

# ULTRACLEAN EQUIPMENT SERIES

\*"Model ○○○" in this catalogue is our model code.



Globally Positioned  
Regionally Connected

Looking ahead, going beyond expectations  
*Ahead* **Beyond**

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Precision Machinery Company

## Model EV-S :: Dry Vacuum Pump

Model EV-S is an industry-standard, robust-roots type dry vacuum technology designed ideally for a light to medium duty applications having ultra low power consumption. Model EV-S consists of various advanced technologies such as controllable pumping speed for broadband pumping capacity coverage, sleep & idle mode function and the most advanced interlock feature as well as optional anti-corrosion Niresist material.



Dry Vacuum Pump / Model EV-S

### ■ Features

- Small footprint, light weight and lower power consumption design to pumping capacity
- Various pump configurations according to process application (Model EV-S\*P: with N<sub>2</sub> purge, Model EV-SN: with Niresist material & N<sub>2</sub> purge)
- DC motor drive provides a lower power consumption and identical pumping performance regardless a frequency (50/60Hz)
- Unique exhaust pumping design contributes pumping performance around atmospheric pressure
- Advanced warning & alarm data storage capability
- Hands on feature for warning setting (programmable from LCD controller)
- Advanced sensing function reduces product down time
- Semi-S2/CE marking/NRTL available

Model	EV-S20(P/N)	EV-S50(P/N)	EV-S100(P/N)	EV-S200(P/N)
Max pumping speed (L/min)	1,670	5,000	10,000	20,000
Power consumption (kW) (at ultimate pressure)*	0.4	0.55	0.65	0.75
Dimension(WxDxH mm)	230x450x274	230x450x520	260x510x520	275x650x580
Mass (kg)	60	100	120	170

\* A value without N<sub>2</sub> purge

## Model EV-L :: Dry Vacuum Pump

Model EV-L is the latest generation medium duty dry vacuum pump, having various heat up options, in addition to field proven energy saving capability of Ebara. Optimized temperature control enable to run in wider application than typical light medium duty pumps, including condensable ones such as Etch and PE-CVD.



Dry Vacuum Pump / Model EV-L

### ■ Features

- Wide application coverage with various heat-up option, suitable for each application
- Upgraded corrosion-proof material available, in addition to standard corrosion-proof material
- Achieved high durability for condensable byproduct, and market leading energy saving capability
- Further energy saving possible with idle mode sequence equipped as standard

Model	EV-L20N	EV-L100N	EV-L200N
Max pumping speed (L/min)	2,000	10,000	18,000
Power consumption (kW) (at ultimate pressure)	0.65	0.9	1
Dimension(WxDxH mm)	280x635x320	380x647x655	380x772x655
Mass (kg)	75	150	200

## Model EV-M : Dry Vacuum Pump

Model EV-M is designed for harsh duty applications where large volumes of by-products are generated in the semiconductor, liquid crystal, and solar cell manufacturing processes. Model EV-M has mastered the balance between resistance to harsh duty applications and energy efficiency. This next-generation dry vacuum pump series sufficiently address customer needs to minimize downtime and reduce running cost.



## Model EST : Dry Vacuum Pump

Model EST is a stand-alone innovative screw pump technology ideal for harsh applications generating reactive chemical by-products. They are best suited for a powdery, corrosive applications.



### ■ Features

- Small footprint
- Energy efficient
- Robust anti-corrosion type material

Model	EV-M20N	EV-M102N	EV-M202N	EV-M302N	EV-M502N	EV-M802N
Pumping speed (L/min)	1,800	10,000	20,000	30,000	50,000	80,000
Power consumption (kW) (at ultimate pressure)	1.2	1.8	1.9	2.3	2.1	2.8
Dimension (WxDxH mm)	370x770x450	380x790x752	380x820x752	380x910x830	485x975x870	630x1,000x1,030
Mass (kg)	170	320	360	400	500	740

### ■ Features

- Ideal configuration for powdery harsh & chemically corrosive application (Hot gas temperature & Niresist material)
- Large pumping capacity and high gas load stability
- Intelligent rotor RPM control function for flexible gas throughput
- Advanced warning & alarm data storage capability
- Hands on feature for warning setting (programmable from LCD controller)
- Semi-S2/CE marking/NRTL available

Model	EST10N	EST25N	EST100WN	EST200WN	EST300WN	EST500WN
Pumping speed (L/min)	1,000	2,500	10,000	20,000	30,000	50,000

## Model ESA :: Dry Vacuum Pump

Model ESA is built by Ebara's robust roots pump technology. Model ESA200W and larger models are best suited for fast pump down requirement on large volume chamber in industries such as LCD, photovoltaic manufacturing equipment. Model ESA 25-D and Model ESA70W dry vacuum pumps have the largest installed base pump on MO-CVD applications. Model ESA dry vacuum pumps also feature intelligent rotation sequence for high gas load and advanced interlock function.



### ■ Features

- Ideal design for fast pumping on large volume chamber
- Intelligent rotor RPM control function for flexible gas throughput
- Optional exhaust configuration is available for organic solvent application
- Advanced warning & alarm data storage capability
- Hands on feature for warning setting (programmable from LCD controller)
- Semi-S2/CE marking/NRTL available

Model	ESA15-D	ESA25-D	ESA25XW	ESA70W(-D) ESA70WN(-D)	ESA80W-HDF ESA80WN-HDF	ESA100W ESA100WN
Pumping speed (L/min) (50Hz/60Hz)	1,400 / 1,700	2,500 / 3,000	5,000 / 6,000	7,000 / 8,400	8,400*1	10,000*1
Typical application	MO-CVD · Large volume load lock · Other clean vacuum					

Model	ESA200W	ESA300W	ESA500W	ESA700W
Pumping speed (L/min) (50Hz/60Hz)	20,000*1	28,000 / 30,000	47,000 / 50,000	80,000*1
Typical application	Large volume load lock · Other clean vacuum			

\*1 50Hz / 60Hz Same pumping speed

## Model EV-SA :: Dry Vacuum Pump

Small air-cooled dry pump suitable for many vacuum applications. Low power consumption and low noise, it is the perfect pump for clean vacuum applications such as analytical instruments and electronic microscope.



### ■ Features

- Air cooled dry pump
- Low noise, low power consumption
- Plug and play, required only electricity supply, flexible installability
- Compliant with CE marking, NRTL

Model	EV-SA20	EV-SA30
Max pumping speed (L/min)	1,670	3,300
Power consumption (kW) (at ultimate pressure)	0.45	0.45
Dimension (WxDxH mm)	324 x 584 x 347	356 x 713 x 347
Mass (kg)	65	90
Ultimate pressure (Pa)	Gas ballast : OFF	3.0
	Gas ballast : ON	5.0
		2.0
		3.0

## Model EV-A10 : Dry Vacuum Pump

Small air-cooled dry pump suitable for many vacuum applications. Flat pumping curve make this an excellent pump for pumping from atmospheric pressure. Highly flexible installation with power as the only required utility. Suitable applications include: Load locks, PVD Systems, Analytical instruments, replacing wet pumps.



Dry Vacuum Pump / Model EV-A10

## Model EV-PA : Dry Vacuum Pump

Model EV-PA is air-cooled, featuring small-size, light weight, and energy efficiency. This next generation Plug & run, portable dry vacuum pumps achieve clean vacuum and extended service interval with non-contact seal design.



Dry Vacuum Pump / Model EV-PA

### ■ Features

- Air cooled dry pump for non-reactive gas general vacuum
- 1,000L/min(60m<sup>3</sup>/h) peak speed, strong for atmosphere pumping down
- Plug and play, required only electricity supply, flexible installability
- Compliant with CE marking, NRTL

Model		EV-A10
Pumping speed (L/min)	Max	1,000
	At atm Press.	800
Ultimate pressure (Pa)	Gas ballast : OFF	1.0
	Gas ballast : ON	2.0
Dimension (WxDxH mm)		317 x 544 x 344
Mass (kg)		75

### ■ Features

- Light weight (less than 21kg)
- Air cooled / Lubricant oil free / Plug & run
- Non-contact seal design (Periodical chip seal replacement not required)
- Low vibration / Low noise

Model	EV-PA50	EV-PA250	EV-PA500
Pumping speed (L/min)	50 (36)	230 (200)	500 (430)
Power consumption (kW) (at ultimate pressure) *Inflow gas volume dependant	0.23 (0.23)	0.24 (0.38)	0.27 (0.60)
Dimension (WxDxH mm)	175x238x192	189x482x253	189x482x272
Mass (kg)	9	16	21
Ultimate pressure (Pa)	20.0 (200)	0.5 (2.0)	

\* With gas ballast ( )

# Model EMT / EBT :: Turbo Molecular Pump

## ■ Features

### ■ Magnetic bearing type

- Wide pumping speed variations from 340 to 3,300L/s
- Integrated controller
- Both air-cooled and water-cooled types available (except Model EMT2200MK and EMT3300MK)
- High-Temperature and anti-corrosion specification available (option)
- Lineup of a wide range of special specifications (e.g., high temperature and ultra-low vibration models)
- Can be set in any direction
- Network connection available
- Compliant with CE marking, SEMI & NRTL



Model EMT

### ■ Separated controller type

Model	EMT397M	EMT427M	EMT907M	EMT1307M	EMT2400M
Pumping speed (N <sub>2</sub> , L/s)	340	400	900	1,300	2,400

### ■ Integrated controller type

Model	EMT1700MK	EMT2200MK	EMT3300MK	EMT3400MK	EMT3800MK	EMT4200MK
Pumping speed (N <sub>2</sub> , L/s)	1,650	2,200	3,300	3,300	3,600	4,200

### ■ Ball bearing type

- Grease lubricated ball bearing type
- Wide pumping speed variations from 70 to 2,400L/s
- Compact, light weight, low cost
- Integrated controller types available (for Models EBT70 and EBT240 only)
- High shock resistance
- Air-cooled and water-cooled types available (air-cooled only for Models EBT70F and EBT240F)
- Can be set in any direction
- Network connection available
- Compliant with CE marking, SEMI & NRTL

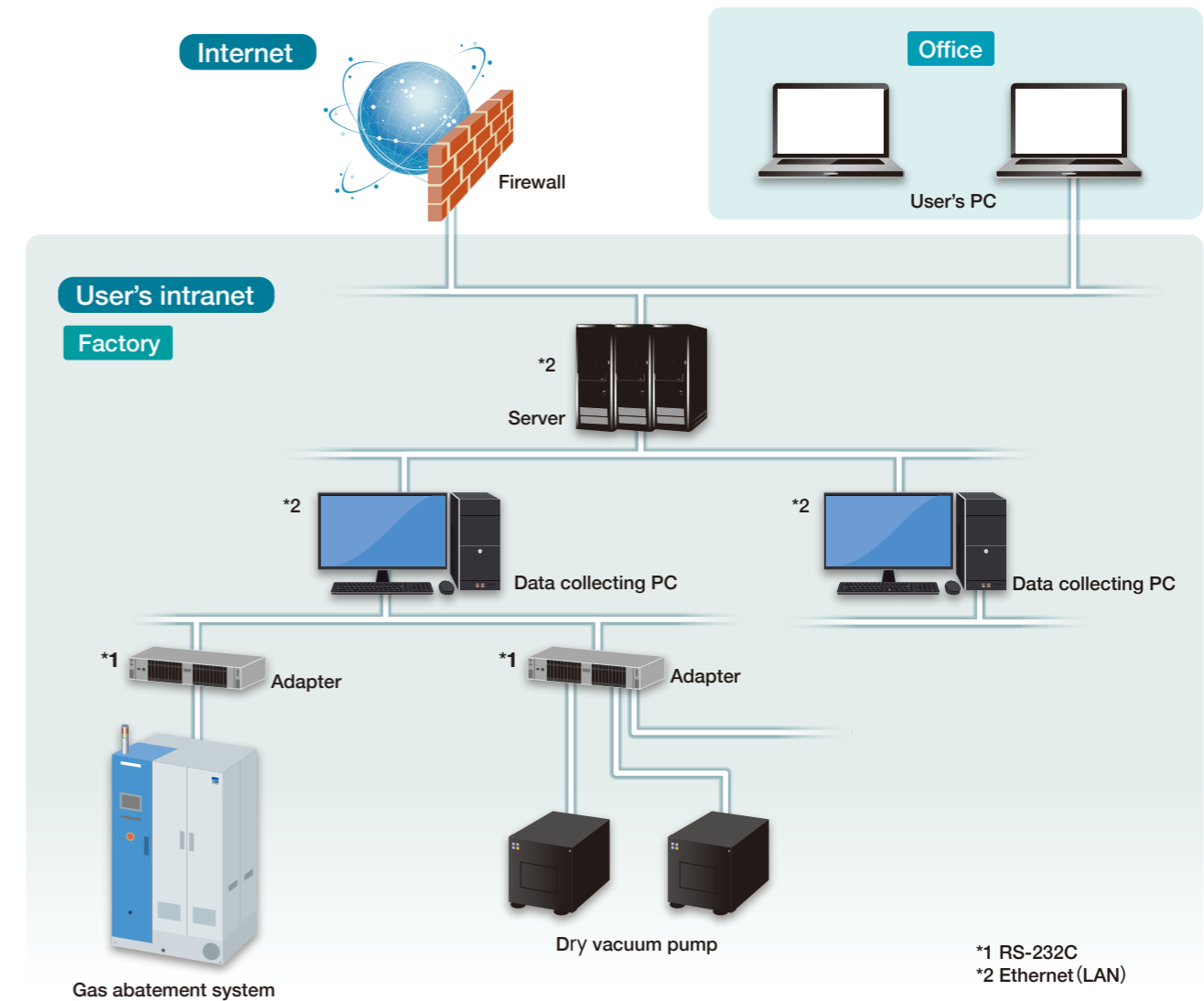


Model EBT

Model	EBT70F	EBT220F	EBT240F	EBT350F	EBT450F	EBT800F	EBT1100F	EBT1400F	EBT2400F
Pumping speed (N <sub>2</sub> , L/s)	70	220	240	330	450	820	1,100	1,400	2,400

# Central Monitoring System

Ebara's advanced networking remote monitoring system features for Ebara component product family. Smart and high-speed data transmission, large storage capacity for data collection maximizes equipment uptime.



## ■ Features

- Remote monitoring capability through web browser once the system is connected to customer's own LAN network
- Most advanced IT technologies (fast transmission speed, large storage capacity) thanks for second interval data collection.
- Store & monitor real operating data and warning / alarm history
- Maximum of 1,200 dry vacuum pumps are connected to one server
- Reporting function for operating data & warning / alarm history according to a preset time frequency
- Optional warning E-mail message feature

Central Monitoring System

Turbo Molecular Pump / Model EMT / EBT

## Model TND : Gas Abatement System

With specially developed burner by EBARA, the abatement system achieves high efficient abatement. Various corrosion and by-products countermeasures extends maintenance interval.



## Model G5 : Gas Abatement System

Model G5, with a lineup of two maximum gas flow capacities of 350L/min and 500L/min, is capable of abating the majority of general processing and cleaning gases including PFCs used in the manufacturing operations of semiconductors, LCD panels, solar cells, and LEDs. This compact system automatically removes powdery by-products with on-demand operation, thus achieving reduction in maintenance and running cost.



Gas Abatement System / Model TND

Gas Abatement System / Model G5

### ■ Features

- Unique combustion method achieves high abatement efficiency and less NOx and CO emission
- Low operating cost by optimized utility consumption
- Extended maintenance interval than conventional system by various corrosion and byproducts countermeasures\*
- Capable of simultaneous abating process gases and cleaning gases
- Model TND-Single (Burn-Wet) and TND-Single Plus (Wet-Burn-Wet) are available

\*It may vary according to process

Model	TND-Single-A1~A4	TND-Single-P1~P4	TND-Single Plus-A1~A2	TND-Single Plus-P1~P2
Dimension (WxDxH mm)	1,200 x 650 x 1,980			
Gas inlet port qty	1 ~ 4		1 ~ 2	
Fuel	Methane	Propane	Methane	Propane
Max. inflow rate (L/min)	200(Per gas inlet port)		400(Per abatement system)	

### ■ Features

- High efficient abatement of various material gases such as global warming gases including PFCs
- Low Cost of Ownership by on-demand operation of changing necessary fuel volume due to variety of gases
- High up-time by the feature of removing powdery by-product

Model	G5-350-A1 ~ A4	G5-500-A1 ~ A4	G5-350-P1 ~ P4	G5-500-P1 ~ P4
Dimension (WxDxH mm)	1,200 x 650 x 1,900			
Gas inlet port qty	1 ~ 4		1 ~ 4	
Fuel	LNG		LPG	
Max inflow gas (L/min)	350	500	350	500



## Model G5 : High gas flow capacity gas Abatement System

The type of Model G5, with a lineup of two types of maximum gas flow of 600L/min and 1,200L/min, is capable of abating high flow rate of flammable gases with Si source such as TEOS in the manufacturing operations of semiconductors.



## Model G6-E : Gas Abatement System

Model G6-E is suited to the abatement of gases containing hydrogen and chlorine used for epitaxial growth and other systems in processes to manufacture semiconductors.



High gas flow capacity Gas Abatement System / Model G5

Gas Abatement System / Model G6-E

### ■ Features

- Capable of high flow rates than standard Model G5
- Increased gas inlets from 4 to 6
- High up-time by the feature of removing powdery by-products from the burner
- Long maintenance interval by the feature of automatic powder discharging from the water circulation tank
- Low cost of Ownership by on-demand operation of regulating utility flows to appropriate conditions depending upon the inflow gas conditions

Model	G5-600-A1 ~ A6	G5-1200-A1 ~ A6	G5-600-P1 ~ P6	G5-1200-P1 ~ P6
Dimension (WxDxH mm)	1,200 × 1,100 × 2,200			
Gas inlet port qty	1 ~ 6		1 ~ 6	
Fuel	LNG		LPG	
Max inflow gas (L/min)	600	1,200	600	1,200

### ■ Features

- Suitable for the treatment of epitaxial grown processing gas
- Treat large volume chlorine gas and hydrogen gas simultaneously. Up to 400L/min is available
- High up-time by the feature of removing powdery by-product

Model	G6-E-A1	G6-E-A2	G6-E-A3	G6-E-A4	G6-E-P1	G6-E-P2	G6-E-P3	G6-E-P4
Dimension (WxDxH mm)	1,200 × 650 × 1,900							
Gas inlet port qty	1	2	3	4	1	2	3	4
Fuel	LNG				LPG			
Max inflow gas (L/min)	400							

# Model FDS : Gas Abatement System

Model FDS is unique thermal & chemical capture technology for ultimate PFCs gas treatment. Since the Model FDS systems do not require water scrubbing, zero waste-water generated to the facility.



## Features

- Fluoride gas captured within reactor (Zero waste)
- Max inlet gas flow of 250L/min with 99% treatment (Model FDS250)
- Model FDS100D/FDS250: 100% uptime due to serial flow design
- Model FDS100: Easy replacement with existing dry type abatement

Model	FDS100S	FDS250*
Dimension (WxDxH mm)	600 x 600 x 2,000	1,520 x 1,000 x 2,150
Reactor	Single	Dual
Max inflow gas (L/min)	100	250

## Applicable gas and efficiency

CF <sub>4</sub>	SiF <sub>4</sub>	NF <sub>3</sub>
C <sub>2</sub> F <sub>4</sub>	CHF <sub>3</sub>	HF, F <sub>2</sub>
C <sub>2</sub> F <sub>6</sub>	CH <sub>2</sub> F <sub>2</sub>	PF <sub>3</sub>
C <sub>3</sub> F <sub>6</sub>	CH <sub>3</sub> F	BF <sub>3</sub>
C <sub>3</sub> F <sub>8</sub>	OF <sub>2</sub>	WF <sub>6</sub>
C <sub>4</sub> F <sub>6</sub>	XeF <sub>2</sub>	TaF <sub>5</sub>
C <sub>4</sub> F <sub>8</sub>	SF <sub>6</sub>	SOF <sub>2</sub>
C <sub>5</sub> F <sub>8</sub>	CO	SO <sub>2</sub> F <sub>2</sub>

Target gas	Max inflow gas Concentration	Efficiency
PFCs	1.0%	<50 ppm as CF <sub>4</sub> (Reactor exchange recommended)
CO	2.0%	<25 ppm (TLV-TWA)
SiF <sub>4</sub>	2.0%	<0.5 ppm as HF (TLV-TWA)

\* Listed items  
This product(s) falls under "the goods listed in the Export Trade Control Order of Japan". In case of export of the product, you are required to obtain the export license through the Minister of Economy, Trade and Industry.

# Dry pump Integrated Gas Abatement System

Dry pump integrated gas abatement system is a harmonized system between vacuum technology & abatement technology based upon EBARA's best know-how. The system is designed in accordance with customer's facility needs for customized integrated solutions.

## Features

- Ebara original integrated abatement system with Ebara dry pump.
- Reduce installation workload & time, facility load.
- Operation & interlock function are integrated as system operation.
- Dry pump Qty: 1~8 units
- Applicable dry pump Model: EV-S / ESR / EST / ESA
- Applicable abatement Model: G5 / GT



## Customized pump rack enables reduction of system footprint & maintenance space



- **Parallel type rack**  
For > 30,000 L/m class pump mounting



- **Stackable type rack**  
For < 30,000 L/m class pump mounting

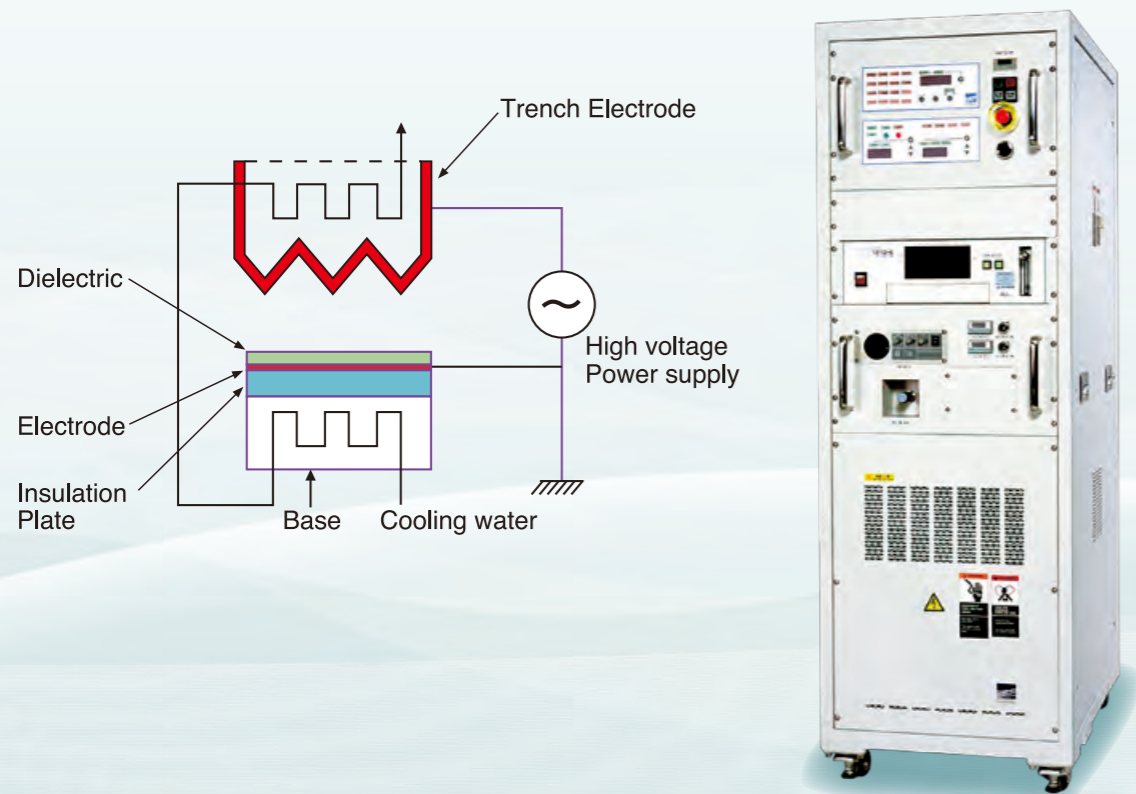


- **Pump lifter for exchange**  
Dedicated lifter for safe pump exchange

The system a customized products. Please contact Ebara for further information

# Model OZC : Ultra High Concentration Clean Ozonizer

Ozonizer employing a new discharge principle that generates highly concentrated ozone through both silent and surface discharge methods.

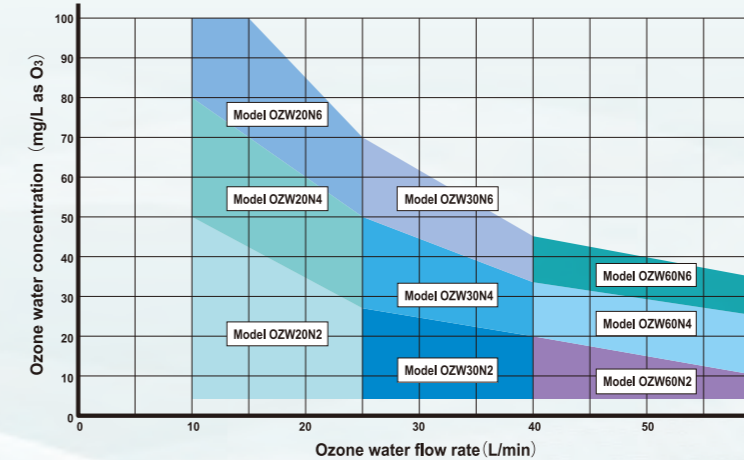


Ultra High Concentration Clean Ozonizer / Model OZC

# Model OZW : Ozonized Water Generator

The model OZW continuously supplies clean ozonized water to meet the requirements of next generation wet process through the use of a new dissolving method, clean pressurizing pump and clean ozone gas generator.

Performance Table for Model OZW selection

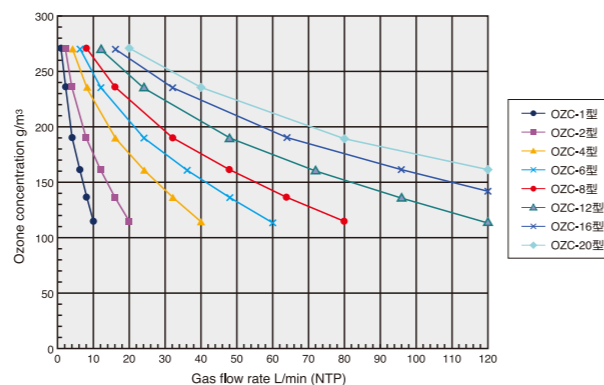


Ozonized Water Generator / Model OZW

### Features

- Steadily generates large volumes of highly concentrated ozone (10 vol% or higher)
- Achieves ultra clean ozone through the adoption of ceramic coated electrodes and sapphire dielectrics
- Compact ozonizer capable of generating ozone of a significant volume per unit area
- Ozone leak sensor is standard

### Performance curve



### Features

- New ozone dissolving method**  
The new direct dissolving method is used instead of hollow fiber membrane to realize lower COO and smaller foot print than our conventional model.
- Impurity free ozonized water**  
Contamination-free ozonized water can be supplied by the use of new direct dissolving method, clean ozonizer and clean pressurizing pump.
- Superior concentration and flow rate stability**  
The ozonized water is continuously monitored and measurement data is used for feed back control to stabilize the ozone concentration at a steady level. Thanks to the use of an infinity variable speed clean pressurizing pump, it is possible to supply a constant flow of ozonized water even when the system has been installed so that a level difference exists between the wet station and model OZW.
- Superior ease of operation, safety and reliability** make the system ideally suited for production line use  
To facilitate operation in combination with a wet station, built in coupled operating signal and interlock signal circuits are provided, with the system configuration designed to assure easy maintenance of all units. The system also has a safety circuit to stop the units safely in an error or emergency. (Can be a SEMI S2 / CE marking available)
- Degas/Regas system**  
The system is capable of providing higher functional water to combine EBARA deaeration water and gas dissolution generators. (H<sub>2</sub>, N<sub>2</sub>, CO<sub>2</sub>)

\* Listed items  
This product(s) falls under "the goods listed in the Export Trade Control Order of Japan". In case of export of the product, you are required to obtain the export license through the Minister of Economy, Trade and industry.

# Model F-REX : Chemical Mechanical Polishing System

Model F-REX is clean room compatible Chemical Mechanical Polishing systems with proven high reliability and high process performance. Various options are available to meet every customer's needs.

**Best CMP solution for R&D and mass production on advanced technology node.**



Model F-REX200M2



Model F-REX300X

### ■ Features

- Dry-in/Dry-out
- High process performance
- Improved productivity (with high reliability and easy maintenance)
- Multi step chemical cleaning capability
- Process end point monitor (Option)
- In-line thickness monitor (Option)
- RELIABLE one head per table concept
- High volume production capability

Model	F-REX200M2	F-REX300X
Number of top rings	2 (For 200 mm wafers)	4 (For 300 mm wafers)
Number of turntables	2	4
Number of cleaning units	4	6 or 8

# Model UFP : Plating System

Model UFP is a clean room compatible electroplating system for Bumping, Re-Distribution layer and Via filling on the panel.



### ■ Features

- Enabling PLP plating based on superb & proven WLP plating performance
- Adjustable platform to customer's demand
- Superior uniformity with high speed plating
- Robust plating features for thin seed layer & warped substrate
- From mass production to R&D, Bump/RDL to Via/Fan-out

Model	UFP-AS
Applicable panel size (mm)	Max 600 x 600
# of plating cells	4 cells ~ 10 cells
Suitable applications	R&D or mass production (Automated)





# Ebara Global Customer Support Network

PRODUCT-Plus

Ebara defines that customer support is one of our product which has been established since our business started.

- Technical support/Facility consultation
- Process support
- Product field support
- Product refurbishment/upgrade



Fujisawa District Tokyo SS



Kumamoto District Kyushu FSC



## Global Network



### USA : Ebara Technologies Inc

- H Q: Sacramento(CA)
- F S C: Sacramento(CA)  
Hillsboro(OR)
- S S: San Jose(CA)  
Albany (NY)  
Newburyport(MA)  
Boise(ID)



### EUROPE : Ebara Precision Machinery Europe GmbH

- H Q: Hanau, Germany
- F S C: Livingston, UK  
Dresden, Germany
- S S: Graz, Austria



### KOREA : Ebara Precision Machinery Korea Inc

- H Q: Pyeongtaek
- F S C: Pyeongtaek
- S S: Seongnam  
Hwasung  
Cheonan  
Icheon  
Cheongju



### CHINA : Shanghai Ebara Precision Machinery Co.,LTD

- H Q: Shanghai
- F S C: Shanghai
- S S: Wuxi  
Dalian  
Beijing  
Wuhan



### TAIWAN : Ebara Precision Machinery Taiwan Inc

- H Q: Taipei
- F S C: Hukou
- S S: Linkou  
Hsinchu  
Taichung  
Tainan



### SINGAPORE : Ebara Engineering Singapore Pte.Ltd

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- F S C: Tuas Link

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**CAUTION**

- The product(s) described herein fall under “the goods listed in row 16 of the appended table 1 of the Export Trade Control Order of Japan”, so in cases of export of such product(s), you need to confirm “use” and “purchaser and/or end-user” and, as case may be, obtain the approval of the Minister of Economy, Trade and Industry. (Please confirm these conditions on your own.) Furthermore, some of the product(s) fall under row 1-15 of the appended table 1 (listed items). In case of export of these listed items, you are required to obtain the export license from the Minister of Economy, Trade and industry. For more information, please contact our sales office located near you.
- All specifications are subject to change without notice.
- “Model ○○○” in this catalogue is our model code.

