

HEATED ULTRASONIC CLEANER



Heated Ultrasonic Cleaner - ToronUC™ H Series

ToronUC™ H Series Heated Ultrasonic Cleaner is a professional-grade, mid-capacity industrial ultrasonic cleaner purpose-designed for workshops, automotive service operations, dental laboratories, manufacturing quality control stations, and maintenance facilities requiring powerful, reliable ultrasonic cleaning in tank sizes of 13 and 36 liters.

Available in two models — ST13A/B (13L) and ST36A/B (36L) — the H Series features dual-frequency operation at either 28 kHz or 40 kHz, giving operators the ability to select the optimal ultrasonic frequency for their cleaning task. The lower 28 kHz frequency generates larger, more energetic cavitation bubbles suited to heavy-duty industrial ultrasonic parts cleaner applications such as degreasing machined components, cleaning automotive parts, and serving as an ultrasonic carburetor cleaner for fuel system service. The higher 40 kHz frequency delivers finer, denser cavitation appropriate for precision parts, dental instruments, and ultrasonic jewelry cleaner applications where surface finish preservation is critical.

The ultrasonic power output is continuously adjustable from 0% to 100% of rated power, allowing the operator to precisely match cavitation intensity to the fragility of the parts being cleaned. A 2mm-thick SUS304 stainless steel tank provides exceptional structural rigidity and chemical resistance for long-term use with industrial cleaning chemistry. An improved PCB design with reinforced component mounting ensures stable, durable operation in demanding industrial environments.

The H Series supports both timed operation (0-30 minutes) and 24-hour continuous cleaning for overnight or long-duration decontamination runs. The integrated ceramic heating element maintains bath temperature from 20°C to 80°C for cleaning chemistry optimization across industrial degreasers, enzymatic solutions, and specialty ultrasonic cleaning concentrates.

28/40 kHz DUAL FREQUENCY	13 / 36 L TANK VOLUME	300-600 W US POWER	0-100% POWER RANGE	20-80°C TEMP. RANGE
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APPLICATIONS

Heated Ultrasonic Cleaner - ToronUC™ H Series Applications

The ToronUC™ H Series heated ultrasonic cleaner addresses a broad spectrum of industrial and professional cleaning applications where mid-capacity tank size, dual-frequency operation, and continuous-working capability are required:

- **Automotive Parts Cleaning:** The definitive ultrasonic carburetor cleaner and fuel system service platform for automotive workshops — removes varnish deposits, fuel gum, carbon buildup, and corrosion from carburetors, fuel injectors, throttle bodies, EGR valves, and fuel rails. The 36L tank accommodates larger automotive assemblies. As an industrial ultrasonic cleaner, it handles engine components, transmission parts, and drivetrain assemblies with equal effectiveness.
- **Industrial Parts Degreasing:** Functions as a high-capacity industrial ultrasonic parts cleaner for manufacturing facilities, removing cutting oils, stamping lubricants, grinding compounds, rust inhibitors, and assembly greases from machined metal parts, castings, stampings, and precision sub-assemblies prior to inspection, coating, or final assembly.
- **Dental Instrument Processing:** Serves as a validated dental ultrasonic cleaner for pre-sterilization decontamination of surgical instruments, dental scalers, curettes, forceps, retractors, and burs. The 40 kHz frequency option provides gentle yet thorough ultrasonic dental cleaner action on delicate instrument surfaces.
- **Jewelry & Precious Metals:** Operates as a professional ultrasonic jewelry cleaner for high-throughput production jewelers and wholesale jewelry manufacturers, removing polishing compounds, buffing wax, plating pre-treatment soils, and casting investment residues from rings, chains, pendants, and cast metal components.
- **Laboratory & Research:** Cleans analytical laboratory glassware, chemical reaction vessels, sample containers, chromatography components, and precision laboratory instruments in pharmaceutical, biotechnology, and university research environments.
- **Optical & Glasses Cleaning:** Provides professional-grade ultrasonic glasses cleaner capability for optical laboratories, lens manufacturing facilities, and optical instrument service centers, removing anti-reflection coating residues, polishing compounds, and mounting adhesives from optical elements.



FEATURES

Heated Ultrasonic Cleaner - ToronUC™ H Series Key Features

- **Dual Frequency: 28 kHz & 40 kHz:** Selectable 28 kHz or 40 kHz ultrasonic frequency provides a single platform capable of both heavy-duty industrial ultrasonic cleaning (28 kHz) and precision/delicate part cleaning (40 kHz). Eliminates the need for separate machines for different application types.
- **0-100% Adjustable Ultrasonic Power:** Continuously variable power from 0% to 100% of rated output enables precise cavitation control for any substrate — from delicate ultrasonic jewelry cleaner and dental ultrasonic cleaner applications at reduced power through full-output industrial ultrasonic parts cleaning.
- **0-30 Min Timer + 24-Hour Continuous:** The time-setting function supports short programmed cycles from 1 to 30 minutes and a continuous operation mode for extended overnight cleaning runs, maximizing workflow flexibility for both rapid and long-duration cleaning tasks.
- **2mm SUS304 Tank for Acid-Proof Durability:** The cleaning tank is fabricated from 2mm-thick SUS304 stainless steel, providing structural rigidity under heavy load, resistance to acidic and alkaline industrial cleaning chemistry, and a service life significantly longer than thinner-walled tanks.
- **20-80°C Heating Range:** Integrated heating maintains bath temperature from 20°C to 80°C, supporting the full spectrum of industrial cleaning chemistries from ambient-temperature degreasers through hot alkaline and enzymatic solutions for maximum contamination removal.
- **Improved Industrial PCB Design:** The control board uses an industrial-grade PCB design with reinforced component mounting and protective conformal coating, preventing component shedding under vibration and ensuring stable long-term operation in industrial and automotive workshop environments.
- **More Uniform Ultrasonic Wave Distribution:** The transducer array and tank geometry are engineered to produce a strong and uniform cavitation field throughout the entire tank volume, eliminating dead zones and ensuring consistent cleaning results across full batch loads.
- **Two A/B Frequency Variants:** Each model is available as both an A variant (40 kHz) and a B variant (28 kHz), allowing precise specification for the primary cleaning application — precision parts and instruments at 40 kHz, or heavy industrial ultrasonic cleaning at 28 kHz.

THEORY & METHOD

Theory & Ultrasonic Cleaning Method

Ultrasonic cleaning operates on the principle of acoustic cavitation — the formation and violent implosion of microscopic vacuum bubbles generated by high-frequency sound waves transmitted through a liquid cleaning medium. Operating at 28 kHz or 40 kHz, the ToronUC™ ultrasonic generator drives bonded transducers that convert electrical energy into mechanical vibration, propagating pressure waves through the cleaning bath at rates of 28,000 or 40,000 cycles per second.

Each pressure wave cycle creates regions of alternating compression and rarefaction in the liquid. During rarefaction phases, dissolved gas is extracted and vacuum micro-bubbles are nucleated. These cavitation bubbles grow over successive cycles until they reach a critical size, then collapse violently — releasing localized energy in the form of shockwaves, micro-jets, and temperatures estimated at thousands of degrees Celsius (contained entirely within the microscopic bubble). The resulting implosion jets reach velocities of hundreds of meters per second and pressures exceeding 500 atmospheres, all at a scale far below the damage threshold of the parts being cleaned.

This cavitation mechanism enables ultrasonic cleaning to penetrate into surface features that no mechanical or spray cleaning method can access: threaded bores, blind holes, undercuts, mesh structures, hinged mechanisms, and complex casting geometries. Contaminants including oils, greases, lapping compounds, flux residues, scale, rust, biological debris, and carbon deposits are dislodged from the substrate and dispersed into the cleaning solution.

The choice of 28 kHz versus 40 kHz directly affects cleaning performance: 28 kHz generates larger, more energetic cavitation bubbles appropriate for heavy-duty industrial cleaning of robust metal parts, while 40 kHz produces smaller, denser bubbles with finer cleaning action better suited to precision parts with delicate surface finishes. Many ToronUC™ industrial models offer both frequencies, giving operators the flexibility to optimize cleaning for their specific application.

The H Series dual-frequency design allows the same unit to function as a gentle ultrasonic cleaner jewelry platform at 40 kHz and a high-powered industrial ultrasonic parts cleaner at 28 kHz, eliminating the need for separate machines for different

cleaning applications. The 0-100% power adjustment further extends this versatility, enabling fine-tuned control over cavitation intensity for any substrate type from delicate precious metal jewelry through hardened steel automotive components.

Ultrasonic Cleaning Process Steps

- 1. Solution Preparation** — Fill the tank with an appropriate aqueous cleaning chemistry (alkaline degreaser, neutral detergent, or acidic descaler) at the recommended dilution. For industrial applications, match the chemistry to the contamination type — alkaline for oils and greases, acid for scale and rust.
- 2. Pre-Heat to Target Temperature** — Activate heating and allow the bath to reach the programmed temperature before loading parts. Elevated temperature reduces contamination viscosity, improves chemical reactivity, and enhances cavitation intensity.
- 3. Degas the Bath** — For fresh or replacement cleaning solution, run a short degas cycle to purge dissolved gases that would otherwise suppress cavitation formation and reduce cleaning effectiveness.
- 4. Load Parts & Run** — Suspend parts in the stainless steel cleaning basket, ensuring adequate spacing for ultrasonic energy to reach all surfaces. Set the timer and power level; initiate the cleaning cycle.
- 5. Inspect & Rinse** — On cycle completion, remove parts and inspect cleanliness. Rinse with clean water to remove loosened contamination and cleaning chemistry residues. Dry with compressed air, clean cloth, or drying oven as appropriate.
- 6. Drain & Refresh Solution** — Use the integrated drain valve (where fitted) to change the bath solution at the recommended interval, maintaining cleaning chemistry effectiveness and preventing re-deposition of dissolved contaminants.

TECHNICAL SPECIFICATIONS

Heated Ultrasonic Cleaner - ToronUC™ H Series Technical Specifications

Model	Tank Size L×W×H (mm)	Unit Size L×W×H (mm)	Volume (L)	US Power (W)	Freq. (kHz)	Heating Power (W)	Timer (min)	Temp. (°C)
ToronUC™ 13H	300×240×180	400×360×450	13	300	28 / 40	500	1-30 / Cont.	20-80
ToronUC™ 36H	510×300×250	570×360×450	36	600	28 / 40	800	1-30 / Cont.	20-80



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