

# EQ SERIES

Gantry Type Linear Drive Wire Cut EDM



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WIRE CUT EDM EQ SERIES

USALLISA Design +886-0970-061888 / 2014.04.15 / 1000 / SB-0107A





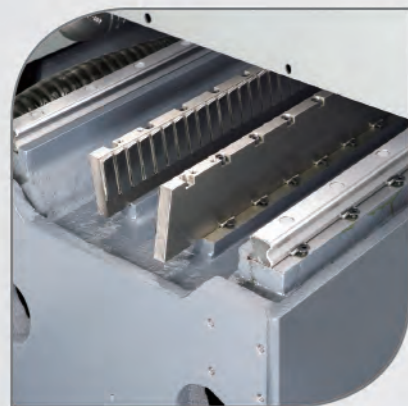
2014  
TAIWAN  
EXCELLENCE

## Gantry Type Linear Motor Drive Wire Cut EDM

The brand new EQ series, which inherits innovative technology and extreme performance of Q series, is finely built under the concept of creating high CVP (Customer Value Proposition). Through perfect cost control, the extraordinary of EQ series like “the first ever Gantry-Frame”, “efficient Linear Motor Drive” and “new energy-saving G7 Power Supply” are able to be presented at fair prices; it favors customers with spending least budget in return for excellent machining experience & benefits.

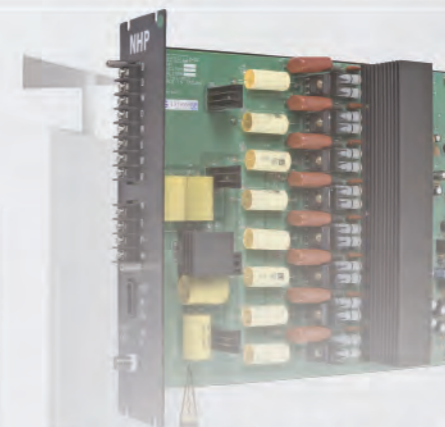
### ◆ Global pioneer gantry moving structure design

- Innovative “No Back Seal Plate” design improves cutting accuracy by eliminating lower arm deflection and more importantly, no back seal plate maintenance required. No more water leakage problem!
- Advanced compact design-saves space nearly 15% compared to conventional model.



### ◆ Highly efficient In-House Linear Motor drive system

- Linear Motors with linear scales make it a complete close loop system. Features like backlash-free, perfect accurate positioning as well as long life span are fulfilled.



### New G7 energy saving power supply

Longer durability of electronic components: Latest G7 features lower temperature inside the power supply by utilizing advanced Cool MOSFET transistor to reduce circuit impedance by 40%(compared with G6).



• LED working light



# Highly efficient Linear Motor drive system

## Benefit of Linear Motor

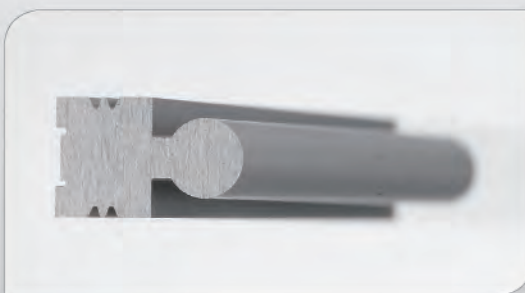
The CHMER built linear motors utilizing high resolution drivers and scales, offer ultimate positioning accuracy and repeatability with no mechanical backlash commonly seen in all ball screw machines. Besides, better part profile on the first pass, as well as allowing skim passes with less than .0002" offset ,maintenance-free, with no accuracy degradation over time like ball screw drives does.

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

**Surface Roughness Enhancement**

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

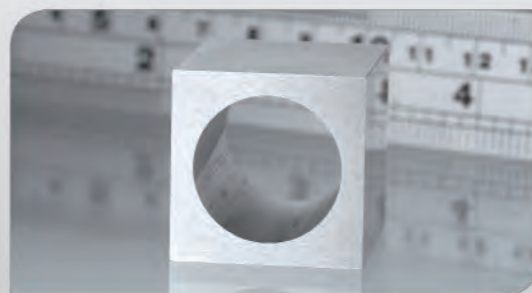
《Cutting Shape》



	Linear Motor		Ball Screw	
	Linear A	Linear B	Linear A	Linear B
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  $\mu$  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 <math><0.0001''</math>(0.25 microns)

Brass Wire=0.20mm/BS Work-piece=SKD11  
Cutting Pass=1+4 Skims T=25 MM  
Ra=0.20  $\mu\text{m}$



Linear Motor	Ball-Screw
1+4Skims=0.23 $\mu\text{m}$ /Ra	1+4Skims=0.28 $\mu\text{m}$ /Ra

## Linear Motor vs Ball-Screw

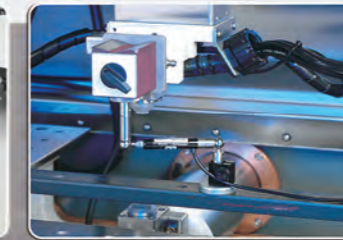
Linear Motor



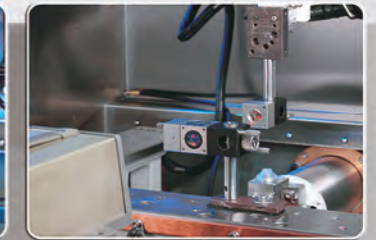
Linear Scale



Ball-Bar Test



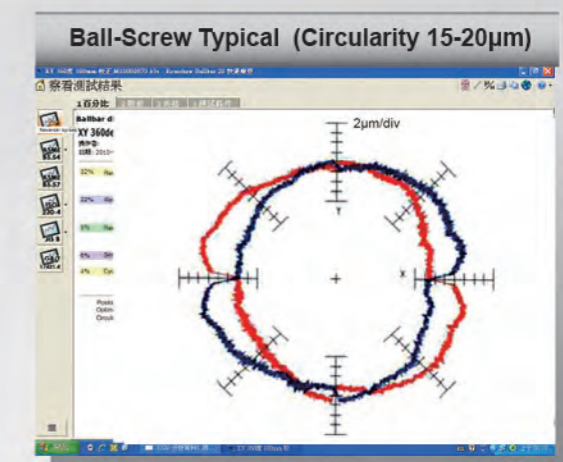
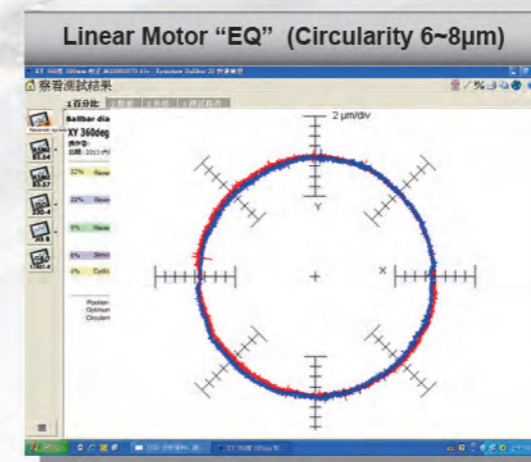
Laser Alignment



New hardware with Linear Motor and Glass Scale (0.5 $\mu\text{m}$  Resolution)  
Laser Alignment and Ball-Bar Roundness Test are conducted for calibration.

## Ball Bar Test

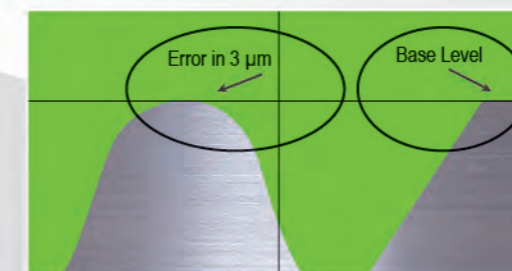
Roundness after 5 years of use



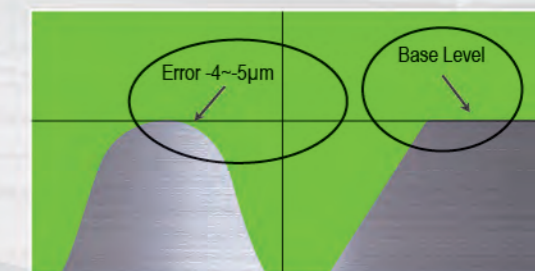
## Improvement of "Corner Cutting" by Linear Motor

Work Conditions:

Brass Wire :  $\varnothing 0.20\text{mm}$  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 $\mu\text{m}$ )  
Optical Projector Scaling: 120X



Ball-Screw (Radius Error: 4~5 $\mu\text{m}$ )  
Optical Projector Scaling: 120X



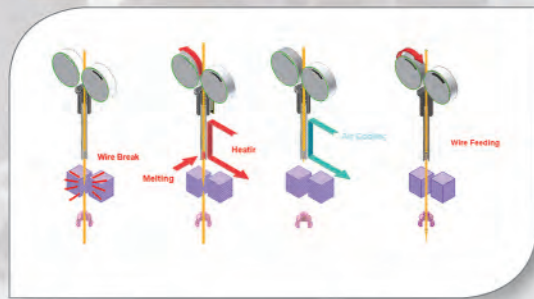
# CHMER The Newest Generation AWT

Unattended over night and over weekend Auto Threading

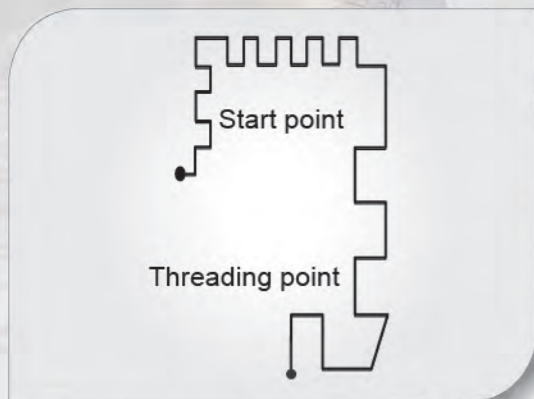
EC Tension Control Technology, ensures constant tension to obtain superb threading success in than 10 seconds.

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.

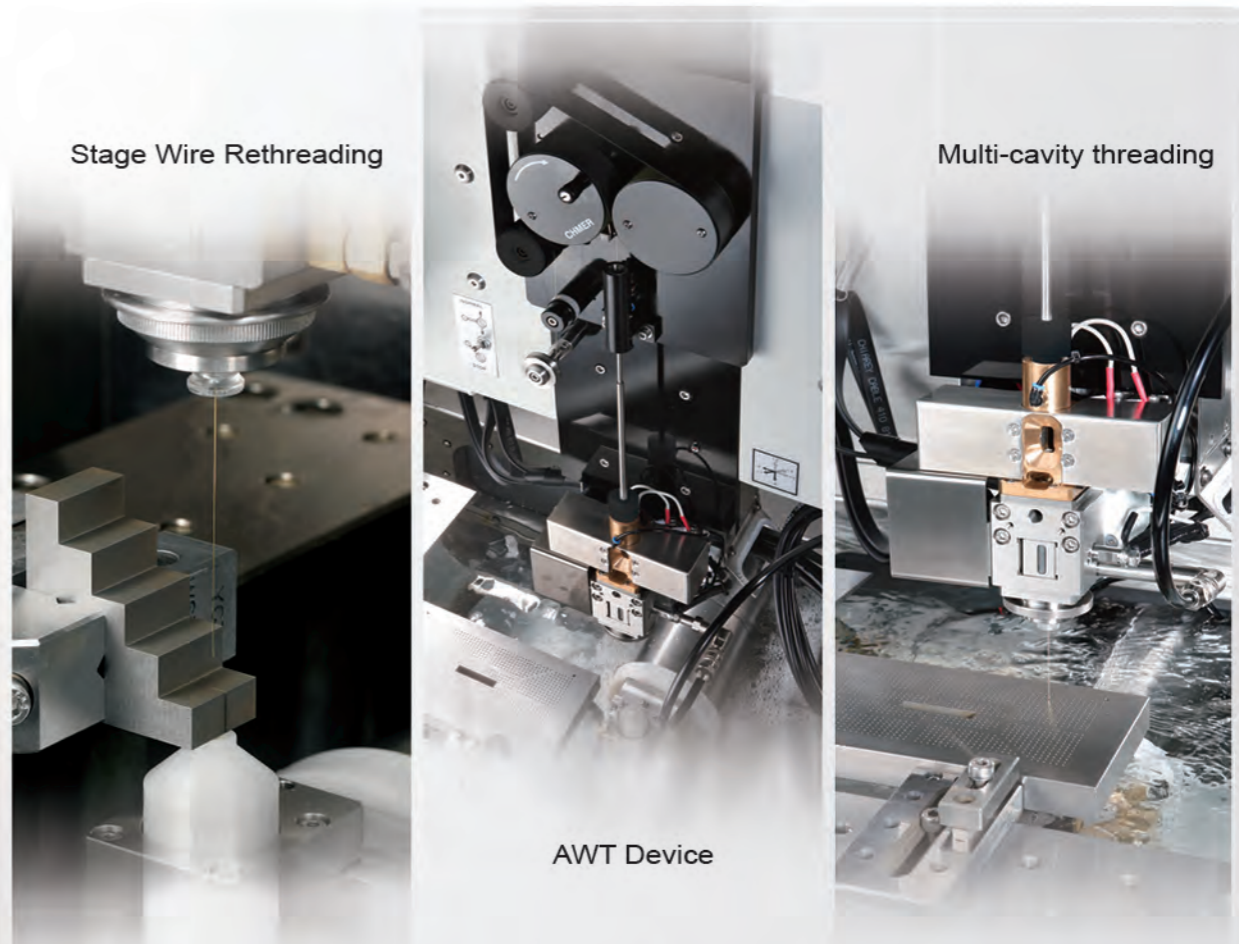
## Reliable automatic wire threading system control



- 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.



Wire Rethread at break points: Immediately performs rethreading when wire breaks.



## All new servo system feedback module of AWT



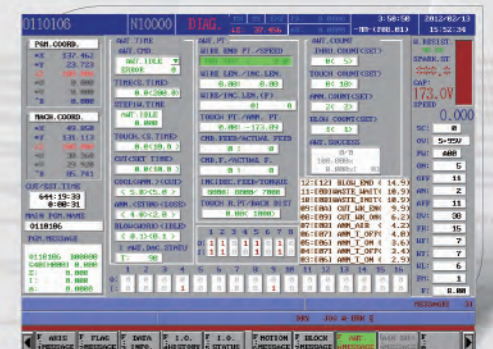
**Visual parameter setting:** Parameters can be set for different wire diameters and types.



**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.



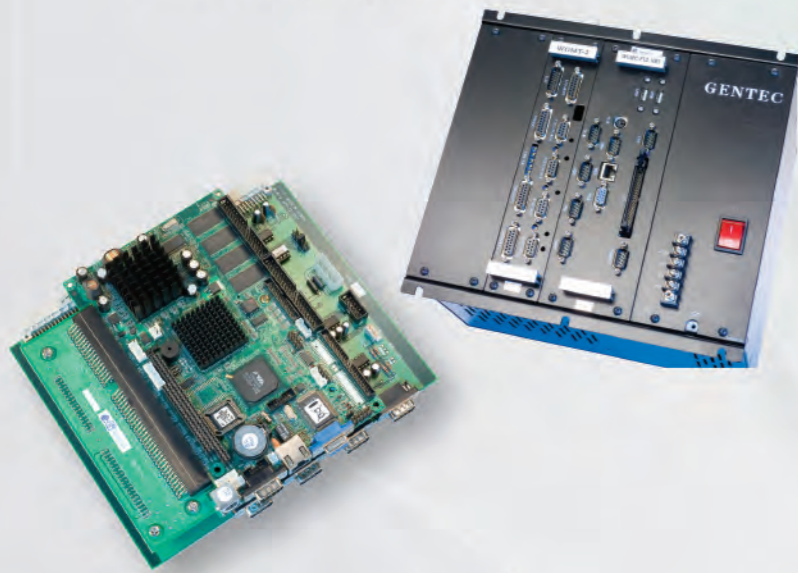
**Monitoring Screen:** Records every step of the AWT process and automatically adjusts cutting conditions to help stabilize the cutting process.



# 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 FANUCM 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 data transmission through memory stick.

## Remote Monitoring

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



## Software Functions



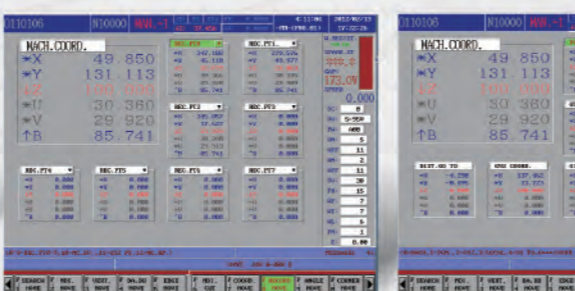
User-Friendly File Management

EDM Technology Database

Advance Application Functions



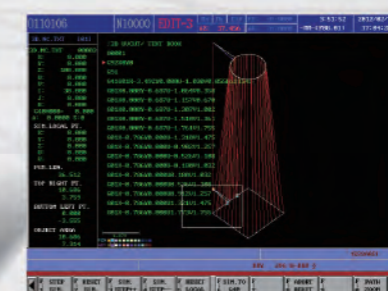
System Device Management+ Optimum system parameter



Power Record pointand CoordinateSystems



Graphic Manual Function



3D Graphic Simulation + NC path Info..



NC Register



# New G7

## 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.



### 『G7』 Generator Power Control System

#### AC-μ Super Fine Finish (Opt.)

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		



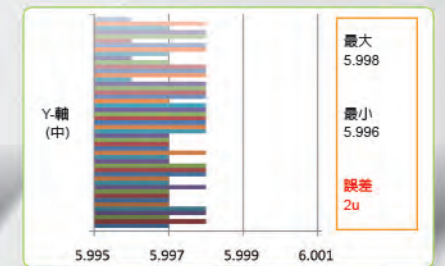
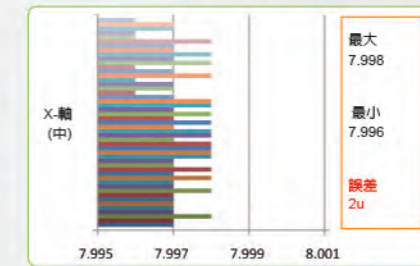
### HP-AVR Cutting Voltage Stabilizer

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.

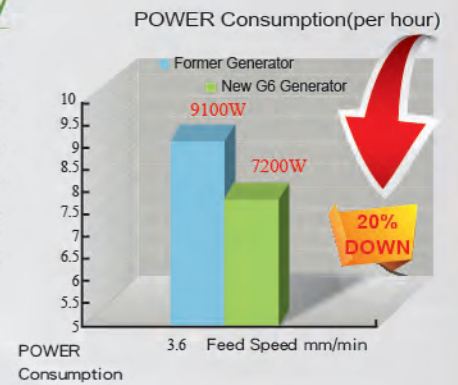


8x6mm square punch  
(Continually for 50pcs job with a single-cut at 30mm thick)



### Energy Saving Power Supply

With exclusively developed power saving circuit NES can recycle the residual energy used to be drained to resistors. This process can reduce the power consumption up to 20% (compared with G6) Also, it reduces the heat emission to fulfill 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)



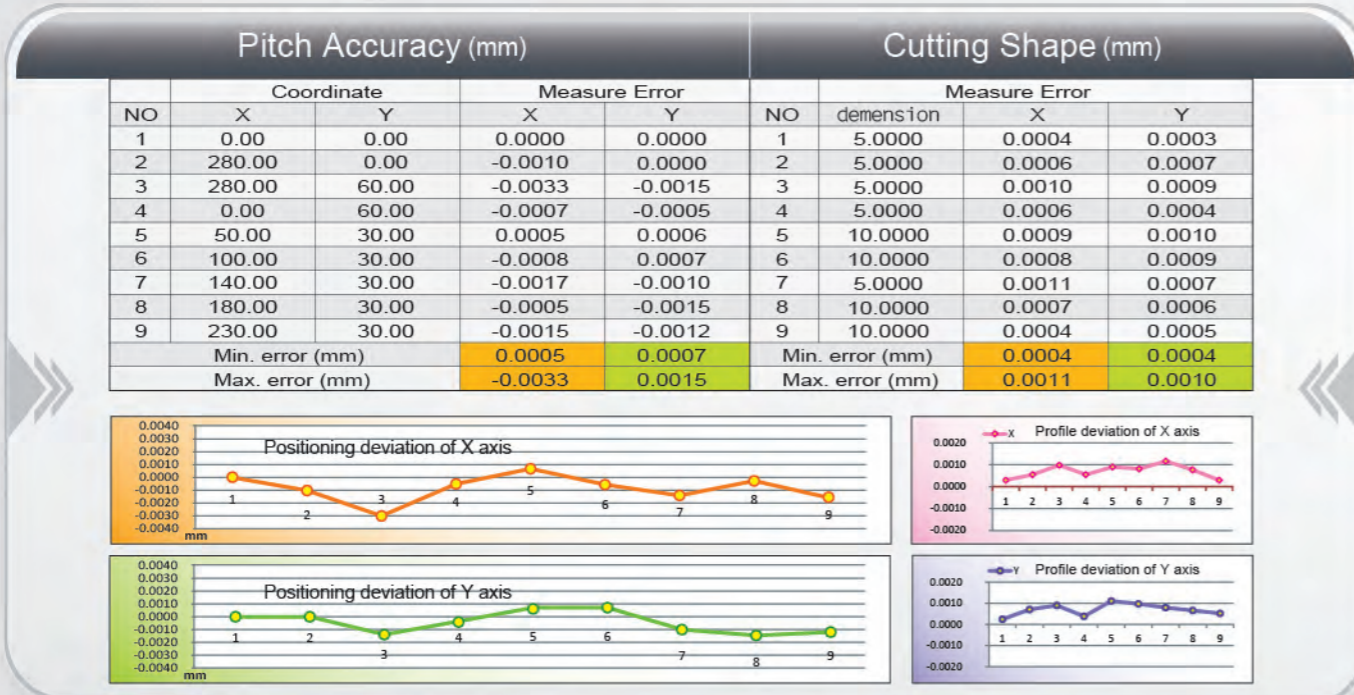
### NFBG Wire Breaks Refrains

5~10% cutting speed increased: The 100MHz high frequency FPGA chip is used to intensively monitor and optimize electric pulse.



## High Accurate Cutting

Workpiece material : SKD11  
 Workpiece thickness : 20.00mm  
 Diameter : 0.20mm (Brass Wire)  
 Number of cuts : 3 times  
 Environment Condition :  
 Temperature controlled room at 23-24°C



A. Real Room Temperature : 23.5°C ±0.5°C / B. Water Temperature : 23.0°C ±0.5°C / C. Real m/c body Temperature : 23.5°C ±0.5°C

## 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.

## Sample Illustration



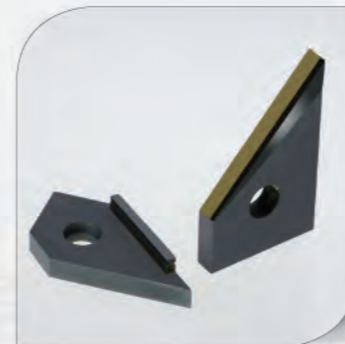
Job Material: SKD-11  
 Job Thickness: 30 mm  
 Wire diameter:  $\varnothing$  0.20 mm  
 Number Of Cut: 1+ 3 Skims  
 Accuracy: 3 $\mu$ m  
 Surface Roughness: Ra 0.35 $\mu$ m



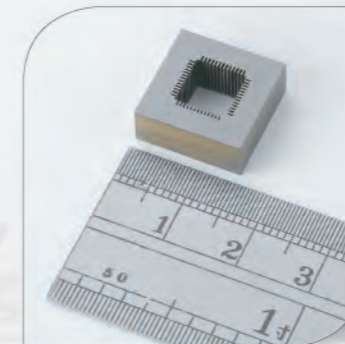
Job Material: SKD-11  
 Job Thickness: 17 mm  
 Wire diameter:  $\varnothing$  0.15 mm  
 Number Of Cut: 1+ 2 Skims  
 Accuracy: 3 $\mu$ m  
 Surface Roughness: Ra 0.55~0.58 $\mu$ m



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



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.  $\varnothing$  0.1mm 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 $\mu$ m  
 Surface Roughness: Ra 0.40 $\mu$ m (AC- $\mu$  ciucuit, opt)



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 $\mu$ m  
 Surface Roughness: Ra 0.58~0.63 $\mu$ m



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 $\mu$ m



## Specification

Model	EQ325L	EQ425L	EQ530L
Axis Travel (XxYxZ mm)	360x250x200	400x250x200	500x300x200
Axis Travel (UxV mm)	60x60	60x60	60x60
Max. Size of Workpiece (mm)	650x450x200 (Flushing) 650x450x145 (Submerged)	750x450x200 (Flushing) 750x450x180 (Submerged)	850x500x200 (Flushing) 850x500x180 (Submerged)
Max. Weight of Workpiece (kg)	350	550	600
XY Feed Rate	Max.1500	Max.1500	Max.1500
Axis Drive System (axis)	X · Y axis by Linear Motor ; U · V · Z axis by AC Servo Motor		
Wire Diameter Range (Standard)	∅ 0.15-0.3(∅ 0.25)(Note :∅0.1mm optional)		
Max. Wire Feed Rate	300	300	300
Wire Tension	300-2500	300-2500	300-2500
Taper Angle	±14.5°/80 (wide-angle nozzle · DA+DB=15mm)		
Outside Dimension(WxDxH mm)	2400x2750x2060	2450x2750x2060	2650x2750x2060
Machine Weight (kg)	2500	2580	2780
<b>Working Fluid Supply Unit</b>			
Tank Capacity	700L	760L	930L
Filter Element	Paper	Paper	Paper
Ion Exchange Resins	14L	14L	14L
Conductivity Control	Auto	Auto	Auto
Fluid Temperature Control	Auto	Auto	Auto
<b>Power Supply Unit</b>			
Circuit System	Power MosFET Transistor		
Max. Output Current	25A		
IP Slect	10		
Off Time System	50		
<b>CNC Unit</b>			
DataInput	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	0.001mm		
Max. Command Value	±9999.999mm		
Interpolation	Linear/Circular		
Command System	ABX/INC		
Machining Feed Control	Servo/ Const. Feed		
Scaling	0.001-9999.999		
Machining EDM Codition Memory	1000-9999		
Total AC Power Input	3 Phase 220±5%/11KVA		

Specifications subject change based on R&D results without prior notice.

## Floor Layout

