

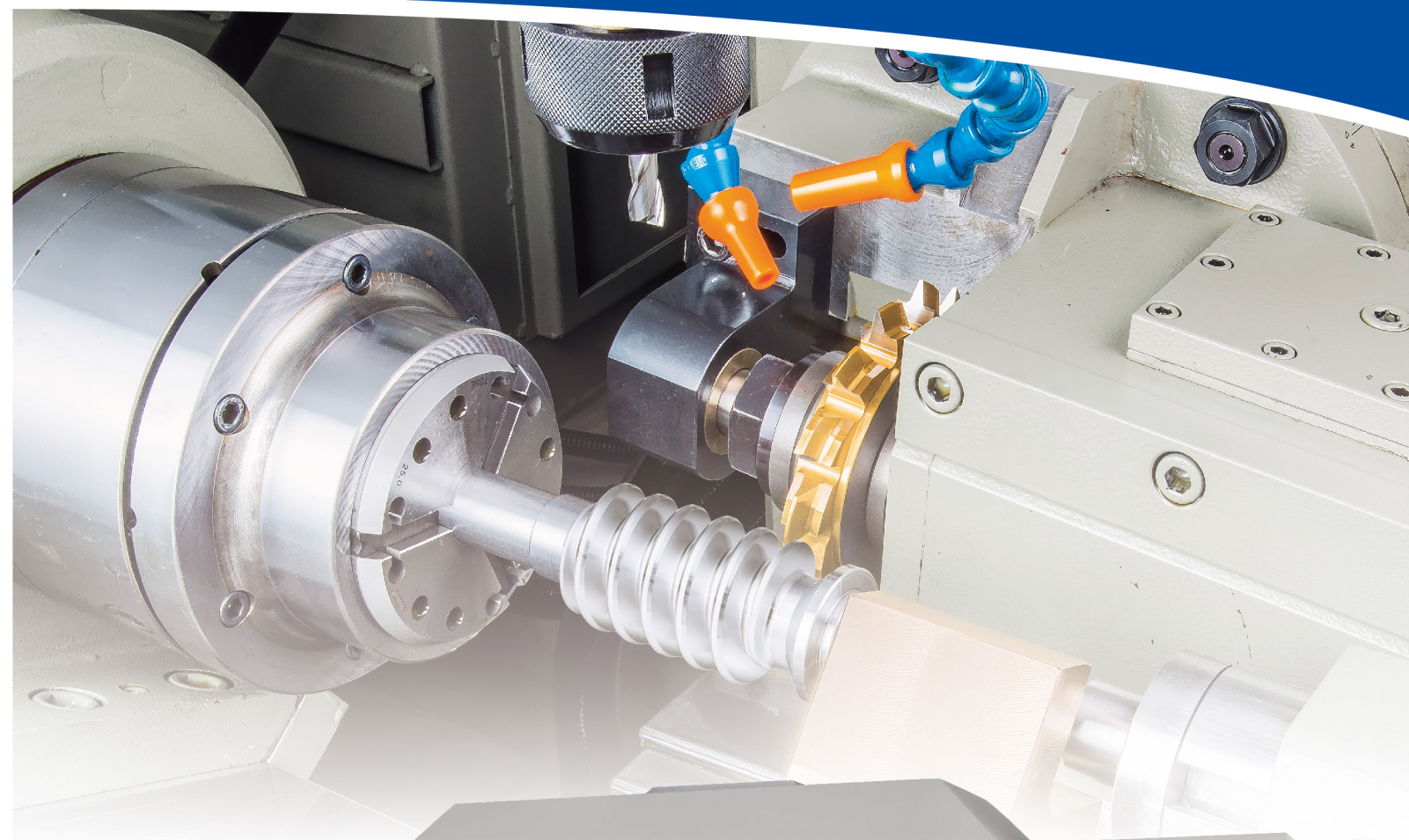
## MACHINE SPECIFICATIONS

MODEL	DS-1000HZ	DS-1000HJ
<b>CAPACITY</b>		
Range of module	M0.25 - M10 (Available with multiple feeds.)	
Degrees of indexing	360°	
Max. cutting length	900 mm	
Max. cutting diameter	250 mm	
Max. tool dia. (hole x keyway)	130 * 31.75 * 7.93 mm 130 * 25.4 * 6.35 mm 130 * 32 * 8 mm	
Helical angle	R.H. 40° · L.H. 90°	
Workpiece clamping method	6" Hydraulic Chuck	
Tailstock method	Hydraulic	
Number of simultaneously moving shaft	7-Axis simultaneous processing	5-Axis simultaneous processing
<b>SPEED</b>		
Max. speed of X-axis (for. / back.)	5000 mm/min	5000 mm/min
Max. speed of Y-axis (right / left)	5000 mm/min	5000 mm/min
Max. speed of A-axis (chuck)	4800 mm/min	4800 mm/min
Max. speed of Z-axis (up / down)	5000 mm/min	-
Max. angular speed of S-axis cutter	2000 rpm	-
Max. angular speed of C-axis cutter	400 rpm	400 rpm
Max. speed of cutting stroke	5000 mm/min	5000 mm/min
<b>ACCURACY</b>		
Perpendicularity of machining	±5 μm / 100 mm	
Workpiece precision	3~4	
Workpiece surface quality (μm)	Ra 0.8	
<b>MOTOR</b>		
C axis cutter motor	7.5 KW / 48 NM	7.5 KW / 48 NM
X axis motor	1.8 KW / 11.5 NM	1.8 KW / 11.5 NM
Y axis motor	2.9 KW / 18.6 NM	2.9 KW / 18.6 NM
Z axis motor	1.8 KW / 11.5 NM	-
A axis motor	1.8 KW / 11.5 NM	1.8 KW / 11.5 NM
S axis cutter motor	1.8 KW / 11.5 NM	-
B axis motor (Cutter tilting axis)	0.4 KW / 1.27 NM	0.4 KW / 1.27 NM
Cutting fluid motor	0.4 KW (1 / 2 HP)	0.4 KW (1 / 2 HP)
Hydraulic motor	0.75 KW (1 HP)	0.75 KW (1 HP)
Oil controller	0.15 KW	0.15 KW
Chip conveyor x 2 unit	40W*1 / 0.2 KW*1	40W*1 / 0.2 KW*1
<b>MISCELLANEOUS</b>		
Total power (kw)	20 KW / 30KVA	16 KW / 20KVA
Net Weight	4600 KGS	4000 KGS
Gross Weight	5200 KGS	4450 KGS
Machine dimensions	340 * 271 * 209 CM	340 * 271 * 165 CM
Packing dimensions	380 * 290 * 254 CM	380 * 290 * 210 CM

• Due to continuous improvement and development, specifications are subject to change without prior notice.



## MULTI-FUNCTION CNC WORM GEAR SHAFT PROCESSING MACHINE



## REGAL MACHINERY CO., LTD.

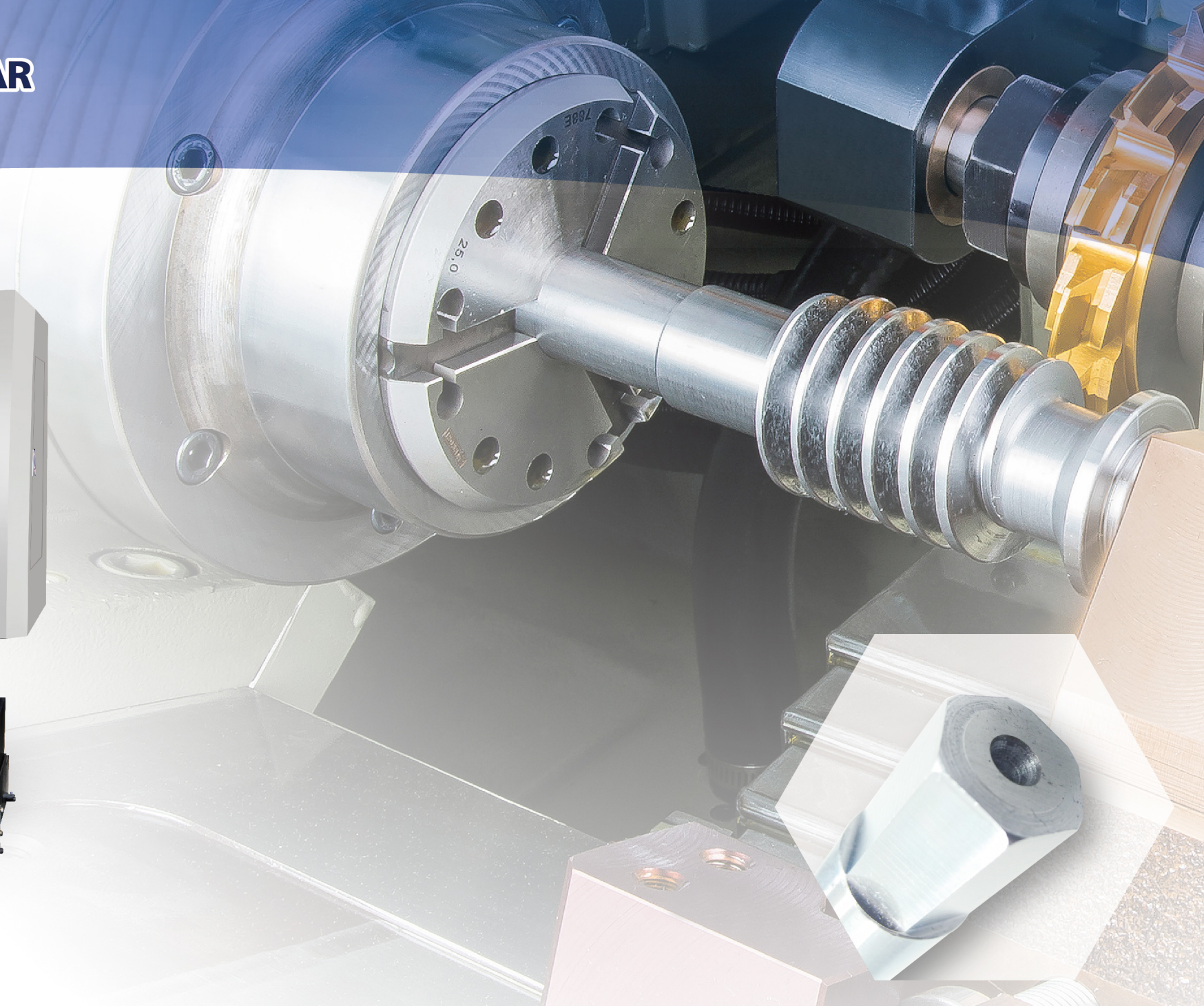
No.16, Ln 56, Fu Zhuang St., Bel Zhuang Village,  
Sheng Kang Dist., Taichung City 42954 Taiwan  
Tel: +886-4-25616639 Fax: +886-4-25616658  
<http://www.rgl.com.tw>

[www.rgl.com.tw](http://www.rgl.com.tw)

[www.hobbing-machine.com](http://www.hobbing-machine.com)



## MULTI-FUNCTION CNC WORM GEAR SHAFT PROCESSING MACHINE



## WORM MILLING MACHINES THE EVOLUTION OF EFFICIENCY AND PERFORMANCE

The newly developed DS-1000HZ combines worm & screw machining, chamfering, and keyway machining functions in one machine.

The DS-1000HJ, on the other hand, is only designed for thread forming and spline shaft milling for customers who would like to save on machine investment cost.

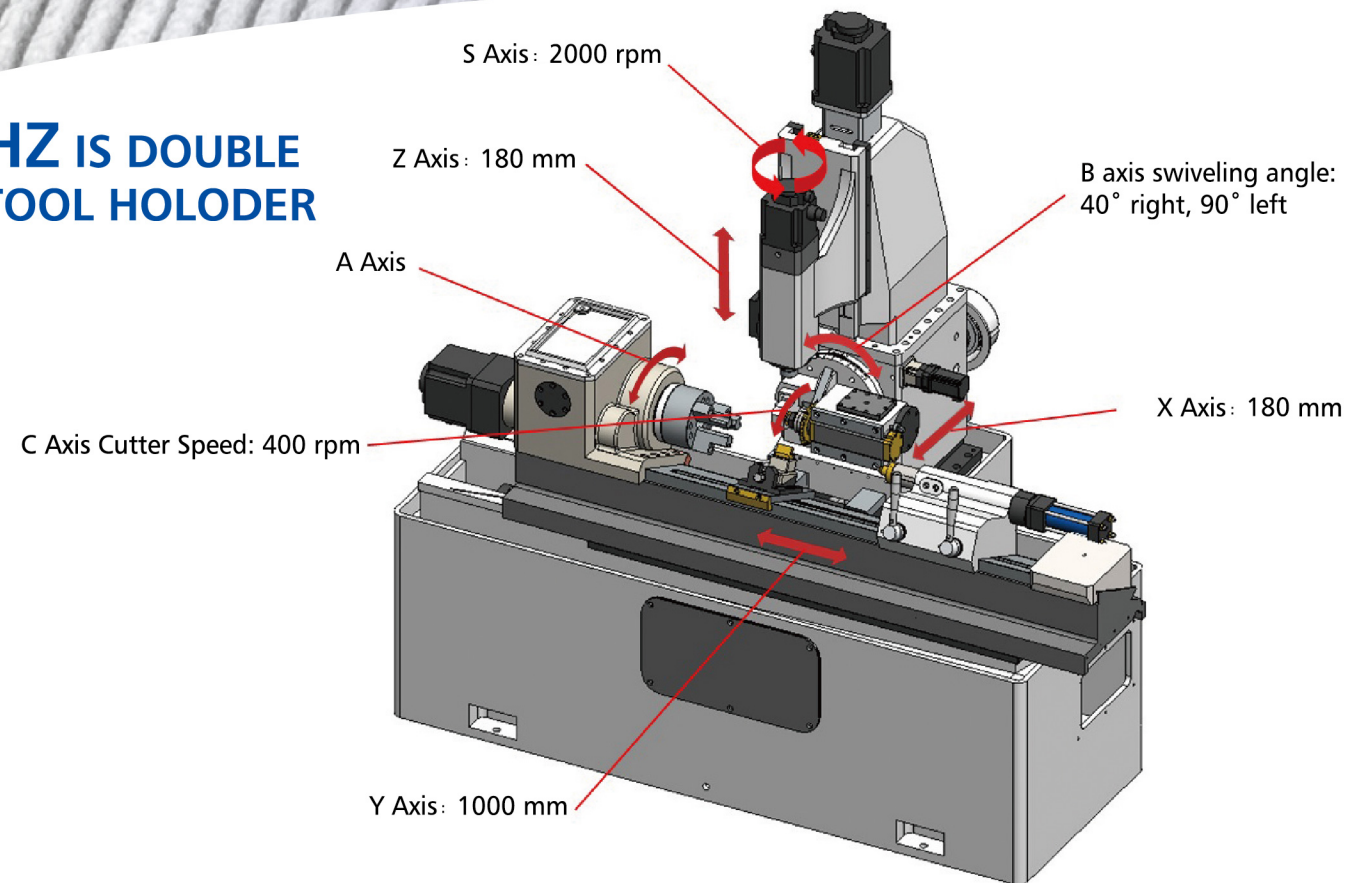
### PATENTED MACHINE FEATURES:

1. Worm machining, screw milling, chamfering, and keyway milling can be processed continuously on the single machine without workpiece repetitively loading/unloading.
2. Dual lead screw is machined at the same procedure to ensure high accuracy and shorten the machining time.
3. Slanted saddle structure provides better cutting stability and reducing vibration which effectively secure cutting accuracy and reducing tool wear.
4. Hydraulic chuck and tailstock make part loading / unloading operations more convenient and faster.
5. Equipped with Syntec computer controller for upgraded performance and user-friendly operations.
6. Oil splash prevention cover.
7. A multi-function machine suitable for grinding wheel slotting and machining of worms, lead screws and spline shafts.
8. All above patented features bring outstanding speed, accuracy, and thereby total efficiency.

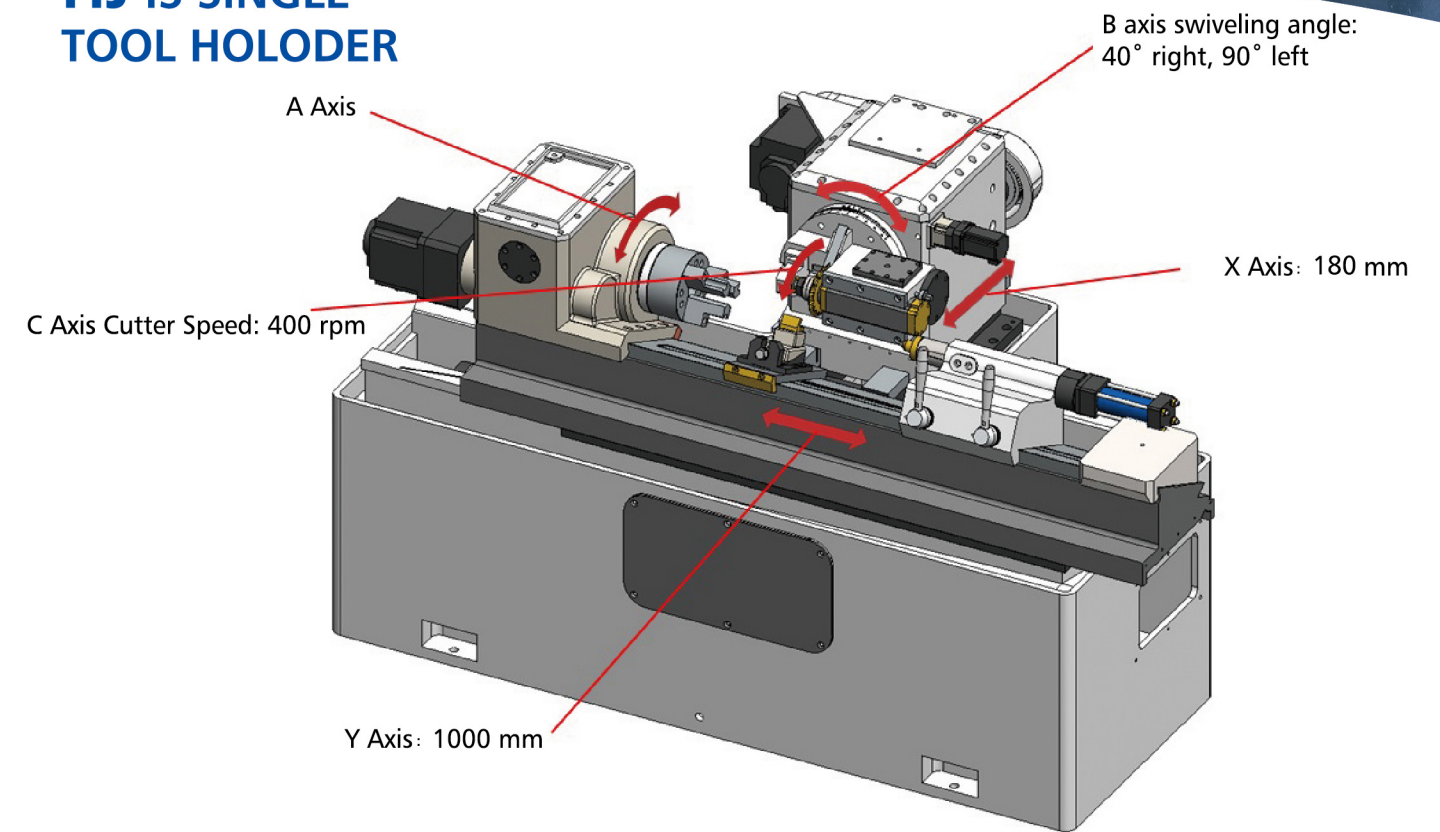


# MULTI-FUNCTION CNC WORM GEAR SHAFT PROCESSING MACHINE

## HZ IS DOUBLE TOOL HOLODER



## HJ IS SINGLE TOOL HOLODER

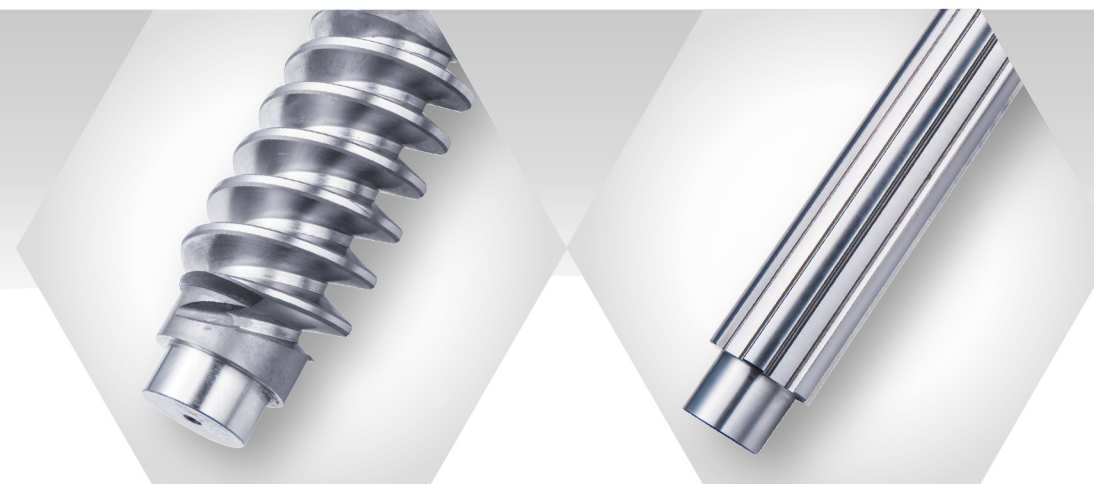


## DS-1000 HZ

- THREAD MILLING
- SHARP EDGE REMOVING
- KEYWAY MACHINING

### MACHINE STRUCTURES

1. Stroke of X, Y, Z axis 180 x 1000 x 180 mm.
2. The first tool holder is designed for thread forming, spling cutting and grinding wheel slotting.
3. The second tool holder (Z axis) is designed for thread sharp edge removing, keyway machining, and polygon milling.
4. The first tool holder can be tilted for machining helical angles. (40° right hand angle and 90° left had angle).
5. Angular speed of the thread milling cutter (X axis) is 400 rpm.
6. Angular speed of the sharp edge removing cutter (S axis) is 2,000 rpm.



## DS-1000 HJ

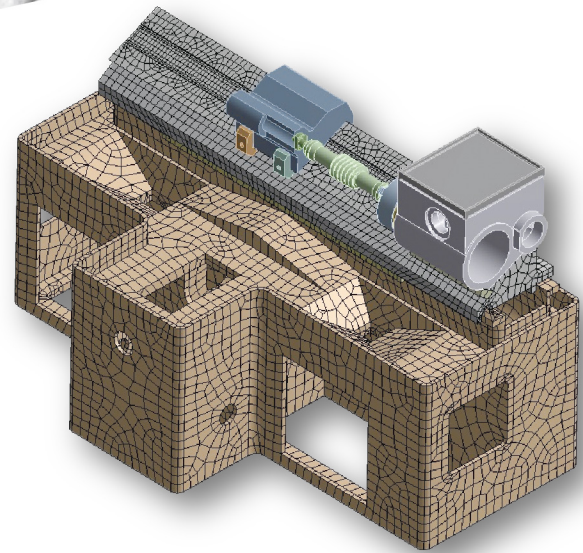
- THREAD MILLING  
(Single lead, dual lead, hypoid gear and Niemann type machining)
- SPLINE SHAFT MACHINING
- GRINDING WHEEL SLOTTING

### MACHINE STRUCTURES

1. X, Y-axis travel: 180 x 1000 mm.
2. The first tool holder is designed for thread forming, spling cutting and grinding wheel slotting.
3. The first tool holder can be tilted for machining helical angles. (40° right hand angle and 90° left had angle).
4. Angular speed of the thread milling cutter (X axis) is 400 rpm.

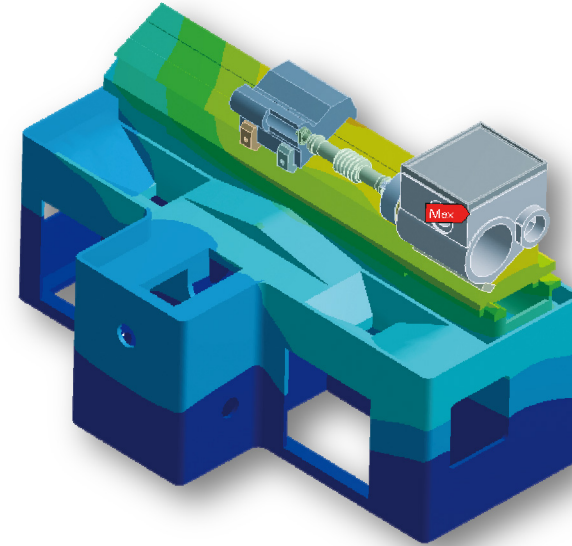


# MULTI-FUNCTION CNC WORM GEAR SHAFT PROCESSING MACHINE



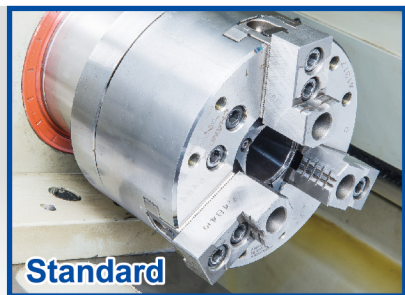
## OPTIMIZED MACHINE STRUCTURE HIGH RIGIDITY! DEFORMATION FREE

The structural parts of DS-1000, such as base and saddle, are analyzed by using advanced finite element Analysis software. Under the maximum cutting load, there is almost no structural deformation on the base, and the structural deformation on the saddle is less than 10µm. The results of analysis show that DS-1000HZ and DS-10000HJ has excellent rigidity.



## MACHINING APPLICATIONS:

1. Thread Milling (Single Lead, Dual Lead, Taper, Hypoid Gear and Niemann Type Machining)
2. Spline Shaft Machining
3. Grinding Wheel Slotting
4. Removing Sharp Edge on the Threads. (DS-1000HZ only)
5. Applicable for Machining Keyways. (DS-1000HZ only)
6. Milling Polygon Workpiece. (DS-1000HZ only)



Standard

### HYDRAULIC 3 JAW CHUCK(Optional)

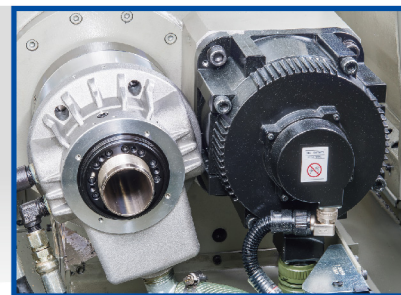
1. Workpiece Rigid headstock is clamped by a Ø6" hydraulic 3 jaw chuck that allows for automatic clamping and unclamping operations.
2. The hydraulic chuck motions can be controlled by means of a foot switch and a push button on the control panel.



Optional

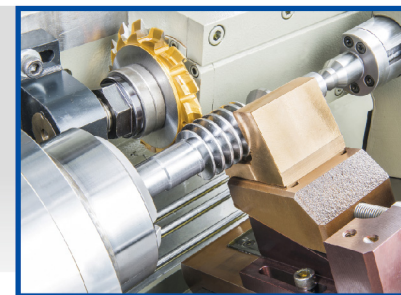
### RIGID HEADSTOCK

1. The spindle is firmly supported by two oversized taper roller bearings in combination with metallic busing. It offers outstanding and stable machining on even heavy worm cutting.
2. All parts in the headstock are lubricated by an oil bath lubrication system to achieve smooth and low noise operation.



### HYDRAULIC ROTARY CYLINDER

1. The hydraulic chuck is controlled by a hydraulic rotary cylinder that offers light weight and maximum stability during high speed running.

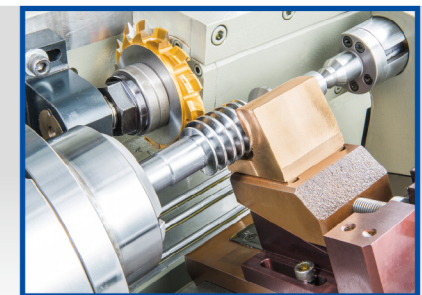


### SLANT SADDLE STRUCTURE

1. The slant saddle is designed with T-shape hard rail which shows an exceptional structural rigidity, and increases work pieces stability.

### TWO-POINTS SUPPORT OF CENTER REST

1. The center rest is manufactured from high quality phosphor bronze with excellent wear resistance.
2. The center rest and workpiece move simultaneously to effectively reduce the wear of center rest.
3. The "L" shaped center rest provides two-point support for reducing vibration to a minimum during cutting, while upgrading machining accuracy and surface finish as well as reducing tool wear.



### FIRST TOOL HOLDER

1. Designed for machining worm, dual-lead worm, variable-lead worm, hypoid gear and Neiman type machining.
2. Also, applicable for machining spline shaft with 6, 8, or 10 grooves. Featuring automatic indexing to eliminate time-consuming manual indexing.
3. Machining of various types of worms is accomplished with only one setup of workpiece. This design may ensure worm accuracy, shorten production times and dramatically raise efficiency.
4. When using a diamond milling cutter on the first tool holder, this machine is capable to perform slotting on grinding wheel.



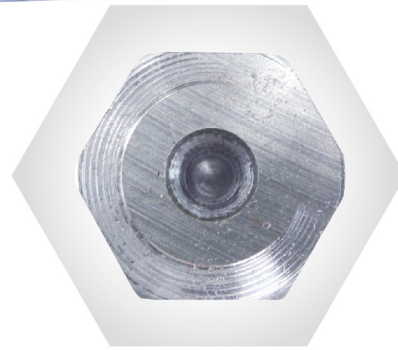
# MULTI-FUNCTION CNC WORM GEAR SHAFT PROCESSING MACHINE

*Surpasses the Speed and Accuracy of Whirl Wind Type Milling Machine*

## MACHING SPEED COMPARISON:

Base on: Module: M3  
Material: S45C  
Thread Length: 50 mm

TAIWAN	130 seconds. (RGL DS-1000 HZ & HJ)
GERMAN	646 seconds.
JAPAN	750 seconds.



• HEXAGONAL PART MACHINING



• SPLINE SHAFT WORK PIECE



• WORK PIECE (TO MATCH WITH BEVEL GEAR)



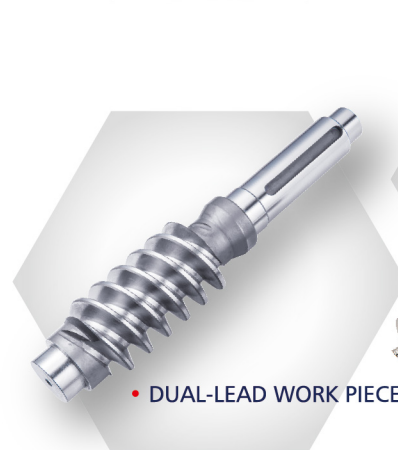
• WORM SHAFT WORK PIECE



• BALL SCREW

## Worm Teeth Cutting Test:

WORM MATERIAL: S45C  
MODULE: M3  
LENGTH: 50 mm  
ACCURACY: 5 μm / 100 mm  
TIME: SHORTENED BY: 70%



• DUAL-LEAD WORK PIECE



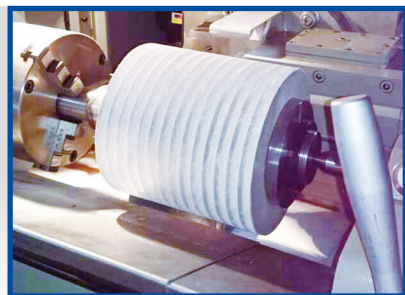
• INTEGRAL FORMING FEED ROD



• CAVEX / NIEMANN



• GRINDING WHEEL MACHINING



## GRINDING WHEEL SLOTTING

1. After mounting a diamond milling cutter on the first tool holder, the machine is capable to perform slotting on grinding wheel.



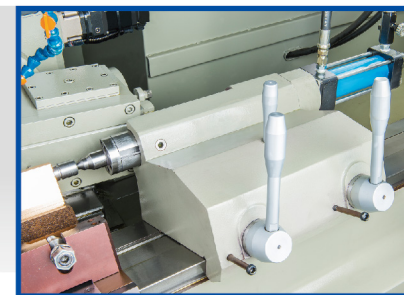
## Second Tool Holder (For DS-1000MZ only)

1. For removing sharp corners on the threads.
2. Applicable for machining keyways.
3. Polygon milling operations.
4. The sharp corners on the threads generated by the first tool holder are quickly removed by the second tool holder, leading to higher machining quality, shortened cycle time and dramatic savings on labor costs.



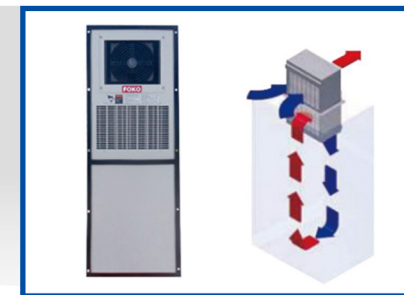
## SYNTEC COMPUTER CONTROL

1. 10.4" colorful LCD screen.
2. Clear interface makes the controller easy to learn and operate.
3. Conversational function allows for easy program editing even when being unfamiliar with G code.
4. Control unit: 0.0001mm
5. Equipped with a MPG handwheel for convenient setup.



## HYDRAULIC TAILSTOCK

1. The tailstock assembly is securely clamped to the saddle with quick and convenient position adjustment.
2. The tailstock quill movement is actuated by hydraulic power, making workpiece clamping and unclamping operations more convenient.
3. The tailstock quill movement can be controlled by means of a push button on the control panel.



## HEAT EXCHANGER FOR ELECTRICAL CABINET

1. With a heat exchanger mounted on the electrical cabinet, the electrical cabinet interior can be maintained at a constant temperature which assures the least troubles and longer life of electronic system and component. In addition, it also helps to increase the service life of the electronic components.



## MAGNETIC CHIP CONVEYOR

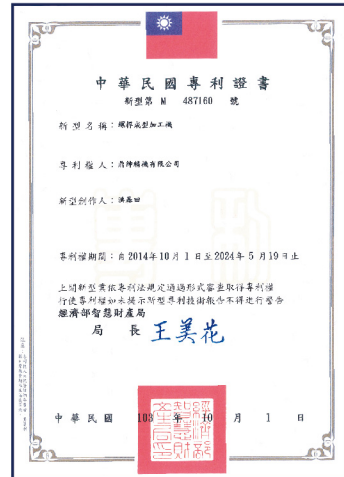
1. Equipped with a rotation mechanism to effectively protect motor.
2. Powerful suction force and great delivery capacity.
3. During running, cutting fluid drops naturally.



# MULTI-FUNCTION CNC WORM GEAR SHAFT PROCESSING MACHINE

## Innovative Design That Has Been Patented in Several Countries.

### Taiwan Patented



No. 487160

### China Patented



2011  
No.192171

### China Patented



2013  
No.3255623

### China Patented



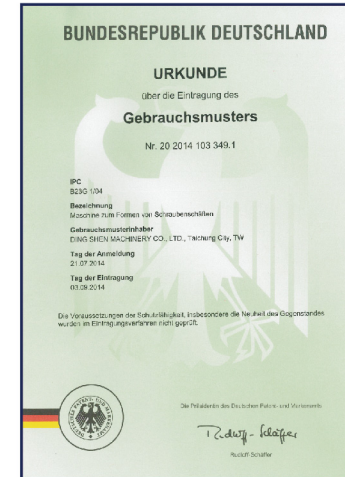
2014  
No.3843859

### Japan Patented



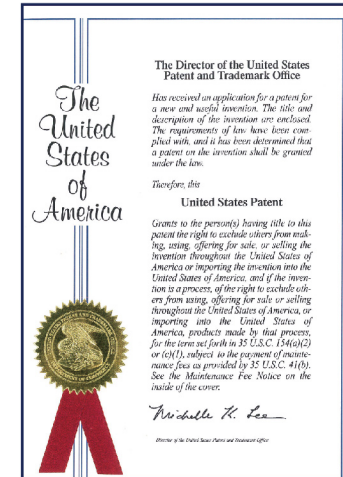
No. 3193764

### Germany Patented



No. 20 2014 103 349.1

### U.S.A Patented



No. US9108259B1

### Korea Patented



No. 20-0480155

## CHRONICLE OF REGAL MACHINERY CO., LTD. & ITS SUBSIDIARY DING SHEN MACHINERY CO.,LTD.

1992 Regal Machinery is established , mainly produces worm gear reducers.

1993 Introducing gear reducers for wood working machinery .

1994 Assigned as the official supplier of Canadian company Power First.

1995~2011

| Introducing worm gear reducers of aluminum alloy.

| Assigned as the official supplier of many U.S. large scale companies.

| Introducing worm shaft driving rotation system for wheel type reducer.

| Introducing special purpose gear reducer for mechanical car parking system.

| Purchases production equipment from Switzerland, Germany and Japan for the capability of processing dual-lead, increases accuracy of gear reducer. Introducing aluminum alloy motor gear reducer of low temperature and noise level. Market stretches out to Europe and USA.

| Introducing new models of CE-conformed gear reducers.

| Assigned as the major supplier by US chocolate and ice cream manufacturers.

| Developed NC worm shaft forming machine with own R&D capability.

| Received Gold Medal Award of Taiwan Excellent Product.

2011 ~ 2016

| Won and registered patent of innovation for features of DS-1000 in U. S. A, followed by Taiwan, Japan China, Germany and Korea.

2014

| Ding Shen Machinery Co., Ltd. Is established for producing NC worm shaft forming machines.