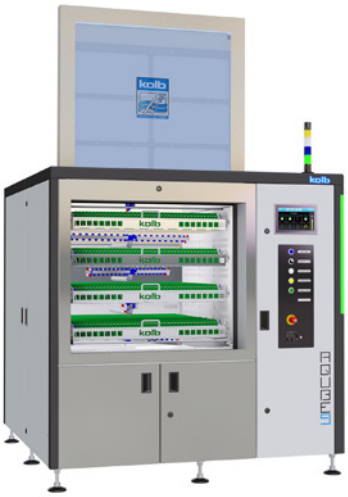
AQUBE® XH9



PowerSpray® · VMH®Drying · ClosedLoop · DNAcces · Traceability

SFr Smart Factory ready

Fully automatic high end 3-tank, 3-circuit PowerSpray® XXL ultra-fine cleaning system for cleaning of assembled PCBs

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

Capacity: up to 830 (19 m^2) eurocards in up to two variable drawer baskets

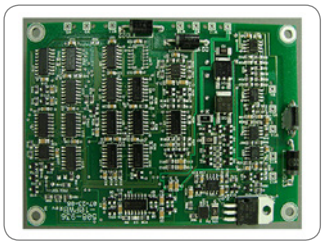
Part number: 0905AQ9XH31 / 0905AQ9XH41 (HT version)

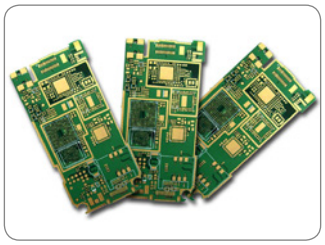
ENERSAVE · WATERSAVE · EASOTECH · SAFEGAR

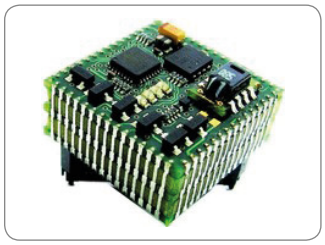
Certifications:
This system in its basic version was certified for its energy and water saving processing, for easy operability and for the standard integration of comprehensive safety features.

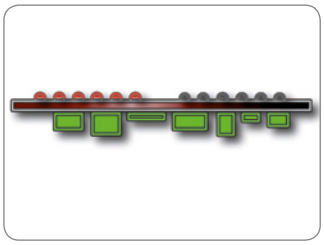
- Three tank system with three separate circuits
- Intelligent network connectivity for implementation in industry 4.0 smart factories
- Fully automatic 4step (optional up to 5step) process: cleaning, (MediumWipe®), rinsing (tap water), DI-water rinsing, VMH®-TurboDigital evaporative drying
- 6.5 seconds relative cycle time for the cleaning, rinsing and drying of one eurocard
- Horizontal PTFE mounted rotor system with up to eight asynchronous spray rotors for thorough wetting (no blind spots)
- Automatic monitoring of ionic residues contamination and controlling of rinse water quality
- Process and service intervals PLC controlled, event issuing and software control via touch screen
- EDGELESS design and VARIccess® maintenance access: maximum capacity on a very small footprint
- HT version for high temperature cleaning and rinsing up to 80 °C available

Key applications


Assembled PCBs


Hybrids (HDIs)


Hybrids (SiPs)


Misprints

The new **kolb** AQUBE® series offer next-generation cleaning systems - even more efficient, even more compact, easy to handle and maintain, pre-equipped for extended water management and cyber-physically ready for the smart factory.

AQUBE® XH9 is a completely German engineered and manufactured fully automatic XXL high volume PCB ultra-fine cleaning system with by far the largest process chamber in a PCB cleaning batch system worldwide and thus with higher capacity per time than even any common inline system: (860 / 19m² eurocards in one cleaning cycle, corresponding to a relative cleaning time of 6.5 seconds per card).

The three-tank, three-circuit configuration ensures very short cycle times, low running costs and makes this system the perfect economic choice for the precision mass cleaning of assembled PCBs.

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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AQUBE® XH9

Fully automatic high end 3-tank, 3-circuit PowerSpray® XXL ultra-fine cleaning system for cleaning of assembled PCBs

Part number: 0905AQ9XH31 / 0905AQ9XH41 (HT version)

Application overview

Most suitable	Optional suitable	Optional suitable	Optional suitable	Not suitable
Assembled PCBs	Stencils	Solder frames	ESD Boxes	Condensation traps
Hybrids	Screens, PumpPrints	Solder carriers	Containers	Filters
Misprints	Misprints	Solder masks	Magazines	Steel sheets

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

Cleaning (key process 1): From the cleaning tank (A) 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 patented PUSHFORCE® nozzles. Their geometry ensures a comprehensive and thorough cleaning, even in inaccessible and critical aereas. 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.

Rinsing with tap water (key process 2): From the first rinsing tank (tank B), the water is pumped through the separate second circuit into the spray rotors. Tap water has (compared to DI / DM water) the advantage of lower surface tension and thus flushes also critical points as low standoffs more efficient.

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.

Clear rinsing with DI / DM water (key process 3): The DI / DM water is produced in an integrated MB-cartridge from tap water and kept in the second rinsing tank (tank C). Through the third cycle it flushes conducting ions of the preliminary processes. This process is repeated automatically until the remaining amount of ions falls below the programmed value.

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

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) 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 a VARIccess® maintenance access system with recessed, variable doors and removable panels. In the maintenance area among others are the pump-out set, the optional re-dosage unit with space for a 25 liter detergent and 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.

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Fully automatic high end 3-tank, 3-circuit PowerSpray® XXL ultra-fine cleaning system for cleaning of assembled PCBs

Part number: 0905AQ9XH31 / 0905AQ9XH41 (HT version)

Main standard features

- PowerSpray® technology bundle: magnetically coupled pump unit, twofold ASYNCHRO® volume-spray rotorsysterm with low maintenance PTFE mounted stainless steel rotors with PUSHFORCE® nozzles, "Option101" softwareprogram (101 freely selectable programs)
- PolyPower® XL configuration with XL-Power pump unit
- EATON Programmable Logic Controller (PLC) with module extension for special programming and technology extensions
- Smart Factory ready: DNAccess® (standard) for remote control (see options) and traceability with retractable touch monitor and integrated industrial PC (see options)
- High resolution 10" (1.280 x 800 px) display with capacitative multi-touch and intuitive process view
- Electrically driven large double-wall airlock door: transparent or process-related with internal pane made of stainless steel
- Fourfold alternating LED status light bar integrated in the system frame
- Lower VA drawer basket, ESD-safe with grounding connection for the operator
- Cartridge fine filter for cleaning and both rinsing circuits
- Full flow coarse filter (process chamber)
- Heater for tank A (cleaning)
- Automatic monitoring of ionic residues contamination and gauging of rinse water quality
- Adjustable DI / DM water mixing and blending unit
- VMH® TurboDigital hot air evaporative drying (control range approx. 45 - 120 °C)
- ClosedLoop reprocessing of cleaning and rinsing fluids
- HMA software and pre-equipping for HMA hardware (Heavy Metal Adsorber) for the cleaning circuit (see options)
- Spare space for MB- / DI-cartridge for deionized (DI) and demineralized (DM) water
- Exchange for rinse water and pump out 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
- VARIccess® service access with right and left-hinged side doors as well as unhinging possibility for side doors, front panel, and rear supply rail
- EDGELESS housing design. Doors, cover panels and hinges without edges, depot for traceability scanner and monitor in the right side panel
- Process sections made of electrolysis resistant elements

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Part number: 0905AQ9XH31 / 0905AQ9XH41 (HT version)

Main options

□	Automatic re-dosage unit for 25 l detergent and 5 l additive container
□	Automatic water change for cleaning circuit (only HT version)
□	Descaling unit to reduce the lime content in the rinsing water
□	Drip & storage reservoir
□	Exhaust unit
□	HMA filter (Heavy Metal Adsober) unit for the cleaning cicuit
□	HT Version for high temperature cleaning up to 80 °C
□	MB / DI cartridge for deionized (DI) and demineralized (DM) water
□	MediumWipe® unit for further optimization of detergent and rinsing fluid use
□	Optional lacquering (frame rack and coverings)
□	Permanent automatic rotor run control
□	Remote Control (remote monitoring, mailing, etc.)
□	Sediment filter (tank A)
□	Speed load cart (reduces downtime for loading by more than 75%)
□	Status light fivefold to display the current process state
□	Traceability unit with PLC data scanner and retractable touch monitor and industrial PC with Intel processor
□	Upper VA drawer baskets with ASYNCHRO® PTFE mounted stainless steel TopDown-double rotors with PUSHFORCE® special nozzles

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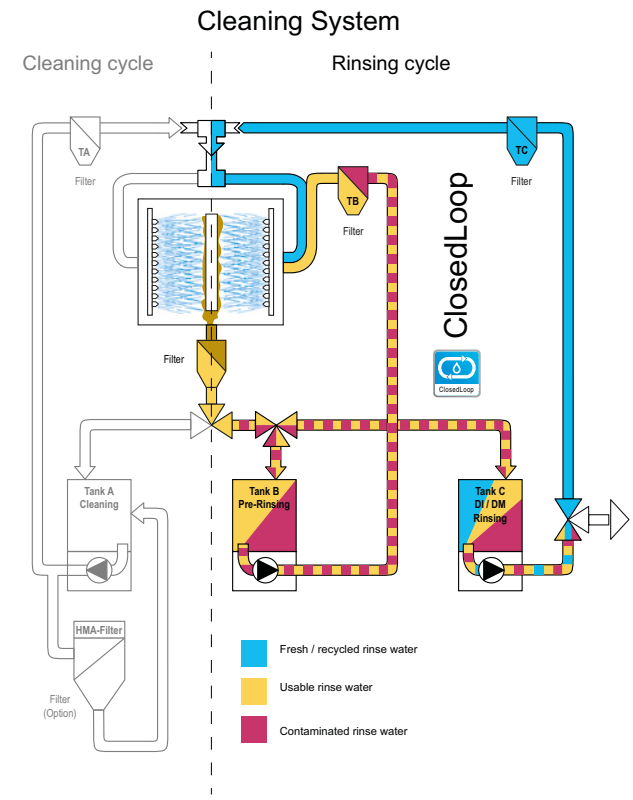
Internal rinse water processing (standard)



Options for water management

WPSD IU SYMBIO-module
Processes mandatory disposable sewage water to plublic sewage network inroducable rinse water.

WPSD 200 system
Processes mandatory disposable sewage water from up to three cleaning systems to plublic sewage network inroducable rinse water.

WPSD 500 system
Processes mandatory disposable sewage water from up to five cleaning systems to plublic sewage network inroducable rinse water.

WPCL IUT3 SYMBIO-module
Recycles DI / DM water for recirculation and multiple reuse in the cleaning system clear rinsing cycle.

WPCL 330 system
Recycles DI / DM water for recirculation and multiple reuse in the cleaning system clear rinsing cycle.

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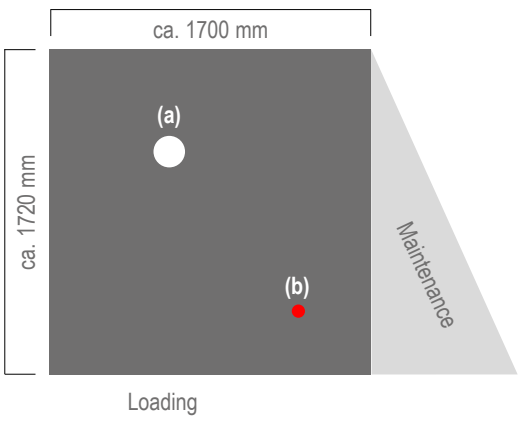
Fully automatic high end 3-tank, 3-circuit PowerSpray® XXL ultra-fine cleaning system for cleaning of assembled PCBs

Part number: 0905AQ9XH31 / 0905AQ9XH41 (HT version)

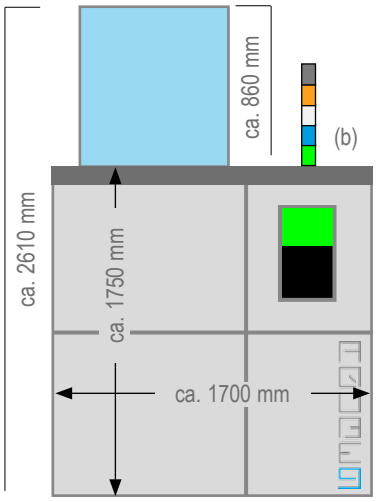
Technical data

Technology base	**kolb** PowerSpray®
Capacity	830 (19 m²) eurocards
Process chamber dimensions	W 970 ▪ D 955 ▪ H 900 mm
Usable space lower basket only	W 880 ▪ D 890 ▪ H 760 mm
Usable space utilizing four baskets	W 880 ▪ D 890 ▪ H 150 mm (four times)
Volume tank A (cleaning), B / C (rinsing)	approx. 100 - 125 l each
Power supply	400 V AC, 32 A CEE / 3PH / 50 or 60 HZ
Power consumption	approx. 18 kW
Control system	PLC (EATON)
Temperature load	up to 55 °C (standard system), up to 80 °C (HT-version)
Control range drying	approx. 45 - 120 °C
Filter system	up to four stage - 1. Full flow coarse filter < 2 mm, 2. Sediment filter inside the tank, 3. 20“ fine filter (1 - 100µm - process dependent), 4. HMA filter
Supply connection 1 (tap water)	3/8", hose connection 14 mm (prov. by customer: inlet water quality < 350 µS conductance value (< 10° dH) or option descaling unit)
Supply connection 2 (DI / DM water)	1/4", hose connection 14 mm (DI-net prov. by customer or bridging to tap water)
Supply connection 3 (compressed air)	6 - 8 bar (100 l / min) for HT version or optional MediumWipe® process
Rinse water drain connection	3/4", hose connection 25 mm with integrated pump out system
Exhaust connection	Ø 160 mm, exhaust capacity 200 to 300m³ / h
Footprint	1.700 x 1.720 mm
Operating noise	63 dB (A)
Empty weight	920 kg

Top view:
Space requirement cleaning system
(a) = Exhaust 160 mm
(b) = Status light



Front view:
with optional status light (b)



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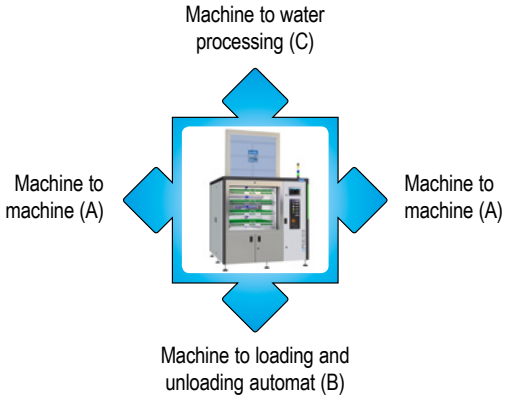
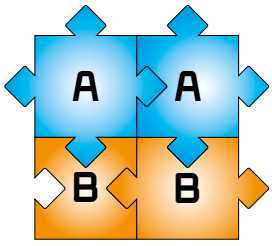
kolb CleaninGrid® Technology

AQUBE® XH9 systems are suitable for use in a **kolb** CleaninGrid® plant. The **kolb** CleaninGrid® technology is an intelligent combination and integration of cleaning, loading, water treatment and control systems to large-scale facilities for the efficient mass cleaning of assemblies, tools and machine parts. The CleaninGrid® technology is completely flexible, constructively easy to execute and based on three connection availabilities:

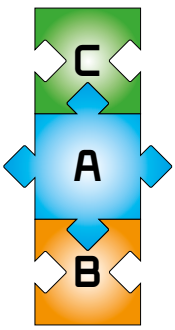
- Machine (A) to machine (A)
- Machine to loading / unloading automat (B)
- Machine to water processing system (C)





Example configuration:
Two AQUBE® XH9 systems, two loading and unloading units.
Capacity:
Appr. 8300 eurocards (per 8 hour shift)
Appr. 25.000 eurocards (per 24 hour operation)

Large installations and comprehensive washing plants
From just connecting two systems together to fulfill moderately growing volume requirements to building a complete washing center for quantities of multi-thousands of boards per day und evaporator water processing, the mutable **kolb** CleaninGrid® technology leaves all options.



Example configuration:
AQUBE® XH9 system with loading and unloading unit and **kolb** vacuumdistiller for 100% recycling of rinse water.
Capacity:
830 eurocards per cycle (appr. 6,5 sec. per board)

The main advantages of the kolb CleaninGrid® technology:

- Much higher throughput than any conventional inline installation (a single AQUBE® XH9 batch system already exeeds the capacity of one average inline system).
- Shorter cycle times per board than any PCB cleaning system on the market.
- Extremely lower power consumption compared to any system or installation on the market with a comparable capacity.
- Significantly lower operating costs compared to any conventional inline system with a comparable capacity.
- The complete installation out of one hand.

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