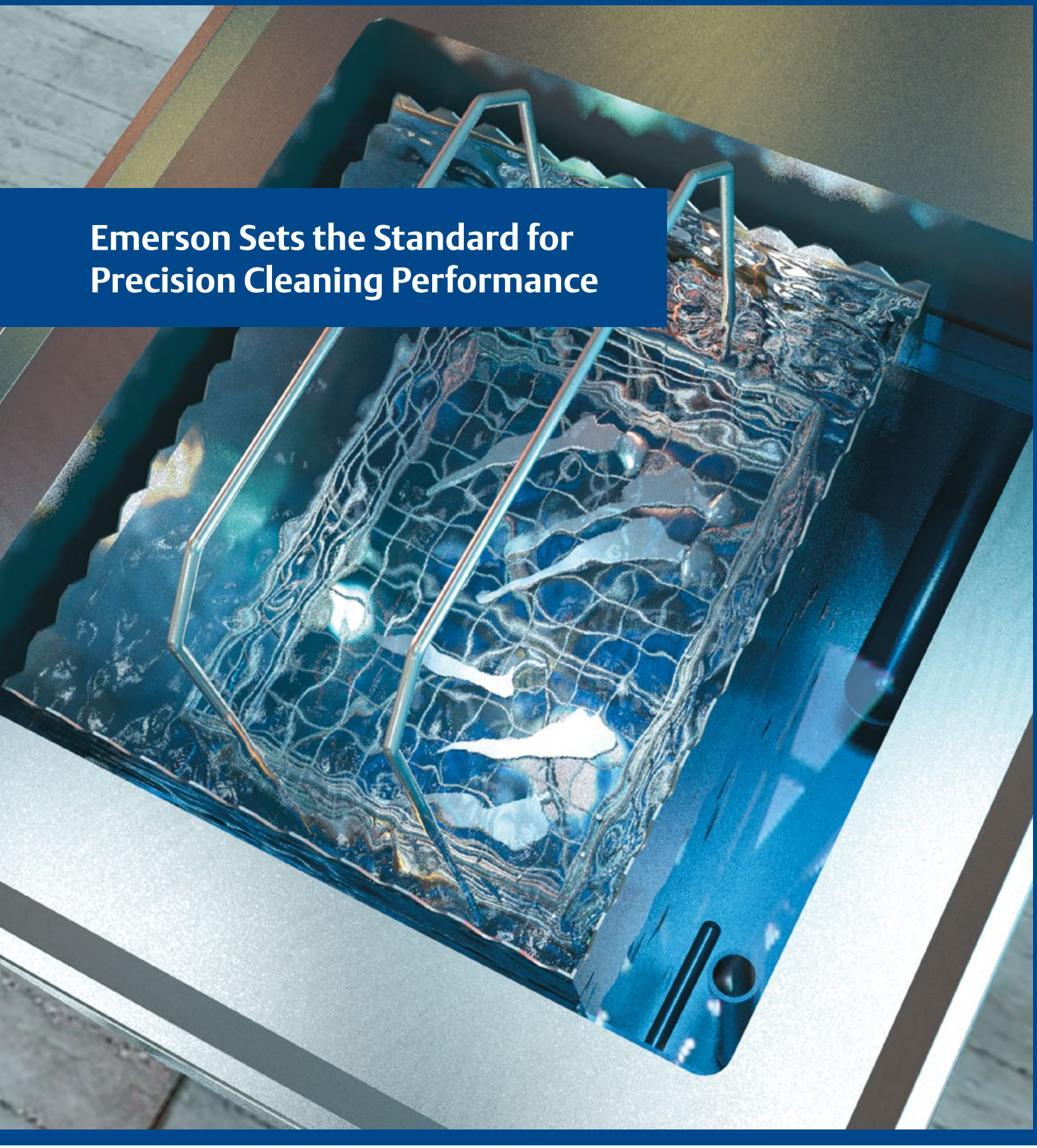


Emerson Sets the Standard for Precision Cleaning Performance

Branson™ GCX Series Ultrasonic Generators and Accessories

GCX technology advances enable more efficient power delivery and improved cost effectiveness for precision cleaning systems

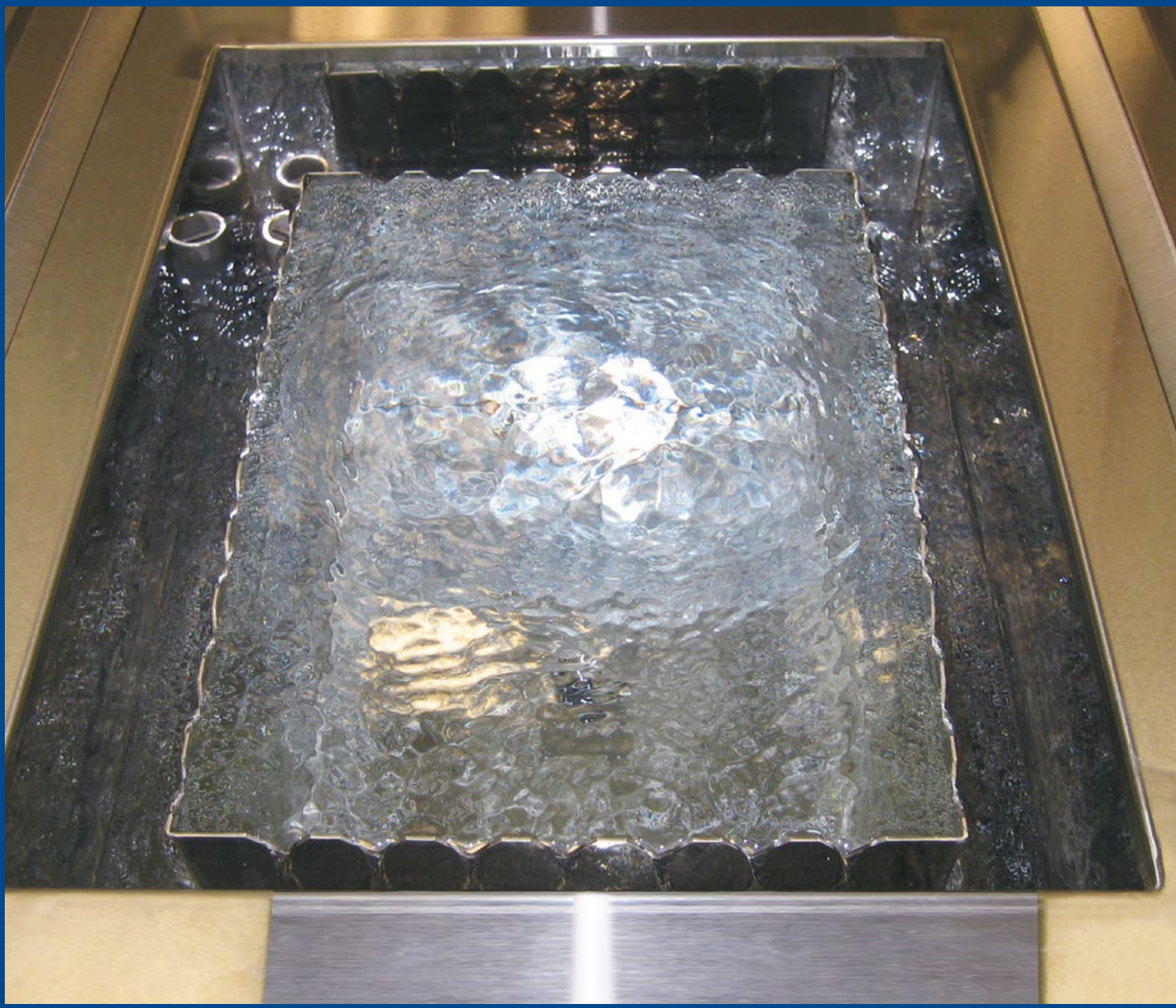
EMERSON

GCX Series Ultrasonic Generators and Accessories

Branson™ GCX ultrasonic generators combine user-friendly digital controls, advanced performance features and a more compact size to precisely control the delivery of ultrasonic energy for precision cleaning systems.

The GCX generator's touchscreen human/machine interface (HMI) eliminates older analog, push-button technology and offers a wider range of precise, digital settings. Its advanced, fully variable power control allows the user to vary the cavitational intensity from 20% to 100%, and a power modulation mode that can be set to automatically increase cleaning power fourfold when needed.

GCX Generator



Cavitation “bubbles” induced by ultrasonics produce high forces on contaminants adhering to substrates such as metals, plastics, glass, and ceramics. Cavitation, in combination with heat and detergents, break the contaminants’ surface tension, allowing the contaminant to dislodge from the surface being cleaned.

GCX Series Ultrasonic Generators and Accessories Index

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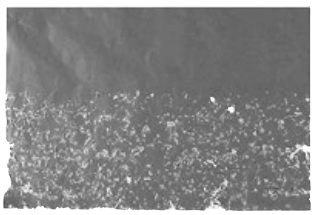
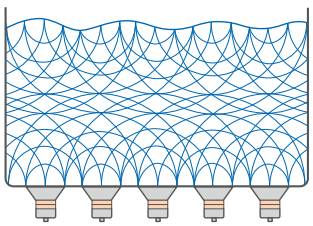
Technical Information GCX Generators and Accessories

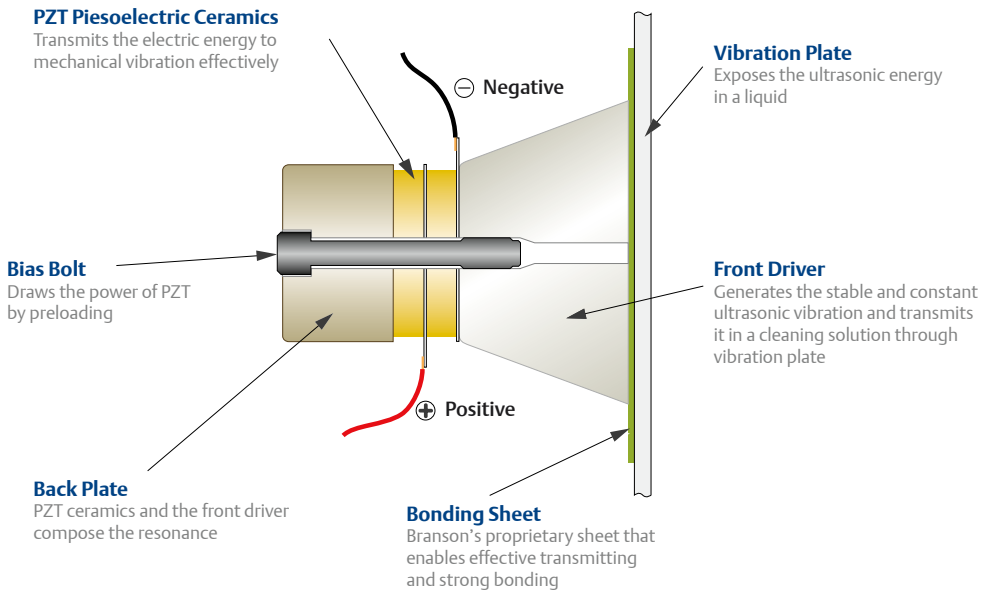
Branson GCX generators from Emerson produce spherical ultrasonic waves that travel throughout the cleaning tank and produce a strong, uniform cavitation effect in the cleaning solution. In addition, a sweep mode acting in a narrow band of +/-1000 Hz above and below the tuned frequency creates an additional random wavelength pattern that improves energy distribution and cleaning.

Spherical Waves Technology

GCX Generator	Spherical Waves
	
	

Transducers

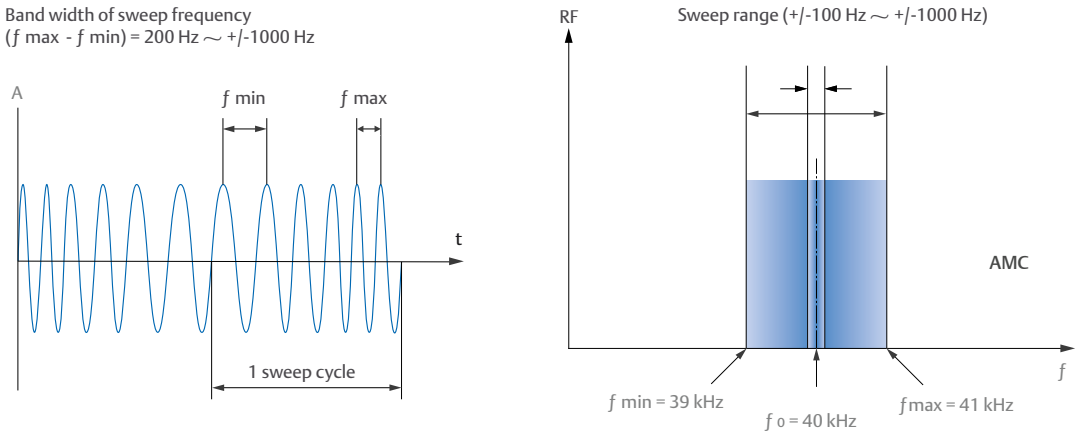
Branson stainless steel immersible transducers offer versatile ways to add ultrasonics to new or existing tanks. The performance of the Branson system is enhanced by our proprietary method of using a specialized bonding sheet to mount the transducer elements to the vibration plate.



Sweep Mode

In Sweep Mode the operating frequency is modulated above and below the tuned frequency by between 100 Hz and 1000 Hz, which produces a random wavelength pattern in the tank. The Sweep Frequency and Sweep Rate (modulation cycles per second) combine to distribute the energy more evenly in the tank and improve cleaning performance.

Sweep Frequency/Sweep Rate



The sweep rate switch has two levels:

Sweep Hi ———— 1000 sweep cycles/sec
Sweep Lo ———— 80 sweep cycles/sec

Key Features and Benefits

Line regulation: A built-in circuit keeps the output constant if the power supply voltage fluctuation is within the range of 208V +/-10%.

Load regulation: The system constantly monitors changes in load, depth, and temperature of the cleaning solution to deliver efficient ultrasonic waves at the optimum frequency.

Power control: The ultrasonic output can be adjusted in the range of 20 to100% according to the cleaning materials. This output is proportional to the cavitation intensity and can be adjusted manually or continuously with the programmable logic controller (PLC). The output level is indicated by the value on the touch screen.

Selectable sweep frequency: This permits the process engineer to select both band width and sweep rate to eliminate standing waves and improve ultrasonic activity distribution.

Power modulation mode: Power modulation generates power bursts with a ratio of 4:1 between peak power and average power. Normally, the ratio of peak power to average power is 2:1. This feature improves cleaning effectiveness when using quasi-aqueous systems and liquids that are less prone to cavitation, such as hydrocarbon fluids.

Automatic frequency tracking (AFT) function: The AFT circuit built into the oscillation circuit keeps pace with changes in cleaning conditions and oscillates at the optimum frequency.

User Interface

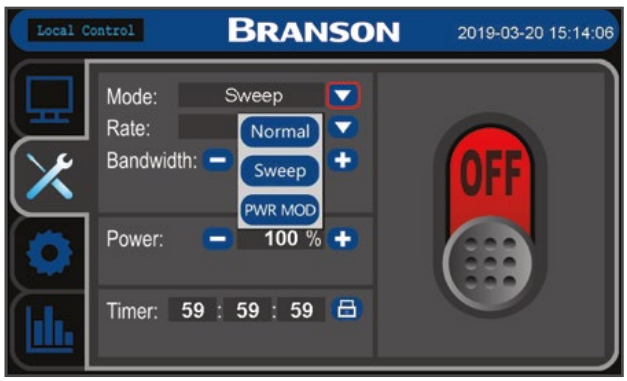
Facilitates setup and monitoring of the generator using the four-menu touch panel operation

- Digital settings to setup operation mode, power level, sweep, timer function, etc.
- Monitoring of the current ultrasonic oscillation and operation status
- System information and language setting (English, Japanese, Chinese)
- Sweep frequency and power control can be set in 1% increments, providing more precise control for accuracy and consistency.

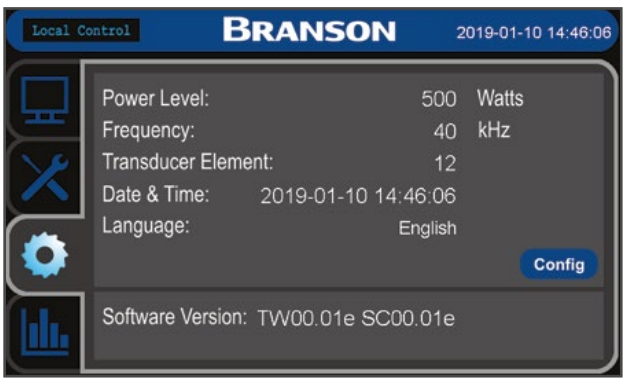
Four-screen Touch Panel HMI

User-friendly, advanced 4-screen HMI provides easy access to system data and setup

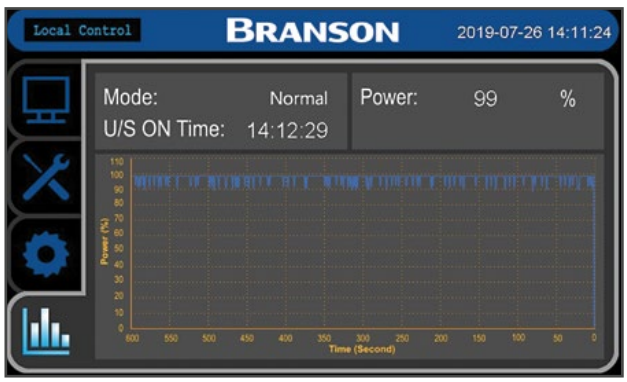
Dashboard Screen



Setting Screen Mode



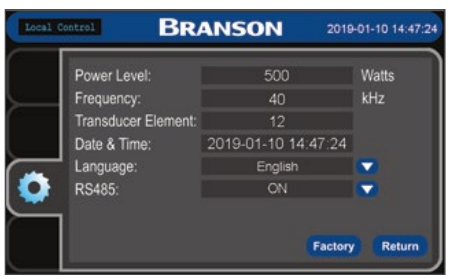
System Information Screen



Power Graph Screen

RS-485 Communication

By enabling the RS-485 communication feature and connecting it to your PC, PLC, or other communication system, it is possible to read real-time data of current time, ultrasonic power output, as well as system errors.



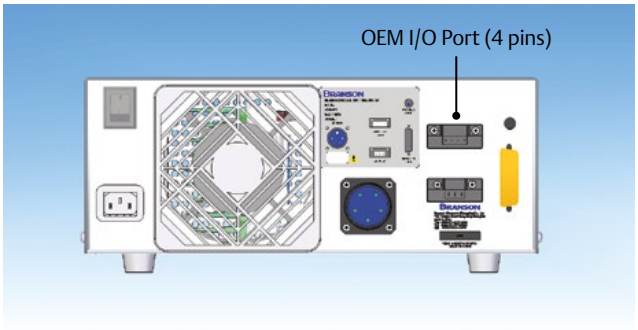
Setting Screen for RS-485

External Control Method

The GCX Series ultrasonic generators allow for two control methods to be selected.

OEM I/O Control Method

- Simple wiring connection for external control
- Available in the touch-screen HMI
- For controlling one unit at a time



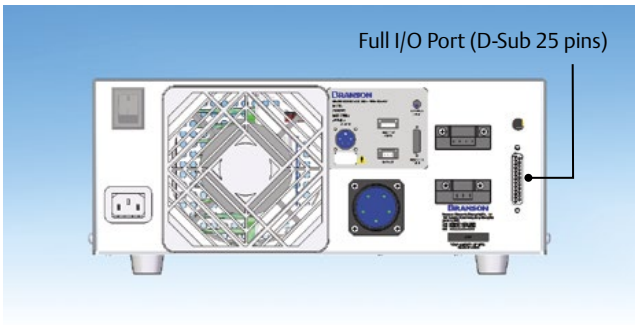
GCX Back Panel – OEM I/O

OEM I/O Function (4 pins)	
Input	Ultrasonic ON/OFF
Output	Ultrasonic Status signal

Other functions, except ultrasonic ON/OFF, are controlled by Touchscreen HMI

FULL I/O Control Method

- Various setting/monitoring from external control
- For controlling multiple units at the same time
- For use if the touch screen is difficult to access



GCX Back Panel – Full I/O

All functions are controlled by external control signal

Full I/O Function (25 pins)	
Input	Ultrasonic ON/OFF
	Sweep ON/OFF
	Rate Hi/Low
	PWR MOD ON/OFF
	Power Control input (DC 0-10V)
	Power Control input (DC 0-20mA or 4-20mA)
	Inter lock
	Reset
Output	Ultrasonic Status signal
	Error signal
	Power level signal (DC 0-10V)
	Power level signal (DC 0-20mA or 4-20mA)

The number of wires can be reduced by using an I/O relay box (optional product).

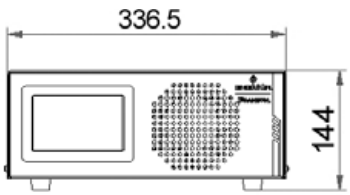
GCX Series Generators

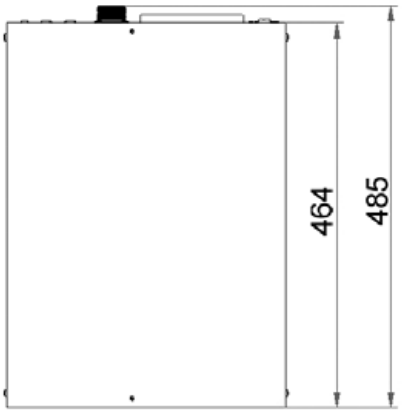
GCX-L Low Frequency Generators

The GCX-L ultrasonic generator has frequencies of 25 kHz and 40 kHz. It generates powerful cavitation in the cleaning tank and provides outstanding cleaning power. The ultrasonic transducers to be employed are individually designed and manufactured according to the size and specifications of the cleaning tank.

GCX-L (25 kHz, 40 kHz)

Model	Operating Frequency	AC Supply Voltage	Input Current (at 200V)	Transducer Elements	Nominal Power
GCX-L-2512	25 kHz	208V ~ 230V +/-10%	3.0A Max	12	500W
GCX-L-2518			4.0A Max	18	750W
GCX-L-2524			6.5A Max	24	1000W
GCX-L-2536			7.5A Max	36	1500W
GCX-L-2548			11.0A Max	48	2000W
GCX-L-4006	40 kHz		2.0A Max	6	250W
GCX-L-4012			3.0A Max	12	500W
GCX-L-4018			4.0A Max	18	750W
GCX-L-4024			6.5A Max	24	1000W
GCX-L-4036			7.5A Max	36	1500W
GCX-L-4048			11.0A Max	48	2000W





GCX-H High Frequency Generators

The GCX-H series ultrasonic generators for precision cleaning utilize a high-frequency range. They are available in three frequencies: 80 kHz, 120 kHz, and 170 kHz. The ultrasonic transducer to be used is individually designed and manufactured according to the size and specifications of the cleaning tank. There are two types of transducers: flange type and immersible type.

GCX-H (80 kHz, 120 kHz, 170 kHz)

Model	Operating Frequency	AC Supply Voltage	Input Current (at 200V)	Transducer Elements	Nominal Power
GCX-H-8012	80 kHz	208V ~ 230V +/-10%	4.0A Max	12	500W
GCX-H-8018			5.5A Max	18	750W
GCX-H-8024			7.5A Max	24	1000W
GCX-H-12012	120 kHz		4.0A Max	12	500W
GCX-H-12018			6.0A Max	18	750W
GCX-H-12024			8.5A Max	24	1000W
GCX-H-17012	170 kHz		4.5A Max	12	500W

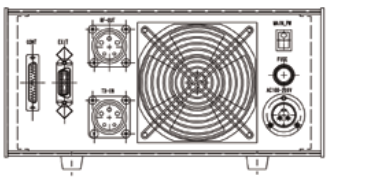
GCX 4-Frequency Generators/Frequency Switching Controllers

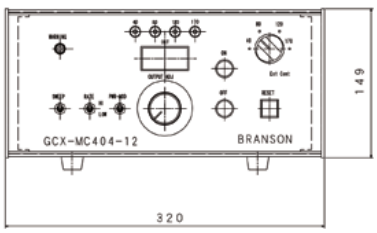
By using the GCX 4-frequency generator and frequency switching controller, four (or any three) frequencies can be freely selected and oscillated. Since ultrasonic cleaning can be performed by switching frequencies, it is very efficient and can be used as a means to evaluate the most efficient cleaning system.

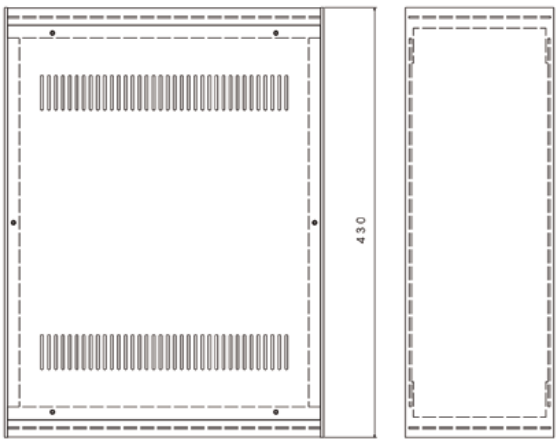
GCX-M (40 kHz, 80 kHz, 120 kHz, 170 kHz)

Model*	Operating Frequency	AC Supply Voltage	Input Current (at 200V)	Transducer Elements	Nominal Power
GCX-M-4FQ06	40 kHz, 80 kHz, 120 kHz, 170 kHz	208 ~ 230V+/-10%	3.0A Max	6	250W
GCX-MC404-6		100 ~ 240V+/-10%	2.0A Max		
GCX-M-4FQ12		208 ~ 230V+/-10%	5.0A Max	12	500W
GCX-MC404-12		100 ~ 240V+/-10%	2.0A Max		
GCX-M-3FQ06	40 kHz, 80 kHz, 120 kHz	208 ~ 230V+/-10%	3.0A Max	6	250W
GCX-MC403A-6		100 ~ 240V+/-10%	2.0A Max		
GCX-M-3FQ12		208 ~ 230V+/-10%	5.0A Max	12	500W
GCX-MC403A-12		100 ~ 240V+/-10%	2.0A Max		
GCX-M-3FQ18		208 ~ 230V+/-10%	6.0A Max	18	750W
GCX-MC403A-18		100 ~ 240V+/-10%	2.0A Max		
GCX-M-3FQ24		208 ~ 230V+/-10%	7.5A Max	24	1000W
GCX-MC403A-24		100 ~ 240V+/-10%	2.0A Max		
GCX-M-3FQ06	80 kHz,120 kHz, 170 kHz	208 ~ 230V+/-10%	3.0A Max	6	250W
GCX-MC403N-6		100 ~ 240V+/-10%	2.0A Max		
GCX-M-3FQ12		208 ~ 230V+/-10%	5.0A Max	12	500W
GCX-MC403N-12		100 ~ 240V+/-10%	2.0A Max		

*GCX-M-4FQxx : 4 Frequency Generator
*GCX-M-3FQxx : 3 Frequency Generator
*GCX-MC : Frequency Switching Controller







Immersible Transducers

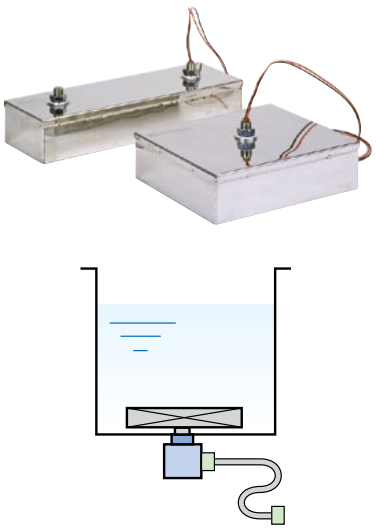
Branson immersible transducers can provide ultrasonics to new or existing cleaning tanks in a variety of industrial settings. Type 316L stainless-steel construction permits the use of a wide range of cleaning chemistries and allows higher-temperature operation up to 100°C due to its highly efficient transmitting capability. Immersibles are available in multiple mounting configurations as shown below. They are also available in custom-made configurations based on user requirements. The standard 40 kHz transducer is capable of being driven by 40, 80, 120 or 170 kHz generators.

Model	Operating Frequency	Nominal Power	Transducer Elements	Dimensions (mm)	Weight
□□610-25-6	25 kHz	250W	6	152 x 254 x 84H	8 kg
□□618-25-12	25 kHz	500W	12	152 x 458 x 84H	14 kg
□□1012-25-12	25 kHz	500W	12	254 x 305 x 84H	14 kg
□□1212-25-12	25 kHz	500W	12	305 x 305 x 84H	15 kg
□□610-40-6	40 kHz	250W	6	152 x 254 x 84H	8 kg
□□618-40-12	40 kHz	500W	12	152 x 458 x 84H	14 kg
□□1012-40-12	40 kHz	500W	12	254 x 305 x 84H	14 kg
□□1212-40-12	40 kHz	500W	12	305 x 305 x 84H	15 kg

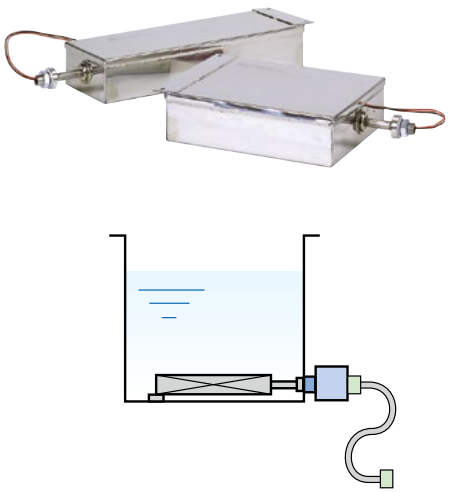
Select the blank of model name "□□" selecting the types "SB" "EB" "FC" "CB" as the mounting configurations. Hard-chrome plating is available as an option.

Transducers and Mounting Configuration Illustrations

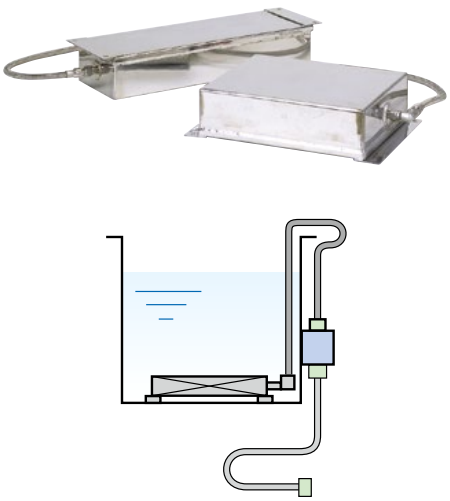
Type SB (D)



Type EB (G)



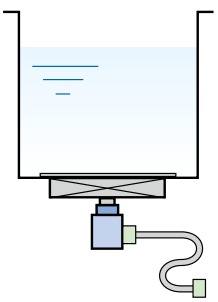
Type FC (F)



Transducer Flange Type with Mounting Illustration

The flange type transducer was developed for bottom face installment, allowing greater use of tank space and easy access for cleaning. This flange type is available in a variety of transducer configurations to enable cleaning of complicated parts with degassed water solution. Branson transducers have a specially designed vibration plate that maximizes energy conversion efficiency.

Flange Type



Ultrasonic Cleaning Tanks with Transducers

A variety of Branson ultrasonic cleaning tanks are available to meet your cleaning needs. Type 316L stainless-steel construction permits use of a wide range of cleaning chemistries. Ten standard sizes range from 10 to 142 liters capacities. All tanks have heaters that are controlled by thermostat. The 40 kHz tanks can be used with 80, 120 or 170 kHz generators.

Model	Operating Frequency	Nominal Power	Transducer Elements	Tank Capacity	Outer Dimensions (mm)	Inner Dimensions (mm)	Heater Capacity	Heater Voltage	Weight
CH610-25-6	25 kHz	250W	6	10 L	310 x 210 x 370H	254 x 152 x 254H	700W	120/220V	12 kg
CH1012-25-12	25 kHz	500W	12	20 L	360 x 310 x 370H	305 x 254 x 254H	700W	120/220V	20 kg
CH1216-25-18	25 kHz	750W	18	38 L	462 x 362 x 420H	406 x 305 x 305H	1400W	220V	30 kg
CH1620-25-24	25 kHz	1000W	24	83 L	565 x 460 x 520H	508 x 406 x 406H	2500W	220V	45 kg
CH2024-25-36	25 kHz	1500W	36	142 L	665 x 565 x 623H	610 x 510 x 505H	2500W	220V	62 kg
CH610-40-6	40 kHz	250W	6	10 L	310 x 210 x 370H	254 x 152 x 254H	700W	120/220V	12 kg
CH1012-40-12	40 kHz	500W	12	20 L	360 x 310 x 370H	305 x 254 x 254H	700W	120/220V	20 kg
CH1216-40-18	40 kHz	750W	18	38 L	462 x 362 x 420H	406 x 305 x 305H	1400W	220V	30 kg
CH1620-40-24	40 kHz	1000W	24	83 L	565 x 460 x 520H	508 x 406 x 406H	2500W	220V	45 kg
CH2024-40-36	40 kHz	1500W	36	142 L	665 x 565 x 623H	610 x 510 x 505H	2500W	220V	62 kg

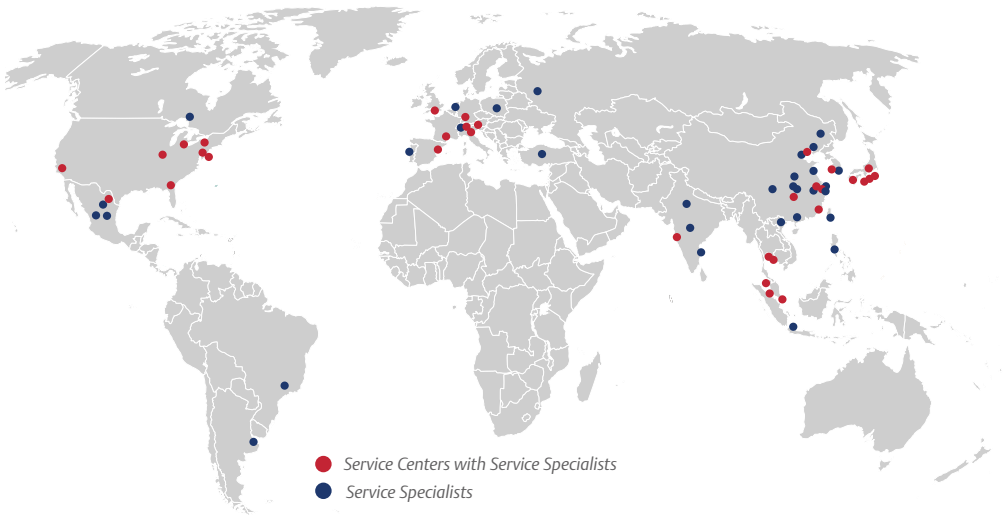
Cylindrical and Pentagonal Inline Liquid Processor

These liquid processors can help speed up degassing, disintegration, dispersion, mixing, emulsification, or extraction. Liquids to be processed are passed through the tube and exposed to a very high intensity ultrasonic field. These designs ensure uniform ultrasonic activity throughout the cleaning solution.

WF3-16 LP-680-20 LP-680-35

Model	Operating Frequency	Nominal Power	Transducer Elements	Exposure Area	Process Capacity	Outer Dimensions (mm)	Material
LP680-35	40 kHz	780W	35	762 x ø162	15 L	762 x ø305	SUS316L
LP680-20	40 kHz	450W	20	457 x ø162	9 L	457 x ø305	SUS316L
WF3-16	40 kHz	—	16	203 x ø73	0.8 L	280 x ø260	SUS316L

Service and Support Anywhere, Anytime



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