



# AL series

The Best Solution of  
CNC Wire Cut EDM Technology

Linear Motor Built-in



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Rising Star Award



National Award of  
Outstanding SMEs

## Environmental Requirements

|                              |   |
|------------------------------|---|
| <b>Power source</b>          | AC220V/AC380V±5% : 3Phase 50 / 60Hz±1Hz   |
| <b>Temperature /Humidity</b> | 25±1°C : less than 75%RH  |
| <b>Environment</b>           | <ul style="list-style-type: none"> <li>• The machine should be not placed near punching machine, drilling machine or any interfering sources.</li> <li>• The machine should be not placed near heat treatment or electroplate systems.</li> <li>• The machine should be placed in an airtight room to keep dust out.</li> <li>• Before positioning machine, pay attention to machine movement during operation and the space needed for maintenance.</li> <li>• Solid foundation of horizontal error should be less than 20µm.</li> </ul> |
| <b>Earth construction</b>    | Earth resistance below 10Ω : separate the earth terminal with other machines.   |
| <b>Pneumatic pressure</b>    | ≥ 6kg / cm <sup>2</sup> (Applicable for machine with AWT and linear motor)  |

■ Due to continual research and development, specifications are subject to change without notice.

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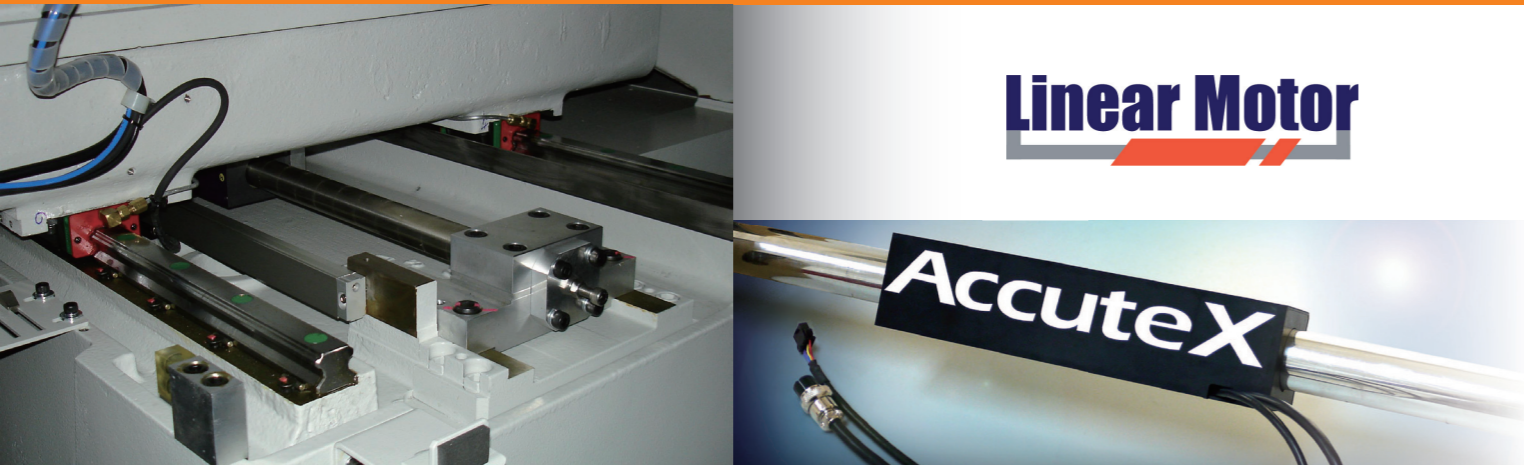




# AL SERIES

## Shaft Linear Motor

- Shaft Linear motor driven with full closed loop control without backlash can use for a long time with high repeatability, low friction loss and high efficiency.
- Rapid servo response can enhance the sensitivity of discharge gap control for the cutting speed up 8%~10%



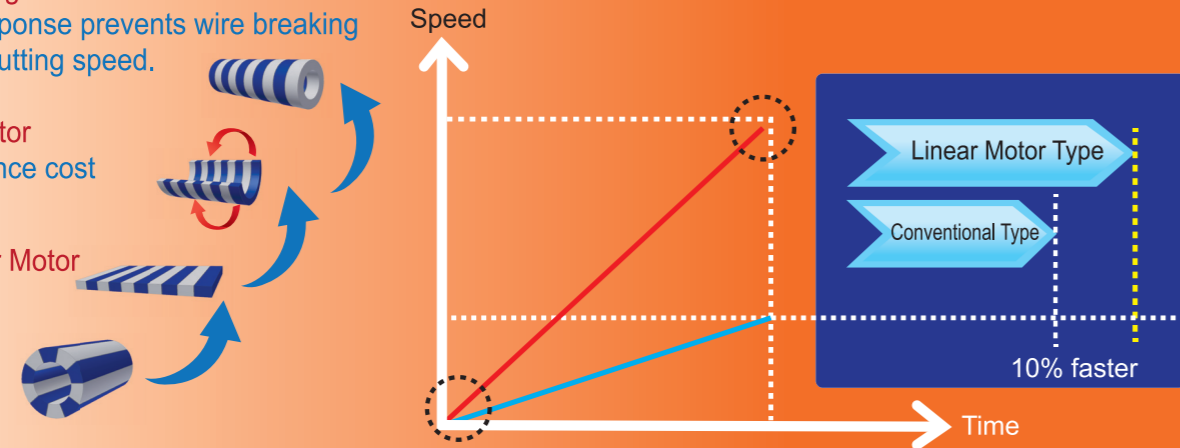
### Improving Cutting Performance

Rapid servo response prevents wire breaking and increases cutting speed.

Shaft Linear Motor  
lower maintenance cost

Flat Type Linear Motor

Rotary Motor



## Corner Control (Corner Pro)

According to different cutting data, wire diameter, angle and workpiece thickness, the Accutex controller automatically optimizes parameters to maintain the best corner cutting performance with high accuracy, as well as cutting speed. Even on the small and continuous corners, Accutex still can meet the best corner accuracy.

Cutting Speed :  
1st Cut : 130 mm<sup>2</sup>/min    Wire : Ø0.25mm  
2nd Cut : 260 mm<sup>2</sup>/min    Thickness : 50mm  
3rd Cut : 320 mm<sup>2</sup>/min

Contour matches closely between workpiece and cutting path.

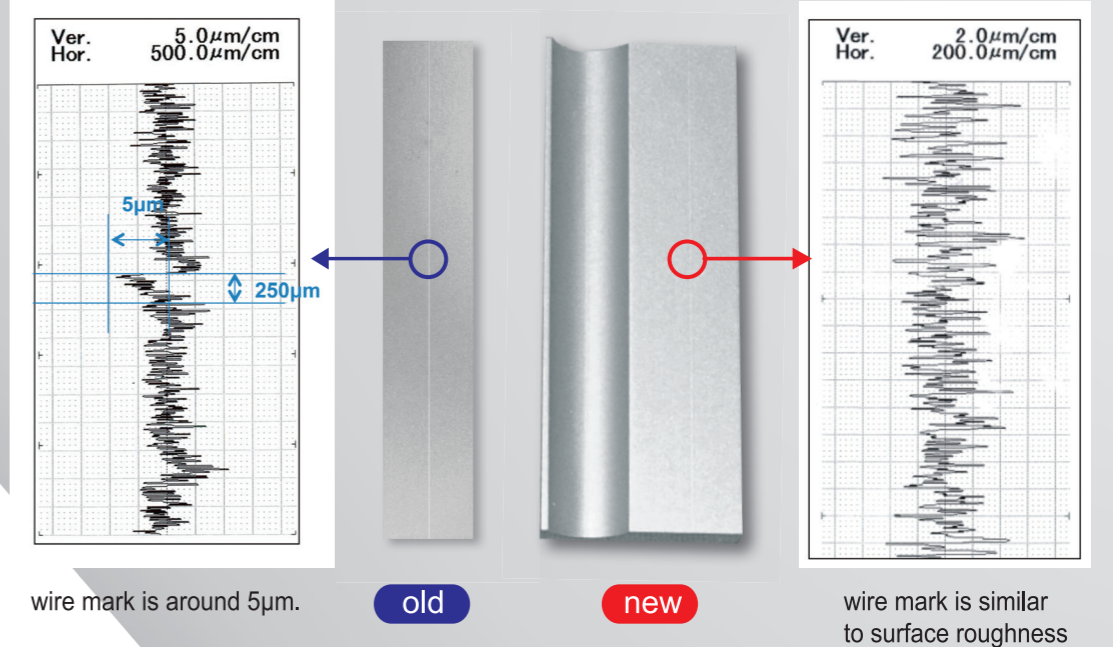
Punch and die can match smoothly within 3µm clearance.

Corner, Arc and Lead In/Out Controls can be enabled / disabled directly from setting or by M-code.

## Lead in/out Technology

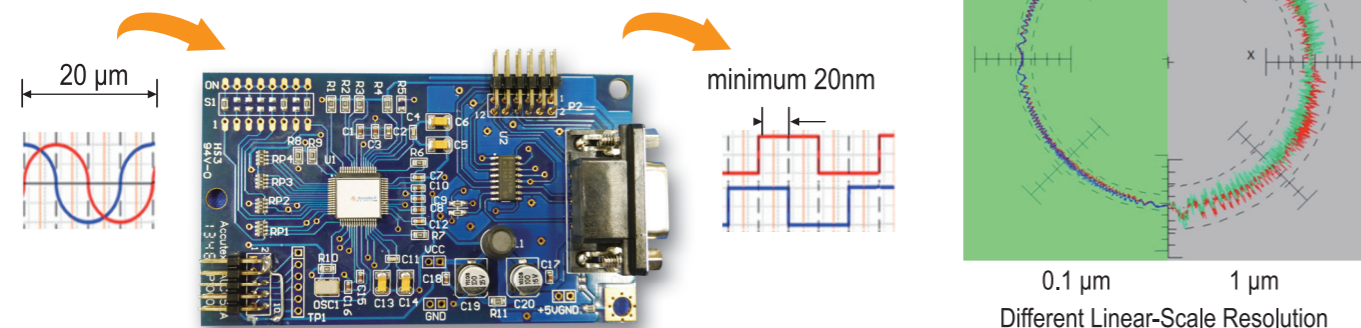
Reduce the wire mark at lead-in block less than 2µm.

Material: SKD11  
Wire : 0.25mm  
Thickness : 50mm  
Cutting times: 3



## High Resolution Signal Processor

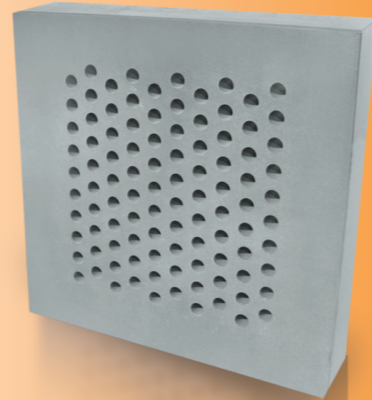
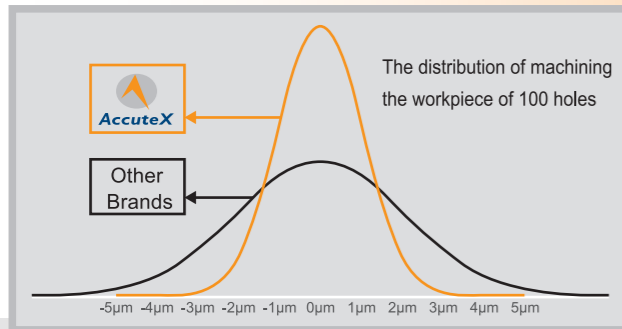
High resolution signal processor achieves more smooth velocity control, and enhances the stability of position control. It can match up the best contouring accuracy. The best resolution for standard scale can narrow down to 20nm.





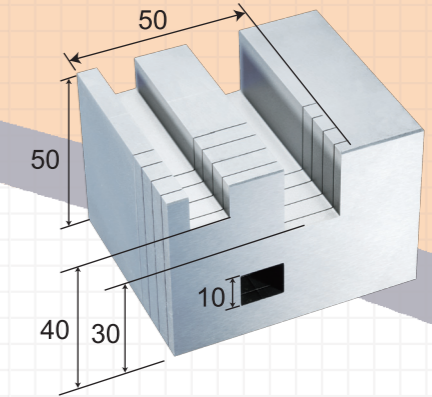
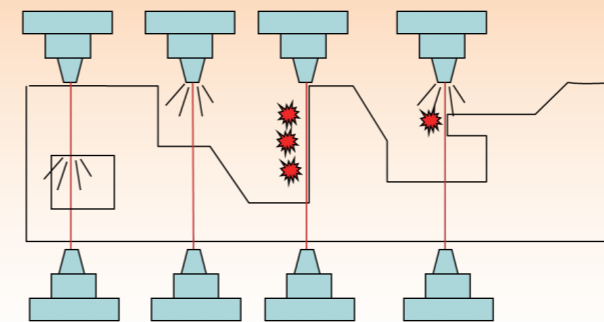
## Stable Discharge Board (SD-Master)

- High repeatability in accuracy by applying the same cutting data on different machines, the consistence enhances the quality of workpiece and simplifies management procedure.
- High speed cutting by SD-Master in stable discharge power stabilizes the cutting process, especially under high-speed mode.
- By Cutting 100 holes of 6mm continuously, 95.45% of all workpieces accuracy are within  $\pm 1.5\mu\text{m}$ . Cutting conditions are made by SKD-11 with 30mm thickness by 0.25mm brass wire with 3 cuts under good temperature and environment control.



## Irregular Thickness Cutting

The AccuteX intelligent discharge unit is capable of dealing with the changing conditions in workpiece thickness and water flushing situations, featuring high cutting speed, and free from wire breaking problems.

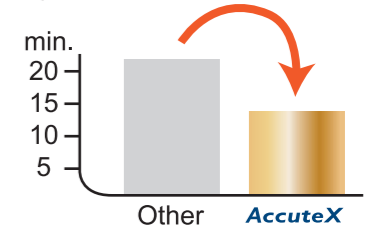


With a single workpiece of different thickness, the maximum cutting speed can be 3.3 mm per minute.

## Efficiency Increased up to 34%

Irregular Thickness Cutting Time:

AccuteX : 15 min.  
Others : 23 min.

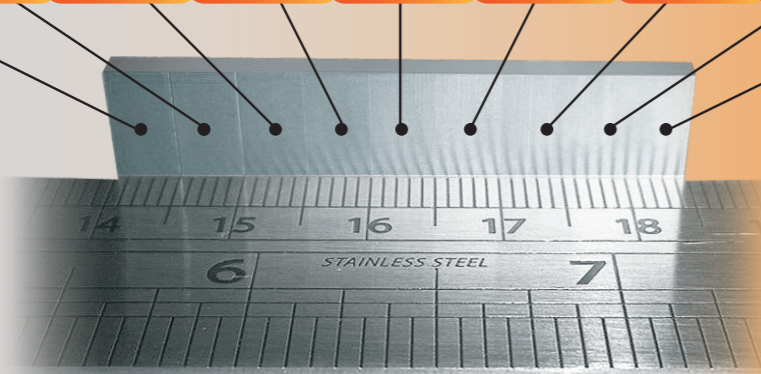


## MTS

- Micro Sparking Technology(MST), this unique technology can reach the best surface roughness to  $\text{Ra} 0.08\mu\text{m}$  (\*)

(\*) Optional

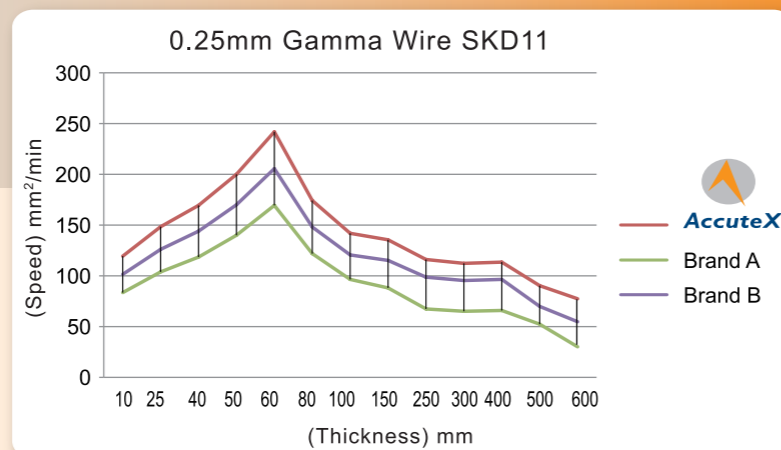
| Cuts | 1 Cut              | 2 Cuts             | 3 Cuts             | 4 Cuts             | 5 Cuts             | 6 Cuts             | 7 Cuts             | 8 Cuts             | 9 Cuts             |
|------|--------------------|--------------------|--------------------|--------------------|--------------------|--------------------|--------------------|--------------------|--------------------|
| Ra   | 2.67 $\mu\text{m}$ | 2.20 $\mu\text{m}$ | 0.67 $\mu\text{m}$ | 0.38 $\mu\text{m}$ | 0.26 $\mu\text{m}$ | 0.20 $\mu\text{m}$ | 0.15 $\mu\text{m}$ | 0.11 $\mu\text{m}$ | 0.08 $\mu\text{m}$ |



(\*)The cutting condition and other related settings are based on AccuteX service information.

## Cutting Efficiency Comparison

- AccuteX R&D team simplifies the generator and electric circuit to eliminate unnecessary power loss, and enhance the cutting efficiency.
- The cutting efficiency compared with other brands under different workpieces thickness is as below.

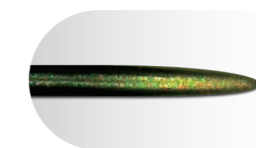


(\*) Date from Accutex service database

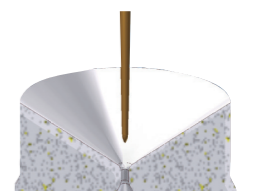
## AWT, Best Threading Reliability (\*)

### AC servo tension wheel

- "AC Servo Tension Wheel", tension control during cutting, features reverse tension while wire breaks.
- "Wire End Needle-Shaping", while the wire is cut off by electricity, the reverse tension and annealing heat treatment are applied to strengthening the wire at the same time.
- "Waste Wire Auto Removing Device" is Accutex exclusive device, used by air blow system to remove waste wire to the collection cabinet quickly and easily.



Accutex Wire End Needle-shaping

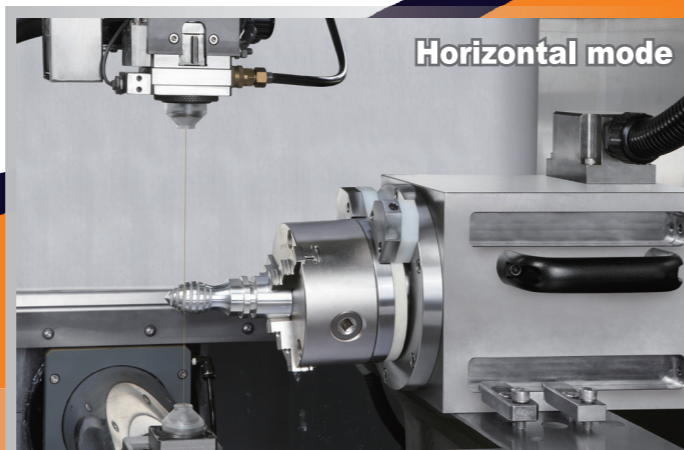


(\*) Optional



## AccuteX Submerged Type Rotary Table (\*)

- Accutex 6th Axis Rotary Table is leading ahead of other WEDM manufacturers by years in R&D which can be applied to submerged operation.
- The Built-in Type Motorized Spindle features ultra-high resolution 720,000 pulses per each revolution, free of backlash problems.
- With IP68 waterproof class, the Accutex Rotary Table may totally be submerged in the water and will still maintain high performance and high accuracy.
- Rotary table can be applied in the vertical and horizontal types.



Horizontal mode



Vertical mode

(\*) Optional

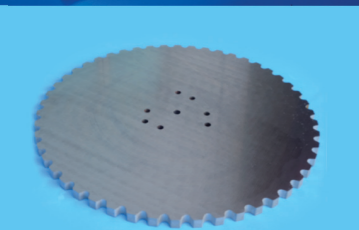
Synchronously cutting



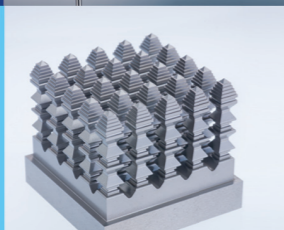
Medical part



Precise robotics component

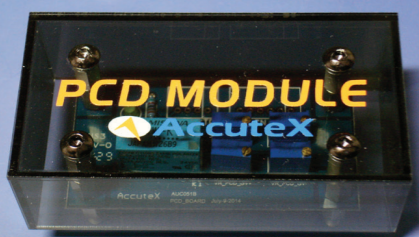


Array electrode

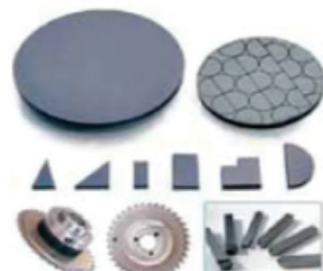


## PCD Cutting & Graphite Machining Power Supply (\*)

- The exclusive ignition circuit and stabilized discharging power supply are the most suitable design for PCD and graphite cutting; furthermore, with quality assurance for a long time machining.
- The collapse of workpiece edge by wire cut can be controlled within minimum range along with high speed machining.
- Accutex wire cut EDM can do 5 axes simultaneous interpolation, also the W axis (6th Axis rotary table) can be installed while doing complex PCD cutting tools.



PCD MODULE



PCD applications



PCD cutting tool

## Machine Specifications

| Specifications                     | MODEL          |                |                |                |                |
|------------------------------------|----------------|----------------|----------------|----------------|----------------|
|                                    | Submerged Type |                |                |                |                |
|                                    | AL-400SA       | AL-500SA       | AL-560SA       | AL-600SA       | AL-750SA       |
| Max. Workpiece Size L x W x H (mm) | 790x610x215    | 990x560x295    | 990x560x295    | 990x620x295    | 1190x720x295   |
| Max. Workpiece Weight (Kg)         | 350            | 400            | 500            | 550            | 750            |
| X/Y Stroke (mm)                    | 400x300        | 500x300        | 560x360        | 600x400        | 750x500        |
| U/V Stroke (mm)                    | 100x100        | 100x100        | 100x100        | 100x100        | 100x100        |
| Z Stroke (mm)                      | 220            | 300            | 300            | 300            | 300            |
| Max. Cutting Taper (H=100)         | 21°            | 21°            | 21°            | 21°            | 21°            |
| Wire Spool Weight (Kg)             | 10             | 10             | 10             | 10             | 10             |
| Footprint W x D x H (mm)           | 2051x2990x2070 | 2480x2980x2210 | 2480x2980x2210 | 2480x2980x2210 | 3000x3200x2250 |
| Water System Capacity (L)          | 630            | 900            | 900            | 900            | 1060           |
| Machine Weight (Kg)                | 3000           | 3600           | 3600           | 3700           | 4300           |

(\*)To acquire the optimum stable cutting performance, the suggested-maximum height of cutting workpiece is the Z axis stroke minus 30mm.

## Controller Functions

|                                 |                        |                               |                              |
|---------------------------------|------------------------|-------------------------------|------------------------------|
| Backlash compensation           | Constant / Servo feed  | Different shape interpolation | Auto position (edge, center) |
| Linear / Circular interpolation | Auto power recovery    | Background edit               | Soft limit                   |
| Cutting path display            | Trace to break point   | Start point return            | Corner control function      |
| Retrace to start point          | Reference point return | Break point return            | Diagnosis                    |
| Reference point setting         | Taper cutting          | Auto corner                   | Z axis software limit        |
| Multi-blocks skip               | Maintenance memo       | Program edit / copy / delete  | Manual data input            |
| Cutting log                     | Axis exchange          | Rotation                      | Auto / Manual feed           |
| Mirror                          | Dry run                | Single block                  | Short back                   |
| Optional stop                   | Block stop             | Sub program                   | Wire consumption offset      |
| Pitch compensation              | Parallel compensation  | 2nd. Soft limit               | Anti-Collision               |

## Controller Specifications

|                       |   |
|-----------------------|---|
| Controller System     | Windows CE  |
| Control Device        | 64-bit Industrial PC                                |
| Memory Device         | 1GB CF Card   |
| Screen Display Device | 17" Color TFT Touch Screen                          |
| Data Input            | Keyboard, Mouse Pointer, RS-232, USB, Ethernet, FTP |
| No. of Control Axes   | 5 Axes / 6 Axes (Option on W Axis)                  |
| Simultaneous Axes     | 4 Axes / 5 Axes (Option on W Axis)                  |
| Min. Command Unit     | 0.0001 mm   |
| Max. Command Range    | ± 9999.9999 mm                                      |
| Command Type          | mm / inch   |
| Cutting Data Memory   | 99999 Sets  |
| Ignition Power Supply | 32 Steps, 53V~138V                                  |
| On Time               | 24 Steps  |
| Off Time              | 43 Steps  |
| Discharge Mode        | Rough Cut / Skim Cut / Fine Cut                     |

## Standard Accessories

- Upper / Lower Flushing Nozzle
- Diamond Guide
- Conductor Plate
- Diamond Guide Remove Jig
- Brass Wire
- Tool Box
- Waste Wire Bin
- Ion Resin Tank
- Ion Exchange Resin
- Paper Filter
- Vertical Alignment Jig
- Water Chiller
- SD Master
- Auto Wire Threading (AWT)

## Optional Accessories

- Spray mist Lubricator
- Safety Door Interlock
- Transformer
- MST (AL-400SA/500SA/560SA/600SA)
- Pilot Lamp
- PCD / Graphite Cutting
- 45Kg Wire Jumbo Feeder
- High Pressure Water Jet Threading (Anti-Collision on Z-Axis is invalid)
- Remote Master
- 0.1mm Wire Application
- Auto Voltage Stabilizer
- Alarm Messenger
- 6th Axis Package (W axis)