



TECHNICAL INFORMATION



AQUBE[®] MH9

Superlarge fully automatic "all-round" tools and parts cleaning system



AQUBE® MH9

CLEANING TECHNOLOGY

Made in Germany

Superlarge fully automatic PowerSpray® "all-round" system for tools and maintenance cleaning

Cleans solder carriers, solder frames, coating carriers, ESD boxes, PCB magazines, pallets, machine parts and small parts

Capacity: 28 carriers up to 750 x 950 mm (29.5" x 37.5") using the washing cart use or up to four washing drawers

Part number: 0900AQ9MH-2

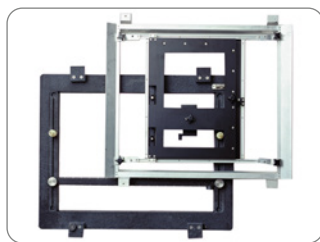


Certifications:

This system in its basic version is 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
- * Average process time: 60 min/cycle = approx. 2 min per carrier
- * Intelligent network connectivity for implementation in industry 4.0 smart factories
- * Fully automatic 3-step process: cleaning, rinsing (tap water), VMH®-Digital hot air evaporative drying
- * Horizontal PTFE-mounted rotor system with ASYNCHRO® 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
- * Suitable for high temperature cleaning and rinsing up to 80 °C (176 °F)
- * High capacity, fast and easy maintenance

Key applications



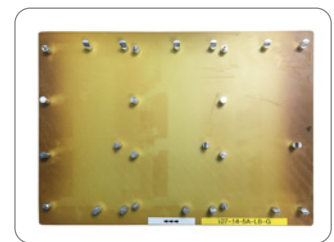
Solder frames, solder carriers



ESD boxes, magazines



Machinery parts



Conformal coating carriers

The AQUBE® MH9, designed and manufactured entirely in Germany, is a state of the art "all-round" state of the art cleaning system with PowerSpray® technology developed for almost all tool cleaning requirements of an electronics production - e.g. for tools, carriers and containers contaminated with flux, oil, dust and grease. The system with a super large cleaning chamber, ClosedLoop rinsing water treatment and a configuration of two tanks and triple circuit function ensures short throughput times and makes this machine the perfect choice for economical tools and maintenance cleaning in electronics production. With cleaning temperatures of up to 80 °C and drying temperatures of up to 120 °C, it is also ideally suited for the kolb complete solution (machine, cleaner, process design, software) for cleaning/paint stripping of conformal coating carriers.

The compact, easy-to-operate and easy-to-maintain system is Smart Factory ready and pre-equipped for extended water management.

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 Power electronics Misprints	Stencils Screens Misprints (bare boards)	Solder frames Solder carriers Coating carriers	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 (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. For information: 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 in process cycle TC conducting ions of the previous processes. This process is repeated automatically until the remaining amount of ions falls below the programmed value.

MediumWipe® (option. 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 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.



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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 rotor system with low maintenance PTFE-mounted stainless-steel rotors with special nozzles, "Option100" software program (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 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
- 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 lifting unit
- VMH®-Digital evaporative drying (control range approx. 45 - 100 °C/113 - 248 °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
- 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



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Main options

- Function package high-temperature application (incl. process chamber thermal insulation, In-VaporStop, 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" (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)
- Automatic re-dosage unit for 5 l additive container
- Automatic water exchange 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 special 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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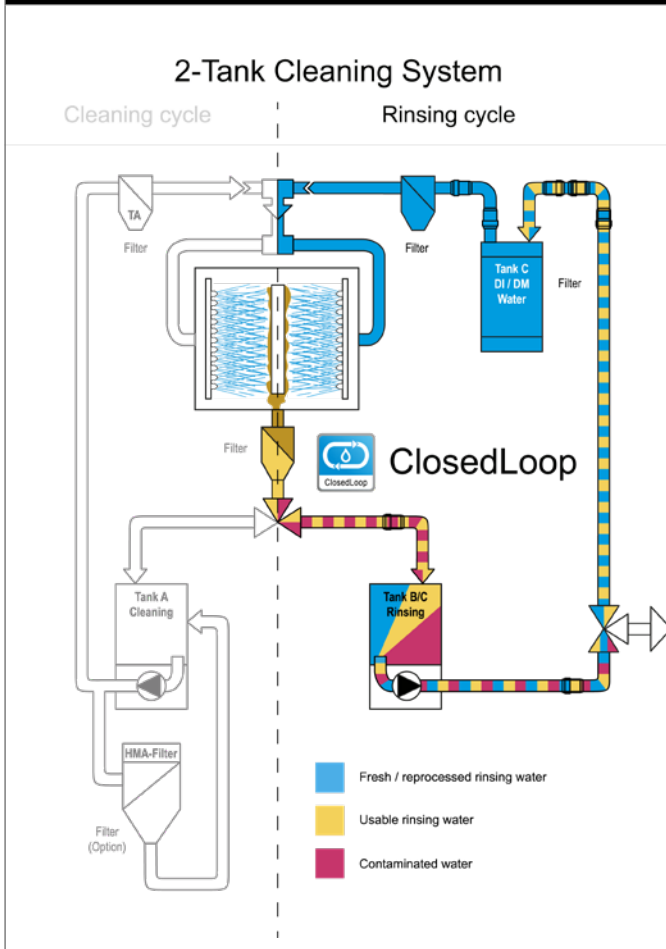
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Internal rinse water processing (standard)

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 cycle	28 carriers up to 750 x 950 mm (29.5" x 37.5") using washing cart or up to four washing drawers for small items, filters etc.
Process chamber dimensions	W 970 ▪ D 955 ▪ H 900 mm (W 38.18" ▪ D 37.59" ▪ H 35.43")
Usable space using wash cart	D 950 ▪ H 750 mm (D 37.5" ▪ H 29.5")
Usable space utilizing four drawers baskets	D 890 ▪ H 140 mm (D 35" ▪ H 5.51") - four times
Volume tank A (cleaning)/ tank B/C (rinsing)	125 l/125 l
Electrical supply/ Power consumption	400 V AC, 32 A, CEE plug/3 Ph/50 or 60 Hz/12.5 kW
Control system	PLC (EATON)
Max. cleaning temperature*	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 - 100µm - process dependent)
Supply connection 1 (tap water)	> 18 °C, 1" 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" hose with 30µm water filter (DI-net provided by customer or bridging to tap water)
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 m³/h (38,847 ft³/h)
Operating condition room temperature	20 - 35 °C (68 - 95 °F)
Foot print/Empty weight/Operating noise	W 1,700, D 1,850 mm (W 66.9", D 72.8")/940 kg (2,072 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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