



# TECHNICAL INFORMATION



## AQUBE<sup>®</sup> XH7 TZD

Ultra-fine high-end cleaning system for PCBAs with ToZero Discharge rinsing technology



# AQUBE® XH7 TZD

## CLEANING TECHNOLOGY

Made in Germany

Fully automatic high-end PCBA fine cleaning system with integrated ToZero Discharge rinsing technology

Cleans PCBAs, hybrids and misprints from flux residues, resin, copper, oxide and soldering support substances

Capacity: up to 522 equals 8.4 m<sup>2</sup> (90.4 sf<sup>2</sup>) eurocards in up to three variable drawer baskets

Part number: 0900AQ7XH-X

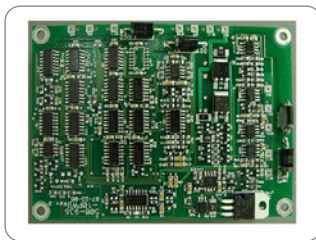


### Certifications:

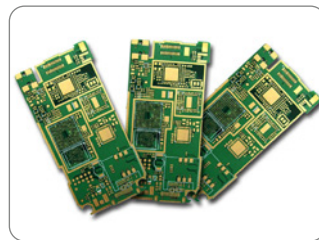
This system in its basic version was certified for its energy and water saving processing, for easy operability and for the standard integration of comprehensive safety features.

- \* Five-tank system with five separate circuits - saves up to 90% rinsing water
- \* Average process time: 65 min/cycle = approx. 7 s per eurocard
- \* Smart Factory ready: remote control, traceability (PLC data scanning and memorizing)
- \* Fully automatic 7-step process: cleaning, MediumWipe®, 3x TZD-rinsing (tap water), DI-/DM-clear rinsing, with integrated WPCL IU technology, VMH® TurboDigital hot air evaporative drying
- \* Horizontal PTFE-mounted rotor system with up to six ASYNCHRO® spray rotors for thorough wetting (no blind spots)
- \* Heater cleaning tank A, automatic water exchange for the rinsing circuit, DI-water system, DI-bypass processing, water measuring unit (ion contamination measurement), ion exchanger and fine filter systems as standard
- \* Processes and service intervals PLC controlled with event issuing and software control via touch screen
- \* Suitable for high temperature cleaning and rinsing up to 80 °C (176 °F)
- \* High capacity on a small footprint, fast and easy maintenance

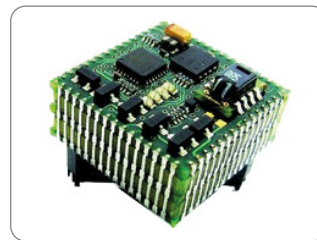
### Key applications



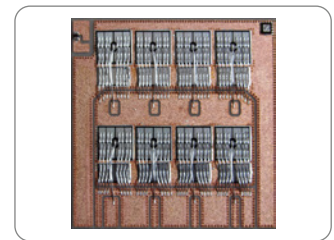
Assembled PCBs



Hybrids (HDIs)



Hybrids (SiPs)



DCBs

AQUBE® XH7 TZD is a fully automatic high-end ultra-fine cleaning system for assemblies/PCBAs, hybrids and DCBs with a capacity of up to 540 (8.6 m<sup>2</sup>/92.5 ft<sup>2</sup>) eurocards and a relative cleaning time of approx. seven seconds per card per cleaning cycle.

The configuration with a large process chamber, five tanks working in parallel with five separate circuits, up to 80°C cleaning temperature and up to 120 °C drying temperature, the system, equipped for the smart factory, ensures short cycle times.

In addition, the integrated TZD (ToZero Discharge) technology reduces rinsing water consumption by around 90 percent compared to a standard system. This also reduces the waste water disposal volume accordingly. This means a drastic reduction in operating and disposal costs while maintaining the same wash quality and making enormous savings on the vital resource of water.

**The cleaning system can be operated with all common electronics cleaning supplies (detergents/chemistry, etc.) which are approved by the manufacturer.**








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Fully automatic high-end PCBA fine cleaning system with integrated ToZero Discharge rinsing technology

Part number: 0900AQ7XH-X



## Application overview

				
<b>Most suitable</b>	<b>Not suitable</b>	<b>Optional suitable</b>	<b>Optional suitable</b>	<b>Not suitable</b>
PCBAs, Hybrids Power electronics Misprints	Stencils Screens Misprints (bare boards)	Solder frames Solder carriers Solder masks	ESD Boxes Containers Magazines	Condensation traps Filters Steel sheets

Optional suitable applications can also be optimally realized with the appropriate options.

**Cleaning** (key process 1): From the cleaning tank A (TA) the cleaner liquid is sucked by a magnetically coupled pump unit and routed with a controllable volume flow through a separate circuit into the PTFE-mounted ASYNCHRO® stainless steel spray rotors with special nozzles. Their geometry ensures a comprehensive and thorough cleaning, even in inaccessible and critical areas. After the washing procedure, the valve switchover of the process chamber undocks the cleaning circuit until the next process run.

**MediumWipe®** (optional intermediate process): The remaining cleaner is blown off from the clean products and blown out of the cleaner circuit and recirculated into the cleaning tank before the valve switchover closes.

**TZD rinsing with tap water** (key process 2): TZD rinsing uses three separate tanks with three separate circuits and a counter-cascaded water exchange process. The rinse water is pumped from the rinse tanks B (TB1, TB2, TB3) via the three circuits into the spray rotors. For information: tap water has the advantage of lower surface tension (compared to DI-/DM-water) and therefore rinses critical areas such as low-standoffs more effectively.

**MediumWipe®** (optional intermediate process): The remaining water is blown off from the products and blown out of the cleaner circuit and recirculated into the rinsing tank (TB).

**Clear rinsing with DI-/DM-water** (key process 3): The DI-/DM-water is produced and stored in an integrated WPCL IU water treatment unit made from city water in the rinsing tank (TC) and rinses off conductive ions from the upstream processes via a separate circuit. This process is repeated automatically until the programmed residual ion quantity is reached.

**MediumWipe®** (optional intermediate process): Blowing off and recirculating the remaining DI-/DM-water into the rinsing tank (TC).

**Drying** (key process 4): The clean products are dried with the patented VMH®-(Venturi Mixed Hot air) technology. A high volume flow of normal circulating air is blown into a venturi nozzle. The resulting differential pressure there (passively) sucks on a small amount of very high temperature air. The resulting air mixture provides for uniformly high drying temperature - adjustable between 45 and 120 °C (113 and 248 °F) - all over the process chamber. Further advantages are robustness and low cost of ownership. Energy is only needed for a fan and the heating of a very small amount of air; the rest is executed by pressure differences and air duct geometry.

**Maintenance:** The system has recessed removable panels for quick and easy maintenance. In the maintenance area among others are the pump-out set, the re-dosage unit with space for a 25-liter detergent container and an optional re-dosing unit for a 5 l additive container as well as the MB cartridge for DI-/DM-water processing. Tank levels as well as pressure values and maintenance cycles are monitored by the PLC and displayed on the touch screen.

Performance description of a fully equipped system. All rights for changes reserved that lead to technical improvement.

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## AQUBE® XH7 TZD



Fully automatic high-end PCBA fine cleaning system with integrated ToZero Discharge rinsing technology

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### Main standard features

- PowerSpray® technology bundle: magnetically coupled XL-Power (tank A) and S-Power (tanks B, tank C) pump units, lower VA drawer basket, twofold ASYNCHRO® volume-spray rotor system with low maintenance PTFE-mounted stainless steel rotors and special nozzles, "Option100" software program (100 freely selectable process programs)
- PolyPower® pump-nozzle configuration with power pump unit
- EATON Programmable Logic Controller (PLC) with module extension for special programming and technology extensions
- Smart Factory ready Premium: for remote control (see options) and traceability with retractable touch monitor and integrated industry PC (see options), Remote Maintenance Assistance (see options)
- High resolution 10" (1,024 x 600 px) display with multi-touch and intuitive process view
- Fourfold alternating LED status light bar integrated in the system frame
- Function package PCBA Cleaning (incl. option automatic water exchange for rinsing circuit/tank C with lifting unit, option heater cleaning tank (TA), function package DI water system (incl. DI-/DM-water measuring unit (residual ion contamination measurement), DI-bypass processing, ion exchanger cartridge, cartridge deaerator)
- Function package TZD Technology Rinsing - to reduce rinse water consumption to up to 90 % per cycle (incl. 3-tank cascade rinsing unit and function package WPCL IU Wastewater Recycling Unit)
- Full flow coarse filter (process chamber)
- Function package Fine Filter System Tank A (incl. XL-Power pump unit for the cleaning circuit, fine filter system for the cleaning tank A (TA))
- Fine filter for the rinsing circuit s/ rinsing tanks B (TB1, TB2, TB3)/rinsing tank C
- ClosedLoop reprocessing of cleaning and rinsing fluids
- Automatic re-dosage unit for 25 l detergent container
- VMH® TurboDigital hot air evaporative drying (control range approx. 45 - 120 °C/113 - 248 °F)
- ESD grounding point for the operating personnel
- Integrated VaporStop in the exhaust air unit
- Safety features: safety interlock on the process chamber door, overflow alarm for all tank sections, overheating protection for all heating and drying elements, end switches for all motor-driven valves and drives, personnel protection insulation
- Removable side doors for quick and easy maintenance
- Doors, cladding and hinges enclosed without edges, depot for traceability scanner and monitor in the side wall recessed
- Process sections made of electrolysis resistant elements



## AQUBE® XH7 TZD



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### Main options

- Function package High-Temperature Application (incl. process chamber heat insulation and In-VaporStop temperature stabilization)
- Function package WPSD IU Wastewater Treatment Unit (incl. WPSD IU SYMBIO® module, pH-lowering unit with pH measuring probe, pH re-dosing, control valves, two heavy metal adsorber cartridges, two cartridge deaerators)
- Function package Online Cleaner Regulation (incl. brix monitor for refraction measurement, automatic re-dosing of the cleaner, flow meter, dosing ball valve)
- Function package Traceability "Basic" (incl. SPC data scanner, data backup in CSV file, backup via SD card (via slot in the PLC))
- Function package Traceability "Comfort" (incl. PLC data scanner and retractable touch monitor and industrial PC with Intel processor)
- Function package QuickChange (incl. SlideIn quick-loading feeder unit, upper wash basket with PTFE-mounted ASYNCHRO® TopDown stainless steel double rotors with special nozzles and SpeedLoad cart to accommodate of two feeder units)
- Automatic re-dosage unit for 5 l additive container
- Decalcification unit for reducing the lime content in the rinsing water (tap water) circuit/rinsing tank B (TB)
- Air filter unit for filtering the drying air according to filter class F7
- MediumWipe® unit for further optimization of detergent and rinsing fluid use
- Upper & middle VA drawer basket with PTFE-mounted ASYNCHRO® stainless steel TopDown-double rotors with special nozzles
- Permanent automatic rotor run control
- QuickConnect rotor quick-clamping system for fast insertion or removal of the rotors
- Remote control (browser-based control/monitoring via mobile device or PC)
- RMA Remote Maintenance Assistance (factory-controlled maintenance support)
- Paint of choice (frame rack, coverings and hood)
- XXL pump unit for the cleaning circuit/cleaning tank A (TA)t



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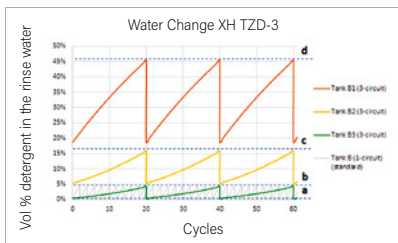
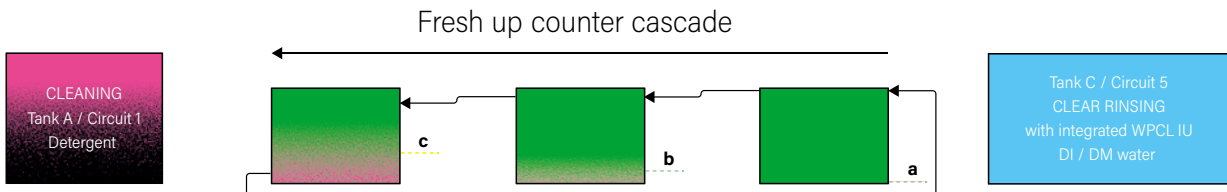
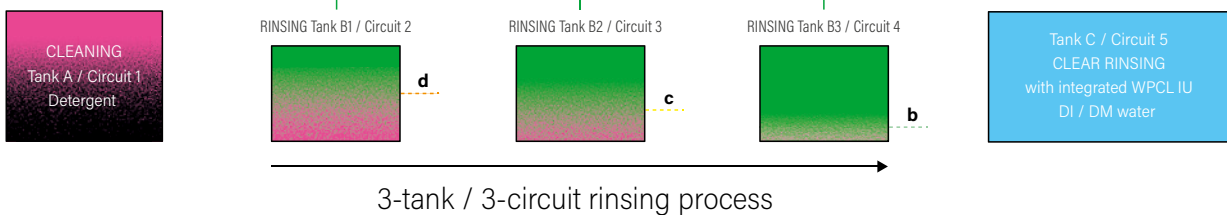


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## TZD (Zero Discharge) rinse water processing

Tank configuration **kolb** AQUBE® XH-systems with TZD Technology (5 tanks)



**up to 90 % LESS  
RINSE WATER  
PER CYCLE**

- Rinse (tap) water
- Detergent
- Rinse (DI / DM) water
- Dissolved contamination

## Further option for water management\*

### WPSD IU SYMBIO® module

Processes mandatory disposable sewage water to be discharged into a public sewage network

\* Operating companies of industrial cleaning systems are responsible for proper disposal of wastewater/rinse water and (wasted) cleaning detergent. Further information on wastewater management at [www.kolb-ct.com/systems/water-management/](http://www.kolb-ct.com/systems/water-management/), consulting requests to [info@kolb-ct.com](mailto:info@kolb-ct.com)



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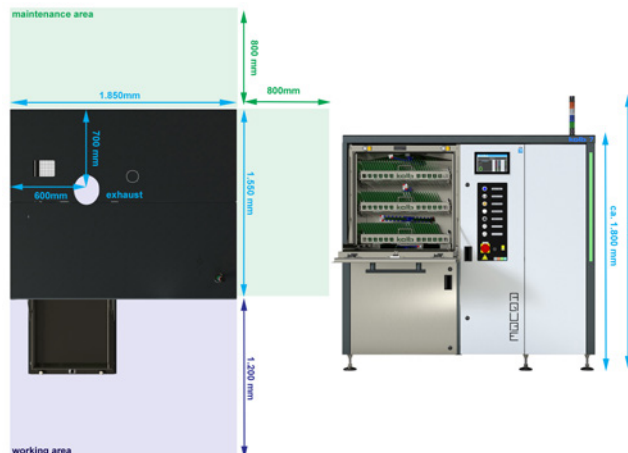
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## Technical data

Technology base	<b>kolb PowerSpray®</b>
Capacity	522 equals 8.4 m <sup>2</sup> (90.4 sf <sup>2</sup> ) eurocards
Process chamber dimensions	W 700 ▪ D 720 ▪ H 710 ▪ mm (W 27.55" ▪ D 28.34" ▪ H 27.95")
Usable space lower basket only	W 620 ▪ D 620 ▪ H 620 mm (W 24.6" ▪ D 24.6" ▪ H 24.4")
Usable space utilizing two baskets	W 620 ▪ D 620 ▪ H 270 mm (W 24.6" ▪ D 24.6" ▪ H 10,6") - two times
Usable space utilizing three baskets	W 620 ▪ D 620 ▪ H 150 mm (W 24.6" ▪ D 24.6" ▪ H 5,9" ) - three times
Volume tank A (cleaning),	95 l
Volume tanks B1/B2/B3 (rinsing)	65 l/65 l/65 l
Volume tank C (DI-/DM-rinsing)	105 l
Electrical supply/Power consumption	400 V AC, 16 A, CEE plug - 3 Ph - 50 or 60 Hz/8.3 kW
Control system	PLC (EATON)
Max. cleaning temperature*	up to 80 °C (176 °F) - *max. temperature load for the tank circuits
Control range drying	approx. 45 - 120 °C (113 - 248 °F)
Filter system	1. Full flow coarse filter < 2mm (0.08"), 2. 20" fine filter (1 - 100 µm - process dependent)
Supply connection 1 (tap water)	> 18 °C, 1/2" hose with 30µm water filter (on-site inlet water quality, pressure 3 - 4 bar, < 250 - 350 µS conductivity (< 10° dH) or descaling unit option. Do not use a softening/soft water system in the inlet)
Supply connection 2 (DI/DM water)	> 18 °C, 1/2" hose with 30µm water filter (DI-net provided by customer or bridging to tap water)
Supply connection 3 (compressed air)	6 - 8 bar (87 - 116 psi) - 100 l/min for option MediumWipe®, connection for 8 mm (0.31") compressed air hose
Rinse water drain connection	(with integrated pump-out system) connection for 1" hose
Exhaust connection	Ø 160 mm (6.3"), exhaust capacity 200 - 300 m <sup>3</sup> /h (7,063 - 10,595 ft <sup>3</sup> /h)
Footprint/Empty weight/Operating noise	W 1,850, D 1,550 mm (W 72.9", D 61")/790 kg (1,742 lbs)/63 dB(A)



Performance description of a fully equipped system. All rights for changes reserved that lead to technical improvement.

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