

# Electrovert

Electronic Assembly Equipment

TW EAE

## Aquastorm<sup>®</sup>

### In-line Aqueous Cleaning Systems



Unsurpassed cleaning, high-efficiency drying, low cost of ownership, ease of maintenance, and minimum downtime all come together in the Electrovert Aquastorm, a world-class pcb cleaning system.



# Electrovert Aquastorm

Aquastorm is a versatile, high-performance cleaning system designed to optimize the PCB cleaning process while minimizing overall cost. Its compact footprint and patented cleaning and drying technologies make the Aquastorm an energy efficient and cost effective cleaning system.

The applications and industries served include:

- Electronics and semiconductor
- Precision medical
- Aerospace/Military
- Automotive
- Industrial/parts cleaning
- Pallet/fixture cleaning
- Debris removal /surface preparation
- Renew/Rework

## Versatile, Proven Cleaning Performance

The Aquastorm is considered the industry's best for precision cleaning, performance, quality construction and life cycle durability. Combined with innovative features and technologies, the Aquastorm continues to be the industry leader and benchmark for cleaners in the industry. The Aquastorm is ideally suited to RMA and no-clean de-flux applications that require chemistry, as well as removal of water-soluble organic acid flux.



## Cleaning Technology

Functional sections of a cleaner are designed to accomplish different tasks in removing contamination. Some sections maximize flooding, while others maximize impact force for cleaning tight spaces. The Aquastorm uses proprietary pump and nozzle technology throughout the system to optimize performance.

The Aquastorm's appropriately sized modules and strategic manifold placement increase throughput while ensuring thorough removal of contaminants. The Aquastorm features perforated rails, curtain containment, and a cabinet designed to manage wash solution within the system for maximum conservation of costly chemistries. The wet chemical isolation module is powered by the recirculating rinse pump to ensure optimal prerinsing. Even the exhaust is separated between the wet and dry modules to minimize chemical migration through the system.

## Stainless Steel Plumbing

Equipped with orbitally welded, stainless steel plumbing to eliminate pressure drops and leaks, all sections can be replaced or upgraded in minutes to maximize uptime and process flexibility. Plumbing sections have quick-disconnect fittings for ease of maintenance.



# Electrovert Aquastorm

## Mixed Spray Fluid Delivery System

The clear advantage of Aquastorm cleaners is the ability to deliver a dynamic combination of chemistry, thermal, and mechanical forms of energy at the surface to effectively clean under low stand-off and difficult to clean components.

The key to the Aquastorm is the utilization of mixed spray technologies including high-impact force for tight spaces, oscillating action for low pressure applications and complete flooding action for high pressure applications. A combination of spray nozzles including Jet Impact Cleaning (JIC), V-jet, Delta-Jet, and Hurricane Jet™ directs dynamic impingement to the product surface and effectively cleans under low stand-off components for difficult cleaning applications.



The wash and rinse module can be configured with up to five different types of spray technologies which include up to 76 JIC nozzles, up to 56 V-Jet nozzles, an upper and lower hurricane spray curtain, and are available with 10, 15, and 20 horsepower pumps. These pumps can generate up to 182 gallons per minute at 95 psi.

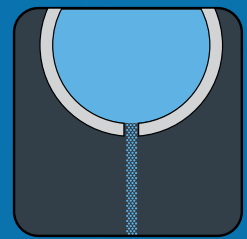
**Jet Impact Cleaning** with a web of omni-directional spray patterns greatly improves cleaning under low-standoff components and eliminates shadowing effects.

**Patented S-Jet™** nozzle technology produces large water droplets for enhanced cleaning performance when operating at a lower rate of pressure. The oscillating action of the S-Jet helps to better clean and flush flux residues in the prewash to reduce foaming in the recirculating wash.

**Patented Hurricane Jet™** provides a continuous curtain of water across the width of the conveyor providing flooding action and pressure that forces water under tightly mounted components. Hurricane Jet can flush contaminants out from under BGA,s/CSPs and flip chips and enables double sided PCB cleaning in a single pass.



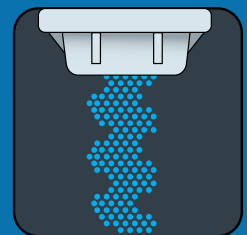
V-Jet



JIC



Delta-Jet



S-Jet



Hurricane

# Electrovert Aquastorm

## Aquastorm In-line Series

Aquastorm is a flexible platform that is available in three base models:

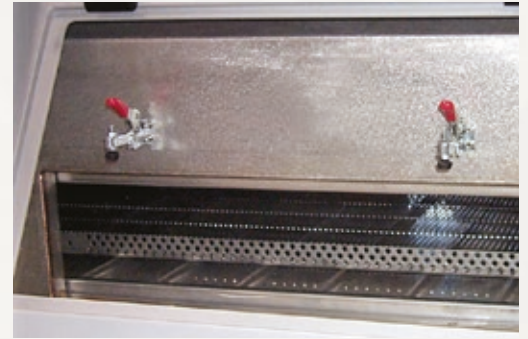
- ◆ **Aquastorm 200**
- ◆ **Aquastorm 100**
- ◆ **Aquastorm 60**

Stainless steel and high-temperature options are available for the Aquastorm 200. All others use polypropylene with stainless steel plumbing.

Each model is configurable with options to suit your needs.

## Drying Performance

Efficient and complete drying is crucial to the cleaning process. An effective system will increase throughput, providing cost savings and superior return on investment. The Aquastorm series offers several drying options, including the high-performing Torrid Zone™ for unmatched flexibility in configuration and performance.



## Torrid Zone Drying Power

Aquastorm's integrated Torrid Zone drying technology utilizes a controlled dynamic process that delivers unmatched drying of complex assemblies to within 0.1 grams of prewashed dry weight. The patented Torrid Zone consists of two sections, an air knife blow-off section to mechanically remove large amounts of moisture from the product, and a forced convection bake-out section to evaporate the remaining moisture from the product. The module reduces exhaust requirements by 44% and uses 15% less power when compared with conventional drying systems, providing a rapid return on investment. Another benefit of Torrid Zone drying is that completely dry PCB's can go straight to test after cleaning alleviating the need for a secondary off-line drying system.



*Aquastorm 100*

**Designed to provide complete cleaning process flexibility, superior cleaning and drying performance, process monitoring, and reliability.**

# Electrovert Aquastorm

## User Interface

The Aquastorm is configured with a Windows®-based operating system that provides familiar pull-down menus. All process parameters are configured in the Aquastorm's computer-controlled operator interface. System pressure, water levels, and temperatures are easily accessed. Data logging and barcode capability are features that enhance and streamline the production process. The system is easily networked for downloading of recipes and remote access to operating data.

- Quick and easy viewing of system pressures, water levels, pump and blower operation, temperature, and fill/drain operation
- Process notes function
- Secure multi-level assignment password protection

## Easy Maintenance and Accessibility

Aquastorm cleaners feature orbitally welded, stainless steel plumbing to eliminate pressure drops and leaks. Quick-disconnect fittings can be replaced or upgraded in minutes to maximize uptime. Rear panels can be easily removed for maintenance with the added benefit of single door removal to access the wash and rinse tanks. Front doors provide quick and easy access to electrical panels, computer, heaters, floats and thermocouples. Hinged, tempered glass windows provide optimum viewing and access.



Aquastorm 60



## Key Values of Aquastorm

### Cleaning technology

- ◆ Unsurpassed cleaning and drying technologies for complex or difficult to clean PCBs
- ◆ Chemical Isolation to manage chemistry and minimize cost

### Torrid Zone Drying

- ◆ Integrated into the machine cabinet
- ◆ Dry complex assemblies to 0.1 grams of prewash dry weight
- ◆ Reduces exhaust requirements by 44% and uses 15% less power

### Built to last

- ◆ Stainless steel plumbing
- ◆ Longest life cycle in the industry
- ◆ Stainless steel drain

# Electrovert Aquastorm

## Custom and Special Cleaning

With over 50 years of innovation and process leadership in the cleaning industry, Electrovert is committed to developing new products and services for most cleaning applications. No matter what the cleaning requirement or challenge may be, please contact our experts to discuss a complete and effective solution.



## Chemical Isolation

Aquastorm's Chemical Isolation is an optional multi-section module that efficiently removes chemistry from the product prior to the rinse section. The majority of the chemistry is removed in the first section, which is close-looped back into the wash tank reservoir.

Chemical Isolation provides optimal process separation and minimizes chemistry consumption. Perforated rails, curtain containment, and a cabinet designed to manage wash solution within the system conserves costly chemistries. The wet chemical isolation module is powered by a recirculating rinse pump to ensure optimal prerinsing and to reduce chemistry dragout to the rinse module. Even the exhaust is separated between the wet and dry modules to minimize chemical migration through the system.



## Service and Support

All support functions including product development, R&D, software, and application support are located at the factory in Camdenton Missouri with an applications lab that includes one of every model of system produced by Electrovert. Our design and applications engineers are dedicated to working with our customers to ensure optimized cleaning processes are developed and supported. All cleaners are backed by our world-class support structure and twenty-four-seven technical support.

# Electrovert Aquastorm

The Aquastorm 200 Stainless Steel cleaning system with dual wash, dual chemical isolation and Torrid Zone dryer provides complete cleaning performance with fast throughput capability and optimal process flexibility.



## Aquastorm 200 Stainless Steel

As PCB designs move towards highly dense, increased complexity, and miniaturization, manufacturers are looking for solutions to increase product throughput and reliability. The Aquastorm 200SS cleaning system with dual wash, dual chemical isolation, and Torrid Zone drying is the total performance package providing fast throughput capability and optimal process flexibility.

### Dual Wash Cleaning

The Aquastorm 200SS is equipped with dual wash modules. This helps to significantly extend the dwell time in a heated wash environment, increases throughput capabilities, and offers dual chemistry process flexibility.

### Advantages of Dual Chemical Isolation

Aquastorm 200SS offers dual chemical isolation – an isolation section following each wash module. The benefit of chemical isolation is to reduce drag-out and take advantage of the dual wash system for dual chemistry capability. The Aquastorm's dual chemical isolation modules provides optimal separation between both wash and rinse sections. Aquastorm 200SS has the flexibility to run DI water only in Wash 1 and chemistry in Wash 2.

### Durable Stainless Steel Design

All wetted materials used within the process area of the Aquastorm 200SS are stainless steel. The durable stainless steel design allows operating temperatures in the wet sections of up to 180°F (82°C). Removable front and rear panels and hinged, tempered glass windows offer complete user accessibility and operational visibility.



## NEW High-Temperature Polypropylene for AS200

This new option uses heat stabilized polypropylene material that costs substantially less than stainless steel. It is able to withstand temperatures up to 180°F (82°C) which is the ideal temperature for optimal cleaning and drying performance. All plumbing and spray nozzles remain stainless steel.

# Aquastorm Series Specifications

Feature			AS200 SS	AS200	AS100	AS60	
Process	Process and Application		Straight DI and Chemistry	Straight DI and Chemistry	Straight DI and/or Chemistry	Straight DI and/or Chemistry	
Physical Characteristics	Material Type	Construction	S	Stainless Steel	Polypropylene	Polypropylene	
			O	NA	Stainless Steel	NA	
			O	NA	High Temp Polypropylene	NA	
	Plumbing		Seamless Welded Stainless Steel				
	Machine Dimensions	Length		31.75' (9.7 m)	Dual Dryer: 23.9' (7.3 m) Torrid Zone Dryer: 26.5' (8 m)	16' (4.9 m)	9.9' (3 m)
Width		72.6" (1.84 m)	59.8" (1.5 m)		56.6" (1.4 m)		
Height		51.3" (1.3 m)					
Conveyor, Loading and Handling	Conveyor	Loading Type		In-line Conveyor			
	Process Width	Maximum Product Width	S	20" (508 mm)		16" (406 mm)	
			O	24" (610 mm)		NA	
	Maximum Weight	Standard	S	1 lb/ft (0.45 kg)			
		Heavy Duty	O	10 lb/ft (4.5 kg)		NA	
	Throat Height, Product Clearance	Maximum Height	S	4" (101.6 mm)			
O			8" (203.2 mm) (does not apply for Stainless Steel construction)		NA		
O			12" (304.8 mm) (does not apply for Stainless Steel construction)		NA		
Operating Characteristics	Module Configuration	Pre Wash		Qty 1	Qty 1	Qty 1	Qty 1
		Wash		Qty 2	Qty 1	Qty 1	Qty 1
		Chemical Isolation		Qty 2	Qty 1 (Optional)	Qty 1 (Optional)	Qty 1 (Optional)
		Rinse		Qty 1	Qty 1	Qty 1	Qty 1
		Final Rinse		Qty 1	Qty 1	Qty 1	Qty 1
		Torrid Zone Dryer		Qty 2	Qty 2	Qty 1	NA
		Dual Dryer		NA	Qty 2	Qty 2	Qty 1
	Wash	Tank Capacity		110 gal (416 liter)	80 gal (303 liter)	80 gal (303 liter)	43 gallon (159 liter)
		Maximum Operating Temperature		180°F (82°C)	Polypro: 160°F (71°C) HTTP & St'stl: 180°F (82°C)	Polypro: 160°F (71°C)	Polypro: 160°F (71°C)
		Pump Size	S	10 HP	10 HP	10 HP	10 HP
	O		15 and 20 HP	15 and 20 HP	15 and 20 HP	NA	
	Rinse	Tank Capacity		110 gal (416 liter)	50 gal (189 liter)	Chemistry type 18 gal (68 liter)	43 gallon (159 liter)
		Pump Size	S	10 HP	10 HP	Chemistry type 2 HP	10 HP
	O		15 and 20 HP	15 HP			
	Dryer	Max Operating Temp	Dual Dryer w/ Optl. IR Heater	NA	160°F (71°C)	160°F (71°C)	160°F (71°C)
Torrid Zone Dryer			300°F (149°C)	300°F (149°C)	300°F (149°C)	NA	
User Interface and Controls	Easy User Interface and Controls		Windows based PC with keyboard and mouse, Ethernet based I/O				
Codes and Compliance	Codes and Compliance	S	UL Certified and Listed for Factory Automation Equipment is standard and included in the base machine on 440/480V systems.		NA		
		O	CE Labeled and Components in lieu of UL				
Country of Origin	Made in Camdenton, Missouri, USA		Factory based R&D, Software Development, Applications/Training and Engineering and 24/7 Technical Support				

See the Engineering Data Sheet for the full list of features and technical data.  
Contact the factory for requests to accommodate special applications and/or products.

O = Optional; S = Standard

ITW EAE is a division of Illinois Tool Works, Inc. It is a consolidation of all of its Electronic Assembly Equipment and Thermal Processing Technology. The group includes world-class products from MPM, Camalot, Electrovert (Speedline), Vitronics Soltec and Despatch.