AQUBE® MH9

Fully automatic state of the art PowerSpray® XXL "allround" cleaning system for all kinds of parts and maintenance cleaning

Fully automatic state of the art PowerSpray® XXL "allround" cleaning system for tools and maintenance cleaning

Capacity: 14 carriers up to 950 x 750 mm (37.5“ x 29.5“), boxes / racks up to 970 x 955 x 900 mm

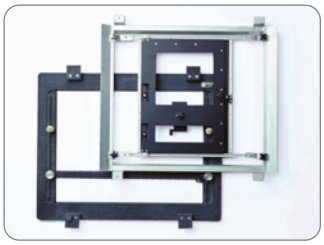
Part number: 0900AQ9MH21

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.

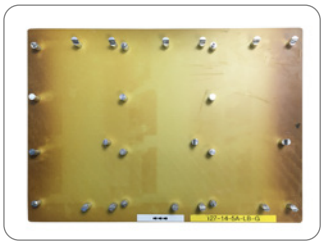
- Two tank system with triple circuit function
- Intelligent network connectivity for implementation in industry 4.0 smart factories
- Fully automatic 3step (optional up to 5Step): cleaning, rinsing (tap water), VMH®-Digital hot air evaporative drying
- Horizontal PTFE mounted rotor system with asynchronous spray rotors for thorough wetting (no blind spots)
- ClosedLoop reprocessing of cleaning and rinsing fluids as standard feature
- Processes and service intervals PLC controlled
- Event issuing and software control via touch screen
- EDGELESS Design and VARIccess® service access: maximum capacity, easy maintenance on a very small footprint
- Suitable for high temperature cleaning and rinsing up to 80 °C (176 °F)

Key applications


Solder frames, carriers


ESD boxes, magazines


Machinery / medical parts


Conformal coating carriers

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® MH9 is a XXL "allround” cleaning system with a super large process chamber or almost every requirement of tools and maintenance cleaning such as the cleaning of carriers, filters, containers and parts from flux residues, oil dust and grease.

The two-tank and up to three circuits configuration ensures short cycle times and makes this system the perfect economic choice for the maintenance cleaning in electronics production. With up to 80 °C (176 °F) cleaning and 100 °C (212 °F) drying temperature also ideally suited for parts cleaning of medical equipment, use in the production of medical electronics and also perfectly suited for the **kolb** coating cleaning / paint stripping turn key solution (machine, detergent, process design, software).

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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Application overview

Optional suitable	Optional suitable	Most suitable	Most suitable	Optional suitable
PCBAs, Hybrids	Stencils	Solder frames	ESD Boxes	Condensation traps
Power electronics	Screens	Solder carriers	Containers	Filters
Misprints (mounted)	Misprints (bare boards)	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 (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 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 (TA) before the valve switchover closes.

Drying (intermediate process only relevant for paint stripping processes): Process description under key process 3.

Rinsing with tap water (key process 2): From the rinsing tank B/C (TB/C), 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 (TB/C).

Clear rinsing with DI / DM water (optional process): The DI / DM water is produced from tap water in an integrated MB-cartridge and flushes conducting ions of the previous 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 3): 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 100 °C (113 and 212 °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 a VARIccess® maintenance access system with recessed, variable doors and removable panels. 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.

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Main standard features

- PowerSpray® technology bundle: magnetically coupled XXL-power (tank A) and X-Power (tank B/C) pump units, twofold ASYNCHRO® volume-spray rotorsystem with low maintenance PTFE mounted stainless steel rotors with PUSHFORCE® nozzles, "Option100" softwareprogram (100 freely selectable programs)
- PolyPower® XL pump-nozzles configuration
- 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" (1,024 x 600 px) display with capacitive multi-touch and intuitive process view
- Fourfold alternating LED status light bar integrated in the system frame
- Electrically driven large double-wall airlock door: transparent or process-related with internal pane made of stainless steel
- Full flow coarse filter (process chamber)
- ClosedLoop reprocessing of cleaning and rinsing fluids
- Automatic re-dosage unit for 25 l detergent container
- Automatic water change for rinsing circuit / tank B/C with lfting unit
- VMH®-Digital evaporative drying (control range approx. 45 - 100 °C / 113 - 212 °F)
- Ø 160 mm exhaust air and vapor extraction unit
- Washing cart for solder frames
- ESD grounding point for the operating personnel
- Spare space for DI / DM cartridge
- 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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Main options

□	Function package high-temperature application (incl. process chamber thermal insulation, VapourStop, temperature stabilization and Ø 250mm 3Step XL chamber extraction with extraction control and tube fan to reduce cooling time)
□	Function package DI Water System (incl.DI / DM water measuring unit, (residual ion contamination measurement), mixing / blending unit, ion exchanger cartridge, cartridge deaeration)
□	Function package Fine Filter System Tank A (incl. XXL-Power pump unit for the cleaning circuit, fine filter system for the cleaning tank A (TA)
□	Function package Fine Filter System Tank B/C (incl. upgrade to XL-Power pump unit for the rinsing circuit, fine filter system for the rinsing tank B/C (TB/C)
□	Function package Online Cleaner Regulation (incl. brix monitor for refraction measurement, automatic re-dosing of the cleaner, flow meter, dosing ball valve)
□	Function package WPSD IU Wastewater Treatment Unit (incl. WPSD IU9 SYMBIO® module, pH-lowering unit with pH measuring probe, pH re-dosing, control valves, two heavy metal adsorber cartridges, two cartridge deaerators)
□	Function package Traceability "Basic" (inc. 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)
□	Automatic re-dosage unit for 5 l additive container
□	Automatic water change for cleaning circuit
□	Decalcification unit for reducing the lime content in the rinsing water (tap water) circuit / rinsing tank B (TB)
□	Desealing filter insert for coating cleaning / paint stripping processes
□	Heater for cleaning tank A (TA)
□	Air filter unit for filtering the drying air according to filter class F7
□	MediumWipe® unit for further optimization of detergent and rinsing fluid use
□	Remote control (browser-based control / monitoring via mobile device or PC)
□	RMA Remote Maintenance Assistance (factory controlled maintenance support)
□	Drawer inserts for container and machinery parts cleaning, ESD safe
□	Drawer inserts for horizontal stencil cleaning with ASYNCHRO® stainless steel TopDown rotors with PUSHFORCE® nozzles
□	Paint of choice (frame rack, coverings and hood)
□	XL-Power pump unit for the rinsing tank B/C (TB/C)

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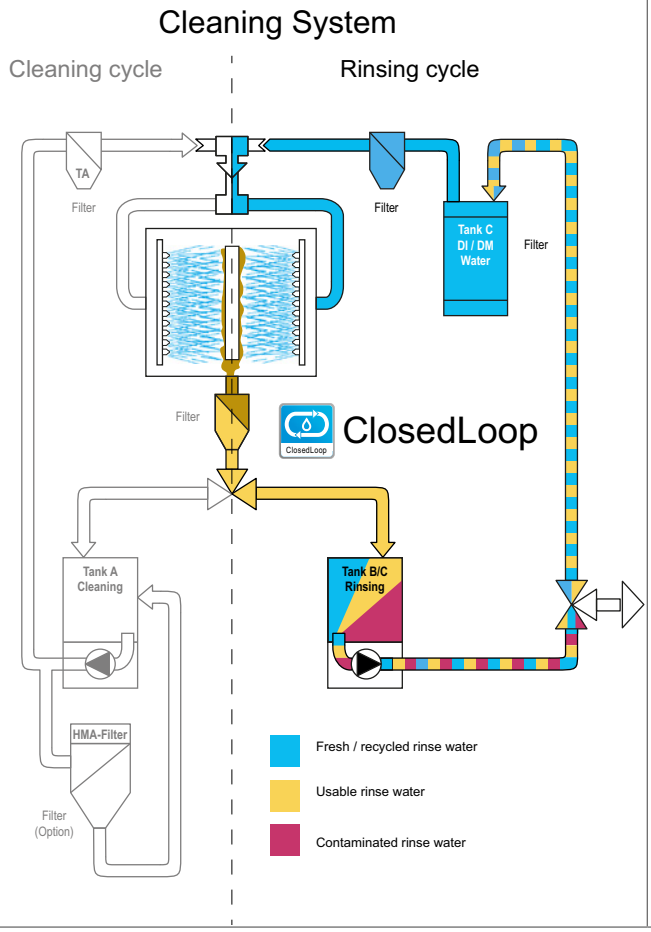
Internal rinse water processing (standard)



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/, consulting requests to info@kolb-ct.com

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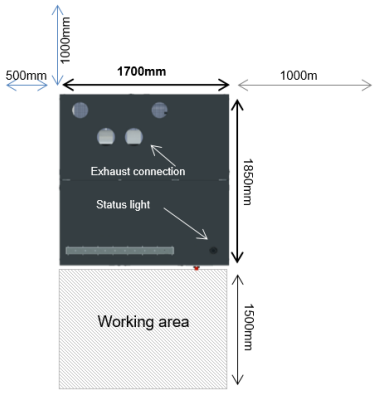
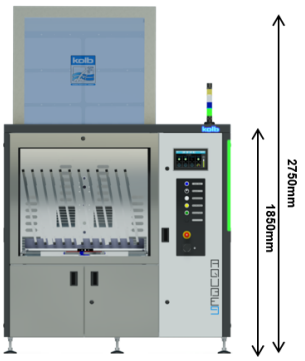
Technical data

Technology base	**kolb** PowerSpray®
Capacity per process cyle	14 carriers up to 950 x 750 mm (37.5“ x 29.5“) in the washcart, boxes / racks up to 970 x 955 x 900 mm or up to four drawer baskets for small parts, filters
Process chamber dimensions	W 970 ▪ D 955 ▪ H 900 mm (W 38.18" ▪ D 37.59" ▪ H 35.43")
Usable space using wash cart	W 970 ▪ D 905 ▪ H 810 mm (W 34.65" ▪ D 35.62" ▪ H 31.88")
Usable space utilizing four drawers baskets	W 880 ▪ D 890 ▪ H 150 mm (W 34.65" ▪ D 35.04" ▪ H 5.9") four times
Volume tank A (cleaning), B / C (rinsing)	125 l each
Power supply	400 V AC, 32 A, CEE plug / 3 Ph / 50 or 60 Hz
Power consumption	approx. 7.5 / 10* kW - (*with option heater tank A)
Control system	PLC (EATON)
Temperature load	up to 80 °C (176 °F)
Control range drying	approx. 45 - 100 °C (113 - 212 °F)
Filter system	up to four stage - 1. Full flow coarse filter < 2mm (0.08"), 2. Sediment filter inside the tank, 3. 20“ fine filter (1 - 100µm - process dependent), 4. HMA filter
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 (compressed air)	6 - 8 bar (87 - 116 psi) - 100 l / min for options HT-version or 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 > 1,100 m^3 / h (38,847 ft^3 / h)
Operating condition room temperature	20 - 35 °C (68 - 95 °F)
Operating noise / Footprint / Empty weight	63 dB (A) / 1,700 x 1,850 mm (66.9" x 72.8") / 920 kg (2,028 lbs)

Top view



Front view

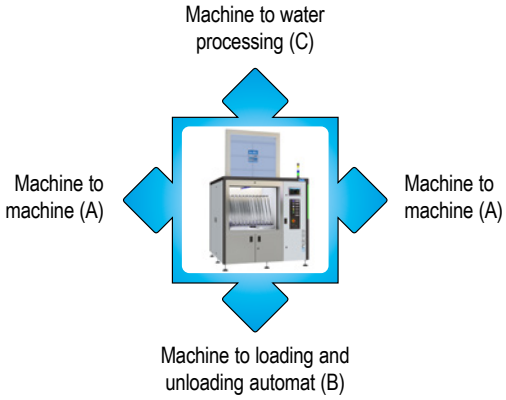


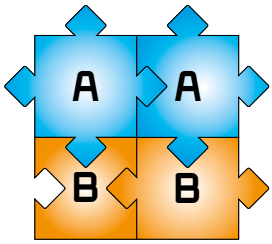
- Recommended maintenance area
- Space for connections

kolb CleaninGrid® Technology

AQUBE® MH9 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:

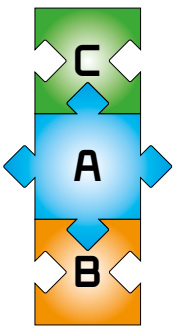
- Machine (A) to machine (A)
- Machine to loading / unloading automat (B)
- Machine to water processing system (C)





Example configuration:
Two AQUBE® MH9 systems, two loading and unloading units.
Capacity:
Approx. 900 solder carriers (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® MH9 system with loading and unloading unit and **kolb** vacuum distiller for 100% recycling of rinse water.
Capacity:
28 solder carriers per cycle

The main advantages of the kolb CleaninGrid® technology:
- ✶ Very high throughput
- ✶ Very short cycle times.
- ✶ 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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