TECHMI Group

Global solutions for a growing world

TECHMI BIO LAB

GLASS FERMENTER FOR DEVELOPMENT OR LABORATORY



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TECHMI BIO LAB

GLASS FERMENTER FOR DEVELOPMENT OR LABORATORY

Academic and industrial research and process development require a versatile, scalable, and reliable bioreactor system. **TECHMI BIO LAB** meets these requirements with state-of-the-art technology and design. Its design, based on continuous improvement and the study of current processes, enables practical and efficient use.



The Techmi Bio Lab bioreactor is designed for small-scale research and development, offering precise control of all critical process parameters. With capacities ranging from 0.25L to 10L, it integrates an advanced control system, high-precision sensors, and a hygienic stainless steel design that ensures stable and reproducible conditions. Ideal for fermentation trials, cell culture, and bioprocess optimization in the laboratory.



1L 3L 5L 7L 10L

Applications:

The Techmi Group laboratory bioreactor is ideal for research in biotechnology, microbiology, pharmaceuticals, food, bioenergy, and chemistry. Its precise control of parameters such as temperature, pH, and agitation allows for the optimization of small-scale fermentation processes. It is adaptable to diverse applications, including the production of biopharmaceuticals, probiotics, biofuels, and biochemicals, and provides scalable data for transitioning to pilot plants and industrial production.

COMPONENTS AND CHARACTERISTICS

USB INPUT PORT

It includes an integrated USB port that facilitates the management of information generated during fermentation trials and processes. This functionality allows for the quick and secure export of data recorded by the system, facilitating subsequent analysis, traceability, and documentation of experiments.



TOUCH SCREEN

An intuitive HMI interface enables real-time control and monitoring of all process parameters. This simplifies operation, variable adjustment, and recipe management.



PERISTALTIC PUMPS

Sterile and precise dosing system for the controlled addition of liquids, such as acids, bases, nutrients, or antifoaming agents. Ensures process accuracy and prevents cross-contamination.

CONTROL TOWER

Fundamental structure that connects the electrical, automation and control systems of the equipment, ensuring stable, safe and fully automated operation of the bioreactor.

COMPONENTS AND CHARACTERISTICS

- Glass tank with oval bottom
- Optimal work volume 30-70%
- Built-in pH, DO, temperature and antifoam sensors.
- Temperature control by means of recirculated water jacket.
- Mechanical stirring by servomotor, speed 0 ~ 1000 rpm (accuracy: ±1 rpm)
- Inoculation and auxiliary ports (possibility of adding more sensors) and sampling system.
- Prepared for batch, fed batch and continuous fermentation.
- LCD touch screen.
- 4 peristaltic pumps installed on the front of the controller, for dosing acid, alkali, antifoam and feeding to the fermenter with manual and automatic control.
- Siemens S7-1200 series PLC control system.
- PID control and automation, SCADA system, and remote monitoring.
- Compact and scalable structure with the possibility of customizing design, components and services.

Volume	0.25 L, 1L, 2L, 3L, 5L, 7L, 10L
Workload	30%-70%
Container material	Borosilicate glass
Gases	Standard: one air intake
	Optional: Multiple air intakes
Gas control	Standard: rotor flow meter (manual)
	Optional: mass flow meter (automatic)
Sterilization	In an autoclave
Basic control	Temperature, stirring speed, pH, OD, antifoam, feed
Bomb peristalsis	Standard: 4 units
Stirring mode	Standard: mechanical stirring
	Optional: magnetic stirring



TECHNICAL SPECIFICATIONS

TECHMI BIO LAB

Weight of the control tower	
	60 kg
Dimensions of the control tower (width × height × depth)	
	350 × 680 × 510 mm
Service connections	• 220 V, 50 Hz
Water	• Water supply pressure: 2-4 barg • Flow rate up to 20 l/min • Temperature = 5-65 °C • Download without pressure • Hose connector for pipes, outer diameter = 10 mm
Gases	• Gas supply pressure: 1.5 barg • Hose connector for pipes, outer diameter = 6 mm
Control tower	
Material	Stainless steel, AISI 304
Tank	Glass
Screen	Touch screen
SCADA Communication	Ethernet industrial
Motor drive	
Engine power	Power: 400 W
Motor rotation speed, direct coupling	0– 1000 rpm
Temperature control	
Heating system consisting of an electric resistance integrated into a water recirculation jacket	

FORMATS

DUAL DOUBLE TANK BIOREACTOR

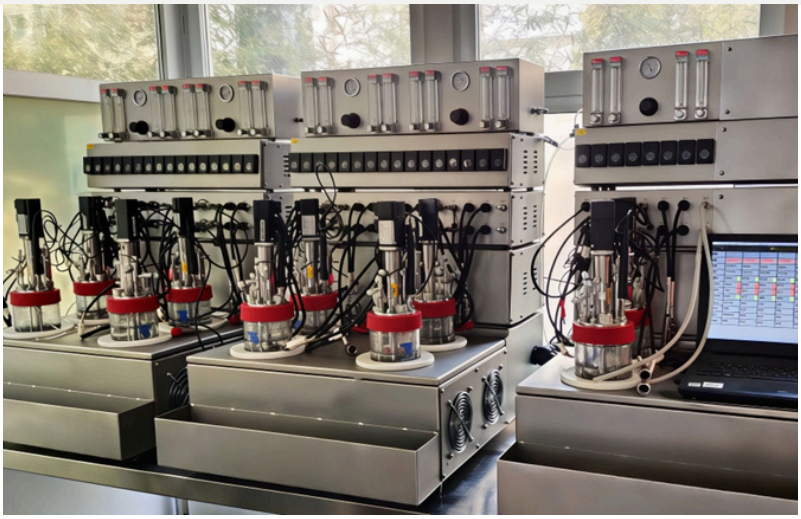
The equipment is designed to offer maximum flexibility and efficiency in fermentation and cell culture processes. Its configuration ***allows for parallel or independent operation,*** *facilitating comparative trials, process optimization, and small-scale development with high reproducibility. Equipped with advanced pH, temperature, dissolved oxygen, and agitation control systems, it guarantees optimal and stable conditions for each culture, along with a compact, modular design and an intuitive interface that enable easy operation.*





The Techmi BIO Lab multi-vessel fermentation station is a system designed for microscale research and development, enabling parallel fermentation trials with high reproducibility and precise process control. This configuration, comprised of several individual bioreactors, **facilitates the simultaneous study of different culture conditions,** which is particularly useful in screening, strain optimization, and bioprocess development.

MULTI-TANK FERMENTATION STATION



Each fermentation vessel has a small working volume, ideal for carrying out different conditions in complex experimental designs simultaneously. It features independent control of key process parameters such as temperature, pH, aeration, and agitation. The system integrates high-precision sensors and a compact, hygienic design, ensuring stable and reproducible conditions in each reactor.

SCALABILITY

Techmi Group's bioreactors are designed to ensure efficient and reproducible **scalability from laboratory to industrial production**, through an approach based on modular design, advanced automation, and precise control of critical variables. The platform allows for a gradual transition between scales while maintaining operational consistency and bioprocess stability.



In the laboratory, Techmi Bio Lab systems integrate complete control of pH, dissolved oxygen (DO), temperature, and agitation, along with automated dosing via peristaltic pumps and continuous data logging. This same control approach is maintained at larger scales, allowing for the replication of operating strategies and facilitating technology transfer.



The Techmi range covers volumes from 0.25L to 100,000L, incorporating high-precision thermal control (±0.1°C), pH regulation (2.0–12.0), dissolved oxygen control (0–100%), variable agitation (20–1000 rpm), and integrated CIP/SIP systems. The adaptable configuration of ports, valves, and feed systems allows each unit to be tailored to specific process requirements.

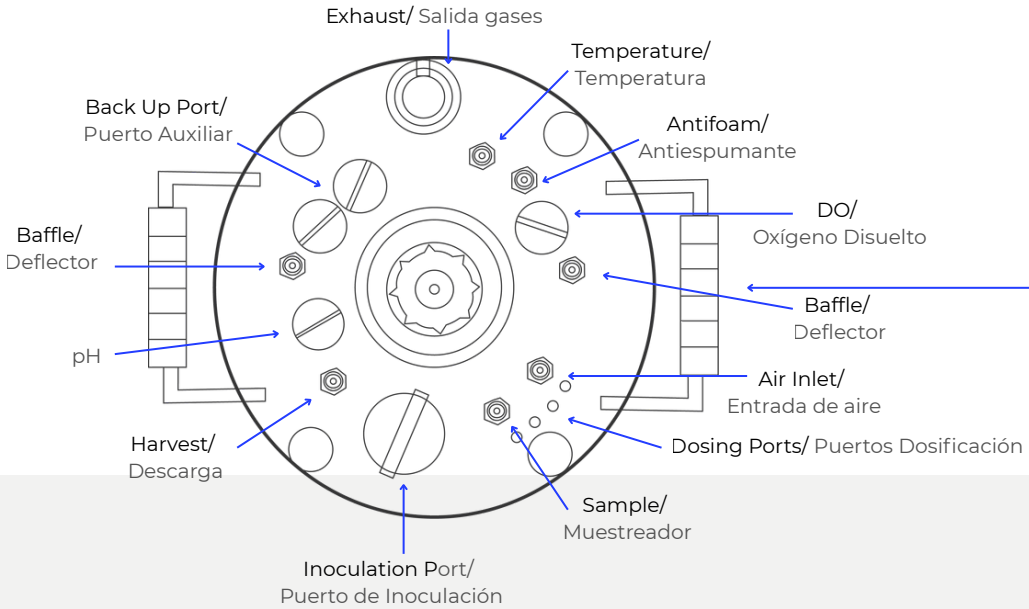
This approach ensures a reduction of risks in scale-up, improves process reproducibility and optimizes development and industrialization times, while maintaining traceability and control at all stages of production.



TANK

TANQUE TECHMI BIO LAB

	1 liter	3 liters	5 liters	7 liters	10 liters
Material	Borosilicate glass, AISI 316L stainless steel, EPDM				
Sizes [L]	1	3	5	7	10
Working volume [L]	0.7	2.1	3.5	4.9	7.0
Space requirements in the autoclave [diameter × height mm]	500 x 150	600 x 170	640 x 220	660 x 230	660 x 300





Control parameters

PERISTALTIC PUMPS

Peristaltic Pump Module:

The system incorporates high-precision peristaltic pumps equipped with fast-loading heads, available in fixed-speed and variable-speed versions to suit different feeding and process control strategies.
The pumps allow for the controlled dosing of culture media, acids, bases, antifoams or feeding solutions, offering a wide range of flow rates depending on the selected tube diameter.

Main features:

- Peristaltic pumps with quick-change head.
- Fixed or adjustable speed settings.
- Integrated software control of the bioreactor.
- Wide dosage range, from microliters per minute to over 120 mL/min.
- Compatibility with different tube diameters to suit each application.
- High precision in feeding processes, pH correction and reagent addition.
- Continuous and reproducible operation for research and development applications.

Operating ranges:

- Fixed speed: standard settings of 5 rpm and 44 rpm.
- Variable speed: continuous adjustment from 0.15 rpm to 150 rpm.
- Maximum flow rate: up to 127.5 mL/min depending on pump configuration and tube diameter.

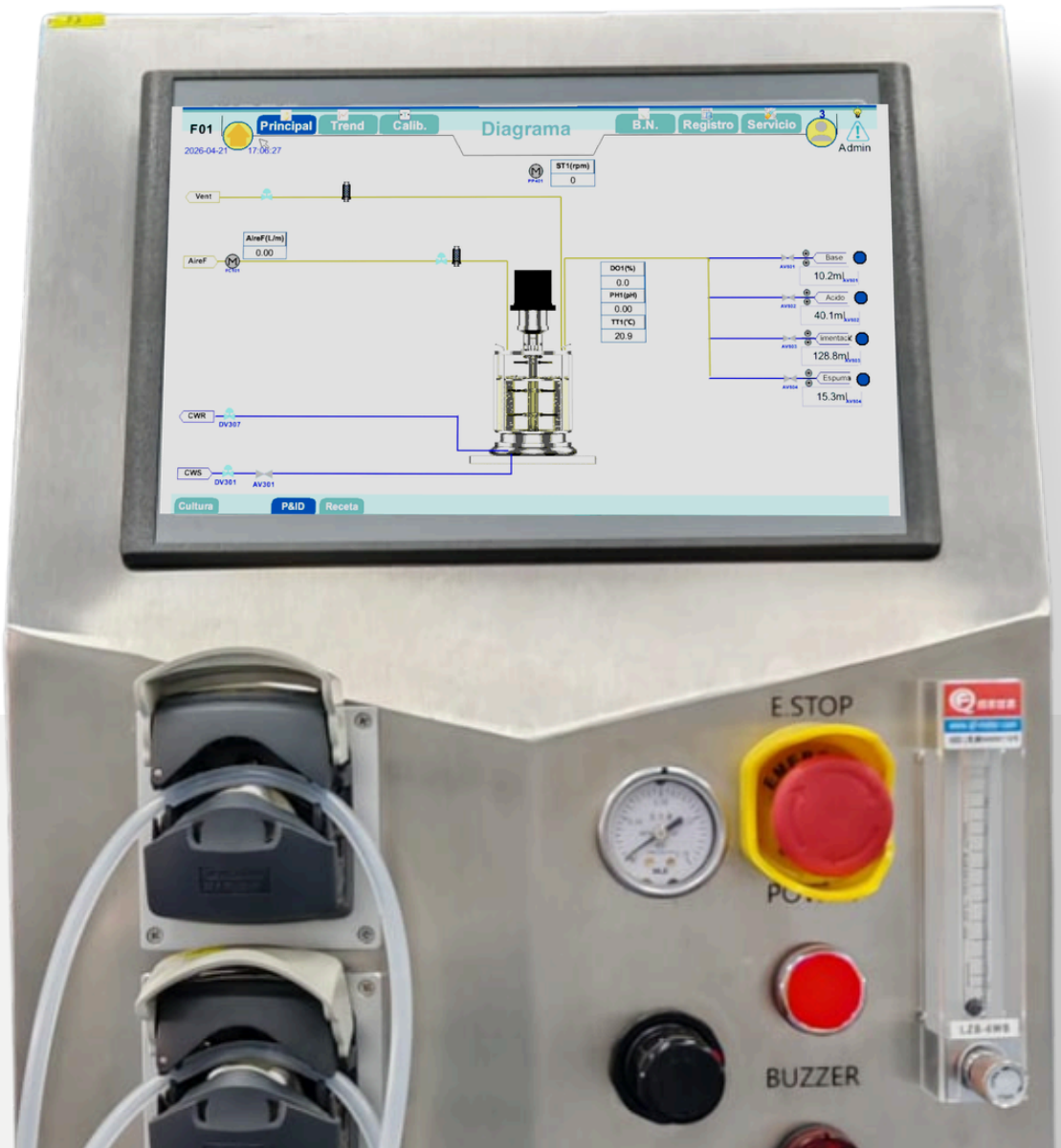
AERATION

AERATION MODULE

Exit to the culture vessel	Hose coupling outer diameter = 6 mm
Configurable flow	0 - 5 L/min

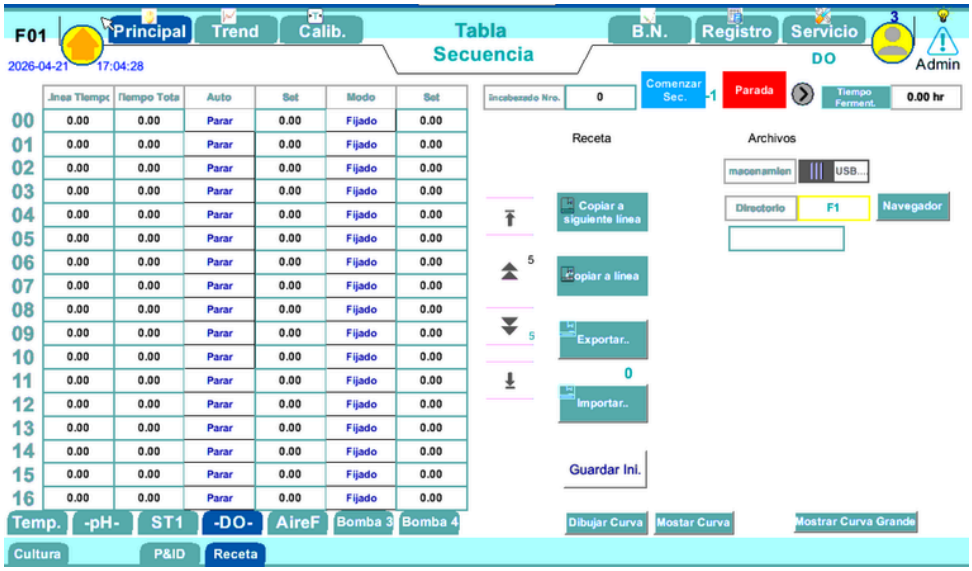
SOFTWARE

Techmi Group's bioreactor software is designed to offer complete bioprocess control in an intuitive, precise, and scalable way. It allows for real-time monitoring and automation of critical variables such as pH, temperature, dissolved oxygen, agitation, and feed, ensuring more stable, reproducible, and efficient processes.
Thanks to its recipe system, historical data logging, and advanced automation, it facilitates scaling from laboratory to industrial production while maintaining traceability and process control. Its intuitive HMI interface and integration capabilities with industrial systems make the Techmi Bio Lab software a key tool for optimizing productivity and simplifying daily bioreactor operation.



AUTOMATION

The bioreactor automation system is based on a programmable digital control that allows for the precise and reproducible definition, execution, and monitoring of operating sequences. Through a graphical interface, the user can configure culture recipes structured in different time stages, each with its own control parameters.



Dissolved oxygen (DO) control using a cascade control strategy. The DO Cascade is a control strategy in which a primary variable (DO) is regulated by sequentially adjusting several secondary variables, such as agitation speed and aeration, to maintain DO at its setpoint, thus optimizing oxygen supply to the culture.



SENSORS

PROCESS CONTROL | SENSORS

	Sensor | Measurement Range | Display Accuracy
Temperature	Pt100 | 0 – 150 °C | 0.1 °C
Dissolved oxygen	Optical | 0 – 100% | 0.1%
pH	0 – 14 pH | 0.01 pH
Foam control	Conductivity
External signal input	0 – 10 V or 4 – 20 mA
Optional: Redox Potential	Electrochemical | –1,000 – 1,000 mV | 1 mV
Optional: Total cell density	Optical | 0 – 200 g/L
Optional: Viable cell density	Capacitance | 10^5 – 10^9 cel/mL
Optional: dissolved CO_2	Optical | 0 – 200 mbar
Optional: Glucose	Enzymatic | 0 – 20 g/L

OPTIONAL CONFIGURATIONS / SERVICES

- *MAGNETIC STIRRING SYSTEM*
- *MASS FLOW METERS FOR GASES*
- *≥ 2 GAS INLET LINES*
- *ALTERNATIVE HEATING SYSTEMS:*
- *PLATE SHIRTS*
- *RADIATIVE HEATING*
- *CUSTOMIZED DRIVE SYSTEM:*
- *CUSTOM DRIVER CONFIGURATION*
  - *MARINE IMPELLERS*
  - *CUSTOM TANK GEOMETRY (FLAT TANK BOTTOM, ETC.)*
- *INTEGRATION OF OPTIONAL SENSORS*

SERVICES

CUSTOM ENGINEERING



At Techmi Group, we develop customized solutions tailored to the needs of each industrial process. Our engineering team designs equipment and complete lines, optimizing productivity, automation, integration, and scalability for sectors such as biotech, chemical, pharmaceutical, and food.

RESEARCH AND DEVELOPMENT

We have an in-house R&D department and laboratory focused on the development, validation, and scaling of processes. We conduct pilot tests and parameter optimization to help our clients transform laboratory ideas and developments into efficient and reproducible industrial processes.



START-UP

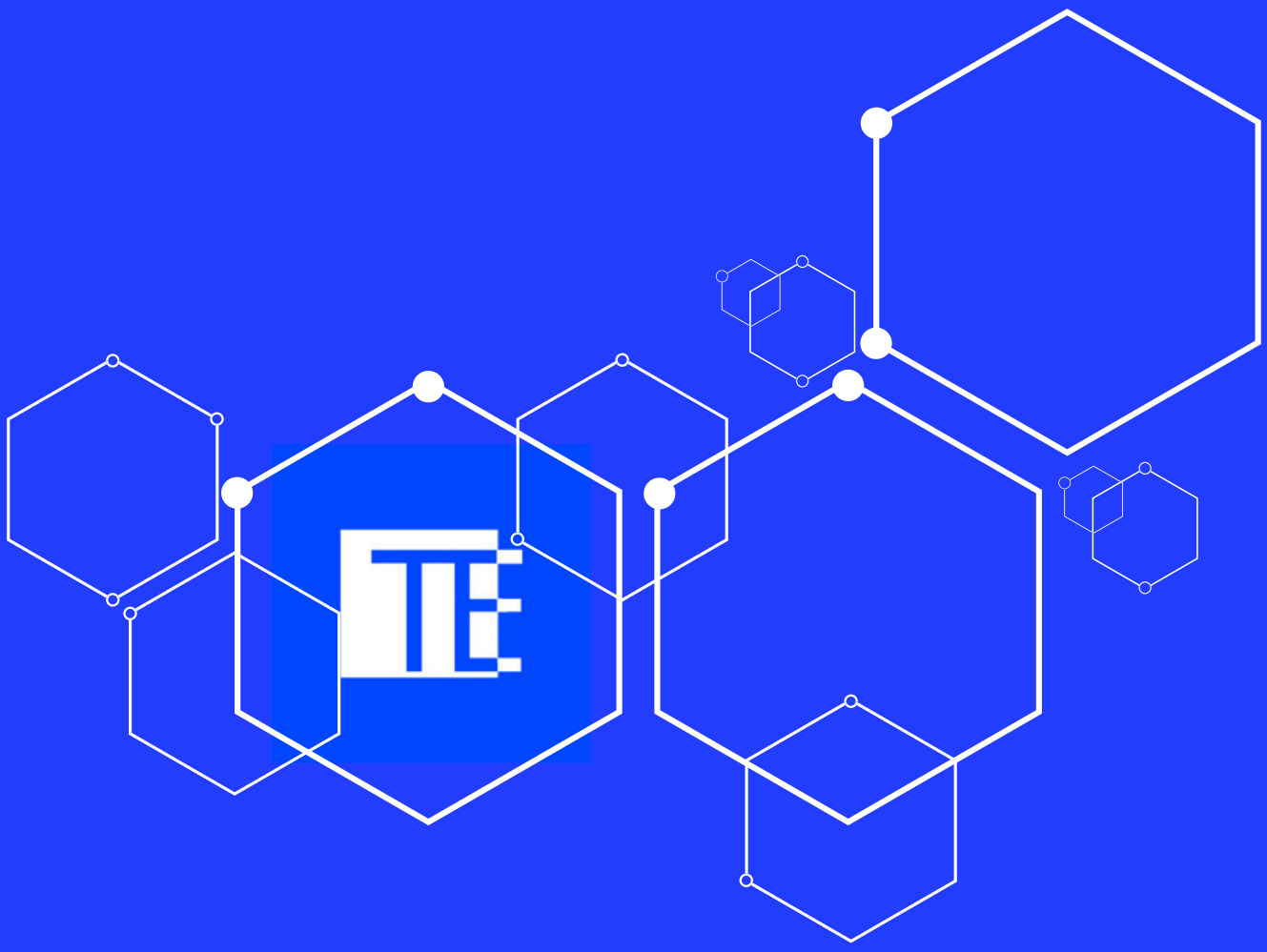


Our specialized technicians perform the installation, configuration, and commissioning of the equipment directly at your facility. We guarantee a safe and efficient integration, validating the correct operation of the system and supporting the client during the start of production.

TECHNICAL SERVICE

We offer specialized technical support and after-sales assistance to ensure the operational continuity of every installation. Our team provides maintenance, diagnostics, optimization, and rapid technical support, both on-site and remotely, guaranteeing maximum performance of Techmi Group equipment.





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