HS SONIC

ULTRASONIC

HS SONIC PNEUMATIC WELDING MACHINE

High-Precision Pneumatic Welding Solutions Intelligent & Efficient, Stable & Reliable

Weld the Future

HS SONIC Pneumatic Welding Machine

Compact in size, rich in functions, meeting all automation needs

TWO CORE ADVANTAGES

Ultrasonic Pneumatic Welding Machine: High-Precision•Multi-Adaptable•Easy-to-Maintain

Integrated Design + Multi-Mode Control + Thread-Level Precision, balancing welding quality and operational convenience to meet diverse production needs.

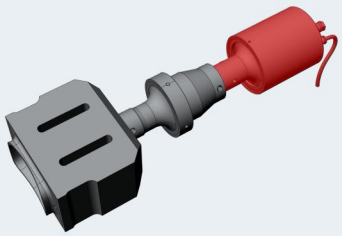
Welding Machine Operating System: Intelligent•User-Friendly•Traceable

Windows OS + Visual Touch Control + Massive Data Storage, balancing operational convenience and production management professionalism while reducing labor costs.

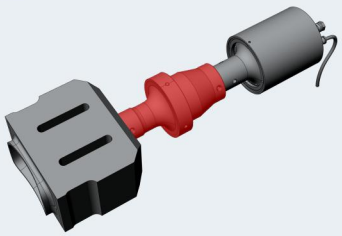
Integrated System Design

Integrating the welding main unit, acoustic triple set (Transducer + Booster + Horn), special fixtures and control software, it features high component compatibility and more stable operation.

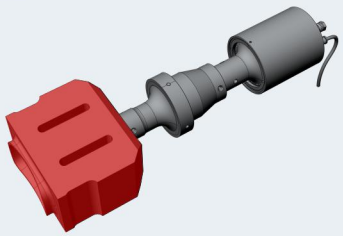
Transducer



Booster



Horn



Comprehensive Safety Protection

Equipped with grounded power supply, emergency stop switch and LOTO locking device, it complies with OSHA safety standards and requires th use of ANSI-certified goggles/ear protectors.

Humanized Structure

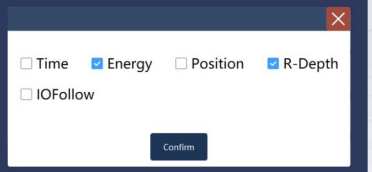
Adjustable base plate + Height-adjustable handwheel + Double-sided start switches, adapting to different operators' habits for more comfortable operation.

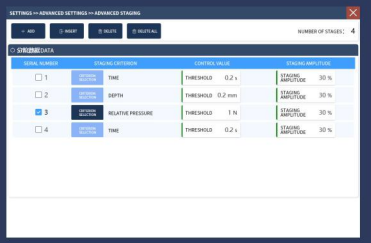
Adjustable base plate
Height-adjustable handwheel
Double-sided start switches

Ultrasonic Pneumatic Welding Machine

Multi-mode welding control

Supports free combination of 5 modes (time/energy/depth/IO following/position), adapting to workpieces of different materials and shapes.



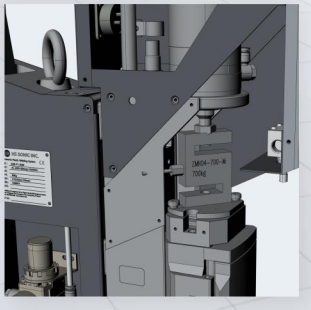


Stepwise amplitud adjustment

Multi-step amplitude can be flexibly set according to welding stages, reducing workpiece damage and improving the welding quality of weak areas.

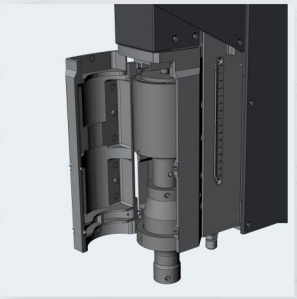
High-precision process control

Equipped with an S-type pressure sensor + 1-micron resolution magnetic scale, pressure and distance parameters are accurately controllable to ensure welding consistency.



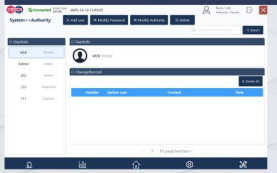
Easy disassembly, assembly and maintenance

The triple unit and fixture can be disassembled and assembled with special tools, the contact surface is repairable, and the linear guide only requires regular lubrication, resulting in low maintenance costs.



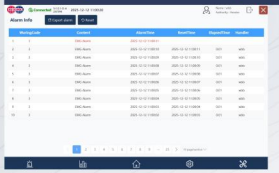
Welding machine operating system

Hierarchical permission management



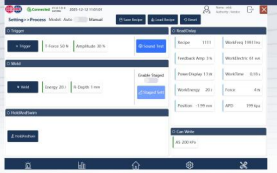
Equipped with roles such as administrator/ maintainer/operator, with refined permission division to prevent misoperation and ensure equipment and data security.

Intelligent fault diagnosis



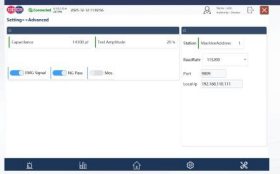
Built-in library of common fault codes such as unlocking failure/overload/emergency stop, with real-time alarms and accompanying handling suggestions for quick problem troubleshooting.

Full-process parameter configuration



Supports recipe management, stepwise parameter setting, and NG judgment threshold adjustment, covering the entire process from welding to quality control with strong parameter adjustability.

External communication compatibility

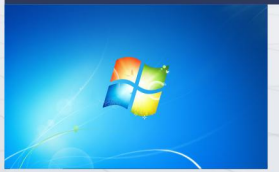


Supports Modbus TCP protocol and MES system integration, enabling remote monitoring and data transmission via USB/Ethernet.

Color touch screen operation

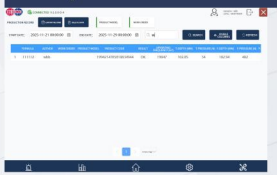
The visual main interface displays production status, process parameters, and maintenance reminders in real time, with intuitive and easy-to-understand operation that allows novices to get started quickly.

Embedded Windows 10 system



Stable operation, rapid response, supports multi-language switching, and is adaptable to production lines in different regions around the world.

Complete data traceability



Capable of storing 300,000 welding records (including key parameters such as frequency/ pressure/energy), supporting data export and alarm information traceability to facilitate quality review.

The touch screen provides a process-guided interface, with menus designed according to welding processes to ensure usability, and automatically records process variables for real-time monitoring of process stability.

HS SONIC Ultrasonic Generator

Compatible with plastic welding machines, stable and reliable, making welding more secure

Stable•Wide Compatibility•Safe

Anti-interference output + intelligent frequency tracking + multi-interface compatibility, balancing energy transfer efficiency and operational safety to adapt to different power welding requirements.

HS SONIC Ultrasonic Generator Six Core Advantages

Welding Control Algorithm

High-precision energy control, constant amplitude control, maximum 0.001Hz frequency modulation step, ultra-fast 0.1 ms response, voltage loop control, wide voltage input, and adjustable frequency tracking step and soft start step.

Production Management System

Comprehensive data recording, high-resolution process curve, quality management system, MES system, and data export.

Process Configuration System

Recipe management, triggering (pressure, depth, time), welding configuration (time, relative depth, absolute depth, and energy, supporting free combination), pressure holding and vibration release system, digital air pressure control system, advanced stepwise system (flexibly configurable).

Real-Time Data System

Supports real-time data display of frequency, power, energy, welding time, pressure, depth, etc.

Protection Control System

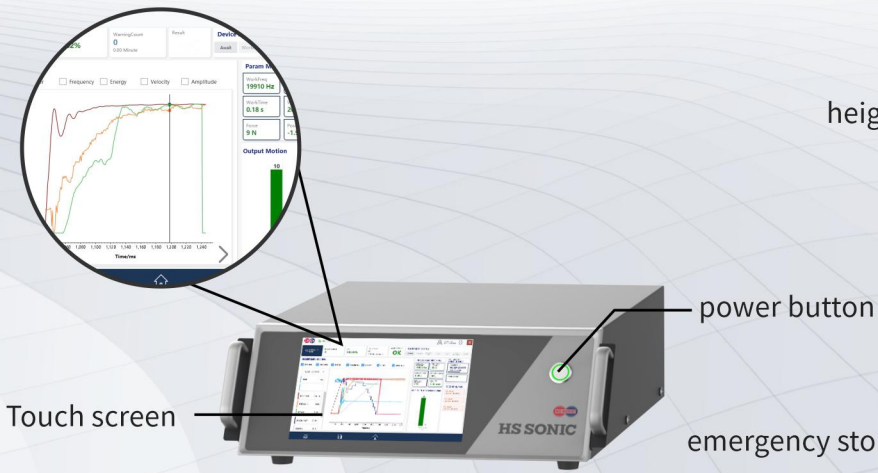
Board-level protection function, temperature monitoring protection, output protection.

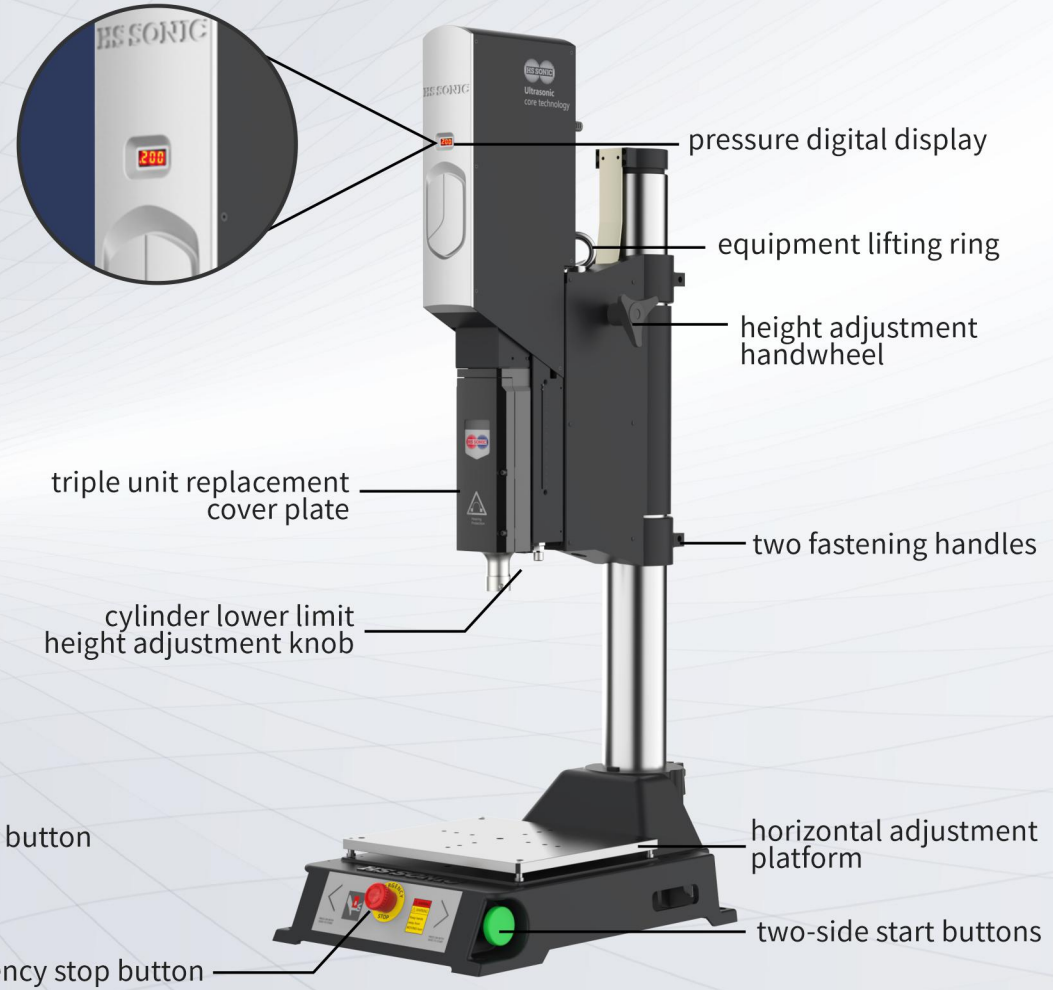
Human-Machine Interface

Flat interaction, concise and elegant.

Equipment Structure Introduction

Make every welding spot traceable with data and every vibration precisely controllable, helping the precision manufacturing industry achieve cost reduction and efficiency improvement in automated production.





HS SONIC Ultrasonic Transducer

Specialized for plastic welding, with powerful force

Principle: Piezoelectric ceramic alternating electric field → mechanical vibration → resonant transmission to the welding horn.
Characteristics: High power output / high conversion efficiency / stable resonant frequency.
Applications: Automotive manufacturing · medical devices · electronic packaging · consumer electronics, etc.

Technical Parameters: To adapt to various environments and applications, HS SONIC mainly provides two structural types of transducers.

The front cover of the transducer is made of aluminum alloy, with air supply as the heat dissipation method, providing a solution for most general-purpose applications with low power (≤4000W).

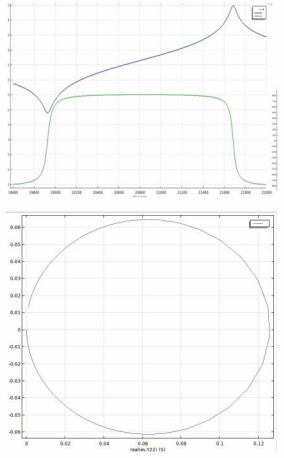
The front cover of the transducer is made of titanium alloy, with an ultra-quiet fan for heat dissipation, providing a stable welding solution for high-power (≤6000W) special applications.

Model	100-AL1560-A(F)	100-AL2030-A(F)	100-TI2060-A(F)	100-AL3018-A(F)	100-TI3512-A(F)	100-TI4008-A(F)
Frequency	15kHz	20kHz	20kHz	30kHz	35kHz	40kHz
Power(W)	6000	3000	6000	1800	1200	800
Amplitude(max)	30-34 μm	20-22 μm	22-24 μm	13-15 μm	9-11 μm	7-9 μm
Frequency Range(kHz)	14.85-15.1	19.85-20.1	19.85-20.1	29.85-30.1	34.85-35.1	39.85-40.1
Capacitance Range(nF)	23-26	14.0-16.5	14.0-16.5	9-12	7-9	7-9
Thread	1/2-20UNF	1/2-20UNF	1/2-20UNF	1/2-20UNF	M8	M8

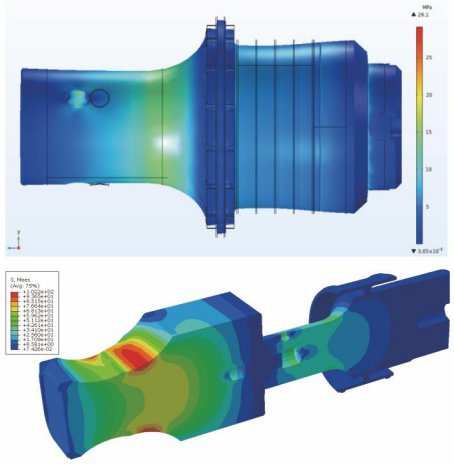
Ultra-long service life

HS SONIC adopts multi-physics simulation technology to scientifically design the transducer structure, horn, and welding tip, effectively resisting high-frequency vibration impact, ensuring the transducer's service life exceeds 1 million cycles, and guaranteeing efficient and stable ultrasonic welding.

Electrical characteristic design



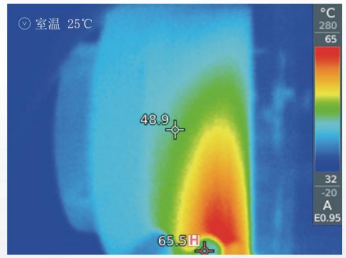
Structural strength design



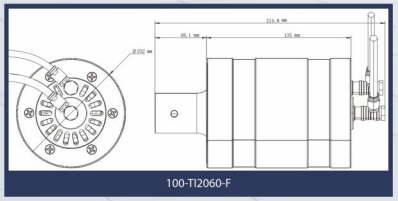
Low heat loss

High-performance piezoelectric ceramics are adopted to maximize the conversion of electrical energy into mechanical energy, reduce energy loss during welding, improve welding efficiency, and lower equipment power consumption.

Under the condition that the continuous peak power of the HS SONIC transducer operates at 5000W, the maximum temperature of the transducer is stabilized at 65°C, limiting the impact of temperature on the acoustic system and ensuring the consistency of welded products.



Transducer Dimensions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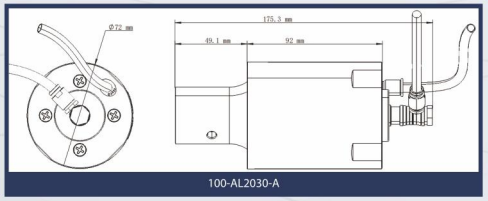

100-AL2030-A

IGW-P1-15XX/P1-20XX/P1-3015/P1-3512/P1-4008 Equipment Specification Sheet

Product Name	IGW-P1-15XX	IGW-P1-20XX	IGW-P1-3015	IGW-P1-3512	IGW-P1-4008
Output power	3kw/4.5kw/6kw	2kw/4kw/6kw	1.5kW	1.2kW	0.8kW
Frequency	15kHz	20kHz	30kHz	35kHz	40kHz
Input voltage	220V	220V	220V	220V	220V
Cylinder diameter	100mm	63mm	63mm	63mm	63mm
Maximum pressure	690kPa	690kPa	690kPa	690kPa	690kPa
Welding mode	☑Time ☑Depth ☑Location ☑IO follow ☑Energy	☑Time ☑Depth ☑Location ☑IO follow ☑Energy	☑Time ☑Depth ☑Location ☑IO follow ☑Energy	☑Time ☑Depth ☑Location ☑IO follow ☑Energy	☑Time ☑Depth ☑Location ☑IO follow ☑Energy
Board level protect	✔	✔	✔	✔	✔
Max power protect	✔	✔	✔	✔	✔
Over voltage protection	✔	✔	✔	✔	✔
Level 4 authority protection	Operator, Engineer, Team Leader, Administrator	Operator, Engineer, Team Leader, Administrator	Operator, Engineer, Team Leader, Administrator	Operator, Engineer, Team Leader, Administrator	Operator, Engineer, Team Leader, Administrator
Safety grating	Optional	Optional	Optional	Optional	Optional
Z-axis adjustable precision	±0.01mm	±0.01mm	±0.01mm	±0.01mm	±0.01mm
Welding time accuracy	±0.001s	±0.001s	±0.001s	±0.001s	±0.001s
System available process	100mm	100mm	100mm	100mm	100mm
System allowable pressure range	0-5000N	0-2000N	0-2000N	0-2000N	0-2000N
System descent speed	50-240mm/s	50-240mm/s	50-240mm/s	50-240mm/s	50-240mm/s
System generated pressure range	0-5000N	0-2000N	0-2000N	0-2000N	0-2000N
High frequency precision conctrol	0.001Hz	0.001Hz	0.001Hz	0.001Hz	0.001Hz
High Energy precision conctrol	0.1J	0.1J	0.1J	0.1J	0.1J
High simpling accuracy	16bit	16bit	16bit	16bit	16bit
Quickly response	100us	100us	100us	100us	100us
Amplitude control	Constant Amplitude	Constant Amplitude	Constant Amplitude	Constant Amplitude	Constant Amplitude
Output voltage	3000Vpeak Max	3000Vpeak Max	3000Vpeak Max	3000Vpeak Max	3000Vpeak Max
Trigger mode	Location、Pressure、 Time、No Trigger	Location、Pressure、 Time、No Trigger	Location、Pressure、 Time、No Trigger	Location、Pressure、 Time、No Trigger	Location、Pressure、 Time、No Trigger
Cooling system	Air Cooling	Air Cooling	Air Cooling	Air Cooling	Air Cooling
Head adjustable height range	360mm (No Horn)	360mm (No Horn)	360mm(No Horn)	360mm (No Horn)	360mm (No Horn)
Support mold size	Max.L260mm*W260mm*H200mm	Max.L260mm*W260mm*H200mm	Max.L260mm*W260mm*H200mm	Max.L260mm*W260mm*H200mm	Max.L260mm*W260mm*H200mm
Welding head stroke	0~100mm (Adjustable)	0~100mm (Adjustable)	0~100mm(Adjustable)	0~100mm (Adjustable)	0~100mm (Adjustable)
Production data export format	.CSV	.CSV	.CSV	.CSV	.CSV
Welding pattern storage	4W	4W	4W	4W	4W
Graphics acquisition frequency	1K	1K	1K	1K	1K
Generate data storage	1、Maximum Welding Data Storage: 300,000 Records; 2、Alarm Capacity: 2,000 Entries; 3、Recipe Capacity: 1,000 Recipes; 4、Maximum Log Storage Period: 120 Days;	1、Maximum Welding Data Storage: 300,000 Records; 2、Alarm Capacity: 2,000 Entries; 3、Recipe Capacity: 1,000 Recipes; 4、Maximum Log Storage Period: 120 Days;	1、Maximum Welding Data Storage: 300,000 Records; 2、Alarm Capacity: 2,000 Entries; 3、Recipe Capacity: 1,000 Recipes; 4、Maximum Log Storage Period: 120 Days;	1、Maximum Welding Data Storage: 300,000 Records; 2、Alarm Capacity: 2,000 Entries; 3、Recipe Capacity: 1,000 Recipes; 4、Maximum Log Storage Period: 120 Days;	1、Maximum Welding Data Storage: 300,000 Records; 2、Alarm Capacity: 2,000 Entries; 3、Recipe Capacity: 1,000 Recipes; 4、Maximum Log Storage Period: 120 Days;

Note: The information in this specification sheet is for reference only. We reserve the right to modify or improve product design or specifications at any time without prior notice.

Comprehensive technical support

HS SONIC Expert End-to-End Support

Strong Collaboration: Joint Design → Component Development → Pre-production Laboratory Testing.
Comprehensive Guarantee: Parameter Verification & Setting + Training & Guidance + After-sales SupportClose cooperation and efficient development throughout the entire project lifecycle.

Welding Horn Finite Element Analysis (FEA)

Precise Simulation: Utilize FEA technology to visualize vibration characteristics and material stress.
Geometric Optimization: Determine the optimal structure to ensure high stability.
Performance Advantages: Maximized ultrasonic efficiency + uniform amplitude distribution + ultra-high durability.

Precision Manufacturing Process of Welding Horns

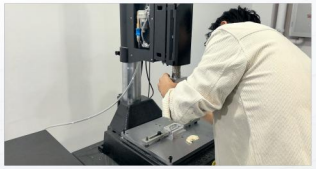
Intelligent Programming: 3D contours are converted via CAD/CAM CNC numerical control, with algorithms strictly controlling precision.
Five-Axis Precision Carving: Supported by a high-speed cutting tool library, the surface finish meets zero-error standards.
Performance Guarantee: Perfect matching between welding horns and components, achieving dual breakthroughs in performance and compatibility.

Comprehensive Welding Tools: Welding Horn Measuring Station

Acoustic Fingerprint: Each welding horn has unique acoustic characteristics.
Laser Precision Measurement: Laser determination of vibration state amplitude distribution (core parameter of welding quality).
Full Data Traceability: Complete recording of welding horn calibration and optimization data.Service Life Extension Process: Special surface coating enhances durability.Ultimate Value: Achieve precise customized matching between parts and welding horns.

Ultrasonic Welding Laboratory

Forward-looking Intervention: Full-process support in the early stage of component design.
Precise Targeting: Specialized optimization guidance for the geometric structure of welding joints.
Empirical Closed-loop: Feasibility principle testing and verification plan.
Demand Penetration: Customer requirements + test results + design concepts implemented throughout the entire process.
3D Prediction: Dynamic digital simulation analysis of welding.
FEA Analysis Foundation: Tool design optimization based on finite element analysis.
Seamless Compatibility: Reconnection to original mechanical/electrical standard interfaces.
Process Intelligent Integration: Integrated planning of welding processes and production line systems.



· Application Optimization

Optimize the mold contour and conduct joint customer tests verified against key technical limits.
Results (Microscopy, Tensile/Sealing/Burst Tests, High-Speed Imaging, Cross-Section Analysis).
Evaluate test performance and record data.

· Eurasian Technology Center

Customer-Oriented: Support feasibility studies.
Localized Support: Senior application experts proficient in Chinese and English.
Strategic Layout: Ultrasonic laboratories covering Asia, Europe and North America.

· Training & Customer Service

Audience Coverage: Beginners and Professionals.
Training Format: Practical Hands-On User Training.
Training Venue: Current Technology Centers.
Customized Services: Meet customers' customized needs

· After-sales Service

Technical Support Response: Supported by service hotlines and technical support centers.
Preventive Maintenance: Long-term maintenance measures.

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