CHMER

LINEAR DRIVE GX+ series

WIRE CUT EDM GX+ SERIES

Environment Conditions:

1. Optimum Room Temperature: 23 ± 0.5°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 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

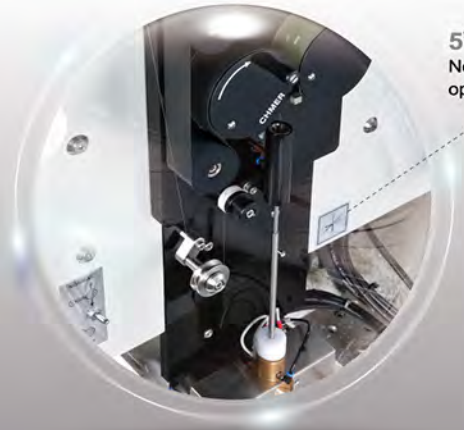
GX+ Series provide the newest technologies with CHMER produced Linear Motors, Power & Servo stabilizer, Energy Saving, 5th Generation AWT and W5F Controller, Inverter Type Water Chiller.

HP-AVR

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

ESL PCB

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



5th Generation AWT

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

Newest W5F Control

CHMER writes their own software allowing for customer upgrade at a later date.

UPGRADE

Inverter Type Water Chiller

Equipped with the newest inverter water chiller the temperature variation inside the chamber within ±0.3°C for precise machining and greatly reduces heat emission meanwhile save energy consumption of air-conditioner by 45%.

Linear Motor

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

Benefit of Linear Motor

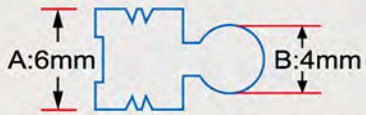
In-House Linear Motor

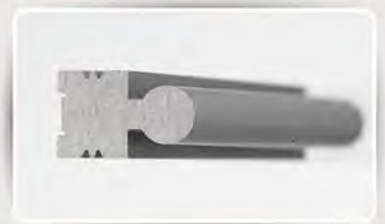
Linear Motor results a wear-free and no conversion motion to have a perfect positioning. GX+series equips X/Y In-House Linear Motor to obtain many advances features that the regular Wire Cut could not have, such as smoothly direct movement, high responsiveness, perfectly accurate positioning as well 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 :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)

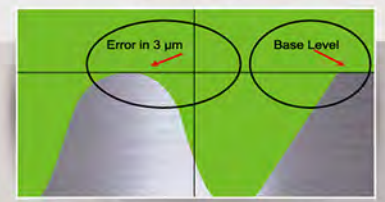
Brass Wire=0.20mm/BS Work-piece=SKD11
Cutting Pass=1+4 Skims T=25 MM
Ra=0.20μm

Linear Motor	Ball-Screw
1+4Skims=0.23~0.25μm/Ra	1+4Skims=0.28μm/Ra

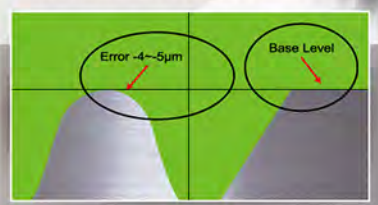
Improvement on "Corner" by Linear Motor

Work Conditions:

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



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



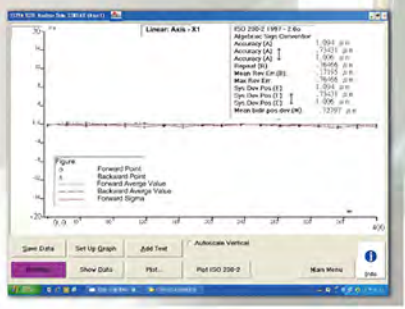
Ball-Screw (Radius Error: 4~5μm)
Optical Projector Scaling: 120X

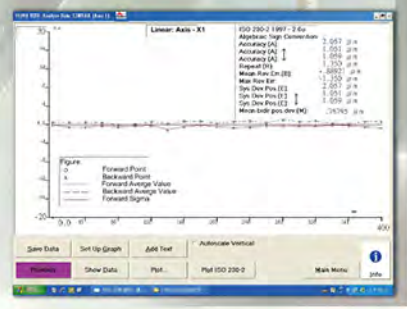
Ball-Screw V.S. Linear Motor

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.

Linear Motor "GX+" (Circularity 6~8μm)

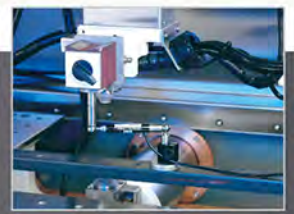
Ball-Screw Typical (Circularity 8~10μm)





▪ Linear Motor

▪ Linear Scale

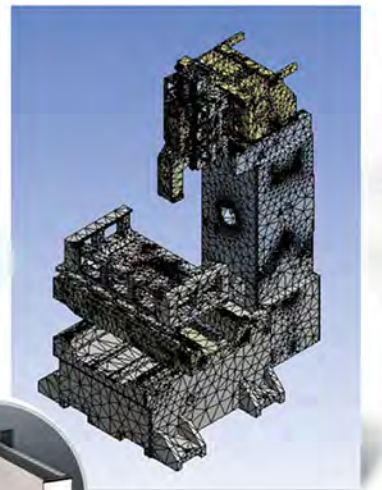


▪ Ball-Bar Test

▪ 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 submergable rotary B-Axis for turns and burns.

▪ 30 kg Jumbo Wire Feeder

▪ Wire chopper

『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.

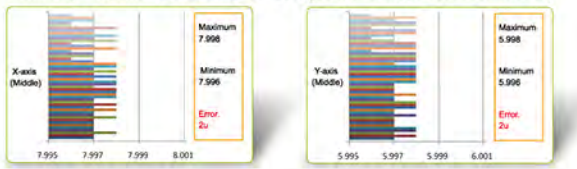
AC-μ Super Fine Finish (N/A on model GX530L/GX640L)

Cut Pass		5th Cut	4th Cut	3rd Cut	2nd Cut	1st 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

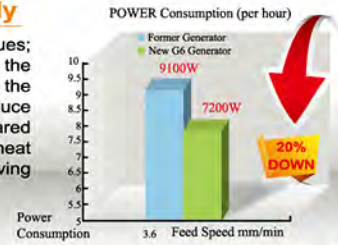
Automatic/Smart voltage-stabilizing power supply.
By using the cutting-edge technology, the new power control system can effective transform the unstable energy into pure stabilized electricity. Through it, the smart logic of the power control can effectively to transform and supply the discharge power 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

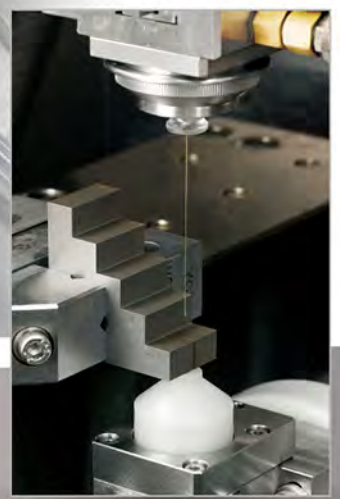
Embedded DOS OS system，reduce burden on processor，more stability of control system and better speed. The superior ASIC Chip, increases the response speed and feedback of cutting servo / current / voltage by real-time. DOS greatly improves CPU reliability while virtually eliminating CPU virus.
DOS also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

CHMER Invented 5th generation AWT

Unattended over night and over weekend Auto Threading

Reliable automatic wire threading system control

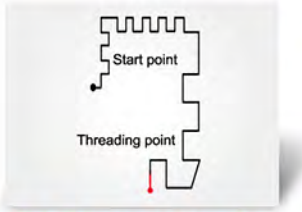
- Capable of threading wire under water and on location. No need to return back to start point, drain the work-tank and then dry-run to wire break point.
- Simply design to make maintenance easy and cost less.
- Can thread wire at stepped work-piece, when the upper head cannot reach the work-piece.



5th Generation AWT

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

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:

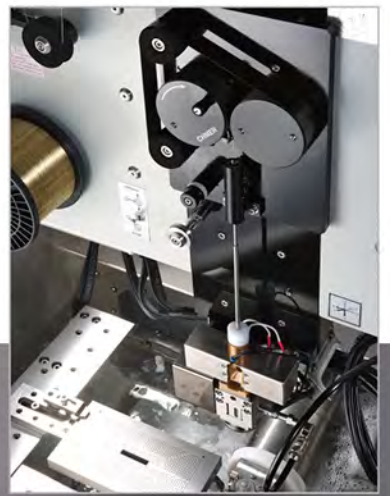
Record every step of AWT process, monitors and adjusts to enhance the stability.

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.



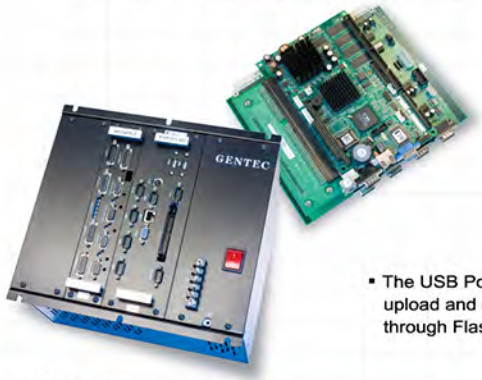
▪ AWT Device

▪ 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

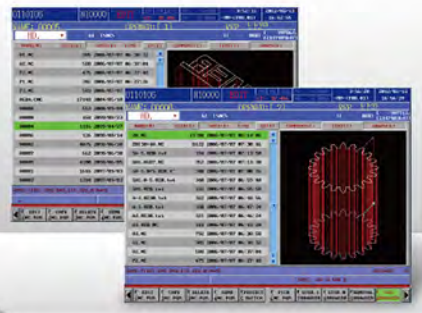
▪ WEB page to monitor Functions (PC)

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

▪ Remote 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

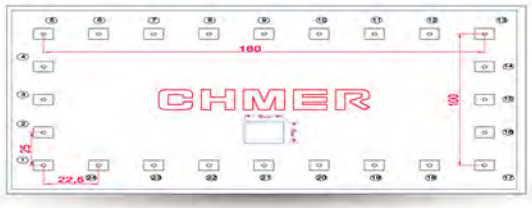
Power Record pointand CoordinateSystems

High Accurate Cutting

±4μm

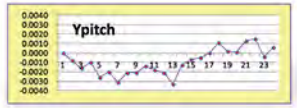
Workpiece material: SKD11 Workpiece thickness =20.00mm
Number of cuts: 4 times
Environment Condition = Temperature controlled room at 23°C~24°C

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

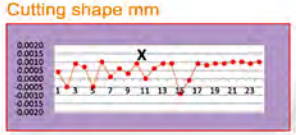


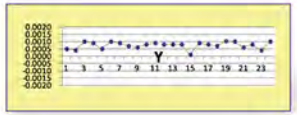
Pitch Accuracy: mm					Cutting shape: mm				
	Coordinate		Measured Error			Job Size		Measured Error	
NO	X	Y	X	Y	NO	X	Y	X	Y
1	0	0	0.0000	0.0000	1	8	8	0.0004	0.0005
2	0	25	-0.0006	-0.0008	2	8	8	-0.0005	0.0004
3	0	50	-0.0012	-0.0016	3	8	8	0.0009	0.0010
4	0	75	-0.0013	-0.0010	4	8	8	0.0007	0.0009
5	0	100	-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

Pitch Accuracy mm

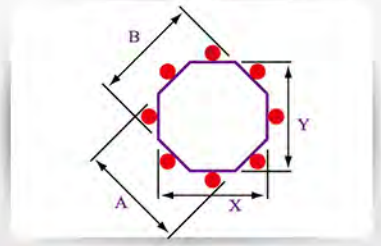


Cutting shape mm





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

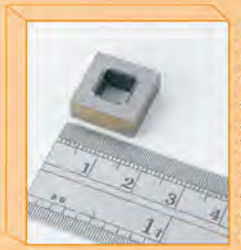
Job Material: SKD-11
Job Thickness: 25 mm
Wire diameter: Ø0.20 mm
Number Of Cut: 1+ 2 Skims
Work Hour: 1 Hour 50 Mins
Accuracy: ±3μm
Surface Roughness:
Ra 0.55~0.58μm

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

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°

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 ciucuit, opt)

Specification

MODEL	GX360L+	GX430L+	GX530L+	GX640L+
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
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 —

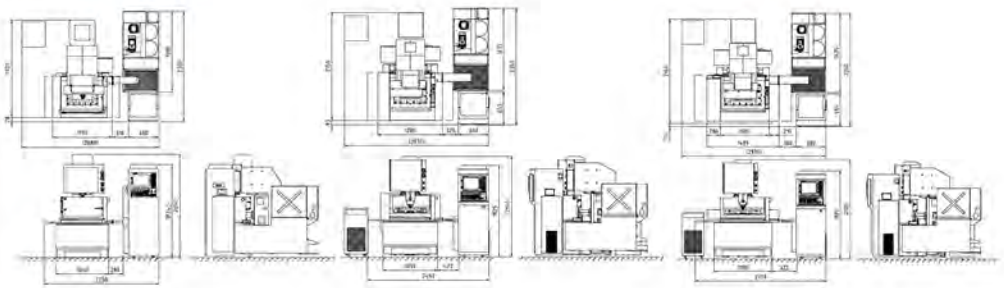
ITEM	SPECIFICATION	AMOUNT	GX360L+	GX430L+	GX530L+	GX640L+
Paper Filter		2 pcs	●	●	●	●
Upper/Lower Diamond Guides	0.26mm	2 pcs	●	●	●	●
Upper/Lower Flushing Nozzles		2 pcs	●	●	●	●
Energizing Carbides		2 pcs	●	●	●	●
Diamond Guide Remove Jig		1pcs	●	●	●	●
Brass Wire	Ø 0.25mm x 5kg	1 roll	●	●	●	●
Tools		1set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