CHMER

LINEAR DRIVE GX+ series

WIRE CUT EDM GX+ SERIES

USA,USA Design+886-4970-061888 / 20160128 / 1000 / WGXE01

Environment Conditions:

1. Optimum Room Temperature: 23 ± 0.5°C Humidity: Below to 75% RH
2. Avoid being 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 stoke 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 :

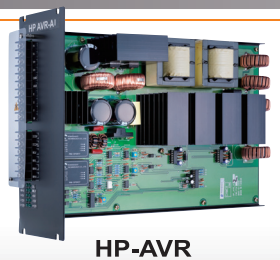
1. Air pressure of 6 kg/cm^2 (95 PSI) for options of AWT and submerged machine is needed.

CHMER

CHING HUNG MACHINERY & ELECTRIC INDUSTRIAL CO., LTD.
http://www.chmer.com

GX+ series evolutionary transformation

GX+ Series provide the newest technologies with CHMER produced Linear Motors, Power & Servo stabilizer, Energy Saving, New energy-saving Generation AWT and W5F Controller, Inverter Type Water Chiller.

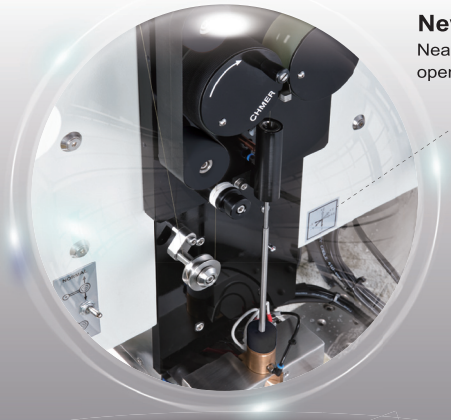


HP-AVR

Power & Servo stabilizer.
Less Wire breaks & High Efficiency repeat cutting.

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).

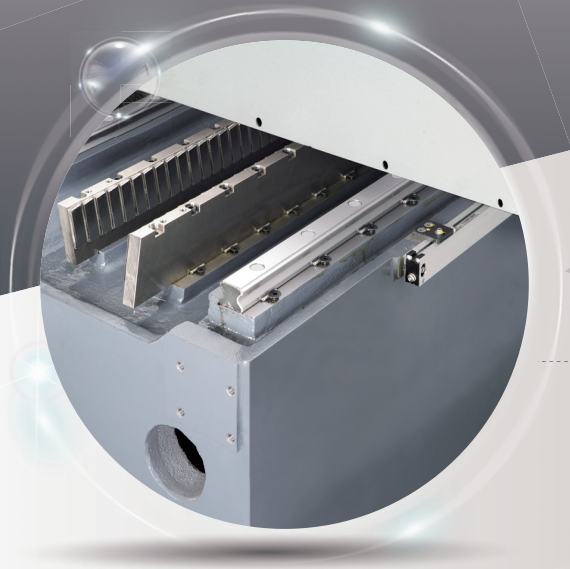


New energy-saving Generation AWT

Nearly 100% Reliable Threading, open air and in the kerf.

New 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 ±0.5°C for precise machining and greatly reduces heat emission meanwhile save energy consumption of air-conditioner by 45%.

Benefit of Linear Motor

In-House Linear Motor

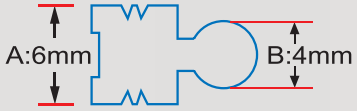
Linear Motor results a wear-free and no conversion motion to have a perfect positioning. GX+ series equips X/Y In-House Linear Motor to obtain many advanced features that the regular Wire Cut could not have, such as smoothly direct movement, high responsiveness, perfectly accurate positioning as well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

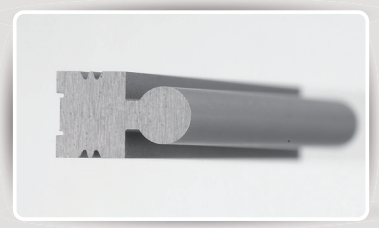
Reduce Profile Error
(Improving Linear & Circular Cross-section)

Work Conditions:

Brass Wire :Ø0.20mm Work-Piece = SKD11
Harden Steel Thickness =50mm
Cutting Pass = 1+2 Skims

《Cutting Shape》



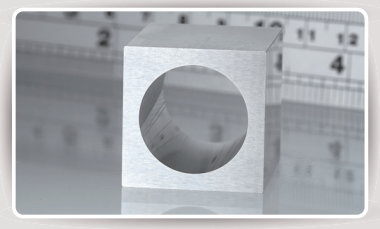


	Linear Motor		Ball Screw	
	A section	B section	A section	B section
Up	5.999	3.999	5.999	3.998
Middle	6.000	3.998	5.998	3.995
Bottom	6.000	4.000	6.000	3.999
Error	-0.001	-0.002	-0.002	-0.005

Surface Roughness Enhancement

With Funtion ： 『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=0.25μm

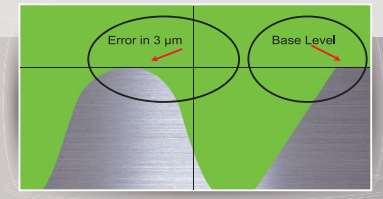


Linear Motor	Ball-Screw
1+4Skims= Ra 0.23~0.25μm	1+4Skims= Ra0.28μm

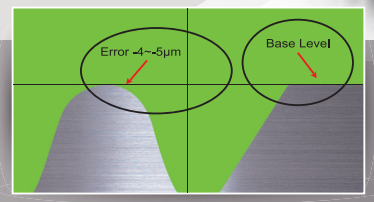
Improvement on "Corner" by Linear Motor

Work Conditions:

Brass Wire :Ø0.20mm Work-Piece = SKD11 Harden Steel Thickness =50mm
Cutting Pass = 1+2 Skims Shape Corner =30° R a 0.58μm Radius (R)=0.20mm



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



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

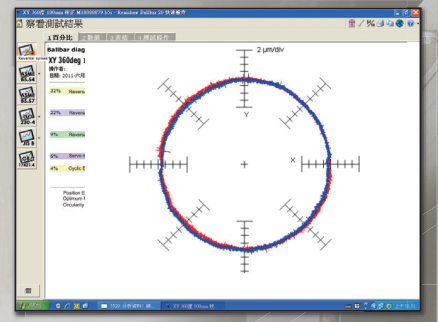
Ball-Screw V.S. Linear Motor

New hardware with Linear Motor & Glass Scale (0.5μm 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.

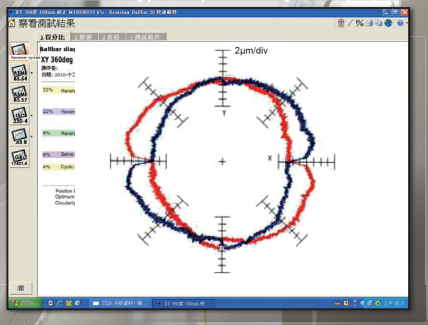
Ball Bar Test

Roundness after 5 years of use

Linear Motor "GX" (Circularity 6~8μm)

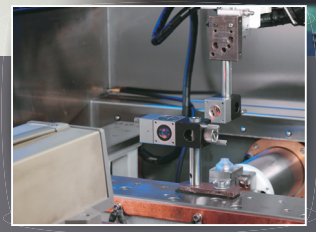


Ball-Screw Typical (Circularity 15-20μm)

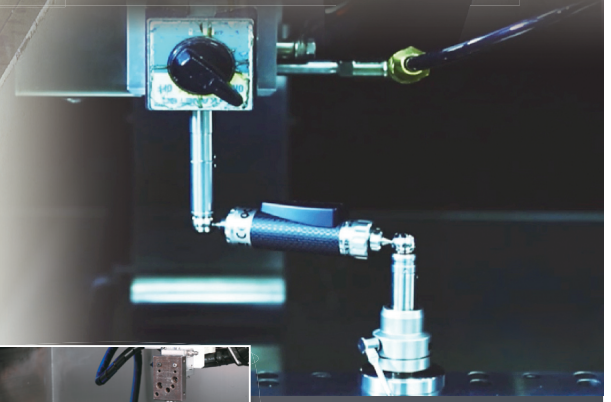


▪ Linear Motor

▪ Linear Scale



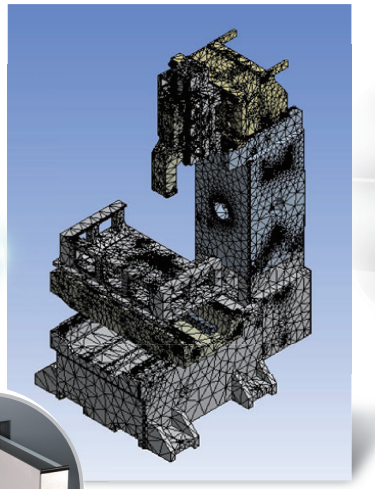
▪ Laser Alignment

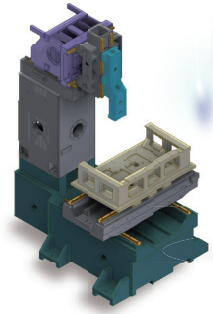


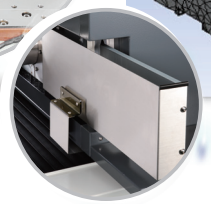
▪ Ball-Bar Test

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.



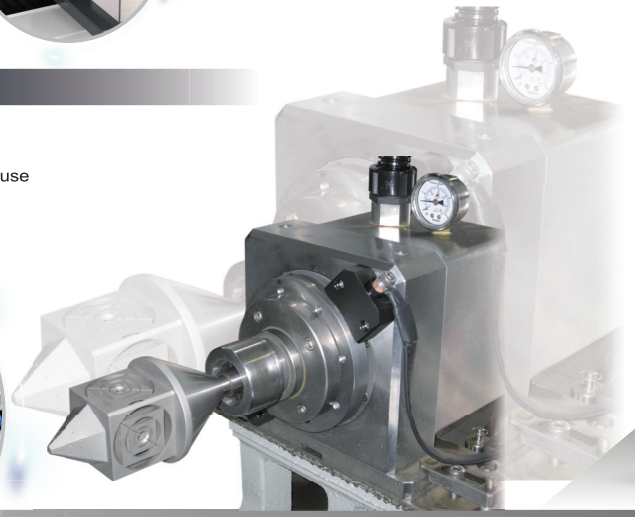


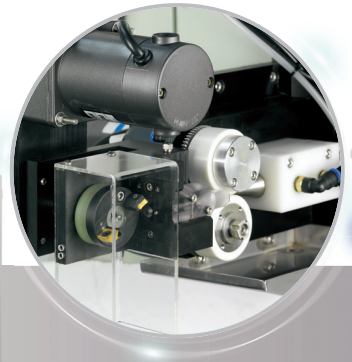


Hardware Functions

In-house Rotary B-AXIS

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





▪ Wire chopper

▪ 30 kg Jumbo Wire Feeder

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.

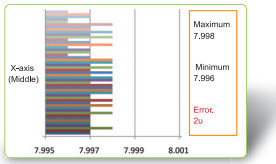
AC-μ Super Fine Finish (N/A on model GX530L/GX640L)

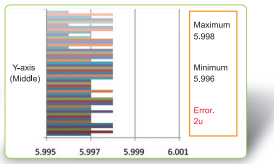
Cut Pass		5thCut	4thCut	3rdCut	2ndCut	1st Cut
Surface Roughness (μm)	Ra	0.25	0.32	0.62	2.0	2.4
	Ry	2.1	3.0	5.0	13.3	14.3

HP-AVR Cutting Voltage Stabilizer

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

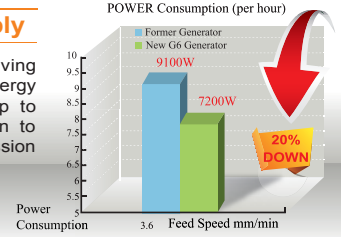
8x6mm square punch (Continually for 50pcs job with a single-cut at 30mm thick)

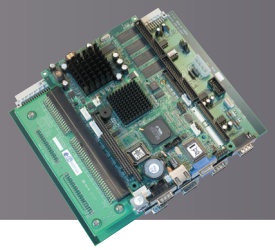




Energy Saving Power Supply

With exclusively developed power saving circuit ESL can recycle the residual energy can reduce the power consumption up to 20% Also, it reduces the heat emission to fullfill energy saving and carbon emission reduction.



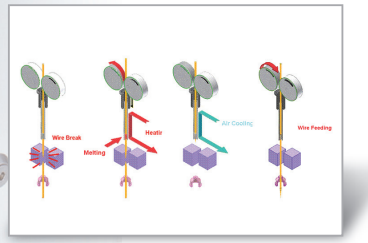


Professional Industrial High Speed Processor & Discharge Erosion control

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)

The Newest Generation AWT of CHMER

Unattended over night and over weekend Auto Threading



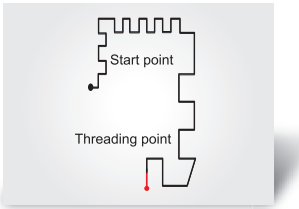
Reliable automatic wire threading system control

- 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.

The Newest Generation AWT

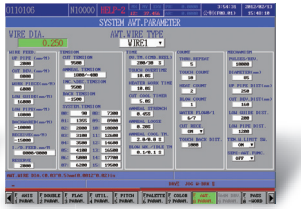
『EC』Tension Control Technology, ensures a constant tension to obtain superb threading rate, less than 10 seconds.
Patented in-house Auto Wire Threading (AWT) can thread 0.07mm Dia. Wire. Beside more simple and concise AWT mechanism can effectively reduce the building cost, failure rate so as to the frequency of maintenance.

All new servo system feedback module of AWT



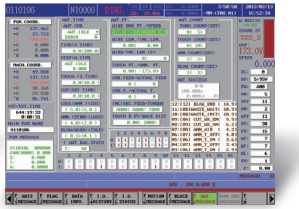
Wire Rethread at break points:

Immediately perform rethreading when wire breaks.



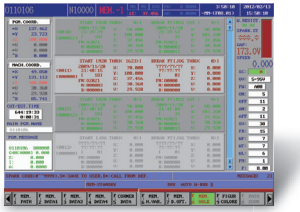
Visual parameter setting:

Parameters can be set for different wire diameters and types.



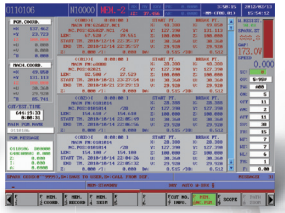
Monitoring Screen:

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



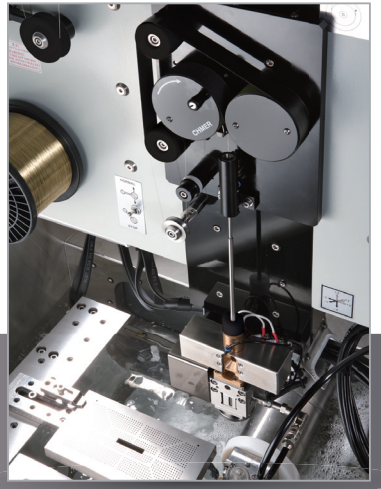
3999 Sets Memory Holes:

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



100 sets NC Program Memory:

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



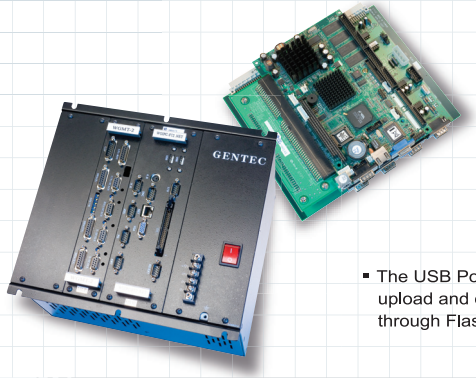
▪ AWT Device

▪ Multi-cavity threading

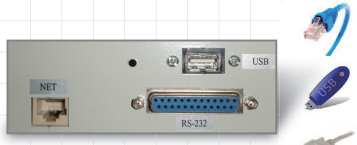
CHMER BUILT CNC CONTROLLER

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 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.

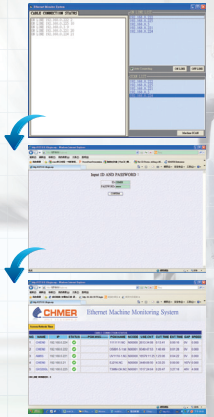


▪ Friendly User Interface and Operate Console.



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

Remote Monitoring



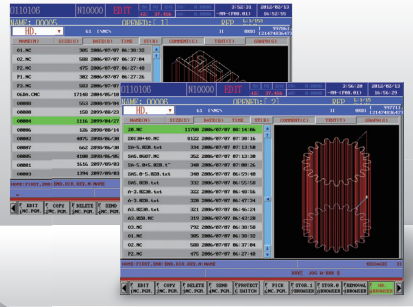
▪ WEB page to monitor Functions (PC)

▪ Team-Viewer™ (A Pay Software, not included)

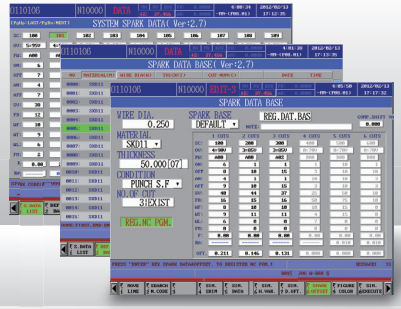
▪ Remote Monitoring Function
Install Chmer exclusive Remote Monitoring Software and authorized "Team-Viewer" for knowing real-time machine status.

Software Functions

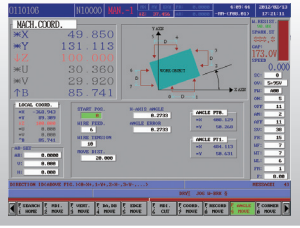
User-Friendly File Management



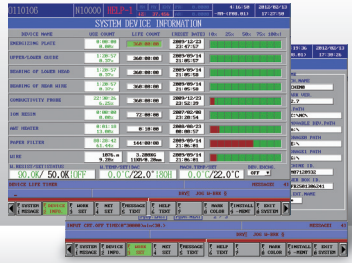
EDM Technology Database



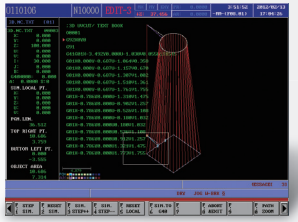
Graphic Manual Function



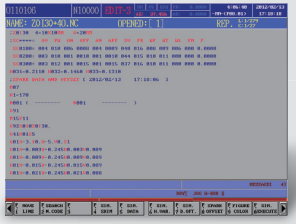
System Device Management+ Optimum system parameter

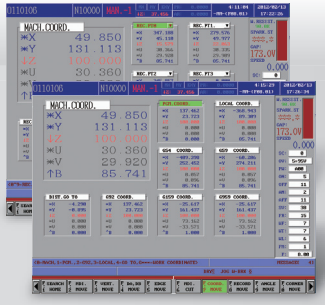


3D Graphic Simulation + NC path Info.



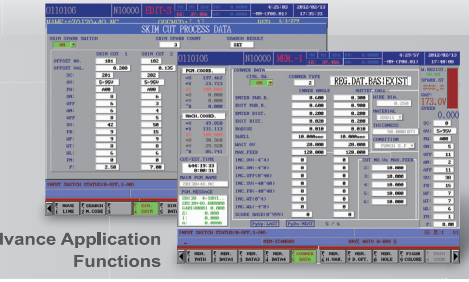
NC Register





Power Record pointand CoordinateSystems

Advance Application Functions

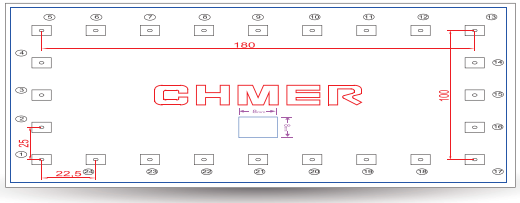


High Accurate Cutting

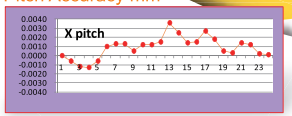
±4μm

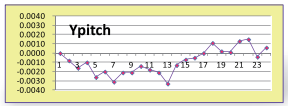
Workpiece material: SKD11 Workpiece thickness =20.00mm
Number of cuts: 4 times
Environment Condition = Temperature controlled room at 23°C~24°C

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

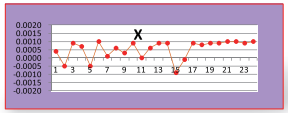


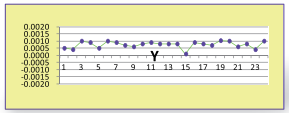
Pitch Accuracy mm





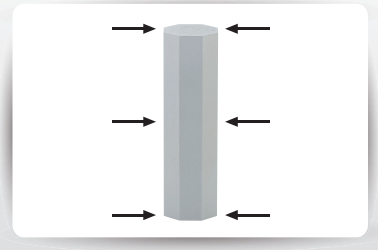
Cutting shape mm

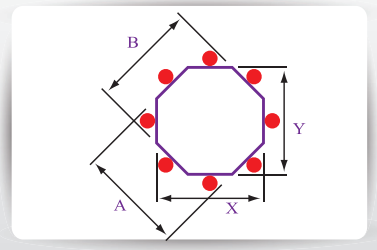




	Pitch Accuracy mm				Cutting shape mm				
	Coordinate		Measured Error			Job Size		Measured Error	
NO	X	Y	X	Y	NO	X	Y	X	Y
1	0	0	0.0000	0.0000	1	8	8	0.0004	0.0005
2	0	25	-0.0006	-0.0008	2	8	8	-0.0005	0.0004
3	0	50	-0.0012	-0.0016	3	8	8	0.0009	0.0010
4	0	75	-0.0013	-0.0010	4	8	8	0.0007	0.0009
5	0	100	-0.0006	-0.0026	5	8	8	-0.0005	0.0005
6	22.5	100	0.0010	-0.0020	6	8	8	0.0010	0.0010
7	45	100	0.0013	-0.0031	7	8	8	0.0001	0.0009
8	67.5	100	0.0013	-0.0021	8	8	8	0.0006	0.0007
9	90	100	0.0005	-0.0021	9	8	8	0.0003	0.0006
10	112.5	100	0.0012	-0.0014	10	8	8	0.0009	0.0008
11	135	100	0.0012	-0.0018	11	8	8	0.0000	0.0009
12	157.5	100	0.0015	-0.0021	12	8	8	0.0006	0.0008
13	180	100	0.0036	-0.0033	13	8	8	0.0009	0.0008
14	180	75	0.0025	-0.0013	14	8	8	0.0009	0.0008
15	180	50	0.0014	-0.0007	15	8	8	-0.0009	0.0001
16	180	25	0.0015	-0.0005	16	8	8	-0.0001	0.0009
17	180	0	0.0027	0	17	8	8	0.0009	0.0008
18	157.5	0	0.0018	0.0011	18	8	8	0.0008	0.0007
19	135	0	0.0005	0.0002	19	8	8	0.0009	0.0010
20	112.5	0	0.0003	0.0001	20	8	8	0.0009	0.0010
21	90	0	0.0014	0.0013	21	8	8	0.0010	0.0006
22	67.5	0	0.0012	0.0015	22	8	8	0.0010	0.0008
23	45	0	0.0002	-0.0004	23	8	8	0.0009	0.0004
24	22.5	0	0.0001	0.0006	24	8	8	0.0010	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

Straightness Accuracy





Straightness

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

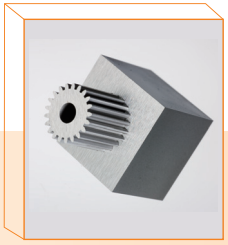
Measurement figure

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

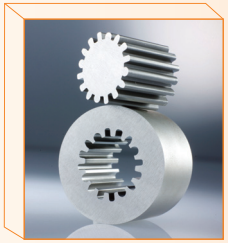
Job Material: SKD-11
Job Thickness: 30 mm
Wire diameter: Ø0.20 mm
Number Of Cut: 1+ 2 Skims
Work Hour: 1 Hour 10 Mins
Shape Accuracy: 3μm
Surface Roughness:
Ra 0.55~0.58μm



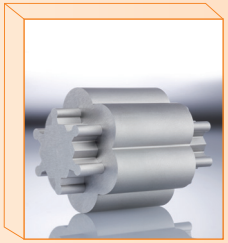
Job Material: SKD-11
Job Thickness: 17 mm
Wire diameter: Ø0.15 mm
Number Of Cut: 1+ 2 Skims
Work Hour: 1 Hour 50 Mins
Shape Accuracy: ±3μm
Surface Roughness:
Ra 0.55~0.58μm

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

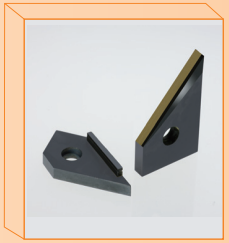
Taper Cut
Job Material: SKD-11
Job Thickness: 11.45 mm
Wire diameter: Ø0.20 mm
Number Of Cut: 1 Cut
Work Hour: 1 Hour 30 Mins
Taper Angle: 21°



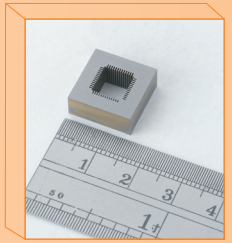
Job Material: SKD-11
Job Thickness: 25 mm
Wire diameter: Ø0.20 mm
Number Of Cut: 1+ 2 Skims
Work Hour: 1 Hour 50 Mins
Shape Accuracy: ±3μm
Surface Roughness:
Ra 0.55~0.58μm



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
Shape 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
Shape Accuracy: 3μm
Surface Roughness:
Ra 0.40μm (AC-μ circuit, opt)

Specification

MODEL		GX360L+	GX430L+	GX530L+	GX640L+
Axis Travel (XxYxZ)	mm	360 x 250 x 220	400 x 300 x 220	500 x 300 x 220	600 x 400 x 300
Axis Travel (UxV)	mm	60 x 60	60 x 60	60 x 60	100 x 100
Max. Size of Workpiece	mm	W725 x D560 x H215	W725 x D600 x H215	W825 x D600 x H215	W910 x D700 x H295
Max. Weight of Workpiece	kg	300	350	500	600
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
Working Fluid Supply Unit					
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
Power Supply Unit					
Circuit System		Power MOSFET Transistor			
Max. Output Current		25A			
IP Slelect		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			

Standard/Optional Accessories

Standard ● Option ○ Not Available —

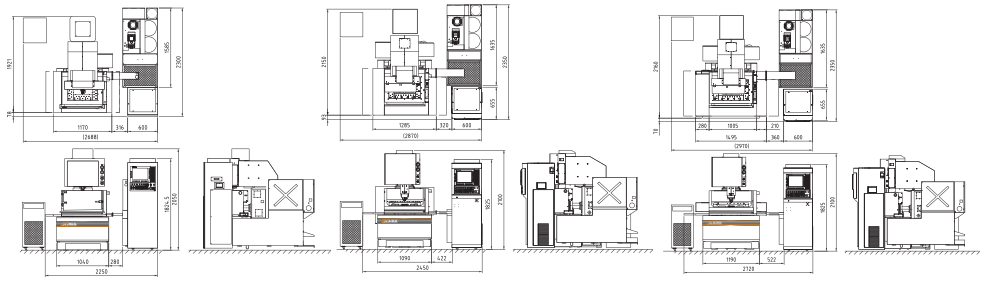
ITEM	SPECIFICATION	AMOUNT	GX360L+	GX430L+	GX530L+	GX640L+
Paper Filter		2 pcs	●	●	●	●
Upper/Lower Diamond Guides	0.26mm	2 pcs	●	●	●	●
Upper/Lower Flushing Nozzles		2 pcs	●	●	●	●
Energizing Carbides		2 pcs	●	●	●	●
Diamond Guide Remove Jig		1pcs	●	●	●	●
Brass Wire	Ø 0.25mm x 5kg	1 roll	●	●	●	●
Tools		1set	●	●	●	●
Ion Exchange Resins	6L	1set	●	●	●	●
Alignment Jig		1set	●	●	●	●
AC Inverter Water Chiller	20000BTU	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)		1 set	●	●	●	●
HP-AVR		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 (6th axis function)	CHMER	1 set	○	○	○	○

3 years warranty on Linear Motors (Rotor+Stator)

5 years positioning guarantee

Floor Layout

GX360L+ GX430L+ GX530L+ GX640L+



Work Table Dimension