

High Precision Linear Drive Series



WIRE CUT EDM Q SERIES

USA/USA Design +886-0970-061888 / 2012 / 1000 / SSB-0103A

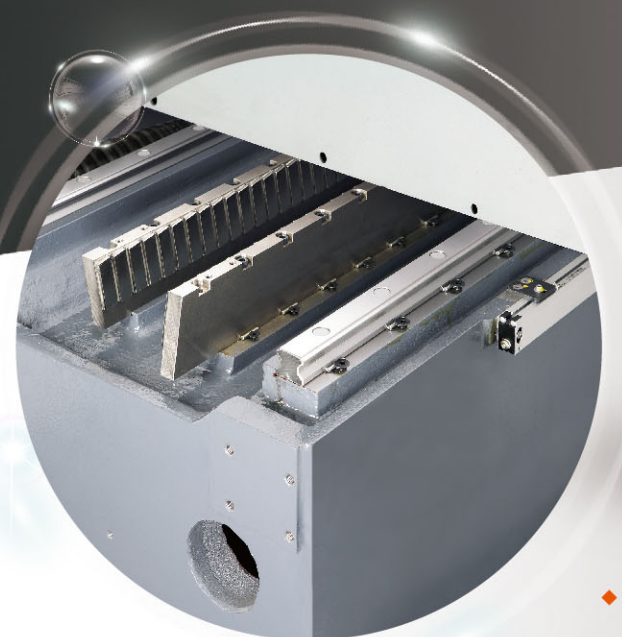
High Precision-Gantry Type Linear Motor Drive Wire Cut



CHMER Q Series are Gantry style linear motor EDMs with moving wire in X, Y, U, V and Z and a fixed table for improved accuracy with fewer passes, built-in Collision Protection and a smaller footprint.

♦ Global pioneer gantry moving structure design **PATENT**

- Innovative "No Back Seal Plate" design improves cutting accuracy by eliminating lower arm deflection and more importantly, eliminates back seat plate maintenance. No more back seals to replace! No more water leakage problem!
- Drop front door for ease of loading/unloading reducing working footprint. (Patent 74419)



♦ Highly efficient In-House Linear Motor drive system **PATENT**

- Linear Motors with linear scales lead a complete close loop. Linear Drive obtains many advances such like backlash- free, perfect accurate positioning as well as long life span.



• LED working light



♦ New G6 energy saving power supply

- The exclusively power saving technology, ESL, can reduce the power consumption up to over 20%. In addition, it can stabilize voltage, enhance machining reliability and accuracy.

♦ High precision temperature control system

Fully-enclosed machine frame design equipped with the 1st inverter Water Chiller to hold the temperature variation inside the chamber within $\pm 0.3^{\circ}\text{C}$ for precise machining and greatly reduces heat emission meanwhile save energy consumption of air-conditioner by 45%.

Highly efficient Linear Motor drive system

Benefit of Linear Motor

Linear Motor

The CHMER built linear motors utilizing precision drivers and scales, offer the ultimate in positioning and repeatability with no mechanical backlash common to all ball screw machines. The linear motors allow for better part definition on the first pass, as well as the precision to allow for skim passes with less than .0002" offset. Long, maintenance-free, with no degradation over time like ball screw drives.

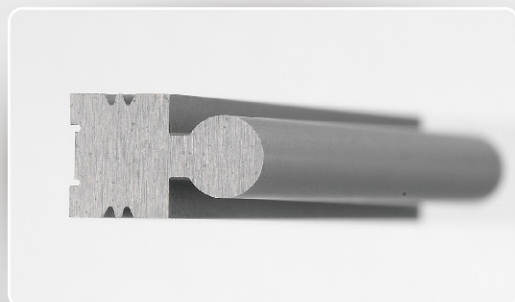
Reduce Profile Error (Improving Linear & Circular Cross-section)

Surface Roughness Enhancement

Work Conditions:

Brass Wire : $\varnothing$ 0.20mm Work-Piece = SKD11
Harden Steel Thickness =50mm
Cutting Pass = 1+2 Skims

《Cutting Shape》

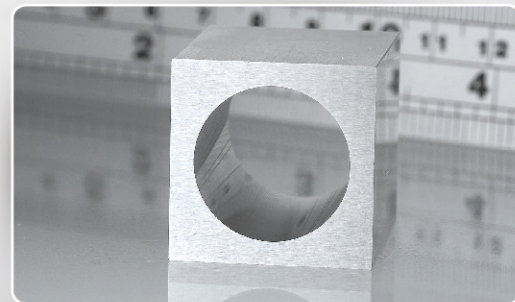


	Linear Motor		Ball Screw	
	A section	B section	A section	B section
Up	5.999	3.999	5.999	3.998
Middle	6.000	3.998	5.998	3.995
Bottom	6.000	4.000	6.000	3.999
Error	-0.001	-0.002	-0.002	-0.005

With Function : 『AC μ Super-Finish Circuit』

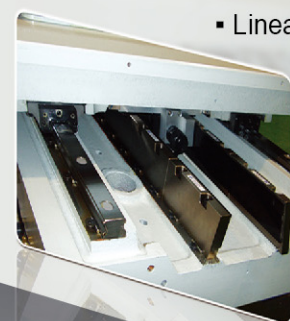
Cutting Result: Improved cutting speed and surface finish with over 3 skims cuts. Linear motor with virtually no backlash provides for even metal removal all around the work-piece , especially when skim cut is <0.0001"(0.25 microns)

Brass Wire=0.20mm/BS Work-piece=SKD11
Cutting Pass=1+4 Skims T=25 MM
Ra=0.20 μ m



Linear Motor	Ball-Screw
1+4Skims=0.20 μ m/Ra	1+4Skims=0.28 μ m/Ra

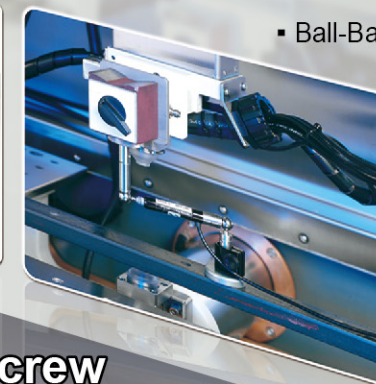
Linear Motor



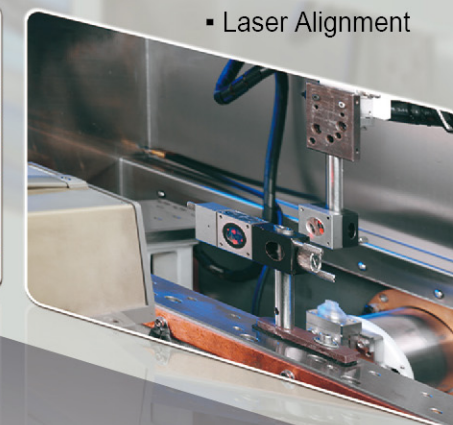
Linear Scale



Ball-Bar Test



Laser Alignment

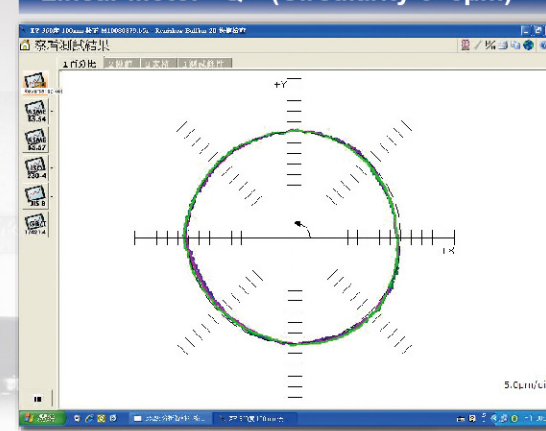


Linear Motor vs Ball-Screw

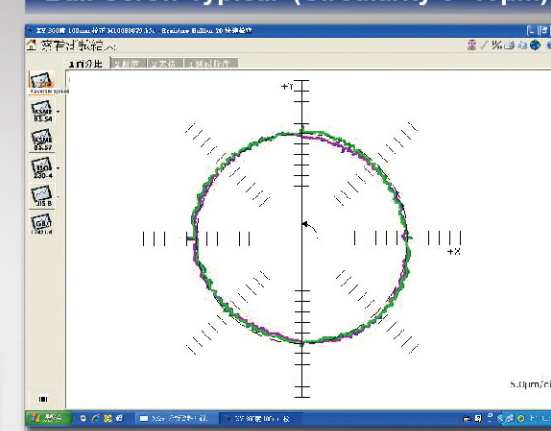
Ball-Bar Test

New hardware with Linear Motor and Glass Scale (0.5 μ m Resolution)
We use Laser Interpolation and BALL-BAR Circularity Test to test the linear drives.

Linear Motor "Q" (Circularity 6~8 μ m)



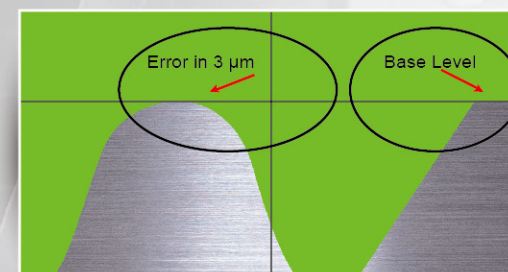
Ball-Screw Typical (Circularity 8~10 μ m)



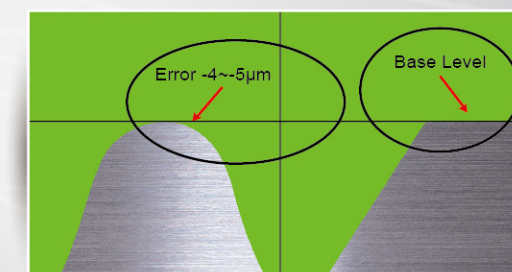
Improvement on "Corner" by Linear Motor

Work Conditions:

Brass Wire : $\varnothing$ 0.20mm Work-Piece = SKD11 Harden Steel Thickness =50mm
Cutting Pass = 1+2 Skims Shape Corner =30° Ra= 0.58 Radius (R)=0.20mm



Linear Motor (Radius Error : 3 μ m)
Optical Projector Scaling: 120X



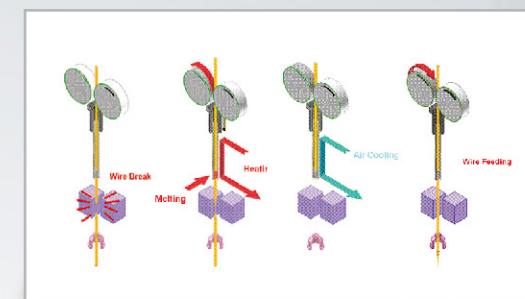
Ball-Screw (Radius Error: 4~5 μ m)
Optical Projector Scaling: 120X

CHMER Invented 5th generation AWT

Unattended over night and over weekend Auto Threading

『EC』 Tension Control Technology, ensures a constant tension to obtain superb threading rate, less than 10 seconds.

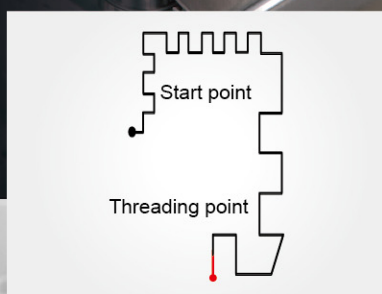
Patented in-house Auto Wire Threading (AWT) can thread 0.07mm Dia. Wire. Beside more simple and concise AWT mechanism can effectively reduce the building cost, failure rate so as to the frequency of maintenance.



Reliable automatic wire threading system control

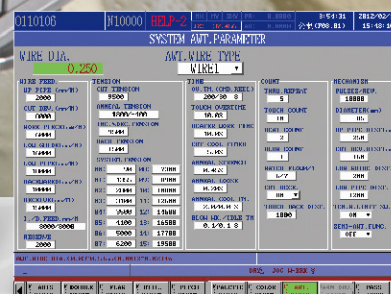
- World's most advanced and reliable automatic threading system using only five (5) moving parts for low maintenance. This auto threader will automatically rethread the wire on location, in the kerf and underwater in less than 10 seconds, no need to drain the tank, return to start point, dry run back to location, refill the tank, and then commence burning which is typical for other AWT systems.

All new servo system feedback module of AWT



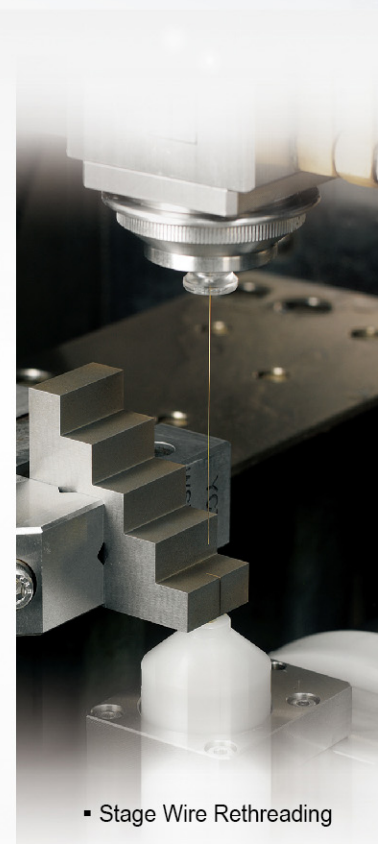
Wire Rethread at break points:

Immediately performs rethreading when wire breaks.

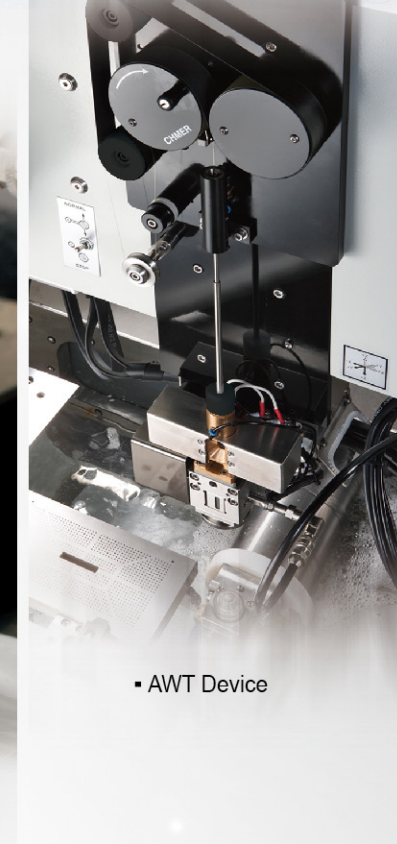


Visual parameter setting:

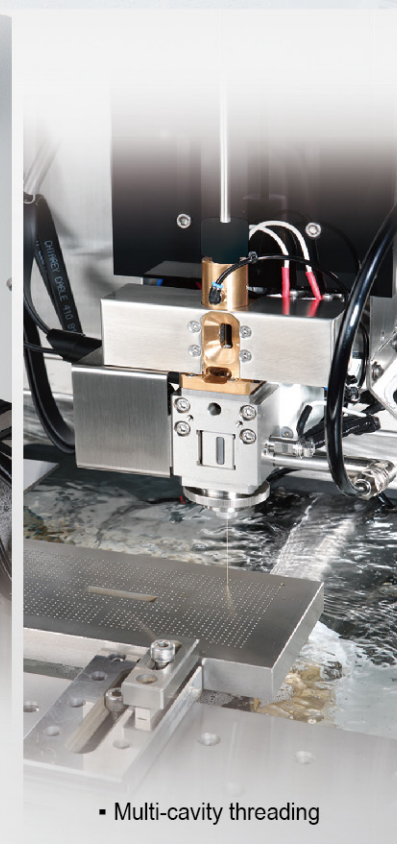
Parameters can be set for different wire diameters and types.



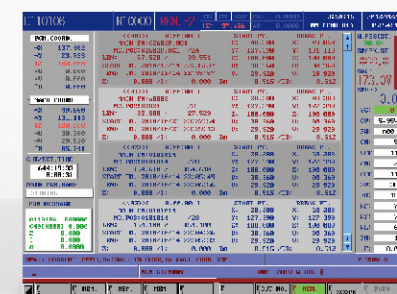
▪ Stage Wire Rethreading



▪ AWT Device

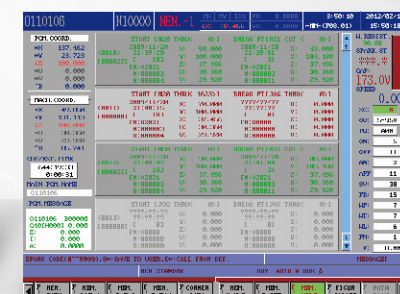


▪ Multi-cavity threading



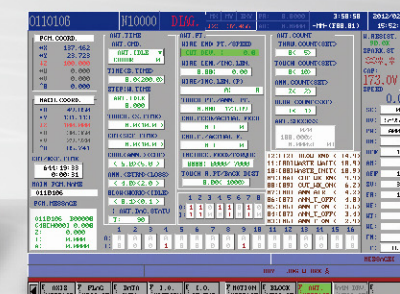
100 sets NC Program Memory:

Store up to 100 of your latest NC programs in the machine memory.



3999 Sets Memory Holes:

Machine stores up to 3999 of the last threading cycles to check reliability.



Monitoring Screen:

Records every step of the AWT process and automatically adjusts cutting conditions to help stabilize the cutting process.

CHMER BUILT CNC CONTROLLER

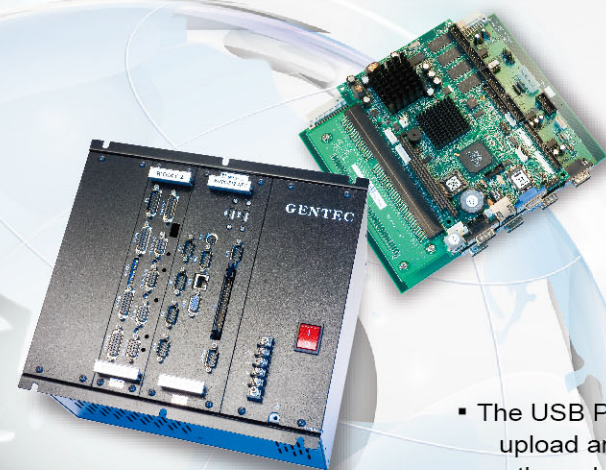
W5F Controller Features

- ♦ All Software and Hardware are with full authorized. (Copyright Reserved by CHMER)
- ♦ IPC 586 Mother Board · Compatible Intel or similar CPU .
- ♦ DRAM 128M bytes .
- ♦ High Capacity storage device CF card 128M bytes .
- ♦ Touch Screen or Optical Mouse Support (OPT) .
- ♦ Synchronized 6th Axis (B Axis) Support (OPT) . Indexing and "Turn & Burn".
- ♦ All software functions and controller are fully compatible with FANUC™ post processor in CAM software.



User-Friendly Console Panel

An user-friendly Operation Panel, easy to understand & easy to learn with a clear & bright 15" TFT LCD monitor to bring good operate experience to users.



- ♦ The USB Port allows to upload and download through Flash drive.



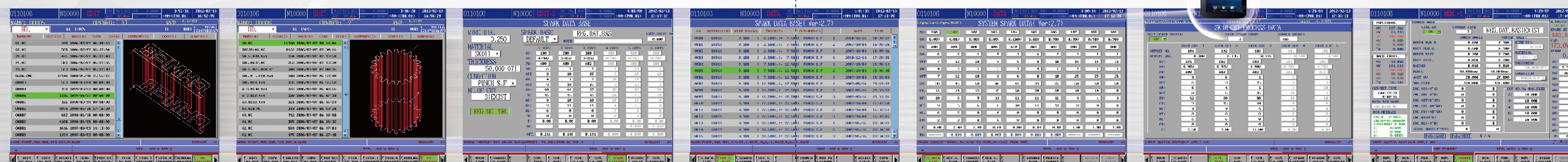
Remote Monitoring



- ♦ Remote Control (Through legal purchase software "Team-viewer") for real-time monitoring & operate machine.



Software Functions



User-Friendly File Management

EDM Technology Database

Advance Application Functions



System Device Management+ Optimum system parameter

Power Record pointand CoordinateSystems

Graphic Manual Function

3D Graphic Simulation + NC path Info.

NC Register

New G6 energy saving discharge circuit

Module PCB and parts in the power supply take less time and technical proficiency for replacement and trouble shoot in addition to high durability and stability. Due to above advantages, we could gain more confidence from distributor and end users.

LINEAR MOTOR DRIVE **Q4025L**

『G6』 Generator Power Control System

AC-μ Super Fine Finish

Job Material: SKD11 / Wire diameter: 0.2mm / Job Thickness: T50mm							
Cut Pass		6	5	4	3	2	1
Surface Roughness	Ra	0.12	0.20	0.28	0.62	2.0	2.4
	Ry	1.1	1.7	2.5	5.0	13.3	14.3

Material	Carbide	Wire diameter	0.20 mm
Thickness	20.0mm	Process	8 cut
Accuracy	3 μm	Working Time	58 mins
Surface Roughness	Ra=0.09 μm		

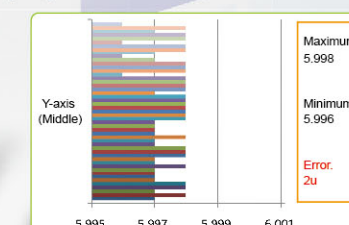
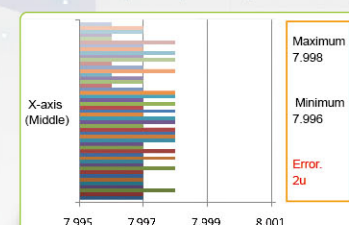


HP-AVR Cutting Voltage Stabilizer

Automatic/Smart voltage-stabilizing power supply. By using the cutting-edge technology, the new power control system can transform the unstable energy into pure stabilized electricity. Input voltages are controlled within +/-1 volt.

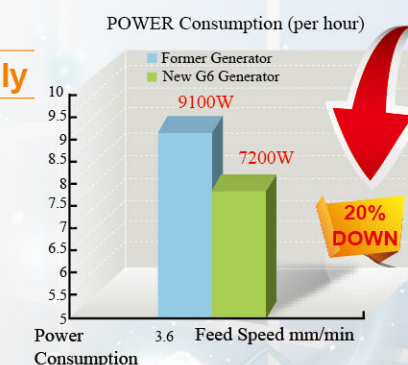


8x6mm square punch (Continually for 50pcs job with a single-cut at 30mm thick)



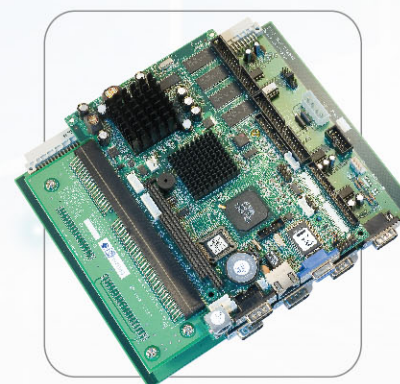
ESL -Energy Saving Power Supply

With exclusively developed power saving techniques; the New Power Control system can transform the power applied in discharge process and recharge the electricity of the generator. This process can reduce the power consumption up to 20% (compared with the previous models). Also, it reduces the heat emission problem. It fits the idea of energy saving and carbon emission reduction.



Professional Industrial High Speed Processor & Discharge Erosion control

Embedded DOS OS system, reduce burden on processor, gives more stability to control system and better speed. The superior ASIC Chip, increases the response speed and feedback of cutting servo / current / voltage by real-time. DOS greatly improves CPU reliability while virtually eliminating CPU virus. DOS also is instantly on; no booting time required. (Windows OS is available as an option)



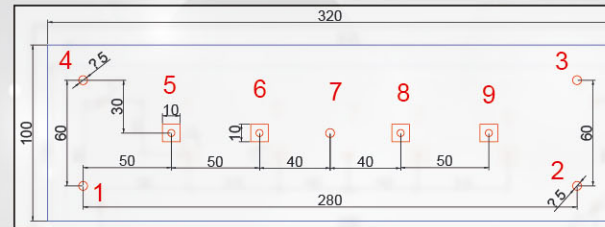
AC Electrolysis-Free Power

AC & DC switchable power supply. AC used for minimum cobalt depletion and best surface roughness in Carbides, also best cutting speed in PCD and PCBN materials. Also extend the life-Span of molds.

High Accurate Cutting

 $\pm 3\mu\text{m}$

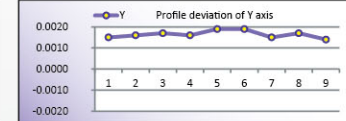
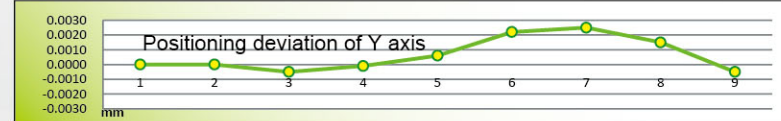
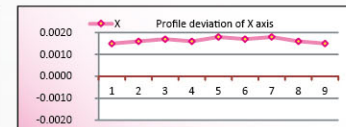
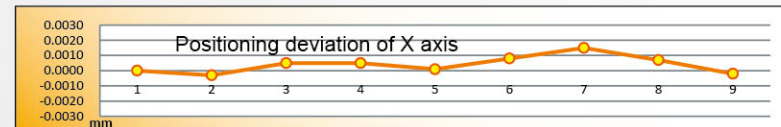
Workpiece material : SKD11
 Workpiece thickness : 20.00mm
 Diameter : 0.20mm (Brass Wire)
 Number of cuts : 4 times
 Environment Condition :
 Temperature controlled room at 23°C



Pitch Accuracy (mm)

NO	Coordinate		Measured Error		NO	Dimension		Measured Error	
	X	Y	X	Y		X	Y	X	Y
1	0.00	0.00	0.0000	0.0000	1	5.0000	0.0005	0.0005	0.0005
2	280.00	0.00	-0.0003	0.0000	2	5.0000	0.0006	0.0006	0.0006
3	280.00	60.00	0.0005	-0.0005	3	5.0000	0.0007	0.0007	0.0007
4	0.00	60.00	0.0005	-0.0001	4	5.0000	0.0006	0.0006	0.0006
5	50.00	30.00	0.0001	0.0006	5	10.0000	0.0008	0.0009	0.0009
6	100.00	30.00	0.0008	0.0022	6	10.0000	0.0007	0.0009	0.0009
7	140.00	30.00	0.0015	0.0025	7	5.0000	0.0008	0.0005	0.0005
8	180.00	30.00	0.0007	0.0015	8	10.0000	0.0006	0.0007	0.0007
9	230.00	30.00	-0.0002	-0.0005	9	10.0000	0.0005	0.0004	0.0004
Min. error (mm)			-0.0003	-0.0005	Min. error (mm)			0.0005	0.0004
Max. error (mm)			0.0015	0.0025	Max. error (mm)			0.0007	0.0009

Cutting Shape (mm)



A. Real Room Temperature : 23.5°C $\pm 0.5^\circ\text{C}$ / B. Water Temperature : 23.0°C $\pm 0.5^\circ\text{C}$ / C. Real m/c body Temperature : 23.5°C $\pm 0.5^\circ\text{C}$

Sample Illustration



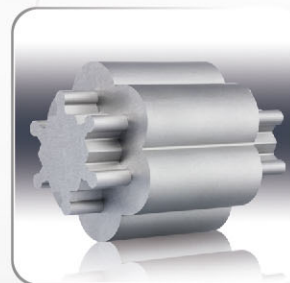
Job Material: SKD-11
 Job Thickness: 30 mm
 Wire diameter: $\varnothing 0.20$ mm
 Number Of Cut: 1+ 3 Skims
 Accuracy: 3 μm
 Surface Roughness: Ra 0.35 μm



Job Material: SKD-11
 Job Thickness: 17 mm
 Wire diameter: $\varnothing 0.15$ mm
 Number Of Cut: 1+ 2 Skims
 Accuracy: 3 μm
 Surface Roughness: Ra 0.55~0.58 μm



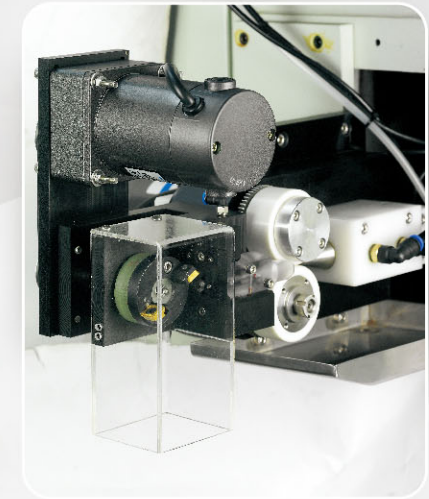
Job Material: SKD-11
 Job Thickness: 25 mm
 Wire diameter: $\varnothing 0.20$ mm
 Number Of Cut: 1+ 2 Skims
 Accuracy: 3 μm
 Surface Roughness: Ra 0.55~0.58 μm



Job Material: SKD-11
 Job Thickness [Punch]: 50 mm
 Job Thickness [Die]: 30 mm
 Wire diameter: $\varnothing 0.20$ mm
 Number Of Cut: 1+ 2 Skims
 Accuracy: 3 μm
 Surface Roughness: Ra 0.58~0.63 μm

Hardware Functions

6th Axis continuous cut or indexing (optional) with in-house submergible rotary B-Axis for turns and burns.

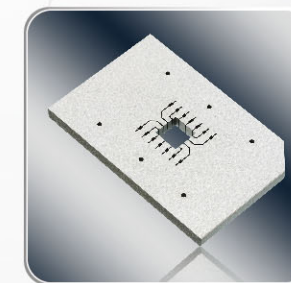


▲ Wire chopper
 P.S. Not available for dia 0.07 / 0.1mm wire device.

◀ The absolute linear scale with a high resolution of 0.1 μm leads an extremely precise positioning as well as high abilities of anti-noise to have high stability in machining. When power restart after power shoot down, easy to resume work by one-touch, no need home searching, no more error in positioning!



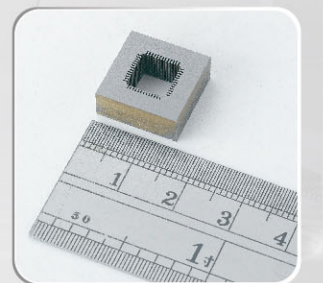
Job Material: SKD-11
 Job Thickness[Punch]: 50mm
 Job Thickness[Die]: 20mm
 Number Of Cut: 1+2 Skims
 Surface Roughness: Ra 0.58~0.63 μm



Job Material: SKD-11
 Job Thickness: 20 mm
 Wire diameter: $\varnothing 0.07$ mm
 Number Of Cut: 4 Cut
 Accuracy: 3 μm
 Surface Roughness: Ra 0.28 μm



PCD formed milling cutters
 Job Material: PCD
 Job Thickness: 2.5 mm
 Wire diameter: $\varnothing 0.20$ mm
 Feed rate: 2.0 mm/min



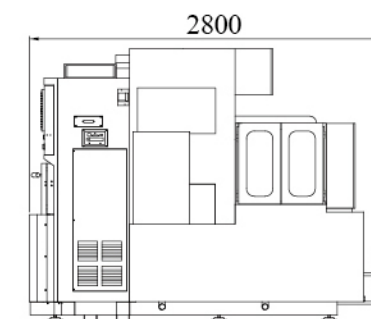
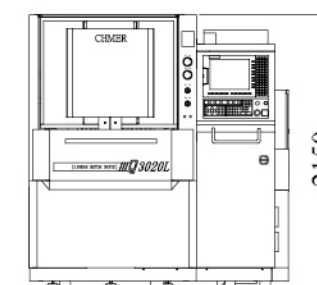
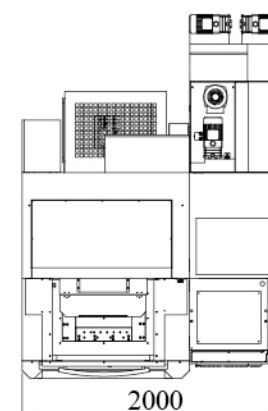
Dia. $\varnothing 0.1$ mm wire processing
 Purpose: For the precision molds of IC industries etc.
 Job Material: Carbide
 Job Thickness: 5 mm
 Wire diameter: $\varnothing 0.10$ mm
 Number Of Cut: 1+ 2 Skims
 Accuracy: 3 μm
 Surface Roughness: Ra 0.40 μm (AC- μ circuit, opt)

Specification

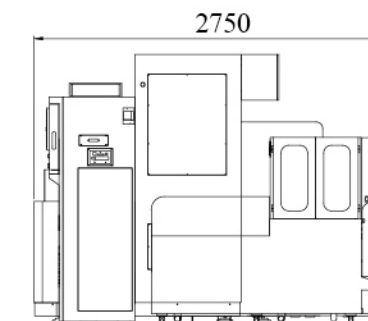
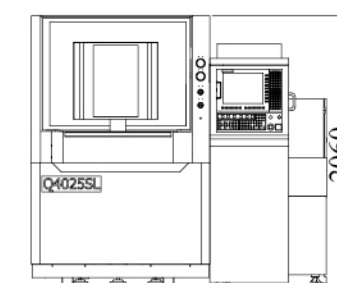
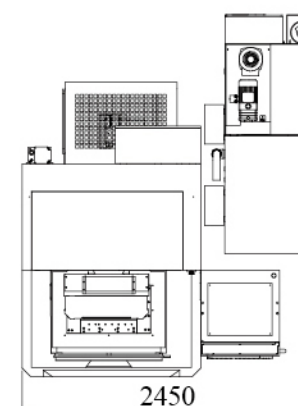
Model	Q3020L	Q4025L	Q5030L
Axis Travel (XxYxZ mm)	300 x 200 x 150 (mm)	400 x 250 x 200 (mm)	500 x 300 x 200 (mm)
Axis Travel (UxV mm)	60 x 60 (mm)	60 x 60 (mm)	60 x 60 (mm)
Max. Size of Workpiece (mm)	W600 x D500 x H145 (mm)	W750 x D560 x H195 (mm)	W850 x D610 x H195 (mm)
Max. Weight of Workpiece (kg)	300 Kg	550 Kg	600 Kg
XY Feed Rate	Max.1500 (mm/min)		
Axis Drive System (axis)	X , Y axis by Linear Motor ; U , V , Z axis by AC Servo Motor		
Wire Diameter Range (Standard)	Ø 0.15~0.3 (Ø 0.25) (Note: Ø 0.1 mm optional)		
Max. Wire Feed Rate	300 mm/sec.		
Wire Tension	300~2500 (gf)		
Taper Angle	±14.5°/80 (wide-angled nozzle , DA+DB=15mm)		
Outside Dimension (WxDxH mm)	2000x2800x2150	2450x2750x2060	2650x2750x2060
Machine Weight (kg)	2500	2580	2780
Tank Capacity (L)	650	760	930
Working Fluid Supply Unit			
Tank Capacity	590L	590L	760L
Filter Element	Paper	Paper	Paper
Ion Exchange Resins	14L	14L	14L
Conductivity Control	Auto	Auto	Auto
Fluid Temperature Control	Auto	Auto	Auto
Power Supply Unit			
Circuit System	Power MosFET Transistor		
Max. Output Current	25A		
IP Select	10		
Off Time System	50		
CNC Unit			
Date Input	Keyboard , RS-232C , USB , LAN		
Display	15-Inch Color		
Control System	32bit , 1-CPU , X&Y Closed Loop		
Control Axis	X , Y , U , V , Z (5 Axis) , 6th axis optional		
Setting Unit	0.001 mm		
Max. Command Value	±9999.999 mm		
Interpolation	Linear/Circular		
Command System	ABS/INC		
Machining Feed Control	Servo/Const. Feed		
Scaling	0.001-9999.999		
Machining EDM Condition Memory	1000-9999		
Total AC Power Input	3 Phase 220 ±5%/11KVA		

Floor Layout

Q3020L



Q4025L



Q5030L

