

**SUPER DRILL
ELECTRICAL
DISCHARGE
MACHINE**

EXD/SD ZNC
SERIES



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EXD/SD ZNC

SUPER DRILL ELECTRICAL DISCHARGE MACHINE

THE LEADING EDM COMPANY IN TAIWAN.

PERSISTENT - GREAT EFFORT - HIGH QUALITY



04 WE ARE OSCARMAX

EXact precision / EXcellent performance

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Persistent Quality and Performance
Consistent Technology and Worth
Service and Enthusiasm Oriented
Innovations and Breakthroughs



Extreme Efficiency · Outstanding Quality

Persistent Quality and Performance
Consistent Technology and Worth
Service and Enthusiasm Oriented
Innovations and Breakthroughs Resulting from
Endless Endeavors

OSCARMAX Profile

Electrical discharge machines play an important role in manufacturing processes. Over many years, OSCARMAX has been totally dedicated to design and manufacturing of electrical discharge machines since establishing in 1985. OSCARMAX has launched over 100 models to meet all market demands. By applying parametric 3D design software, we can shorten the time of design, research, and development. In the meantime, we can find the ideal design, and therefore increase quality of product and compatibility. Furthermore, we have cooperated with aerospace industry to carry out the automatic production with smart management system. In the result, we maintain the machine efficiency and increase process stability. We believe that with continuous breakthrough, we are on the way to future.

Zero-Training Concept

We believe that "less is more", how we manage to use the fewest resources to create a maximum value. OSCARMAX aimed to promote a ZERO-training concept. Once the machine has been installed, it can be used directly with minimal time spent by training, even with no previous experience with EDM machining. Focused on quicker learning, to maximize the productivity. Therefore, engineers can focus more on products design and other production lines.

EXD series Electrical Discharge Machine Launched

OSCARMAX hereby present EXD series Electrical Discharge Machine with self-designed user interface running on Windows platform for user-friendly and intuitive operation.

■ EXD Quick Integration

Integration of EtherCAT communication between all machine electronics allows to share the information, accelerate the integration process, display the utilization rate, alarm warnings etc. EXD series was designed with parametric AI system, which by receiving feedbacks from actual sparking conditions, online diagnosis, characteristics analyzing and quality monitoring collects the data to optimize the efficiency of machine.

■ EXD Automatic Production Line

With ethernet connectivity and remote control, electrical discharge machines can be easily integrated with existing automatic manufacturing production line. Once the EXD series is integrated in automatic production line, the processing system is able to analyze inputs and outputs through the application programming interface (API) and turn into one working unit. By API, operator is capable to make integration modularly and systematically.

■ Build the Smart Industry

With the concept of Zero-training, latest advanced technical solutions and professional service, OSCARMAX has expanded its market from automotive to aerospace industry. With the requirements of low volume, wide variety market, OSCARMAX continues to enhance the technology of EDM, as well as the integration of automation. By choosing EXD series EDM, OSCARMAX expect to offer support for customers. We are now in the fourth industrial revolution. Characterized by increasing automation and the employment of smart machines and smart factories. Let's build the smart industry world together!

Export : OSCARMAX sinker and drill EDM covers over 40 countries. With professional local representatives, we deliver full services including installation, training, and after-sale service.

- | | | | | |
|-------------|-------------------|-----------------|--------------|----------------|
| 1 Canada | 9 Norway | 17 Lebanon | 25 India | 33 Philippines |
| 2 U.S.A. | 10 Germany | 18 Algeria | 26 Sri Lanka | 34 Malaysia |
| 3 Mexico | 11 Poland | 19 Tunisia | 27 Korea | 35 Indonesia |
| 4 Colombia | 12 Czech Republic | 20 Egypt | 28 China | 36 Singapore |
| 5 Peru | 13 Slovenia | 21 South Africa | 29 Thailand | 37 New Zealand |
| 6 Brazil | 14 Italy | 22 Saudi Arabia | 30 Vietnam | 38 Australia |
| 7 Argentina | 15 Ukraine | 23 Romania | 31 Japan | |
| 8 UK | 16 Turkey | 24 Russia | 32 Taiwan | |



Two Series

Super Drill Electrical

P7-12

EXD Series

Automation Integration Services



- Multi-holes, precise blind hole, micro drill, various sizes of tubes.
- Allow to work multi-holes on one workpiece with different thickness (with 4th axis).
- Complex angles jobs (with rotary table).
- Auto-production line integration.
- With WEDG(Wire Electrical Discharge Grinding) tech, tubes are well grinded and ready for future use.
- DXF convert into G code automatically.
- Submersible tank(optional) produces better efficiency on through-hole job and its stability of work.

P13-16

SD ZNC Series



- Micro drill jobs.
- Quick learning, easy operation.
- Additional rotary table control (RTC) allows to spark in multi angles.
- Submersible tank(optional) produces better efficiency on through-hole job and its stability of work.

EXD Series

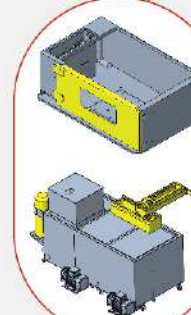


Pneumatic Chuck
Precision type $\phi 0.1-3.0$
Collet ER type $\phi 0.3-6.35$ (ER16) [Optional]
High Speed Rotation RPM600 [Optional]

EtherCAT



Quick Assembly on Generator Wiring
Connection via EtherCAT between all machines to share information including status, warning, error and etc



Submersible Tank [Optional]
Increase efficiency and stability on the jobs
**Fire sensor and distinguisher are required for oil fluid



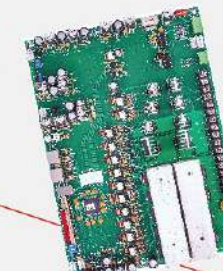
JAPAN MADE PUMP



High Pressure Electric Pump
High water output through tubes with low pressure output from pump



FET-M latest development carry out high efficiency result on job



21.5" touch screen on remote control box
Ease of operation



System Feature

- Portable controller with 21.5" touch screen with HDMI interface, easy for operation.
- Windows10 platform, capable for installing additional applications.
- Equipped with digital voltmeter, current meter, and temperature sensor etc., to monitor the machine status easily.
- Intelligent edit system compacted with electrical waveform, allow the sparking signal to be sent to controller to diagnose and control therefore produce the best output.
- Up to 6 axes control – XYZWZUV, with rotary table to satisfy complex job.
- ECO stand-by mode for power saving.
- Equipped with IOT, where use API(DLL file) to work remotely, and possible to display with other machines' working data.
- Allow online training, problems diagnosis and system update remotely.

Controller Feature

- EtherCAT integration between multi machines.
- Dual core CPU, easy process on job movement and parameters calculations.
- Advanced movement software with no motion card which result in high stability and possibility on extension.
- EtherCAT all digital integration interface with high bandwidth and high revolution.
- EtherCAT all digital servo motor with high compatibility.
- EtherCAT digital I/O card: High reliability, easy integration with low maintenance cost.
- Touch screen controller with keyboard where all the information can be entered easily.

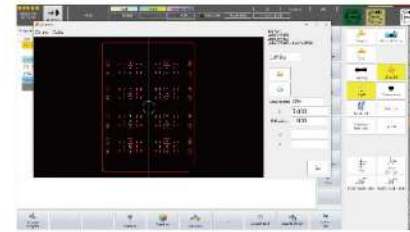
Operating Application



- Conversational interface – quick edit & images with description.
- Easy insert parameters, generate complex program for edit.
- Easy and clear icons designed.



- Built-in search function – GM code generated by simply enter command.



- DXF file preview, quick edit available.
- Choose the working hole and diameter to generate the program.



- FUZZY mode allows to simply choose materials and suggest the suitable program.
- Operators are allowed to edit the FUZZY parameters to optimize.



- Remote control with touch screen where easy to operate and visual check by the machine.

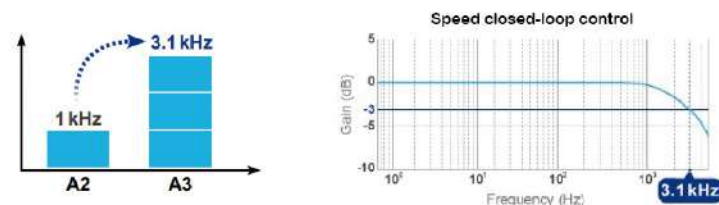


- OSCARMAX technicians able to do online training, problems diagnosis and system update remotely.

DELTA AC Server Introduction

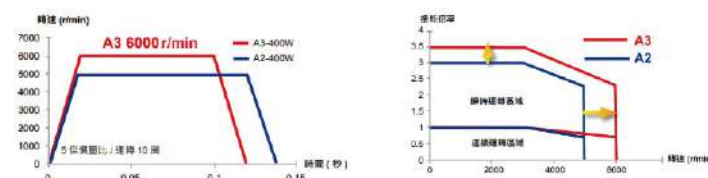
3.1 kHz Bandwidth

- Higher responsiveness and shorter settling time increases productivity



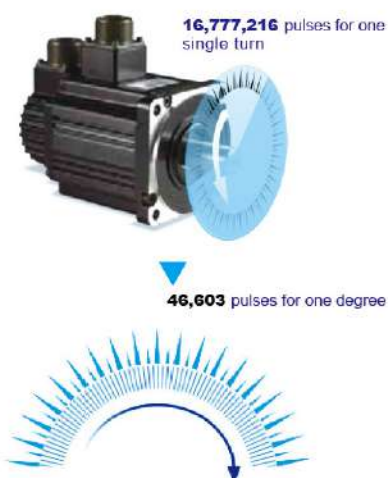
6000 r/min Rotation Speed / 350% high torque

- Motor 6000r/min, increases 1000 r/min rotation speed than A2. With same travel distance, less time spent therefore increase productivity.



24-bit Absolute Type Encoder

- 16,777,216 pulses/turns ensure precise positioning.
- Steady performance at low-speed enhances machining quality.
- Keeps motor's position during power shortage.



EXD Series machine

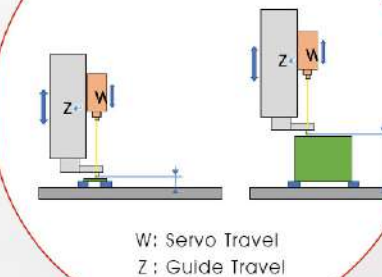
Moving Table type

EXD400

X : 400
Y : 300
Z : 200
Z2 : 150
W : 345



EXD – axes



Optional: Wheel disk ATC, Submerged Working Tank

EXD435

X : 400
Y : 300
Z : 500
W : 500



Optional: Wheel disk ATC

EXD645

X : 600
Y : 400
Z : 500
W : 500



Processing Example

Automatic Tools Changer (ATC)

Automatic electrode tubes changing system, with optional Automatic Guide Changer (AGC) allows to produce different holes' sizes without any manual adjustment. Every tube diameter requires specific guide diameter. Standard sizes are produced with 0.1mm increment.



/ATGC Equipment



/With AGC System

Auto Guides Changer, with guides offset compensation to ensure the accuracy.

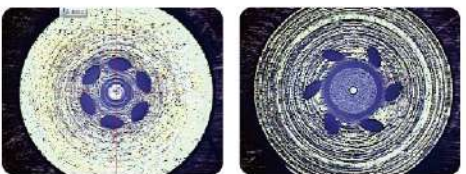


Material: SKD-11
Electrode tube: Ø0.3mm ~ Ø1.2mm ~ Ø2.5mm
Depth: 10mm
Time: 2 hours
DXF file uploaded, multi holes job with ATGC equipment system to complete.



AB Axes Equipment

By using single or double axes rotary device to work on complex angel workpieces or equal-angle multi holes.



Material: Stainless 420
Electrode tube: Ø0.3mm
Depth: 0.6mm*6
Time: 3 min
With AB axes 30°, equal angel with 6 sparks, 5 mins working time.



Material: Stainless 420
Electrode tube: Ø0.1mm
Depth: 0.2mm
Time: 20 seconds
Actual finished size hole: Upper – 0.113 Bottom – 0.123mm



Material: Stainless
Electrode tube: Ø1.0mm
Depth: 3.8mm
Time: 600 holes in 4 hours
With A/B axes and CAM imported

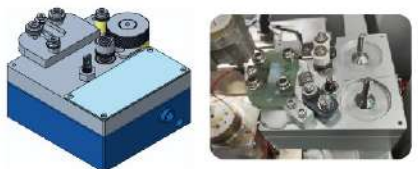


Material: Titanium alloy
Electrode tube: Ø3.00 ±0.05mm
Depth: 20mm
Time: 10 mins / hole
Design the jig and work with A/B axes for multi-degree jobs

WEDG Equipment (Wire Electrical Discharge Grinding)

/WEDG Wire-EDM Grinder

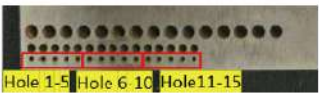
To refurbish the electrodes, ensure the stable wear out and increasing the accuracy of holes. Mostly working on blind holes or precise through holes.



NO.	上孔直径 (mm)	下孔直径 (mm)
11	0.7620.780	0.002
12	0.7620.732	0.014
13	0.7620.743	0.008
14	0.7620.747	0.019
15	0.7750.743	0.033

NO.	上孔直径 (mm)	下孔直径 (mm)
1	0.7730.730	0.043
2	0.7850.708	0.061
3	0.7630.714	0.055
4	0.7710.720	0.041
5	0.7650.725	0.040

Material: STAVAX
Electrode tube: Ø0.7mm
Depth: 10mm
Time: 50 seconds / hole
1 minute finished cutting tube



After standard sparking, the tube wears out, which affects the sizes of hole diameter. By using WEDG device can solve this problem and increase the accuracy of the through holes.

By running the test, the hole 1-5 was sparking in standard mode, which result in 0.061 to 0.040mm difference comparing from the top of the hole and bottom of the hole. However, with WEDG device (hole 11-15), the result of difference between top and bottom holes size is 0.033 to 0.002mm

Specification Table

Structure			Table-Moving type	Column- Moving type			
Model (by size)				EXD400	EXD435	EXD645	EXD1060
Specification	Table Travel	X	mm (inch)	400(16)	400(16)	400(16)	1000(80)
		Y		300(12)	300(12)	300(12)	600(24)
		W		345(14)	500(20)	500(20)	500(20)
	Guide Travel	Z	mm (inch)	200(8)	500(20)	500(20)	500(20)
		Manual Guide Travel Z2		150(6)	—	—	—
	Max. Workpiece Weight (W×D)		mm (inch)	915*385 (36*15)	800*665 (32*26)	870*750 (34*30)	1290*950 (51*37)
	Guide(30mm) to Work Table		mm (inch)	5-355 (0.2-14)	25-525 (1-20.6)	25-525 (1-20.6)	25-525 (1-20.6)
	Max. Workpiece Weight		kg	450	500	690	1600
	Table Size (W×D)		mm (inch)	600*300 (24*12)	600*320 (24*13)	650*450 (25.6*18)	1050*650 (41*25.6)
	Machine Weight		kg	1200	1500	2000	3000
Filter	Tank Capacity		l	120	360	120	180
	Filter Density		µm	10	10	10	10
	Filter Elements			2	2	2	2
Generator	Max. Working Current		A	120	120	120	120
	Overall Power Consumption		KVA	10	6	10	10
	Weight		kg	370	370	370	370

Integrated with MES (Manufacturing Execution System) and SI (System Integration)



- Through API, easier on gathering all production information, utilization rate, machine status and progress rate of the work.
- Support on custom fixtures design, allow the production line can be eligible on producing multi products.



- Integration with online measure, electrodes warehouse, workpiece warehouse and RFID tag to update the status in real time.
- With RFID tag installed, capable to track and manage all electrodes and workpiece.



Quality Control



Remark: integrated with MES (Manufacturing Execution System) and SI (System Integration)



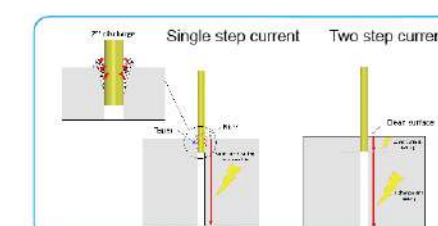
- All series are tested and adjusted by high accuracy equipment to ensure stability and efficiency of the machine.
- Mechanical geometric accuracy examined
- EXD all series are tested by laser before delivery to ensure its quality

Precision type $\phi 0.1-3.0$
Collet ER type $\phi 0.3-6.35$ (ER16)
[Optional]



System Feature

- High speed super drill circuit MOSFET drive, specially design for micro drill.
- Rotary spindle and high-pressure resistance, able to reach RPM 150. Options for ($\phi 0.1-3.0$ mm) or ER16($\phi 0.3-6.35$ mm).
- Unique design on castings connection, ensure machine can perform high horizontal accuracy while high loading workpiece.
- With standard electrode tube holder, perform well accuracy on $\phi 1.5$ mm or below tubes.
- Additional stainless steel water tank design, easier on replacing fluid regularly to ensure the work quality and efficiency.
- Submersible tank(optional) produces better efficiency on through-hole job and its stability of work.



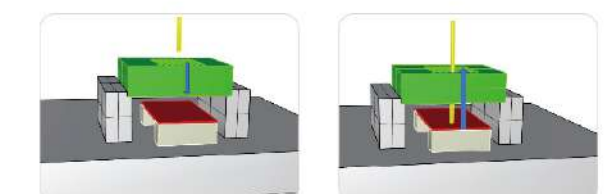
- ▶ Increase the efficiency during the sparking on uneven surface.
- ▶ Ensure the accuracy of the upper hole.
- ▶ Reduce unnecessary wear out during activating the sparking.



Application Feature

Finish Stop Device :

- Automatically finishes the operation.
- Prevent to spark the worktable.



Specification Table

Structure			Table-Moving type			
Specification	Model (by size)		SD300	SD400	SD550	SD755
	Table Travel	X	300(12)	400(16)	550(22)	700(28)
		Y	250(10)	300(12)	400(16)	550(22)
		W	345(14)	345(14)	345(14)	345(14)
	Guide Travel	Z	mm (inch)	200(8)	250(8)	300(12)
		Manual Guide Travel Z2	mm (inch)	150(6)	150(6)	150(6)
	Max. Workpiece Weight (W×D)		610×420 (24×16)	990×460 (39×18)	1075×540 (42×21)	1630×690 (64×27)
		Guide(30mm) to Work Table	mm (inch)	5-355 (0.2-14)	45-395 (1.7-15.6)	145-595 (5.7×23.4)
	Max. Workpiece Weight		kg	120	450	1000
	Table Size (W×D)		mm (inch)	400×260 (16×10)	600×300 (24×12)	800×450 (31.5×18)
Filter	Machine Weight		kg	700	1200	1950
	Tank Capacity		l	60	60	80
	Filter Density		μm	10	10	10
	Filter Elements			2	2	2
Generator	Max. Working Current		A	50	50	50
	Overall Power Consumption		KVA	4.6	4.6	4.6
	Weight		kg	NA	NA	250

Other Application



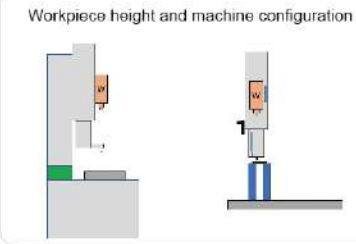
Optional R.T.C. controller for jobs requiring specific angle

- Available on SDZNC/EXD/ZCNC series.
- Editable program for multi angle rotation and unequal angle.
- Easy to mount and unmount - can be shared with other machines.



Standard accessory – Alignment pack

- Adjustment pins for concentricity and perpendicularity alignment.
- Ensure the stability and accuracy of machine.



Custom made raiser block for higher workpiece

- Increases the distance from spindle to worktable.
- Place parallel block for smaller workpiece.



SD300 ZNC PLUS

X : 300
Y : 250
Z2 : 150
W : 345



SD400 ZNC PLUS

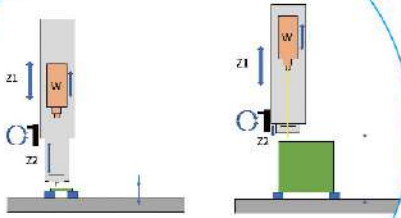
X : 400
Y : 300
Z : 200
Z2 : 150
W : 345



SD550 ZNC PLUS

X : 550
Y : 400
Z : 250
Z2 : 150
W : 345

SD ZNC – axes travel

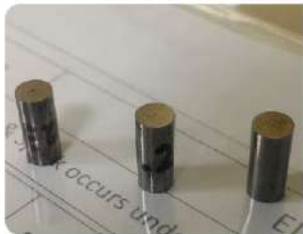
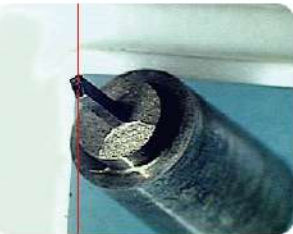
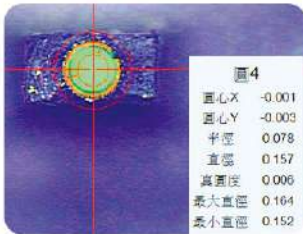


W: Servo Travel
Z: Guide Travel
Z2: Manual Guide Travel

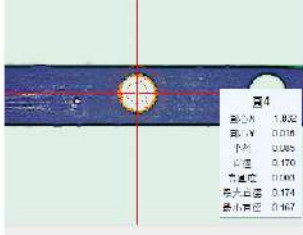
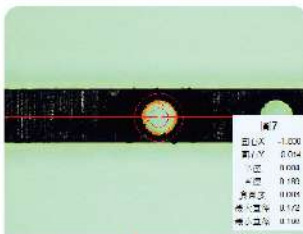
Processing Example



TF10(Tungsten Carbide)
Electrode Tube: Ø0.12mm
Workpiece: 0.2mmx0.38mm(Upper)
2mmx3mm(Under)
Depth: 4mm
Actual size of finished hole:
Ø0.16mm
Time: 4min
Wear out: 1:4



SD ZNC processing
Material: Tungsten Carbide
Depth: 11mm
Time: 6mins
Wear out: 1:3
(Refer to images on the right
0.13、0.2、0.3)



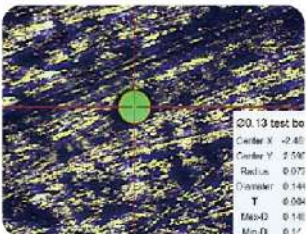
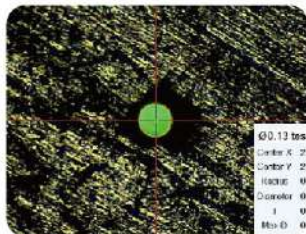
Material: Tungsten Carbide
Electrode Tube: Ø0.15mm
Depth: 2.5mm
Time: 2min
Actual size of finished hole:
Ø0.174mm

Material: Tungsten
Electrode Tube:
Ø0.7mm
Depth: 43mm
Time: 15min

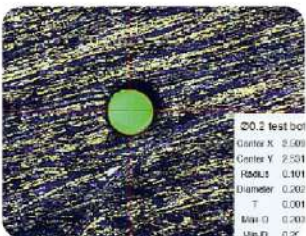
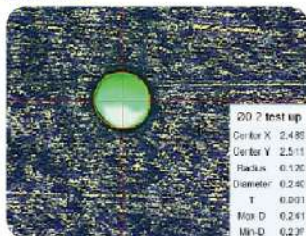
Material: Tungsten
Electrode Tube:
Ø0.7mm
Depth: 6.1mm
Time: 2min
Actual size of finished
hole: Ø0.74mm



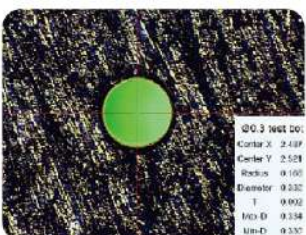
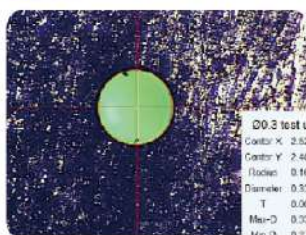
Dia 0.13



Dia 0.2



Dia 0.3



SD ZNC processing
Material: Titanium alloy
Depth: 175mm
Time: 13 mins
Wear out: 1:0.8

Material: Titanium alloy
Electrode Tube: Ø0.3mm
Depth: 85mm
Time: 20min
Actual size of finished
hole: Ø0.341mm



Material: SUS304
Electrode Tube: Ø0.5mm
Depth: 0.6mm
Time: 40 seconds
Actual size of finished hole:
Ø0.536mm

Standard Accessories

ITEM	SD ZNC	EXD
Filter	√	√
Stainless Water Tank (Please refer to P.19 circulatory system)	√ (60L/80L)	√ 390L (Including DI water filter and monitoring)
Tool Box	√	√
X、Y Axis - 1μm Linear Scale	□	√
X、Y Axis - 5μm Linear Scale	√	—
Electrode Guide Ø1.0mm	√	√
Precise Electrode Chuck Ø0.1~3.0mm	√	√
Electrode Tube Ø1.0mm	√	√
Correction Rod Ø6mm, 3mm	√	√
LED Work Lamp	√	√
Parallel Spacer	√	√
Z Axis Decoder	—	√
W Axis Decoder	√	√
X、Y、W Axis Precise Ball Screw	√	—
X、Y、Z Axis Double Nuts Precise Ball Screw	—	√
Auto-stop device	√	—
Signal Tower Light	√ (2 Layers)	√ (1 Layer)

√: Standard □: Optional —: No support

Optional Accessories

ITEM	SD ZNC	EXD Table-Moving type	EXD Column-Moving type
ER type Precise Collet Ø0.3~6.35mm	□	□	□
ER to Precise Chuck Adapte	□	□	□
Pneumatic Rotary Spindle	□	□	□
Wheel disc ATC 20/32 Tools	—	—	□
Single Axis Rotary Table	□ R.T.C. Single Axis Controller Required	□	□
AB Axes Rotary Table	—	□	□
Stainless Working Tank	□	□	□
Water Quality Monitoring System	□	√	√
390L Circulating Water System (Including resin circulating and water monitoring)	□	√	√
LED Work Lamp	□	□	□
UV fire detector	□	□	□

√: Standard □: Optional —: No support

Rubber Seal

ITEM	without hole	0.3	05	1.0	2.0	3.0	4.0	5.0	6.0
Standard Rubber Seal	●	●	●	●	●	●	●	●	●
ER type Rubber Seal	●	●	●	●	●	●	●	●	●

Suggest using 0.5mm smaller
rubber seal than the
electrode tube. If using
0.5mm and below size of
tubes, suggest using blind
hole rubber and poke the
hole by needle.



Standard Rubber Seal



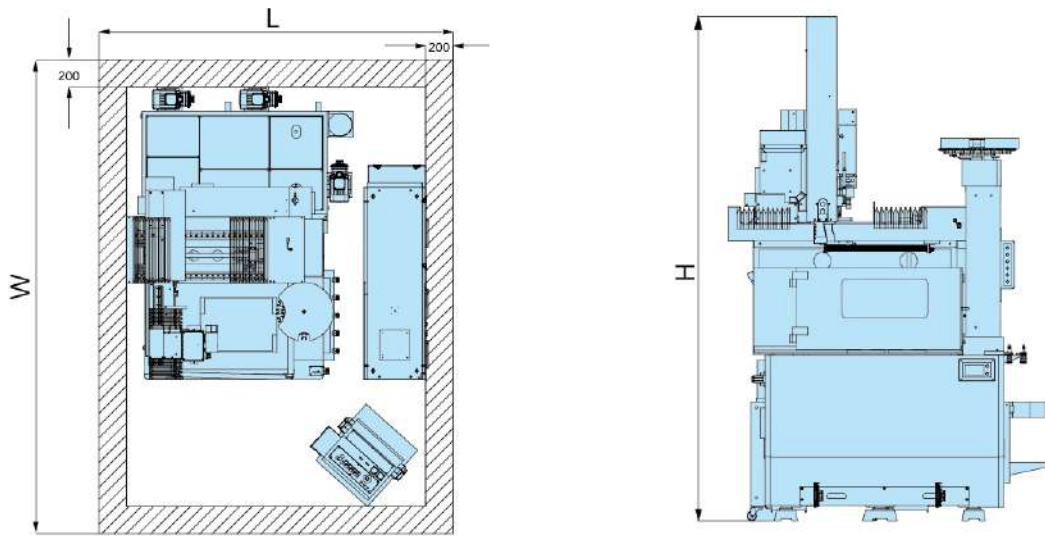
ER type Rubber Seal



Floor Plan

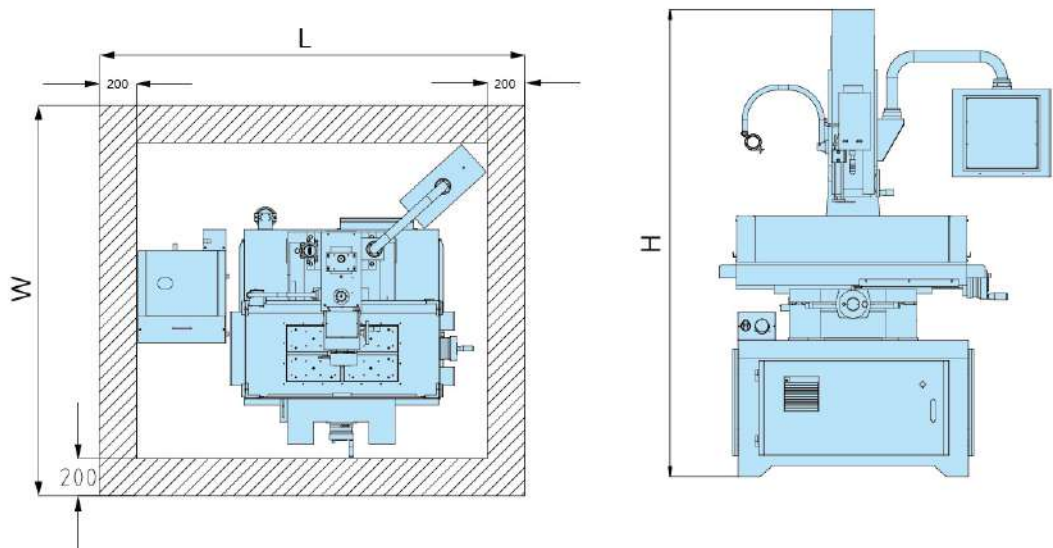
EXD Series

Model	Length (mm / inch)	Width (mm / inch)	Height (mm / inch)
EXD400 (Table-Moving type)	1693(67)	1940(76)	2344(92)
EXD435	2055(81)	2535(100)	2621(103)
EXD645	2200(87)	2506(99)	2630(104)
EXD1060	2388(94)	2425(96)	2465(97)



SD ZNC Plus Series

Model	Length (mm / inch)	Width (mm / inch)	Height (mm / inch)
SD300	1404(55)	1383(54)	2652(104)
SD400	2036(80)	1675(66)	2290(90)
SD550	1812(71)	1580(62)	2290(90)
SD755	2527(100)	2075(82)	2290(90)

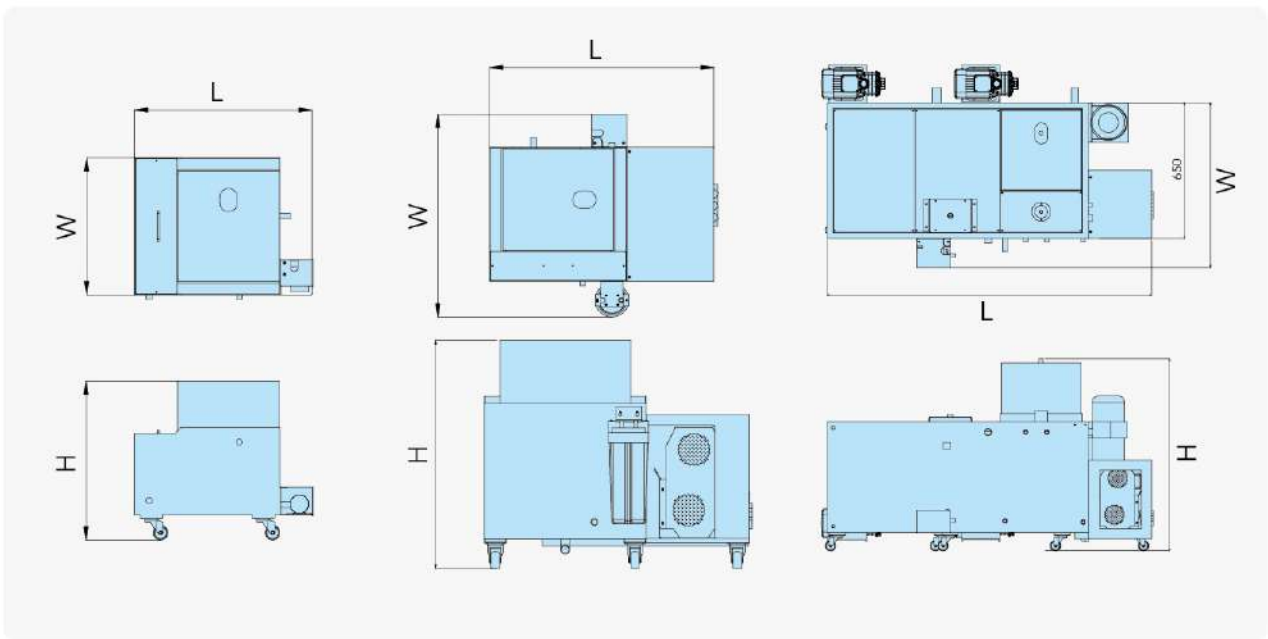


Filtering Water System	60L stainless tank	80L stainless tank	390L stainless tank
Use	SD300 SD400ZNC Standard	SD550 SD755ZNC Standard	Standard for all EXD series Optional for ZNC series with submersible tank
Length (mm / inch)	500	770	1552
Width (mm / inch)	470	460	787
Height (mm / inch)	544	665	917
Weight (kg)	20	51	90
DI water filter System	N/A	N/A	Standard
Water conductivity monitor	N/A	N/A	Standard
High Pressure Electric Pump	N/A	Optional	Optional

60L stainless tank

80L stainless tank

390L stainless tank



Movable Controller

EXD Generator

