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Haier

Cold Chain Perfected

Haier Biomedical

THE VACCINE SAFETY SOLUTION

www.haiermedical.com

Intelligent Protection of Life Science

FEB 2020

CONTENT

A platform for sharing, an ecosystem of trust.

Haier Group

Haier Group is a global leading provider of better-life solutions, and its home appliances business brands have led the way for eleven consecutive years. In this technology driven era and the Internet of Things (IoT), Haier transformed from a traditional manufacturing enterprise into a cutting-edge, win-win IoT community ecology, taking the lead in igniting the Internet of Things economy. Currently, the Haier Group owns Haier, Casarte, GE Appliances, Fisher & Paykel, Hoover Candy, AQUA and Leader as its smart home appliances brands. In the IoT service area it's RRS, Haier Consumer Finance, COSMOPlat and Shunguang and Haier Bros in the cultural and creative industry. The global brand matrix reflects the strategy of "Smart Home Customization" in other words, a smart home customized for a better life.

Worldwide Network	Trading Company	R&D Centers	Manufacturing	Industrial Parks	Sales Network
International	24	8	54	12	37683
Global	66	10	108	24	143330

The Haier Biomedical Vaccine program is one of the most important areas of our focus, we are committed and will continue to provide lifesaving cold chain solutions for global vaccine immunization programs.

Getting vaccines to children in hard-to-reach places is challenging, but a challenge we freely accepted from the GAVI Alliance – ensuring a safe and stable supply cold chain for vaccines saves lives. I am personally very proud that we have delivered on this challenge and our cold chain solutions can be found across the world, effectively saving and securing life through vaccine security.

I guarantee, that we will continue to invest in new technology and infrastructure to strengthen health systems and support immunization programs, ensuring Haier Biomedical's complete cold chain solutions are working towards keeping the world safe.

— Dr. Liu
Managing Director
Haier Biomedical

Haier Biomedical

Haier Biomedical, headquartered in Qingdao, was founded to focus on design, manufacturing, marketing and sales of low temperature storage equipment for biomedical samples.

Operating on a global scale, Haier Biomedical provides the world's only complete storage solutions for a range of applications, including biological sample storage, blood management, vaccines, medical products and reagent storage across multiple sectors like pharma, academia, biotech and within medical/clinical arenas.

Haier Biomedical's solutions can be found in many prestigious and leading organizations in the UK, Europe, the America's, Africa, the Middle East and across the Asia Pacific. Furthermore, significant investment into the development and solution for solar-powered refrigeration units for areas that lack constant electric power supply has significantly changed the landscape in solving the cold chain for remote communities.

Haier Biomedical successfully creates a new synergy by combining its manufacturing with IoT-based biological and medical sciences and practices. The company is the driving force of innovation in product design and application. Its low-temperature storage equipment works with IoT-based technology to make it possible for product real-time monitoring and tracking, intelligent vaccination, and precise blood management. Haier Biomedical leads a new revolution in traditional manufacturing as well as innovative technology development.

Haier Biomedical's complete cold chain equipment and services are currently used in more than 120 countries.

Importance of Vaccines

To Human Life

1 In more recent times, Haier Biomedical has already progressed extensively with huge global success with regard to providing cryopreservation for saving and securing life through vaccine security. Immunization by vaccine inoculation can save a child's life and is therefore vital to human life.

The Director-General of WHO claims: "Vaccines are one of our most important tools for preventing outbreaks and keeping the world safe. While most children today are being vaccinated, far too many are left behind. Unacceptably, it's often those who are most at risk– the poorest, the most marginalized, those touched by conflict or forced from their homes - who are persistently missed."

2 More than 1 in 10 missed out on lifesaving vaccines such as measles, diphtheria and tetanus in 2018, according to data from WHO and UNICEF.

3 Every 20 seconds a child dies from a disease that could have been prevented by secure and safe vaccine coverage.

4 As vaccines need to be kept at a particular temperature to remain effective, one of the main reasons resulting from the numbers above lays in the unreliability of power supplies in many rural areas worldwide. Haier Biomedical combats this insufficiency of safety and security of vaccines effectively with Haier Biomedical vaccine storage solutions.

5 140,000 is the number of medical refrigerators that Haier Biomedical delivered till 2019, this was in order to improve improper refrigeration of vaccines in areas where safety and security of vaccine storage is needed the most.

Monitoring animal health and preventing an outbreak of an animal disease is not only essential to the country's food supply and therefore to their health, but also to the country's economy. Only healthy livestock will result in safe food supply and thus stable consumer prices.

Animal diseases with human health implications can adversely impact public health, global trade, and the stability of the agricultural segment of an economy. Those kind of disease outbreaks can actually cost a country millions if not billions of dollars due to animal slaughters, trade halts, and subsequent disease eradication efforts. This is why economic growth can even stagnate if improper access to medicines and animal care is unattainable.

Veterinary vaccines play a significant role in protecting animal health and reducing their suffering. This is also important regarding transmission of zoonotic and foodborne infections to people that can be prevented. The correlation between animal and human health is an approach known as 'One Health'. Looking at both areas simultaneously, one can prevent disease outbreaks across species.

Despite delivering a source of healthy, essential proteins through milk and meat to humans, healthy livestock is also a vital driver for farmers, families and for the communities around them.

Improving an animals well-being, farmers can increase results in enhancing efficiency of food production, which can lead to greater income for themselves, but should also be taken into consideration due to the bourgeoning global over-population that we are facing. We need to ensure a safe, sufficient and nutritious food supply for future generations!

This is especially important in developing countries were agriculture is still expanding. Vaccination provides significant net income benefits from reduction in livestock mortality, increased milk products, and savings by reducing antibiotic and acaricide treatments.

Animal vaccines demand the same cold chain as human vaccines, hence a dependable medical refrigeration network is crucial. A cold chain suffering from a decimated energy infrastructure prevents suitable refrigeration for vital vaccines, Haier Biomedical is the solution provider.

A Long Way to Vaccination

Increased vaccine usage leads to a higher amount of vaccines lost due to improper storage, which is only one of the main causes of poor immunization coverage rates. To maintain the quality of vaccines, they have to be protected from extreme and temperature fluctuations. If exposed to inadequate temperature, vaccine potency diminishes, which cannot be regained.

From the moment when vaccines are manufactured, they need to be constantly stored at the right temperature until they reach the recipient. Hence, Haier Biomedical has successfully introduced new technology and infrastructure for a complete Cold Chain Solution to secure vaccine safety and quality.

The Last Mile

It is not always easy to deliver lifesaving vaccines to the ones who need it the most. However, Haier Biomedical's highest priority can ensure vaccine safety and security across the entire cold chain network and continue to strive and meet the challenge of vaccine security to the last mile.

Providing a Complete Life-Cycle Customer-Service Solutions

After Sales Service + Local Partners

Haier Biomedical has a large network of distributors, service and sales partners, who share the Haier philosophy and spirit of customer satisfaction on a global scale. In order to assure the highest quality and customers' contentment from initial sales, installation to after sales service of our products, we have carefully selected the best partners to work together with us to ensure the platform for sharing an ecosystem of trust transcends across all our networks.

Quality Management

Haier Biomedical's products carry manufacturer's warranty on parts and labor. To strengthen our product satisfaction internationally, we have also signed contracts with our suppliers for 10 years, which guarantees the availability of spare parts needed. Customer satisfaction is Haier Biomedical's goal on every product.

In-Country Training

To provide the best service possible, we deliver In-country training to our Haier partners on a regular basis. Transferring knowledge from Haier Biomedicals experienced professionals to our partners and customers teams is an essential step in providing the highest of standards.

Remote Monitoring and Control

For temperature control across thousands of devices, Haier Biomedical offers Remote Temperature Monitoring Devices, vital for surveillance and monitoring.

Haier Biomedical's Vaccine Safety Solutions

- *Solar Clinic*
- *Solar Direct Drive Cold Room*
- *Walk-In Cold Room*
- *Solar Direct Drive Vaccine Refrigerator*
- *Solar Direct Drive Blood Refrigerator*
- *Icepack Freezer*
- *Ice-Lined Refrigerator*
- *Vaccine Refrigerated Vehicle*
- *Vaccine Stock Monitoring Solution*
- *Remote Temperature Monitoring Device (RTMD)*
- *Optional Accessories*
- *Smart Vaccine Refrigerator*
- *Case Studies in Uzbekistan, Ethiopia and Guinea*

Solar Clinic

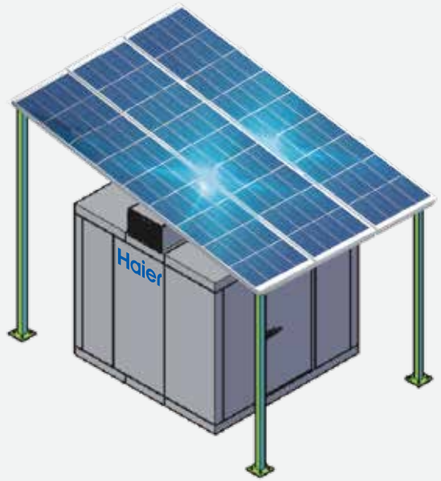
- Solar drive clinic provides complete vaccination equipment and solar power supply system for villages where residents are relatively concentrated or fixed, by upgrading an existing room or structure is simple and then readily accessible for the local community.

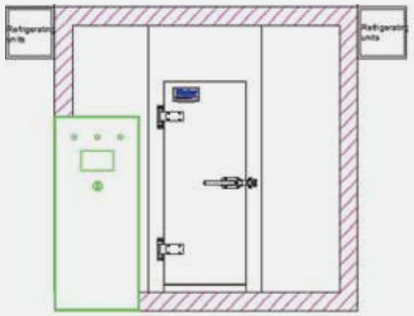
- Provide solar power supply solutions.
- Advanced vaccination information management system to initiate the local medical management plan.
- Help to upgrade local vaccination levels.

Vaccine Safety Solutions

Solar Direct Drive Cold Room

- Solar direct drive cold room uses solar cooling, combined with ice lined technology, maintains the temperature in the cold room between 2-8 degrees throughout the day;
- Used for storing large quantities of temperature-sensitive products, such as vaccines and medications;
- Used for national or regional vaccine centers, hospitals, and biopharmaceutical industries suitable for immunization projects.





Cold Room Features:

- SDD cold room uses solar direct drive cooling technology;
- Optional power supply of 110-220V AC/DC power;
- With EHC system for pads, fans and lamps;
- Combined with ice lined technology;
- Freeze-free design, temperature uniformity is less than 2 degrees;

- Complying with the ambient temperature range 10-43 degree;
- Long holdover during power off (Field test in Abuja) ;
- More than 100 hours(10 cbm, ambient temperature 25-32°C);
- Temperature record and alarm system, door ajar alarm and power failure alarm;
- Low operation cost, annual energy saving is about 8000kwh.

Walk-In Cold Room

The complete unit is also designed for installations in housed areas such as warehouses that need to meet specific temperature standards. Previously Haier have already successfully installed these units in India, Guinea, Syria, Pakistan, Burundi, Zimbabwe and other regions across the world.

Temperature

- Temperature recorder
- Forced air – cooling system

CFC-free

- CFC-free high-density foam insulation

Alarm System

- audible alarm system

Automatic Defrosting

Walk-In Cold Store Unit

- The cold room is suitable for a variety of applications: It can be used to freeze or refrigerate samples for healthcare, research, agriculture and biotechnology purposes.
- Walk-In Cold Room (WIC): Interior temperature can be controlled within a range of 2 °C to 8 °C.
- Walk-In Freezer (WIF): Temperature is set at -20°C.

Specifications

Model	HRZK-40D	HRZK-20D	HRZK-10G	HRZK-20G	HRZK-30G	HRZK-40G	HRZK-40GD	
	Freezer Room	Freezer Room	Cold Room				Combined Cold/Freezer Room	
							Cold Room	Freezer Room
WHO PQS Code	E001/003							
Defrost Mode	Electrical heating							
Refrigerant	CFC-Free							
Internal Temperature Range (°C)	-20	-20	2-8	2-8	2-8	2-8	2-8	2-8
Evaporator Temperature (°C)	-25	-25	-7	-7	-7	-7	-7	-25
Power Supply (V/Hz)	380/50	380/50	220/50	220/50	380/50	380/50	380/50	
Power (W)	2950	1810	894	1285	1831	1860	1380	1520
Refrigeration Output(W)	4290	2410	1300	2427	3358	4600	2737	1770
Capacity(m³)	40	20	10	20	30	40	25	15
Condensation Temperature (°C)	43							
Density (Kg/Cbm)	40+/-2							
K-Value (m2K)	0.22							
Insulation Thickness (mm)	100							

Product appearance and specifications are subject to change without notice

Vaccine Safety Solutions

Solar Direct Drive Vaccine Refrigerator/Freezer

Haier Biomedical's solar-powered refrigerators are vital to remote, rural and other effected regions in order to ensure the right temperature for vaccines even during power shortages. Haier Biomedical produces a range of chest and upright refrigerators, with our Solar Direct Drive refrigerators available in many different sizes.

Solar Energy Driven
• Solar power is green and environmentally friendly

Environmentally friendly
• Ecofriendly product

Anti-Freeze
• A level protection ensures required internal temperature

Patented Technology
• Heat-pipe provides better temperature uniformity

Ergonomic Design
• Easy to clean and corrosion proof

Lock Catch Designed To Match Padlock

Handgrip

Display Panel

Specifications

Model	HTC-40	HTC-110	HTC-112	HTD-40
	Refrigerator	Refrigerator	Refrigerator	Freezer for Icepacks
WHO PQS Code	E003/075	E003/076	E003/102	E003/086
Cabinet Type	Chest	Chest	Chest	Chest
Gross Volume (L)	40	110	110	40
Vaccine Storage Capacity (L)	22,5	59	75	-
Exterior Dimensions (W*D*H) in mm	788*720*875	1128*720*875	1128*720*875	788*720*875
Holdover time at 43°C	122hrs18mins	106hrs17mins	-	-
Holdover time at 32°C	163hrs36mins	152hrs28mins	-	/
Autonomy Time at 43°C	117hrs18mins	96hrs24mins	92hrs46mins	-
Autonomy Time at 32°C	-	-	145hrs29mins	-
Power of Solar Panels	180W*2	180W*2	180W*2	180W*2
Min. Solar Radiation (kWh/m2/day)	3.5	3.5	3.5	3.5
Freeze Protection Level	A	A	A	-
Optional	30 Days Temperature Logger Remote Temperature Monitoring Device (RTMD)			

Specifications

Model	HTCD-90	HTCD-160	HTC-120	HTC-240
	Refrigerator+ Freezer	Refrigerator+ Freezer	Refrigerator	Refrigerator
WHO PQS Code	E003/074	E003/057	E003/116	E003/117
Cabinet Type	Chest	Upright	Upright	Upright
Gross Volume (L)	Refrig.: 58 Freezer: 32	Refrig.: 120 Freezer: 40	120	240
Vaccine Storage Capacity (L)	37,5	100	100	200
Exterior Dimensions (W*D*H) in mm	1128*720*875	890*825*1700	865*825*1422	865*825*1815
Holdover time at 43°C	137hrs47mins	160hrs8mins	-	-
Holdover time at 32°C	169hrs6mins	230hrs10mins	-	-
Autonomy Time at 43°C	114hrs 56mins	121hrs27mins	112hrs24mins	95hrs23mins
Autonomy Time at 32°C	-	-	183hrs20mins	151hrs10mins
Power of Solar Panels	180W*4	255W*3	180W*2	180W*2
Min. Solar Radiation (kWh/m2/day)	3.5	3.5	3.5	3.5
Freeze Protection Level	A	A	A	A
Optional	30 Days Temperature Logger Remote Temperature Monitoring Device (RTMD)			

Vaccine Safety Solutions

Solar Direct Drive Blood Refrigerator

Applicable for storing wholeblood, medicines, biological products and other laboratory products that need to be stored at 4°C.
Suitable for the storage of blood and blood articles in areas that have power shortages.

Product Features

- Solar direct drive refrigerator without battery.
- Wide applicable ambient temperature: 5-43°C.
- Vertical structure, first-in first-out, easy operation.
- Stainless steel drawer.
- Optional RTMD.
- Automatic drainage design .

HTXC-240

Specifications

Model	HTXC-240
Cabinet Type	Upright
Gross Volume (L)	240
Blood Storage Capacity(L)	Bags 192
Exterior Dimensions (W*D*H) in mm	865*825*1815
Autonomy Time at 43°C	95hrs23mins
Autonomy Time at 32°C	151hrs10mins
Power Supply(V)	24VDC
Freeze Protection Level	A
Optional	Remote Temperature Monitoring Device

Icepack Freezer

Haier Biomedical's Icepack Freezer is designed to store e.g. vaccines, freeze icepacks, pharmaceuticals between -15°C and -25°C. Application is used within institutes epidemic prevention, clinics, hospitals, research institutes as key examples.

Ergonomic Design

- Easy to clean, safety lock to prevent unauthorized access

CFC-free

- CFC-free high-density foam insulation

Temperature Control

- LCD temperature display, internal temperature range between -15°C to -25°C

Specifications

Model		HBD-116	HBD-286
		Freezer	Freezer
WHO PQS Code		E003/002	E003/003
Cabinet Type		Chest	Chest
Temperature Range (°C)		-15~-25	-15~-25
Gross Volume (L)		121	286
Exterior Dimension		670*630*915	1240*630*915
Holdover Time		More than 4hr (up to-5 °C)	More than 5hrs (up to -5 °C)
Noise dB(A)		43	44
Accessories	Foot	yes	yes
	Basket	2	3
Optional		Automatic Voltage Stabilizer	

Product appearance and specifications are subject to change without notice

Vaccine Safety Solutions

Ice-Lined Refrigerator

Haier Biomedical's Ice-Lined Refrigerators are specifically designed to secure safety and potency of sensitive vaccines which need to be cooled at a controlled and stable temperature. Equipped with a solar-powered display panel, rated for a wide ambient range of 5-43°C , this refrigerator is appropriate for unstable electricity supply regions.

Solar Energy Display Panel

HBC-80

Specifications



Model	HBC-80	HBC-150	HBC-260
	Refrigerator	Refrigerator	Refrigerator
WHO PQS Code	E003/089	E003/088	E003/087
Cabinet Type	Chest	Chest	Chest
Ambient Temperature (°C)	5-43	5-43	5-43
Gross Volume (L)	80	150	260
Vaccine Storage Capacity	61	122	211
Exterior Dimension	788*717*872	1128*717*872	1647*717*940
Holdover Time at 43°C	59hrs 58mins	60hrs 50mins	62hrs
Holdover Time at 32°C	98hrs 26mins	96hrs 23mins	117hrs 24mins
Noise Level (dB(A))	<40	<40	<40
Freeze Protection Level	A	A	A
Optional	30 Days Temperature Logger Automatic Voltage Stabilizer Remote Temperature Monitoring Device		

Patented Technology

• Heated pipe for better temperature uniformity

CFC-free

• CFC-free high-density foam insulation

Temperature Control

• Equipped with digital solar powered temperature display to measure controlled inside temperature range from 2°C– 8°C

Ergonomic Design

• Safety lock to avoid unauthorized access control, equipped with handles on the sides

HBCD-90

Solar Energy Display Panel

Specifications



Model	HBCD-90	HBC-120	HBC-240
	Refrigerator + Freezer	Refrigerator	Refrigerator
WHO PQS Code	E003/097	E003/114	E003/115
Cabinet Type	Chest	Upright	Upright
Ambient Temperature (°C)	5-43	5-43	5-43
Gross Volume (L)	Refrig.: 42 Freezer: 32	120	240
Vaccine Storage Capacity	30	100	200
Exterior Dimension	1128*717*872	890*829*1425	890*829*1815
Holdover Time at 43°C	63hrs 48mins	128hrs48min	87h14min
Holdover Time at 32°C	132hrs 21mins	185h	165h
Noise Level (dB(A))	<40	<40	<40
Freeze Protection Level	A	A	A
Optional	30 Days Temperature Logger Automatic Voltage Stabilizer Remote Temperature Monitoring Device		

Vaccine Safety Solutions

Vaccine Refrigerated Vehicle

- High chassis, excellent cross-country capacity.
- Euro-2 standard, easy and low-cost maintenance in African area with backup power.
- Complies with WHO/PQS standard requirements.
- Backup power supply.
- Heating system to use in -20℃ ambient temperature.

Vaccine Stock Monitoring Solution

Monitoring the vaccine status of all vaccination sites nationwide, providing Enterprise Resource Planning (ERP) management for decision makers with timely and accurate information of vaccine inventory and temperatures.

- 7-inch touch screen.
- Internal Internet-enabled SIM card.
- Solar power USB, EHC power supply.
- External NTC temperature sensor.

Function:

- Manual entry of vaccine stock.
- Data acquisition of temperature.
- Receives immunization notifications.
- Checks inventory reports.
- Check inventory trend and alarm information.
- Information data and files of vaccines.
- Checking vaccine warehousing plans.
- Submitting information for invalid vaccines.
- Checking historical temperature curve.

Remote Temperature Monitoring Device (RTMD)

Remote Temperature Recording:

- The external temperature sensor measures the temperature, records and stores the measured temperature values automatically, and transmits them to the platform through GPRS, realizing remote platform monitoring to provide ultimate sample safety.

Application Scenarios:

- It can be used for real-time monitoring of warehousing and distribution of food, medicine, vaccine, blood, reagents, biological products, biological sample tissue and other items as required. The application solutions include refrigerated trucks, incubators, cold rooms, cold packs, refrigerated cabinets, refrigerators, freezers and as key examples.

Cloud Platform Website

http://ucoole.haierbiomedical.com

Item	Specifications
Temperature sensor	NTC sensor：-40℃~+120℃（±0.5℃within -30℃to +20℃, ±1℃ for other） PT100 sensor （optional）：-200℃~+150℃（±0.3℃）
Environment Sensor	Temperature：-10℃~+55℃ Humidity：0%RH~99%RH
2G	850M/900M/1800M/1900M
Battery	6000mAh Charging voltage：5V~12V Charging current≤1.5A
Map location	Google map and LBS(Location Based Service)
Material	Shell：PC / Shell jacket：ABS
Dimension	114.5 mm *71.5 mm *22mm

2G

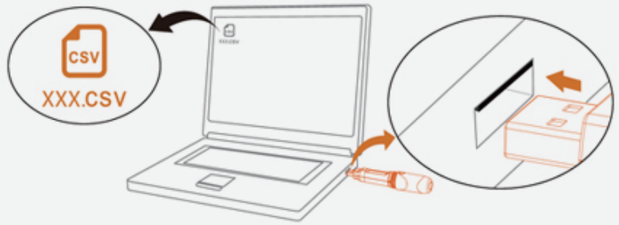
- Complies with WHO standards, WHO prequalified code: E006/060.
- The user is free to set up, and automatically uploads data to portal when powered on.
- Remote portal management platform, which can track temperature, location, and signal strength information, and provides output multiple data analysis reports.
- One charge, more than 10 days of battery life.
- The device supports sound and light alarms.
- USB data export (30 days temperature record).
- IP65 protection, waterproof, shockproof and dustproof to fit a variety of complex environments.

Haier Biomedical Optional Devices

30 Days Electronic Temperature Logger

- Approved by WHO, PQS Approved, PQS code:E006/042.
- Designed specifically for 2~8°C vaccine storage, equipped with high/low temperature visual alarm, meets WHO standards.
- Recording capacity is over 30days, recording interval is 6 minutes, outdated data will be overwritten by new data automatically when the recording volume is full.
- The logger can be plugged into the USB port of any PC to automatically generate a CSV file, including temperature data and temperature graph which can be generated by data management software.
- Built-in disposable wide temperature range lithium battery (Non-replaceable) with a minimum operating life of two years, after a maximum shelf life of one year.

HETL-01



Easy to download data

Accessory: Bracket

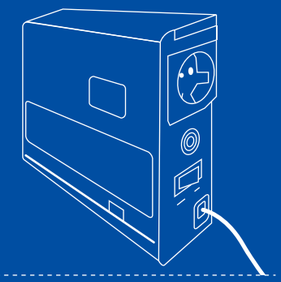
Specifications

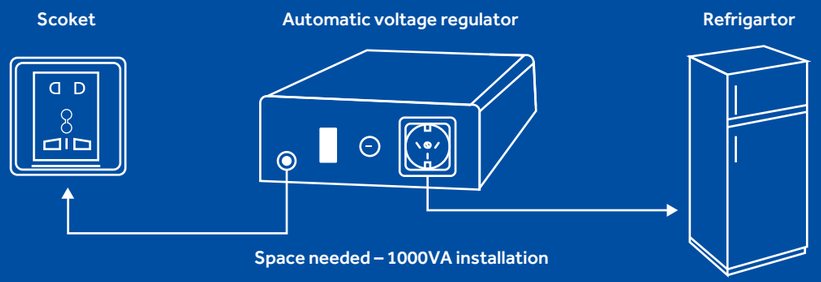
Model	HETL-01	Model	HETL-01
Temperature Range(°C)	-20~+50	Recording Volume	8192 Data Points(34 days)
Main Material	ABS (Transparent Shield: PC)	Logging Interval	6 min
Data Interface	USB Interface	Power Source	Non-Replaceable Battery
Display Medium	LCD	Size (Length*Diameter mm)	131*24
Resolution	0.1°C	Service Life	2 years
Accuracy	±0.5°C for -20°C~+40°C ±1°C for the others		

Product appearance and specifications are subject to change without notice

Voltage Regulator

- Protection functionality in case of delay, over voltage, low voltage, overload etc.
- High-speed and fully automatic voltage stabilizer based on the latest technology.
- Able to support 230 V with a +-10% precision.





Specifications

Model		HVS-1000VA
Power(VA)		1000
Input Voltage Range(Vac)		AC 173-278 V
Frequency(Hz)		50/60
Output Voltage Range		230v±10%
Efficiency		>98%
Phase		Single Phase
Display		Simulated Voltmeter Display Output Voltage
Operating Temperature Range		-5-45 Celsius Degree
Relative Humidity (No Condensation)		10%-100%
Atmospheric Pressure	Kpa	84-107
Packing Dimension (W*D*H)	mm	360*205*105

Product appearance and specifications are subject to change without notice

Vaccine Safety Solutions

Smart Vaccine Refrigerator

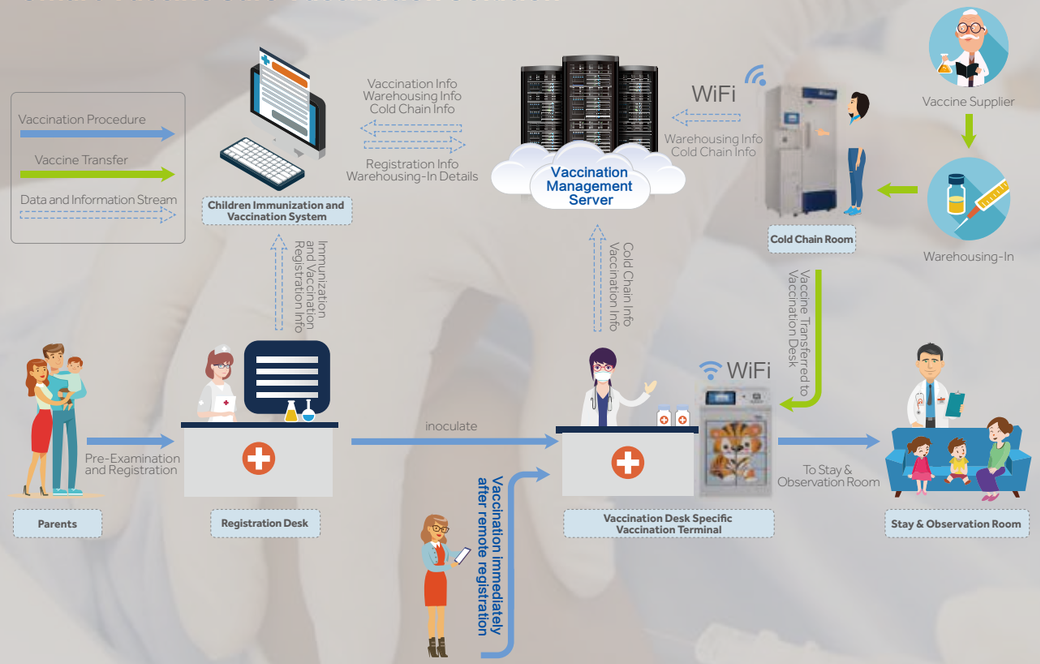
Haier Biomedical has developed the Smart Vaccination Solution, upgrading the conventional vaccination work- flow, adopting advanced refrigeration technology, automation and intelligent vaccine delivery by incorporating IoT technologies. By connecting and leveraging the existing digital outpatient service system, the vaccination process can be managed as follows: after the vaccination record is scanned during the vaccination flow, the IoT based vaccination refrigerator will automatically eject the required vaccine, then re-check it by scanning to ensure accurate vaccine dispensing and eliminate any errors in combination with standardized vaccination procedures. The vaccination record will be uploaded in real-time to the system.

Key Advantages

- End-to-end visibility and transparent information
- Prompt and accurate delivery of vaccines
- Eliminate vaccination errors

Quick precision accuracy is especially needed in areas where vaccination procedures are at the highest demand. Essential steps are in place to ensure product safety and superior reliability of the vaccination program.

Smart Vaccine Safe Vaccination Solution



Smart Vaccine Preservation Refrigerator

HYC– 361

Classification based storage

- Standard refrigerator has 21 compartments with 7 shelves.
- In each compartment multiple types of vaccines can be stored, first-in-first-out rules apply to all vaccines.
- Different vaccines can be stored, while reducing errors during warehousing-in/out procedures.

The smallest package units

- Warehousing-in/out procedures are verified based on the electronic regulatory barcodes.
- Full digitalization and automation of vaccine management.
- Guarantees the accuracy and validity of vaccine storage data.

Data and information streams

- Data is quickly exchangeable between cold chain room and vaccination desk.
- Vaccination program manager or Disease Control Center manager utilizes vaccination management server to monitor real-time of all vaccines stored by each vaccination station/center.

Smart Vaccine Refrigerator (at vaccination desk)

HYC– 61

Automated accurate vaccine dispensing	Reduce temperature fluctuation	Rechecking of vaccine information	Integrated nurse workstation
Vaccines will be ejected automatically after scanning patient vaccination record. Re-confirmation of vaccines, inventory information, expiration dates and cold chain early warnings: The time of dispensing can be shortened and the rate of vaccination errors can effectively be reduced.	8 independent chambers, small chamber doors can be opened separately to take out the vaccine required as quickly as possible, this minimizes the door opening time for safer storage of vaccines.	The warehousing-in/out and dispensing of vaccines can be verified by using electronic regulatory barcodes. Guaranteeing accurate vaccination, this vaccination function can only be conducted once vaccine is verified by scanning the barcode.	The queue, vaccination and authorization management, vaccination information input and real-time cold chain control are integrated into the vaccination desk vaccine refrigerator. Centralizing multiple tasks, it streamlines overall management.
			

Specifications

Model	HYC-361	HYC-61	Model	HYC-361	HYC-61
Cabinet Type	Upright	Upright	Power(W)	254W	230W
Climate Class	N	N	Electrical Current(A)	1.6A	1.5A
Cooling Type	Forced air cooling	Forced air cooling	Capacity(L/Cu.Ft)	361/12.75	61/2.15
Defrost Mode	Manual+ Auto defrost	Manual+ Auto defrost	Exterior Dimensions(W*D*H)in mm	665×710×1965	600×600×935
Power Supply(V/Hz)	220-240V/50Hz	220-240V/50Hz	Certification	CE	CE

Product appearance and specifications are subject to change without notice

Case Study Uzbekistan

Haier Biomedical's team successfully completed the "five-star template of IMMUNO wisdom vaccine in Tashkent, Uzbekistan" project was completed between the 31st October and 13th November 2019. Using the Haier Spirit and with teamwork, Haier Biomedical achieved its goals again and well above expectations: Benefiting more human life with the help of science and technology.

Excellent Service, Superior Care

--Uzbekistan "Wisdom Protect Bioscience"

The Tashkent IMMUNO center (private facility) is the best Vaccination center in Uzbekistan. The overall layout takes the design of the Wisdom Vaccination Center from Haier Biomedical as its reference, with a children's equipped playground inside, so that children can enjoy the friendly and safe environment "childhood fun" service while they are waiting for inoculation. The vaccination site has a hospital department and a large hospital building is currently under construction.

Haier Biomedical's vaccination center provides a complete service system covering the whole process of registration, Doctor examination, payment and vaccination, which effectively showcases the overall benefits of this center to the entire family, ensuring the smooth completion of vaccination for everyone, the safest way for vaccinations.

The vaccines are stored in smart vaccine refrigerator HYC-361 and HYC-61. Wisdom's products use Russian interface and the operation system is designed according to local vaccination requirements, which ensures the perfect combination of technology and Internet of things, it includes overall information management of vaccines including vaccine inventory expiry and early warning and previous inoculation data, tracing all previous vaccinations, this ensures vaccination safety and facilitates the information statistics and queries.

For U vaccine: Vaccinating outside, if the vaccines are taken out of refrigerator and have not been used, they need to be stored separately from other vaccines and displayed distinctively when being put back to refrigerator.

For general vaccine storage: Over time it's necessarily to consider how to keep the refrigerator's inside temperature within 2-8 degree when the ambient temperature is less than 5 degrees, the Haier Biomedical works closely with Wisdom to ensure it meets the recommeded criteria.

Case Study: Ethiopia

Haier Biomedical's Research and Development has focused on solar vaccine refrigerators for countries in Africa which have vaccine storage problems like in Ethiopia. Our goal is to continuously improve globally through technology and infrastructure to strengthen health systems and support immunization programs in all indigent situations.

A Haier Biomedical has supplied 4,500 SDD and 1600 ILR vaccine fridge to Ethiopia since 2013. The fridges that Haier Biomedical have supplied serves as many as 1 million children for vaccination.

Haier Biomedical has supplied 3,000 SDD in the year of 2017 for an NGO project, which covers all the provinces in Ethiopia. Not only have we supplied the equipment, but also we provided localized services including distribution, installation and service with a 10 years warranty. This ensures strong back up services, sharing technology and employment in Ethiopia by training more than 100 local technicians.

B Life expectancy in Ethiopia was 42 years and the infant mortality rate was 96.8 per thousand births.
44 percent of the population live on less than 1$ a day and 50 percent live on less than 15 kg/month. Electricity accounts for 13% of the country's population. Nearly 3 million people are infected with AIDS. National coverage of medical services reached 87%.

C "We can't afford the high cost of refrigerator maintenance and repair, which has led to very low use of refrigerators in the past."

Haier's vaccine refrigerator is completely driven by solar energy, refrigerator temperature is guaranteed, and our local makers regularly overhaul the equipment.

They also teach about the correct usage. The product is equipped with The Internet of Things, which enables timely alarm and timely maintenance once there is a problem. It makes me feel like I'm no longer a user, but a beneficiary. I think it's also a great safety for children and parents who come to inoculate. It's a good thing, said Mulunesh Herema, head of the vaccination site.

Haier Biomedical provides full-process, full-cold chain, full life cycle of services to create a win-win ecologcal platform, users get the whole process of solutions. And we can also achieve value-added, win-win benefits, resources, says Kassa Hailegiorgis, a local service provider.

Case Study: Guinea

In 2018 Haier Biomedical took part at the annual West Africa Project EFI, discussing and evaluating the current health system situation in West and Middle Africa, the aim being to find cost effective and immediate ways to further improve public health in those regions.
In Guinea, a country that was under discussion during EFI was topical for Haier Biomedical as we have already placed in cooperation with UNICEF, 210 units of our combined Ice-lined refrigerator and freezer (HTCD-160) into Guinea.

In 2018 Haier Biomedical's refrigerators were delivered to a private health facility in Guinea, prior to providing our products to the private operator, the vaccination process and requirements were as follows:
(Without having a proper information storage system, the registration of vaccination is only noted on the vaccination booklet.) Like in many developing countries, lack of education and enlightenment can be observed in Guinea as well. In Guinea many locals due to religious beliefs did not believe in vaccination.
They actually believed that vaccinations of children lead to a higher chance of getting pregnant in the longer term. So, persuading locals with the truth was not an easy task for doctors. But in the end they managed to convince the local communities and this followed with children being brought to clinics for vaccination.

Most cities in Guinea have vaccination clinics outside the city centres where vaccinations can be carried out. However, for over 6 years they did not have any cold-chain equipment, which made accessibility to safe vaccination very difficult. Every day vaccines were merely kept cold at best with cooling packs, which had to be brought 15 km from a city medical center to the clinic.

This process meets several problems: In order to get all clinics equipped with vaccines, it is crucial to prepare following week's vaccination schedules in advance. This is not only time-consuming, it can also effect the reliability and safety of vaccines as they need to be stored between 2-8°C to ensure their full efficacy. That is why, in this case if the planning was not sufficient enough, some children would either have to wait for a new appointment or vaccines had to be brought back to the city medical center. This process being highly inefficient and also the possible exposure to diseases like Hepatitis B, Guinea needed to solve this vaccination storage problem.

Haier Biomedical has since delivered to many health facilities our refrigerators, more children are now able to benefit and get local vaccinations. Now the clinics can safely and securely store a week's or even a month's vitally needed vaccination supply with Haier Biomedical equipment.

Milestones & Awards

2004

- Winning a WHO (World Health Organization) sponsored project, Haier Biomedical provided 10,000 ice lined refrigerators to India, marking Haier Biomedical's entry into the international market.

2008

- Haier Biomedical was awarded an order by India MOHFW to supply 8,559 vaccine freezers and 5,900 ice lined refrigerators.

2009

- Haier Biomedical's ice lined refrigerator and icepack freezer qualified by WHO/PQS , the first vaccine refrigerator manufacturer in China to achieve this qualification.

2011

- Haier Biomedical achieved the LTA (Long Term Agreement) status with UNICEF (United Nations Children's Fund) to supply ice lined refrigerators and vaccine freezers. Additionally, the company became prequalified to meet WHO/PQS standards for cold room and freezer room.

2012

- Haier Biomedical's solar direct driven vaccine refrigerators achieved WHO/PQS prequalification status.

2013

- Haier Biomedical approved for UNICEF tender to supply 100 SDD HTC-60 H refrigerator units to DPR Korea.
- The order marked the first time that the company won SDD refrigerator tenders. Furthermore, the company also provided 400 ice pack freezer units HBD-116 and 400 HBC-200 ice-lined refrigerators to MOH of Sudan.

2014

- Haier Biomedical's large capacity ice lined refrigerators passed WHO/PQS prequalification.

2015

- More than 3,500 Haier Biomedical vaccine refrigerators were delivered to central and east Africa as well as North Korea. Providing much needed health care improvement for the people in these regions.

2016

- The latest design SDD units were qualified to meet WHO/PQS standards. They are now listed on WHO website.
- The SDD models include HTC-110,HTC-40, HTCD-90. All are with Grade A freeze protection and solar power driven without using a battery.
- Supplied 230 ice lined refrigerators to UNICEF Turkmenistan and the Ukraine. Shipped 275 solar driven blood bank refrigerators to MOH of Congo.
- Supplied 100 ice lined refrigerators under a WHO contract to Namibia.

2017

- Won tender by CMS Sudan for vaccine immunization to supply 150 solar powered vaccine refrigerator with freezer units. This order marked the third time that Haier Biomedical had won tenders in Sudan;
- Haier Biomedical won an order by MOH of India to supply 11,126 ice pack freezers. To date, more than 40,000 Haier Biomedical vaccine refrigerators and freezers are operating in India.
- Haier Biomedical receives order from PAHO to supply 44 solar powered units of vaccine refrigerator with freezer to Honduras.
- This order is the first time that a China- based company received an order from PAHO.
- UNICEF awarded Haier Biomedical an order to supply 100 solar powered vaccine refrigerators with freezer to India.

2018

- August, Haier Biomedical secure tender from UNICEF to supply 210 solar vaccine refrigerator units to Guinea.
- December, Haier Biomedical secure multiple tenders from UNICEF to supply vaccine refrigerator units;
  - Uzbekistan- 764 vaccine refrigerator units
  - Kyrgyzstan - 632 vaccine refrigerator units
  - Myanmar - 320 solar vaccine refrigerator units

2019

- Haier Biomedical secured UN bids for vaccine cold chain projects in 9 countries, including Uzbekistan, Kyrgyzstan, Tajikistan, Rwanda, Zimbabwe, Central Africa, Mauritania, Liberia and Niger. The numbers approved for delivery into these countries is more than 4,500 units.
- October 25th: Science and Technology Innovation Board today unveiled the New Bio-Identity of Haier Biomedical: 688139, Science and Technology Innovation Internet of Things Board - was officially born!

2020

January:
- New Manufacturing Facility Opens in Qingdao;
- 2123 Solar Direct Drive Vaccine Fridges for Yemen Immunization Program.

February:
- Uganda CCEOP II: 996 Vaccine Refrigerator Units with RTMD's.