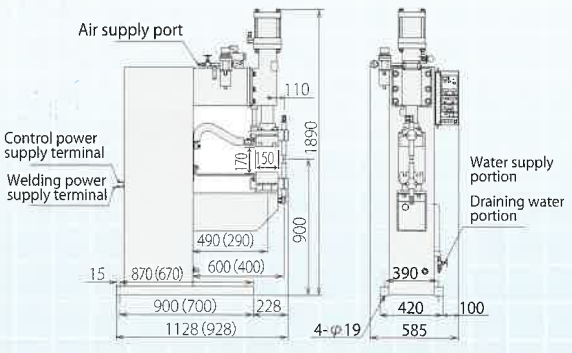



**SL-AJ-610**




**SL-AJM(S)-610**

In () is short type




**Spot welding capability**

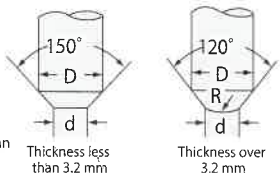
| Type | Soft polished metal sheet welding B class equivalence |
|---|---|
| SL-AJ30-601 | 0.5～2.8 t |
| SL-AJ (S) 35-601 | 0.5～3.2 t |
| SL-AJ (S) 50-601 | 0.5～3.2 t |
| SL-AJ (S) 50-610 | 0.5～4.0 t※ |
| SL-AJS75-610 | 0.6～4.0 t※ |
| SL-AJ90-610 | 0.6～4.0 t※ |
| SL-AJS90-610 | 0.8～4.0 t※ |

※signal items, the thickness is able to over 0.4t, please contact to department of sale and marketing when select machinery.

## Mild steel sheet spot welding condition chart (Reference value) Alternating spot

| Sheet thickness | Erectrode | | | Minimum pitch | Minimum lap | Best condition (A class) | | | | Medium condition (B class) | | | | Normal condition (C class) | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | max φd | min φD | R | | | Welding time | | Electrode force | Welding current | Welding time | | Electrode force | Welding current | Welding time | | Electrode force | Welding current |
| | | | | | | 50Hz | 60Hz | | | 50Hz | 60Hz | | | 50Hz | 60Hz | | |
| mm | mm | mm | mm | mm | mm | Cycle | Cycle | kN | A | Cycle | Cycle | kN | A | Cycle | Cycle | kN | A |
| 0.25 | 3.2 | 10 | | 6 | 10 | 3 | 4 | 0.9 | 4,000 | 4 | 5 | 0.6 | 3,700 | 13 | 15 | 0.3 | 3,000 |
| 0.4 | 3.2 | 10 | | 8 | 10 | 4 | 5 | 1.1 | 5,200 | 7 | 8 | 0.7 | 4,500 | 17 | 20 | 0.4 | 3,500 |
| 0.5 | 3.5 | 10 | | 9 | 11 | 5 | 6 | 1.3 | 6,000 | 8 | 10 | 0.9 | 5,000 | 20 | 24 | 0.4 | 4,000 |
| 0.6 | 4.0 | 10 | | 10 | 11 | 6 | 7 | 1.5 | 6,600 | 10 | 12 | 1.0 | 5,500 | 22 | 26 | 0.5 | 4,300 |
| 0.8 | 4.5 | 10 | | 12 | 11 | 7 | 8 | 1.9 | 7,800 | 13 | 15 | 1.2 | 6,500 | 25 | 30 | 0.6 | 5,000 |
| 1.0 | 5.0 | 13 | | 18 | 12 | 8 | 10 | 2.2 | 8,800 | 17 | 20 | 1.5 | 7,200 | 30 | 36 | 0.7 | 5,600 |
| 1.2 | 5.5 | 13 | | 20 | 14 | 10 | 12 | 2.6 | 9,800 | 19 | 23 | 1.7 | 7,800 | 33 | 40 | 0.8 | 6,100 |
| 1.4 | 6.0 | 13 | | 23 | 15 | 12 | 14 | 3.0 | 10,600 | 22 | 26 | 2.1 | 8,500 | 38 | 46 | 1.0 | 6,600 |
| 1.6 | 6.3 | 13 | | 27 | 16 | 13 | 16 | 3.5 | 11,500 | 25 | 30 | 2.4 | 9,100 | 42 | 50 | 1.1 | 7,000 |
| 1.8 | 6.7 | 16 | | 31 | 17 | 15 | 18 | 4.0 | 12,500 | 28 | 33 | 2.7 | 9,700 | 45 | 54 | 1.3 | 7,500 |
| 2.0 | 7.0 | 16 | | 35 | 18 | 17 | 20 | 4.6 | 13,300 | 30 | 36 | 2.9 | 10,300 | 48 | 58 | 1.5 | 8,000 |
| 2.4 | 7.8 | 16 | | 40 | 20 | 20 | 24 | 5.7 | 15,000 | 37 | 44 | 3.6 | 11,300 | 54 | 65 | 1.8 | 8,600 |
| 2.8 | 8.5 | 16 | | 45 | 21 | 23 | 28 | 6.9 | 16,200 | 43 | 52 | 4.2 | 12,100 | 60 | 72 | 2.2 | 9,400 |
| 3.2 | 9.0 | 16 | 75 | 50 | 22 | 25 | 30 | 8.0 | 17,500 | 50 | 60 | 5.1 | 12,900 | 65 | 78 | 2.5 | 10,000 |
| 3.6 | 10.3 | 22 | 100 | 57 | 29 | 34 | 41 | 9.1 | 18,200 | 60 | 72 | 5.5 | 13,600 | 85 | 102 | 2.7 | 10,600 |
| 4.0 | 11.1 | 22 | 100 | 67 | 32 | 42 | 50 | 10.1 | 18,900 | 73 | 88 | 6.3 | 14,100 | 104 | 125 | 3.1 | 11,000 |

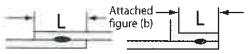
Remark (1) Minimum pitch comes from practical shunt effect depended on adjoining spot welding to show the neglect limit.
(2) Minimum lap displays in (b) figure.
(3) In case of different thickness 2 sheets welding, please refer to the thin sheet thickness for safety.
(However, in case of thickness comparison, it is less than 1:3 in case that the convex of electrode is in thin sheet side)
Also, less than 4 sheets welding layer becomes safety standard.
(However, in case of sum of thickness sheet, it should be less than 4 times of one sheet.



Thickness less than 3.2 mm　　Thickness over 3.2 mm

- In case of spot or projection welding which the accuracy of parallel degree of electrode is important, please separately consult.
- Projection welding which is able to operate with general-purpose machine, also can do nut projection easily

Attached figure (a)




### When do such below welding

(Refer to soft metal sheet spot welding condition chart)

| | ★In case of black surface | ★In case of bonding sheet |
|---|---|---|
| Electrode pressure force | 10~20% Increase | 5~10% Increase |
| Welding current | 5~10% Decrease | 5~10% Increase |
| Welding time | Same | Same |
| Upslope | 1~5 Cycle | 1~5 Cycle |

### Stainless metal sheet reference welding condition

(Please refer to soft steel sheet spot welding condition chart)
Electrode pressure force increases 50%, welding current reduces 10% and welding time reduces 30%

## Important equipment is alternative spot·projection welding machine

| Function / Type | | Main circuit power supply | | | | Power supply control | | Cooling water | | Compressed air | | Installation | Grounding |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | | Power supply volta | Power supply capacity | Switch | Connecting cable | Power supply voltage | Connecting Lead line | Cooling water volume | Hose diameter | Compressor capacity | Hose diameter | Base bolt | Earth cable |
| | | V | kVA | A | mm² | V | mm² | ℓ/min | φmm | kW | φmm | | mm² |
| SLAJ30-601 | Single phrase alternating current | 380V 50Hz | 30 | Over 150(75) | Over 38(22) | 100 | 1.25 | 5 | 12 | 2.2 | 13 | M16 | 14 |
| SLAJ35-601 | | | 35 | | | | | | | | | | |
| SLAJS35-601 | | | | | | | | | | | | | |
| SLAJ50-601 | | | | | | | | 6 | | | | | |
| SLAJS50-601 | | | 50 | Over 300(150) | Over 60(38) | | | | | | | | |
| SLAJ50-610 | | | | | | | | 10 | | 3.7 | 19 | | |
| SLAJS50-610 | | | | | | | | | | | | | |
| SLAJS75-610 | | | 75 | Over 400(200 | Over 80(50) | | | | | | | | |
| SLAJ90-610 | | | 90 | Over 500(250) | Over 100(60) | | | | | | | | |
| SLAJS90-610 | | | | | | | | | | | | | |
| SLMS50-610 | | | 50 | Over 500(250) | Over 60(38) | | | | | | | | |
| SLAJM(S)50-610 | | | | | | | | | | | | | |
| SLMS75-610 | | | 75 | Over 400(200) | Over 80(60) | | | | | | | | |
| SLAJMS75-610 | | | | | | | | | | | | | |
| SLMS90-610 | | | 90 | Over 500(250) | Over 100(60) | | | | | | | | |
| SLAJM(S)90-610 | | | | | | | | | | | | | |

Remark
- The cooling water pressure is due to water supply portion 0.1~0.3 MPa
- Compressed air is due to air supply port 0.5~0.7 MPa range, please use dry air. ※In case of the value number of power supply main circuit is over 50kW for high pressure receiving equipment, please refer to displayed value.
- Use value in () u when 400V utilization ※For receiving equipment which is less than 50kW, the value of main circuit power supply cannot be referred (Abolish power supply voltage value). Therefore, please refer to standard electrical power of each receiving equipment. The volume of cooling water is possible to depend on consumption in electrode heat sink. We provide an option part to improve consumption heat sink