

### Haier Biomedical Solar Direct Drive (SDD) Cold Room

### New Product Launched

On October 13, the Haier Biomedical Solar Direct Drive (SDD) Cold Room New Product was successfully launched, the long-awaited new SDD cold room product was finally unveiled to the world!

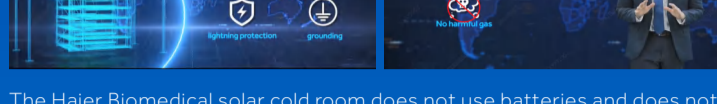
The current AC cold rooms and conventional solar cold rooms are facing many challenges in deployment, operation and maintenance, such as high operational costs, high power consumption, low robustness and the inability to control remotely. In response to the above issues that we are facing in the industry, Haier Biomedical has innovatively developed the SDD (solar direct drive) cold room, which has been completely upgraded from the power supply system to refrigeration system and monitoring system!



#### Adopting Solar Power Supply System, No Need for Electric Power, Environmentally Friendly and Energy-saving

Haier Biomedical developed the Solar Direct Drive Cold Room. The refrigeration system and electronic control components are all DC-driven and the solar panels drive the refrigeration system directly without an auxiliary battery. It perfectly solves the problems of high electricity and unsuitability in areas with unstable power supply which has traditionally affected older generation cold rooms.

The working voltage of the cold room cooling unit is 32-60 Voltage of Direct current which is relatively wide, and the fan is driven by the constant voltage of 24V DC from the compressor output. It also has lightning protection and grounding devices to effectively prevent electrical components from being damaged by lightning which ensures stable and safe operation of the cold room.



The Haier Biomedical solar cold room does not use batteries and does not consume fossil fuels or energy or produce harmful gases. It is energy-saving, environmentally friendly and is fully compliant and in line with the UN sustainable development strategic requirements.

#### Adopting Ice Thermal Energy Storage Technology, Providing a More Powerful Safety Guarantee

The Haier Biomedical solar cold storage room utilizes ice thermal energy storage technology and uses solar energy to produce cold storage capacity, even if there is not enough light or during the night or rainy days, the frozen ice in the water tank will slowly release its cold energy to ensure that the temperature in the cold room can be maintained at 2-8 °C. Its holdover time is at 3 days at 43° C and 5 days at 27° C. Even if there is a failure in the cold room, there will be enough time for trouble shooting and maintenance. However, the conventional cold room is greatly affected by the power supply, and unstable power causes the temperature to fluctuate, the Haier Biomedical SDD Cold room does not suffer the same issues and is completely safe, secure and reliable.



**Ambient temperature** 43°C  
**Holdover time** 3 days

27°C  
5 days

### PLC Monitoring System, Providing a More Ergonomic User Experience

The Haier Biomedical solar cold room adopts PLC (programmable logic controller) technology, it can accurately display and control the refrigeration unit to make the temperature more uniform. Meanwhile, the PLC can start the cooling unit based on the solar radiation to fully use the solar energy. For example, starting only 1 cooling unit around 9am, then the other 3-4 units will start around mid-day according to the requirement of the cold energy compensation.



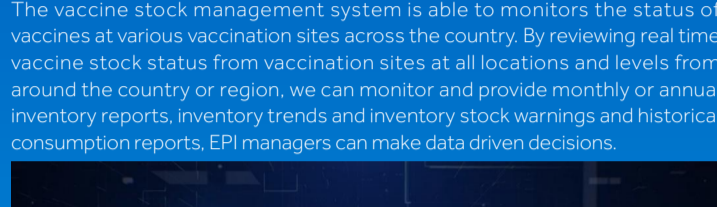
#### Equipped with a 10-inch LCD screen, which is convenient for real-time data reading and historical data exporting while at the same time, the temperature alarm value can be set by users.

When connected to the internet, users can log in remotely from a PC or mobile device to view the data, check the temperature, alarms, compressor operating system all in real time and also check historical data. The engineers can also use the error log to carry out remote diagnosis and control the system remotely. For example, the engineers are able to remotely turn on or turn off the compressor, provide remote operating diagnostics and make any adjustments as needed.



Equipped with LORA (Long range radio technology) remote temperature monitoring device, which is a low-power self-networking monitoring equipment system, this unique system can simultaneously collect temperatures, door open/close status and power on/off status from multiple cold rooms or multiple vaccine fridges. It also supports remote monitoring and management, which is capable for monitoring the status of cold rooms at all levels.

The vaccine stock management system is able to monitor the status of vaccines at various vaccination sites across the country. By reviewing real time vaccine stock status from vaccination sites at all locations and levels from around the country or region, we can monitor and provide monthly or annual inventory reports, inventory trends and inventory stock warnings and historical consumption reports. EPI managers can make data driven decisions.



Haier Biomedical is always user-oriented, continuing to invest in independent innovation, research and development. At Haier Biomedical, we will continue to adhere to the IoT technology advancements and empower the life sciences of the future!

### How to Ensure the Quality of Each Biomedical Freezer/Refrigerator

Scan the code of the ultra-low temperature freezer that enters the final inspection stage and connect it to the system, and scan the appearance. Then, according to the model inspection standard, check the required inspection parts including the appearance, product body, door seal, accessories, manuals and other related printed materials one by one and upload photos to the system, then wait for the second inspection and judgment of the information management and control system to ensure that the monitoring data of each machine can be observed in real time.

This is the daily work of Mr. Lu, the quality inspector of Haier Biomedical who is in charge of final product inspection. Generally, he needs to repeat the process 50-60 times a day.

In the quality inspection workshop of Haier Biomedical's new IoT factory, every quality inspector is seriously focused and professional while strictly repeating every process in their charge. It is such a large and precise coordinated quality inspection system that ensures the quality of each manufactured-finished product.

For a high-precision equipment such as a biomedical freezer or refrigerator, strict quality control is essential for sample safety. Therefore, how to establish an intelligent, thorough and efficient quality inspection system is a problem that all manufacturers must solve. At Haier Biomedical, from the completion of production to the successful offline production of each unit, a product has to go through at least two thorough processes to finish a comprehensive quality inspection process covering appearance, safety performance and functional performance. The quality inspection of Haier Biomedical consists of four major links, maximizing efficiency, coverage, intelligence and accuracy to ensure the highest quality of each product.

#### First Product/Unit Inspection

In the production process, after the foaming mold is installed and debugged, there might occur deformation and size in conformity with the requirements, which will affect the subsequent process production. In order to avoid this problem, Haier Biomedical has introduced a daily first product/unit inspection for each model planned to be produced on the day. After measuring and confirming that the first unit's appearance and dimensions are accurate and without any deviation, mass production can be carried out to ensure the best product size accuracy.

#### Safety Inspection

From the first inspection process to final assembly, the safety detection link mainly involves product safety inspections including leak detection, grounding and pressure resistance tests. Each welding position is inspected by leak detection equipment to ensure that each product meets the product's factory safety performance test requirements while automated inspections are carried out through information-based laboratory safety tests to prevent test errors caused by human factors.

#### The Complete Process of COVID-19 Nucleic Acid Detection

At present, the cumulative number of confirmed cases of COVID-19 pneumonia worldwide has passed 40 million, and the total deaths have exceeded one million. The global anti-epidemic work has not been ongoing for nearly a year. The epidemic has recently rebounded after a period of relatively low cases in most countries. More recently, the number of daily exceeded confirmed cases of COVID-19 in the world has exceeded 430,000. The huge number of confirmed diagnoses has brought many obstacles to the epidemic prevention and control, it is also highlighted that this battle is bound to be long and tough, thus enhancing the ability to detect and control the highly infectious virus is a common issue facing the whole world today.

As a firewall for the prevention and control process of the COVID-19 epidemic, timely detection of viruses and control of the further spread are essential, this requires the virus detection system to be efficient, accurate and secure. Improper collection, storage, and transportation of patient samples may affect sample quality and generate false test results. Therefore, doing a professional job in sample collection and processing, and providing a stable and uniform storage and transportation environment is necessary to ensure sample quality and result accuracy.

In this article, Haier Biomedical will share with you the whole process of COVID-19 nucleic acid detection from sample collection, transportation to detection and storage, as well as solutions to ensure the safety of lab clinicians and the accuracy of measurement results combining with the practical application experience.

#### Sample Collection

In this step, samples of the test objects are collected mainly through nasal swabs or throat swabs. The medical staff can collect samples standing in the Haier Biomedical positive pressure swab booth. The pressure difference between inside and outside the swab booth will greatly guarantee the safety of the staff. The samples collected will be put into test tubes in batches and stored in seal.

#### Sample Transportation

Put the collected samples into a sealed container, and store them uniformly in biomedical transport coolers and transport them to the laboratory for the following testing.

#### Performance Inspection

As a key part of product quality control, performance inspections test a series of performance data such as internal temperature, temperature uniformity, cooling speed, switch-on power and USB function, which is the most demanding and time-consuming section of the overall inspection process. When testing temperature uniformity, the quality inspector must first arrange points on the main sensor and the center point of each floor for data collection and parameter adjustment in advance. If any tiny deviation occurs, it is easy to trigger the high and low temperature alarms, thus the link is often with higher requirements for the inspector's skills, experience and patience. In order to ensure the accuracy of data, the test process takes 12 hours and it often requires the support of night shift colleagues. The test data will be generated the next day and the quality inspector will judge whether it is compliant according to all necessary standards and will be automatically uploaded to the system and synchronized to the test date of corresponding machine, which is convenient for any follow-up inquiries.

#### Final Inspection

The appearance refinement of the whole unit and the structure will be rechecked in this process. The final inspection before coming to the off-production line to packaging is required for each product. This link mainly includes the inspection of the whole machine appearance, door assembly, refrigerator/freezer equipment, accessories and other related inspections, confirming no problem exists after packing and shipment.

Sampling inspection: Before shipment, the sampler shall conduct random inspections on finished products according to the quality and control requirements and further check the appearance and performance test to ensure that each batch of products meets the highest standards and requirements set by Haier Biomedical's Quality and Control Department.

Haier Biomedical's intelligent quality control and inspection link is also a successful integration of IoT technology with production links. Through the terminal system, the data of all models are connected, which can be observed in real time, greatly reducing labor costs and manual error rates while achieving follow-up real-time traceability of all data for each product, which is convenient for long-term equipment maintenance and product optimization.

Any global leading brand should ensure such quality practices are adhered to ensuring all checks and balances are followed to produce the highest quality products in the market. These internationally leading practices have been implemented at Haier Biomedical. At Haier Biomedical, we have achieved this with actual product experience and user feedback. Strict quality control is Haier Biomedical's commitment to every user who chooses to trust us, and it is also the responsibility of Haier Biomedical to undertake the best practices in the industry to continue to have the trust and of all users for our brand. Intelligent protection of life, being responsible to users, Haier Biomedical is always committed to providing you with the best biomedical cold chain solutions!

### How to Perform PCR Nucleic Acid Detection

**Sample Processing**  
After the samples arrive in the laboratory, they need to be carried out in a **clean bench**, and then stored in a medical refrigerated freezer.

**Sample Testing**  
After sample preparation through the **biological safety cabinet**, a **centrifuge** is required for pyrolysis and a **nucleic acid extractor** is used for nucleic acid extraction. The extracted nucleic acid sample must be amplified by a **PCR detector** to amplify the target DNA sequence to the required amount for detection. The nucleic acid samples that have been amplified need to be tested for virus through the kit and a test report should then be issued. If the result is positive, the corresponding test object is confirmed to carry the virus.

For more information, please check Haier Biomedical COVID-19 Detection PCR Laboratory Solution.

#### Sample Preservation

After the experiment is over, the samples or further experiment should be properly sealed and stored in **-86°C ULT freezers** for future experiments. Haier Biomedical's ultra-low temperature freezers have passed the Energy Star, CE, UL and other globally recognized certifications. Different product series can meet various setting requirements. For example, the **Twincool series ULT freezer** can maximize sample safety, the **Frequency Conversion ULT freezer series** is more energy-saving and environmentally friendly; meanwhile different functions such as IoT modules are equipped optionally to meet multiple localized special demands.

#### Laboratory Disinfection

In order to reduce the risk of leakage, the entire laboratory, all experimental samples, experimental equipment and disposable protective clothing need to be strictly disinfected. The instruments and samples need to be packed in three sealed layers, and then the laboratory safety cabinet table, related instruments and the surface of the protective clothing are fully disinfected with 75% alcohol. The solid waste needs to be put into a **Haier Biomedical Vertical Automatic High-Pressure Steam Sterilizer** for thorough disinfection after the experiment.

The fight against the COVID-19 epidemic is destined to be a protracted battle. We need to accumulate experience and wisdom in every battle together, and strictly control every step and detail to win this battle. Haier Biomedical will continue to pay attention to the progress of the epidemic, keep exploring the actual needs required to win the fight, and continuously upgrade products and solutions to provide solid security and powerful weapons for all front-line heroes in the fight against the epidemic!

### Haier Biomedical: Mauritania CCEOP Project Successfully Completed

As a long-term partner of UNICEF and Gavi, Haier Biomedical has been committed to helping economically underdeveloped areas improve their medical cold chain, by successfully matching the region with the best cold chain solutions according to actual local needs and support the vaccination process to protect children's health globally. At Haier Biomedical, we provide solutions on a case by case basis, there is no one fit all solution, so it is important to fully understand the needs and wants of local communities, again here in Mauritania we have implemented such a solution.

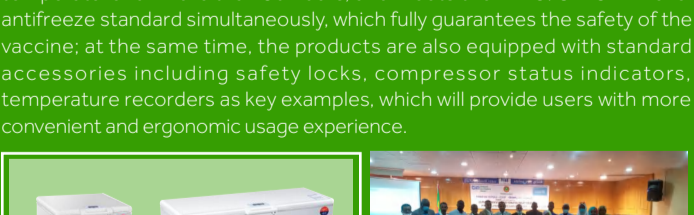
This year, Haier Biomedical won the bid for providing around 400 vaccine refrigerators from the CCEOP project in Mauritania. In consideration of the possible impact of the high temperature and rugged road conditions in the local desert area, and the need for coordination assistance for various transport means such as camels and ships in some areas, the product delivery date was brought forward as early as possible, and the team pre-planned the route and transportation plan to deal with various difficulties in transportation. With thorough planning the project has been successfully

In addition, and in order to better serve the local market and facilitate the use of products & solutions, local service providers in Mauritania overcame various difficulties and successfully held a practical training meeting in the central area on October 5th, systematically introducing the installation, daily use and maintenance knowledge of the Solar Direct Drive (SDD) and ice-lined vaccine refrigerators.

The products for this project mainly include SDD vaccine refrigerators and ice-lined vaccine refrigerators. Haier Biomedical's SDD vaccine refrigerators are specially designed for remote areas. The direct solar power supply is used to solve the problem of insufficient local power supply. In addition, the patented heat pipe technology is designed and used to ensure temperature uniformity, the A-level antifreeze technology protects the stability of the internal temperature and ensures the safety and reliability of the vaccine.



Haier Biomedical's ice-lined refrigerators adopt an upgraded refrigeration system, which is suitable for 5-43°C ambient temperature, and its manufactured with energy-saving and efficient non-chlorofluorocarbon high-density foam material, which has a superior thermal insulation effect. It can ensure the vaccine temperature between 2-8°C at 43°C ambient temperature for more than 30 hours, and meets the WHO/UNICEFA level antifreeze standard simultaneously, which fully guarantees the safety of the vaccine; at the same time, the products are also equipped with standard accessories including safety locks, compressor status indicators, temperature recorders as key examples, which will provide users with more convenient and ergonomic usage experience.



Haier Biomedical, intelligent protection of life empowers with continuous technology upgrade and we are committed to providing the optimum complete cold chain solutions for the world!

### Haier Biomedical: Malaysia Anti-epidemic Work, Gaining High Praise from the Local Government

Since the outbreak of the COVID-19 epidemic, Haier Biomedical has been closely keeping an eye on the progress of the global epidemic and is committed to providing assistance to the best of its ability on a global scale, adhering to best practice corporate social responsibility.

This month, through a local partner in Malaysia, Haier Biomedical donated two sets of biomedical equipment, including a RFID pharmacy refrigerator HYC-390R and a biological safety cabinet HR-IIA40, to the local medical institution Institute of Medical Research and National Public Health Laboratory to provide assistance for local anti-epidemic work.

At present, the donated equipment had arrived locally, and Haier Biomedical's action has won high praise from Malaysian government.



The donated HYC-390R RFID pharmacy refrigerator is the main product of Haier Biomedical Intelligent Reagent Network Solution, based on the IoT module, the unit provides automatic sensing and intelligent management. Using high-frequency RFID plus IoT technology, it ensures intelligent inventory, inventory entry & exit records and intelligent replenishment and the product temperature uniformity can reach ±3°C, meeting the 3Q standard of pharmaceutical factories, equipped with functions such as validity warning and authorized access management, providing users with higher security.

The biological safety cabinet HR40-IIA2 belongs to Haier Biomedical Classic Series which is widely recognized by the market, with reliable quality and high cost performance. Adopting ultra-high efficiency speed, real-time display of low flow wind speed, inflow time speed, flow, pressure in the static pressure box, pressure in the negative pressure box as key examples, while fully ensuring the cleanliness of the sample and the safety of the experimenters; the work surface is made of 304 stainless steel, without any fixed screws, meaning no accumulation of pollutants; at the same time the unit is equipped with removable air-in-flow plate and work surface, convenient for cleaning and disinfection; the operation area's internal wall is manufactured with stainless steel integrated structure design, with 12mm large arc transition, avoiding cleaning dead corners and easy to clean and disinfect, providing users with a more ergonomic operating experience.

Haier Biomedical, intelligent protection of life empowers with continuous technology upgrades, we are committed to providing the optimum complete PCR product solutions, assisting global anti-epidemic work and being the first choice as your biomedical cold chain solutions provider!

### Haier Biomedical -30°C Biomedical Freezer - DW-30L1280F

- \* Dual Refrigeration System
- \* Intelligent Defrosting Technology
- \* Hydrocarbon Energy Saving
- \* Microcomputer Control System



### Haier Biomedical IoT ULT Freezer

- \* IoT System Real-time Monitoring
- \* Intelligent Large Screen Visual Management
- \* Equipped with Multiple Interfaces
- \* Multiple Alarm Functions for Safety and Security
- \* Precise Temperature Control for Safe & Secure Storage
- \* High-efficiency and Energy-saving

