

LINEAR DRIVE **GX<sup>+</sup>** series



WIRE CUT EDM GX<sup>+</sup> SERIES

**Environment Conditions:**

1. Optimum Room Temperature:  $23 \pm 0.5^{\circ}\text{C}$  Humidity: Below to 75% RH
2. Minimum Floor Vibration.
3. Avoid being located against sunshine.
4. Avoid being located against heat-treatment or plating plant nearby.
5. Clean and low dust environment.

**Space Requirement:**

Take notice of the space for machine stroke to move during normal operation and daily maintenance.

**Grounding :**

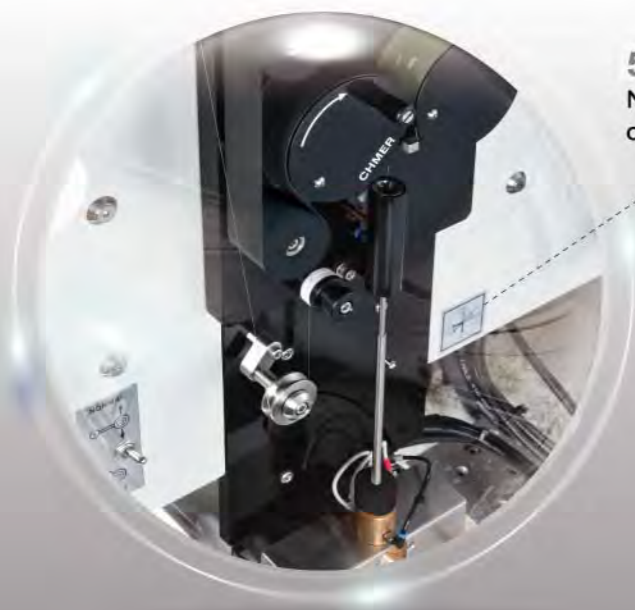
1. It's recommended to have an Earth Ground.
2. An independent ground is recommended.
3. The grounding cable should be 10 gage wire or larger.

**Demand of Air pressure :**

1. Air pressure of  $6 \text{ kg/cm}^2$  (95 PSI) for options of AWT and submerged machine is needed.

## GX<sup>+</sup> series evolutionary transformation

GX<sup>+</sup> Series provide the newest technologies with CHMER produced Linear Motors, Power & Servo stabilizer, Energy Saving, 5th Generation AWT and W5F Controller, Inverter Type Water Chiller.



**5<sup>th</sup> Generation AWT**  
 Nearly 100% Reliable Threading,  
 open air and in the kerf.



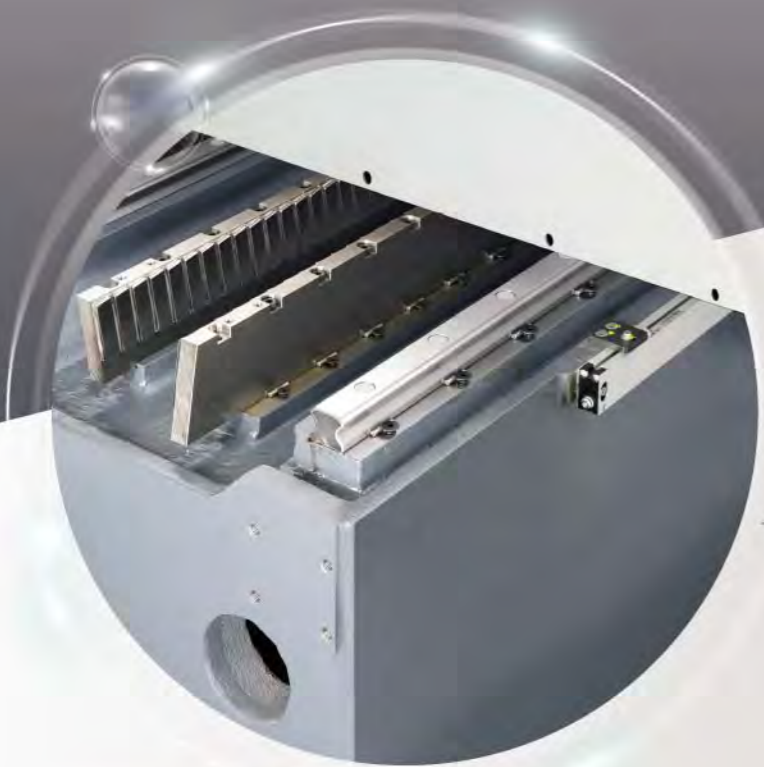
**HP-AVR**  
 Power & Servo stabilizer.  
 Less Wire breaks & High Efficiency  
 repeat cutting.



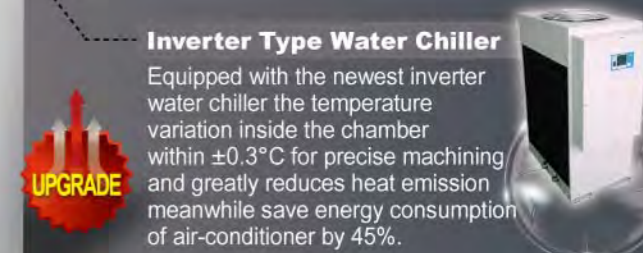
**ESL PCB**  
 AC-DC Power Transformation.  
 Nearly 20% Reduced Electrical  
 Consumption.



**Newest W5F Control**  
 CHMER writes their own  
 software allowing for customer  
 upgrade at a later date.



**Linear Motor**  
 CHMER built Linear Motor Precision  
 with High resolution drivers and glass scales  
 on X & Y axis.



**Inverter Type Water Chiller**  
 Equipped with the newest inverter  
 water chiller 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%.



GX430L<sup>+</sup>

GX530L<sup>+</sup>

GX640L<sup>+</sup>

## Benefit of Linear Motor

### In-House Linear Motor

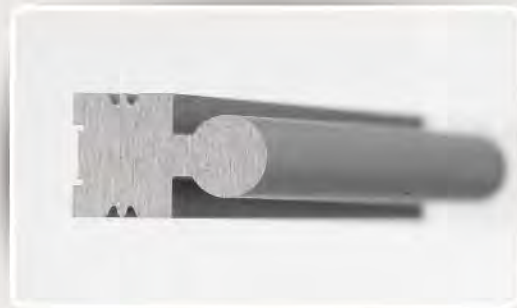
Linear Motor results a wear-free and no conversion motion to have a perfect positioning. GX<sup>+</sup> series equips X/Y In-House Linear Motor to obtain many advances features that the regular Wire Cut could not have, such as smoothly direct movement, high responsiveness, perfectly accurate positioning as well as vibration, maintenance and backlash free. So it guarantees an outstanding performance and long life span.

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

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

### Surface Roughness Enhancement

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 <0.0001”(0.25 microns)

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

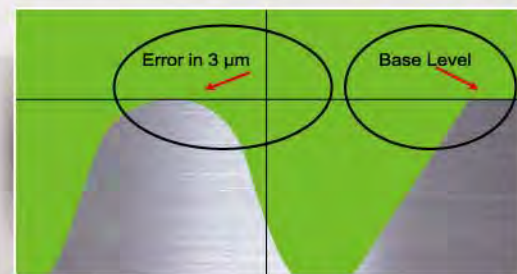


Linear Motor	Ball-Screw
1+4Skims=0.23~0.25 $\mu$ m/Ra	1+4Skims=0.28 $\mu$ m/Ra

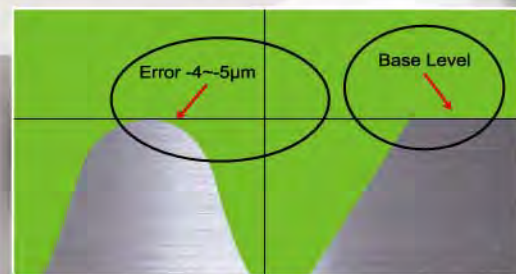
### Improvement on “Corner” by Linear Motor

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



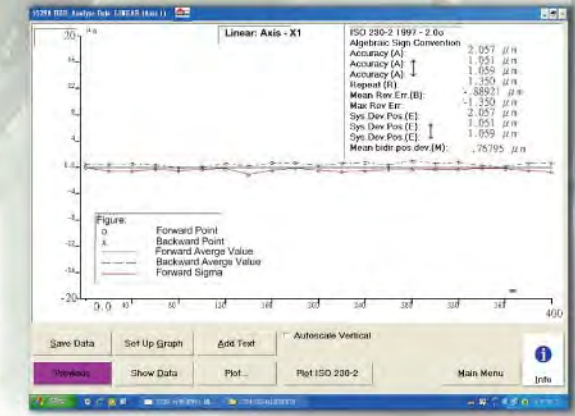
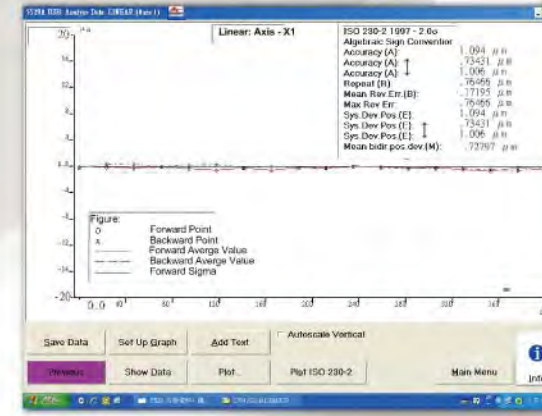
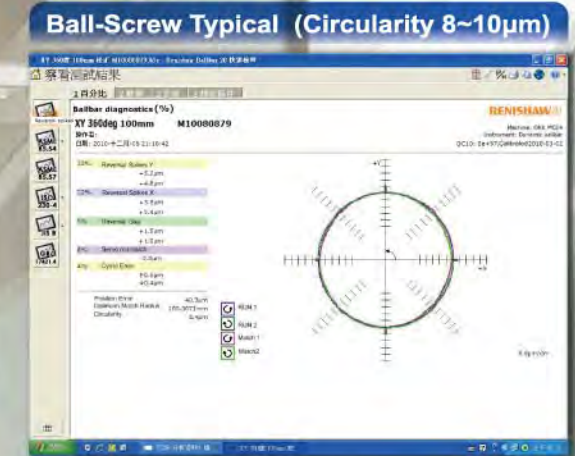
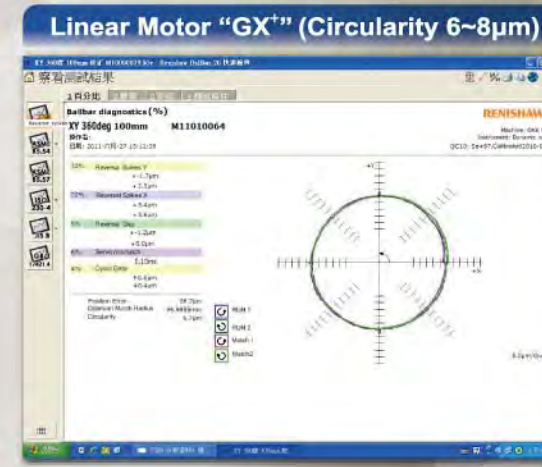
Linear Motor (Radius Error : 3 $\mu$ m)  
Optical Projector Scaling: 120X



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

## Ball-Screw V.S. Linear Motor

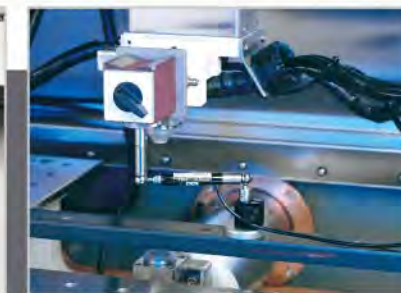
New hardware with Linear Motor & Glass Scale (0.5 $\mu$ m Resolution) are the need match °  
Use Laser Interpolation & BALL-BAR Circularity Test to prove the strictly Q.C. control at CHMER, the result was satisfactory.



• Linear Motor



• Linear Scale



• Ball-Bar Test

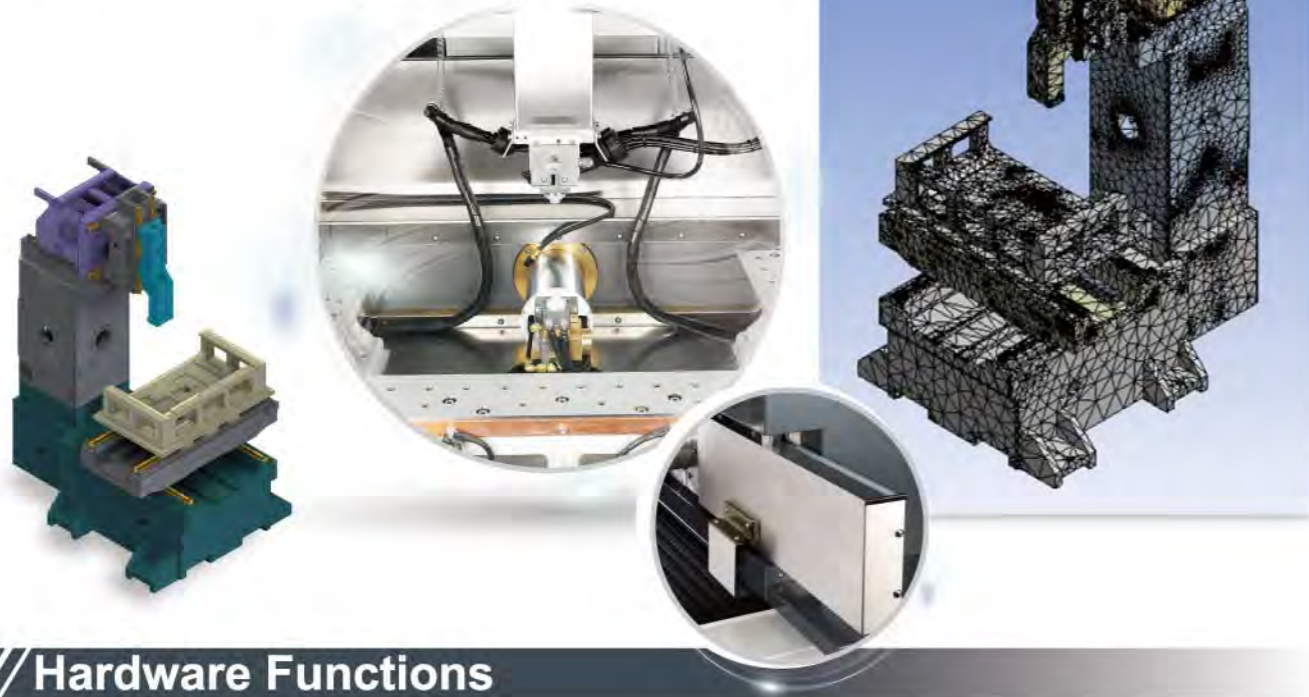


• Laser Alignment

## High Rigidity and Thermal Balanced Structure

To meet machining demands, The machine has been designed from the base frame through 3D simulation to optimize stability and extend the machine life.

Center-of-gravity position on leveling pads, maintain an enormous machine accuracy without any deformation.



## Hardware Functions

### In-house Rotary B-AXIS

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



• Wire chopper



• 30 kg Jumbo Wire Feeder

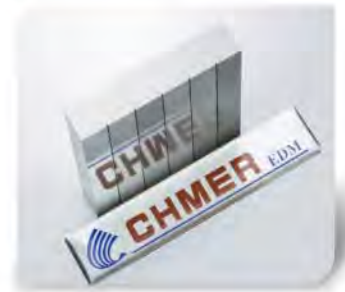
## 「G6」 Generator Power Control System

### 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.

### AC-μ Super Fine Finish (N/A on model GX530L/GX640L)

Cut Pass		5 <sup>th</sup> Cut	4 <sup>th</sup> Cut	3 <sup>rd</sup> Cut	2 <sup>nd</sup> Cut	1 <sup>st</sup> Cut
Surface Roughness	Ra	0.25	0.32	0.62	2.0	2.4
	Ry	2.1	3.0	5.0	13.3	14.3



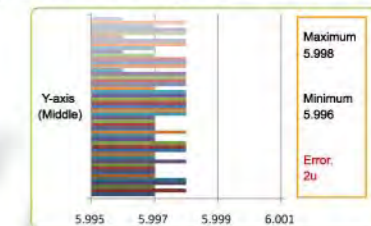
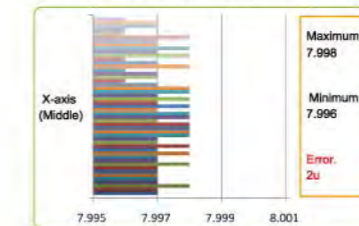
### HP-AVR Cutting Voltage Stabilizer

Automatic/Smart voltage-stabilizing power supply.

By using the cutting-edge technology, the new power control system can effectively transform the unstable energy into pure stabilized electricity. Through it, the smart logic of the power control can effectively transform and supply the discharge power for a fast cutting feed.

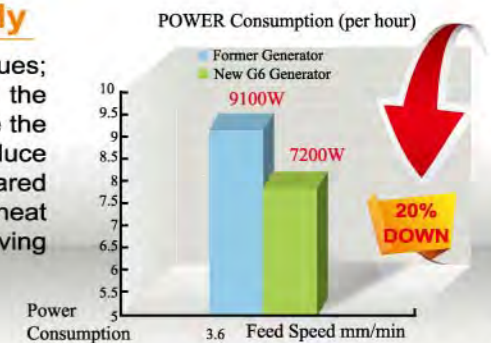


8x6mm square punch (Continually for 50pcs job with a single-cut at 30mm thick)



### 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 over 20% (compared with the previous models). Also, it reduces the heat emission problem. It fits the idea of energy saving and carbon emission reduction.



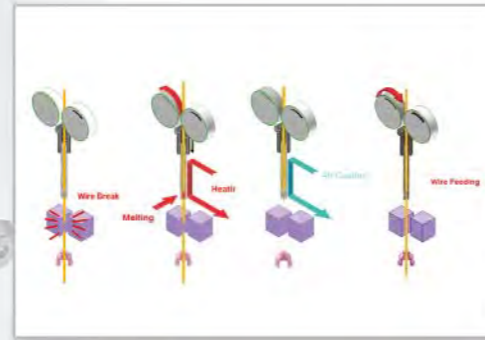
### Professional Industrial High Speed Processor & Discharge Erosion control

Embedded DOS OS system, reduce burden on processor, more stability of 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)



# CHMER Invented 5<sup>th</sup> generation AWT

Unattended over night and over weekend Auto Threading

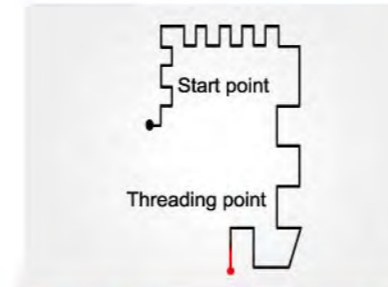


### Reliable automatic wire threading system control

- Capable of threading wire under water and on location. No need to return back to start point, drain the work-tank and then dry-run to wire break point.
- Simply design to make maintenance easy and cost less.
- Can thread wire at stepped work-piece, when the upper head cannot reach the work-piece.



## All new servo system feedback module of AWT



### Wire Rethread at break points:

Immediately perform rethreading when wire breaks.



### 3999 Sets Memory Holes:

Record the latest 3999 sets if processing holes, allow user to check the failure and then restart.



### Visual parameter setting:

Parameters can be set for different wire diameters and types.



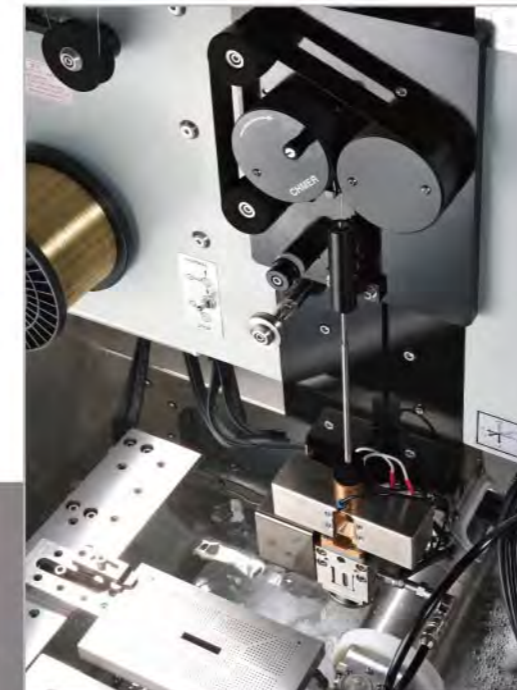
### 100 sets NC Program Memory:

Record the latest 100 sets NC programs, let the operator know the processing whether be finished based on the board information.



### Monitoring Screen:

Record every step of AWT process, monitors and adjusts to enhance the stability.



### 5<sup>th</sup> Generation AWT

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

• Multi-cavity threading

• AWT Device

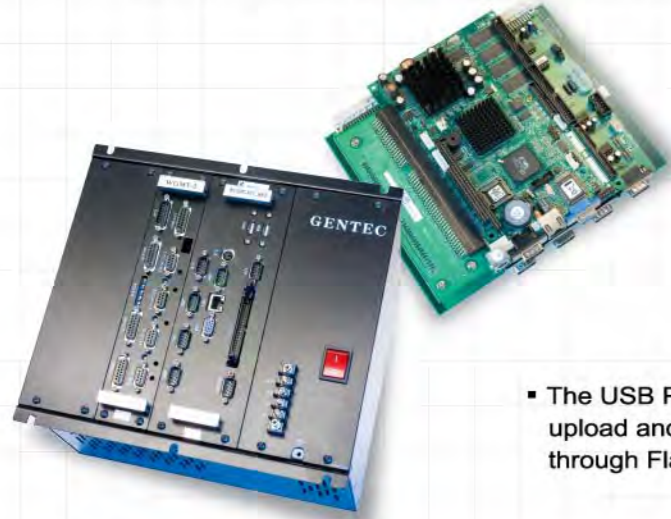
## CHMER BUILT CNC CONTROLLER

### 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 64M bytes .
- ◆ High Capacity storage device CF card 128M bytes .
- ◆ Touch Screen or Optical Mouse Support (OPT) .
- ◆ Synchronized 6<sup>th</sup> Axis (B Axis) Support (OPT) . Indexing and "Turn & Burn".
- ◆ All software functions and controller are fully compatible with FANUC<sup>TM</sup> post processor in CAM software.



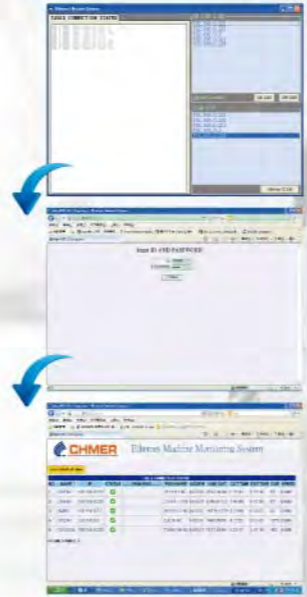
▪ Friendly User Interface and Operate Console.



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



### Remote Monitoring



▪ WEB page to monitor Functions (PC)



▪ Team-Viewer<sup>TM</sup> (A Pay Software, not included)



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

### Software Functions

#### User-Friendly File Management



#### EDM Technology Database



#### Graphic Manual Function



#### System Device Management+ Optimum system parameter



#### 3D Graphic Simulation + NC path Info.



#### NC Register



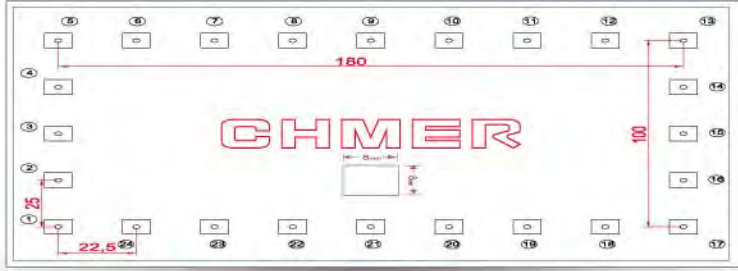
#### Advance Application Functions



**±4μm**

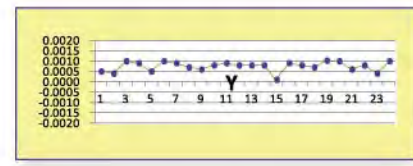
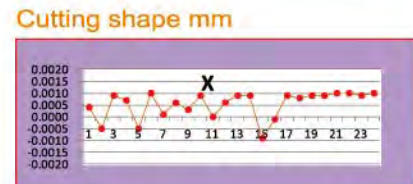
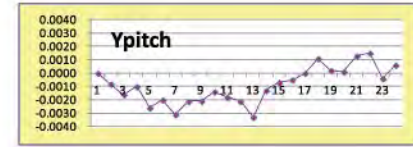
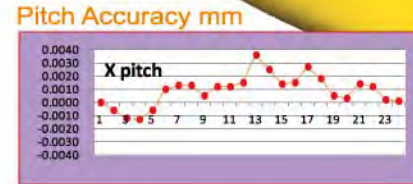
## High Accurate Cutting

Workpiece material: SKD11 Workpiece thickness =20.00mm  
 Number of cuts: 4 times  
 Environment Condition = Temperature controlled room at 23°C~24°C

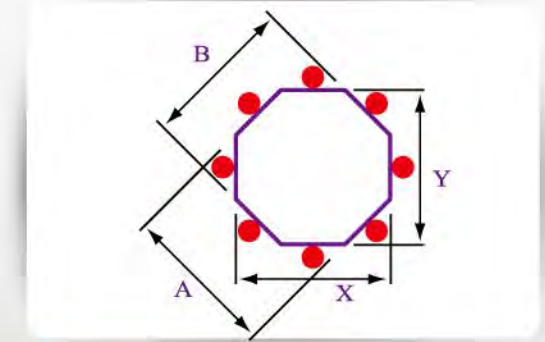
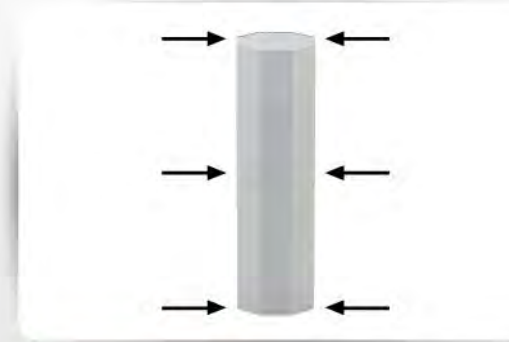


Pitch Accuracy: mm				Cutting shape: mm			
NO	Coordinate	X	Y	NO	Job Size	X	Y
1	0	0	0.0000	1	8	8	0.0004
2	0	25	-0.0006	2	8	8	-0.0005
3	0	50	-0.0012	3	8	8	0.0009
4	0	75	-0.0013	4	8	8	0.0007
5	0	100	-0.0006	5	8	8	-0.0005
6	22.5	100	0.0010	6	8	8	0.0010
7	45	100	0.0013	7	8	8	0.0001
8	67.5	100	0.0013	8	8	8	0.0006
9	90	100	0.0005	9	8	8	0.0003
10	112.5	100	0.0012	10	8	8	0.0009
11	135	100	0.0012	11	8	8	0.0000
12	157.5	100	0.0015	12	8	8	0.0006
13	180	100	0.0036	13	8	8	0.0009
14	180	75	0.0025	14	8	8	0.0009
15	180	50	0.0014	15	8	8	-0.0009
16	180	25	0.0015	16	8	8	-0.0001
17	180	0	0.0027	17	8	8	0.0009
18	157.5	0	0.0018	18	8	8	0.0008
19	135	0	0.0005	19	8	8	0.0009
20	112.5	0	0.0003	20	8	8	0.0009
21	90	0	0.0014	21	8	8	0.0010
22	67.5	0	0.0012	22	8	8	0.0010
23	45	0	0.0002	23	8	8	0.0009
24	22.5	0	0.0001	24	8	8	0.0010
Min. error mm		-0.0013	-0.0033	Min. error mm		-0.0009	0.0004
Max. error mm		0.0036	0.0015	Max. error mm		0.0010	0.0010

A. Real Room Temperature : 23.5°C ±0.5°C  
 B. Water Temperature : 22.5°C ±0.5°C  
 C. Real m/c body Temperature : 23.5°C ±0.5°C



## Straightness Accuracy



### Straightness

Workpiece: SKD-11 Thickness: 30 mm  
 Wire diameter: Ø0.2mm No. of cut: 3 cuts  
 Accuracy: ±2 μm

### Measurement figure

Marked red color means the measured points.

Accuracy	X	A	Y	B	Error
Up	9.999	9.999	9.999	9.999	0μ
Mid.	9.997	9.999	9.999	9.999	2μ
Dn.	9.999	9.999	9.999	9.999	0μ
Error	0.002	0	0	0	

## Sample Illustration



Job Material: SKD-11  
 Job Thickness: 30 mm  
 Wire diameter: Ø0.20 mm  
 Number Of Cut: 1+ 2 Skims  
 Work Hour: 1 Hour 10 Mins  
 Accuracy: 3μm  
 Surface Roughness:  
 Ra 0.55~0.58μm



Job Material: SKD-11  
 Job Thickness: 17 mm  
 Wire diameter: Ø0.15 mm  
 Number Of Cut: 1+ 2 Skims  
 Work Hour: 1 Hour 50 Mins  
 Accuracy: ±3μm  
 Surface Roughness:  
 Ra 0.55~0.58μm



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



**Taper Cut**  
 Job Material: SKD-11  
 Job Thickness: 11.45 mm  
 Wire diameter: Ø0.20 mm  
 Number Of Cut: 1 Cut  
 Work Hour: 1 Hour 30 Mins  
 Taper Angle: 21°



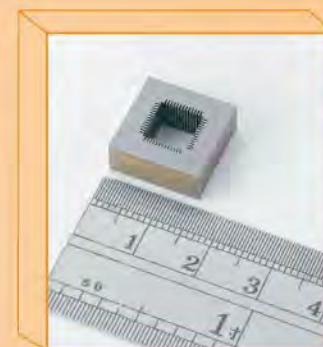
Job Material: SKD-11  
 Job Thickness: 25 mm  
 Wire diameter: Ø0.20 mm  
 Number Of Cut: 1+ 2 Skims  
 Work Hour: 1 Hour 50 Mins  
 Accuracy: ±3μm  
 Surface Roughness:  
 Ra 0.55~0.58μm



Job Material: SKD-11  
 Job Thickness [Punch]: 50 mm  
 Job Thickness [Die]: 30 mm  
 Wire diameter: Ø0.20 mm  
 Number Of Cut: 1+ 2 Skims  
 Work Hour: 4 Hours 00 Mins  
 Accuracy: 3μm  
 Surface Roughness:  
 Ra 0.58~0.63μm



**PCD formed milling cutters**  
 Job Material: PCD  
 Job Thickness: 2.5 mm  
 Wire diameter: Ø0.20 mm  
 Feed rate: 2.0 mm/min



**Dia.Ø0.1mm wire processing**  
 Purpose: For the precision molds of IC industries etc.  
 Job Material: Carbide  
 Job Thickness: 5 mm  
 Wire diameter: Ø0.10 mm  
 Number Of Cut: 1+ 2 Skims  
 Accuracy: 3μm  
 Surface Roughness:  
 Ra 0.40μm (AC-μ circuit, opt)

## Specification

MODEL	GX360L <sup>+</sup>	GX430L <sup>+</sup>	GX530L <sup>+</sup>	GX640L <sup>+</sup>
Axis Travel (XxYxZ mm)	360 x 250 x 220 (mm)	400 x 300 x 220 (mm)	500 x 300 x 220 (mm)	600 x 400 x 300 (mm)
Axis Travel (UxV mm)	60 x 60 (mm)	60 x 60 (mm)	60 x 60 (mm)	100 x 100 (mm)
Max. Size of Workpiece (mm)	W725 x D560 x H215 (mm)	W725 x D600 x H215 (mm)	W825 x D600 x H215 (mm)	W910 x D700 x H295 (mm)
Max. Weight of Workpiece (kg)	300 Kg	350 Kg	500 Kg	600 Kg
XY Feed Rate	Max. 1500 (mm/min)			
Axis Drive System	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: Ø0.10mm optional)			
Max. Wire Feed Rate	300 mm/sec.			
Wire Tension	300~2500 (gf)			
Taper Angle	±14.5°/80(wide-angled nozzle · DA+DB=15mm)		±21°/100(wide-angled nozzle · DA+DB=15mm)	
Machine Weight kg	2500	2600	3195	3595
<b>Working Fluid Supply Unit</b>				
Tank Capacity	590L	650L	650L	760L
Filter Element	Paper	Paper	Paper	Paper
Ion Exchange Resins	14L	14L	14L	14L
Conductivity Control	Auto	Auto	Auto	Auto
Fluid Temperature Control	Auto	Auto	Auto	Auto
<b>Power Supply Unit</b>				
Circuit System	Power MOSFET Transistor			
Max. Output Current	25A			
IP Select	10			
Off Time System	50			
<b>CNC Unit</b>				
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			

## Standard/Optional Accessories

Standard ● Option ○ Not Available —

ITEM	SPECIFICATION	AMOUNT	GX360L <sup>+</sup>	GX430L <sup>+</sup>	GX530L <sup>+</sup>	GX640L <sup>+</sup>
Paper Filter		2 pcs	●	●	●	●
Upper/Lower Diamond Guides	0.26mm	2 pcs	●	●	●	●
Upper/Lower Flushing Nozzles		2 pcs	●	●	●	●
Energizing Carbides		2 pcs	●	●	●	●
Diamond Guide Remove Jig		1pcs	●	●	●	●
Brass Wire	Ø 0.25mm x 5kg	1 roll	●	●	●	●
Tools		1set	●	●	●	●
Ion Exchange Resins	6L	1set	●	●	●	●
Alignment Jig		1set	●	●	●	●
AC Inverter Water Chiller	2T	1 set	●	●	●	●
AC Power		1 set	●	●	●	●
USB Port		1 set	●	●	●	●
X&Y Axis Linear Motor	CHMER	1 set	●	●	●	●
X&Y Axis Glass Scale	0.5 μm	1 set	●	●	●	●
Resuming Work function		1 set	●	●	●	●
Remote Monitoring function		1 set	●	●	●	●
Swivel TFT Panel		1 set	●	●	●	●
Auto Wire Threading Device		1 set	○	○	○	○
Energy Saving Power (ESL)	(G6 Generator)	1 set	○	○	○	○
HP-AVR	(G6 Generator)	1 set	○	○	○	○
AC-μ Fine finishing		1 set	○	○	—	—
30 Kg jumbo wire feeder		1 set	○	○	○	○
Wire Chopper		1 set	○	○	○	○
0.1 mm wire device		1 set	○	○	○	○
Rotary B-axis (6 <sup>th</sup> axis function)	CHMER	1 set	○	○	○	○

3 years warranty on Linear Motors (Rotor+Stator)

5 years positioning guarantee

## Floor Layout

