



ITCubeTM

Data Center Integrated Solution

Stock code 002518



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TODAY'S CHOICES, TOMORROW'S LEGACY !!

KSTAR

ITCubeTM

Easy the Complex



SNA
Global Philippines, Corp.

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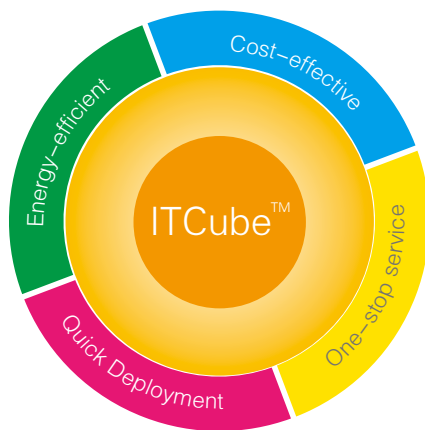
TODAY's CHOICES, TOMORROW's LEGACY !!

KSTAR ITCube™

Data Center Integrated Solution

With the rapid development of cloud computing and mobile Internet businesses, the growth of IT density and energy consumption are bringing a lot of challenges to the traditional data center. To complying with the requirements of cloud computing and virtualization in future, as well as improving the efficiency of data centers and controlling the cost of investment, KSTAR has launched ITCube™ series data center solution. ITCube™ has all-in-one, green efficiency, modular design concept, to help clients achieve rapid deployment, flexible expansion, efficient operation and convenient management through the next-generation data center lifecycle.

ITCube™ Core Values



- Quick Deployment

Modularization component、standardization interface、factory pre assembled、quick installation on site

- Energy-efficient

Modular UPS、precision cooling、closed aisle

- Cost-effective

Low design cost、low project cost、low maintenance cost

- One-stop Service

Total solution package including key sub-system equipment, installation and after-sale service.

ITCube™ Product Overview

Kstar ITCube™ series data center solution includes three solutions of IDU(Integrated Data Center Unit), IDM(Integrated Data Center Modular), IDR(Integrated Data Center Room), covering all of indoor scenes of data center in order to meet the diverse needs of customers.



Integrated Data Center Unit (IDU)

IDU integrated with cabinets, monitoring, power supply and distribution system, batteries, inrow air-conditioning and other infrastructure, packages the complex data center solutions into a highly efficient, plug to play product.

Quick Deployment

Energy saving

Smart

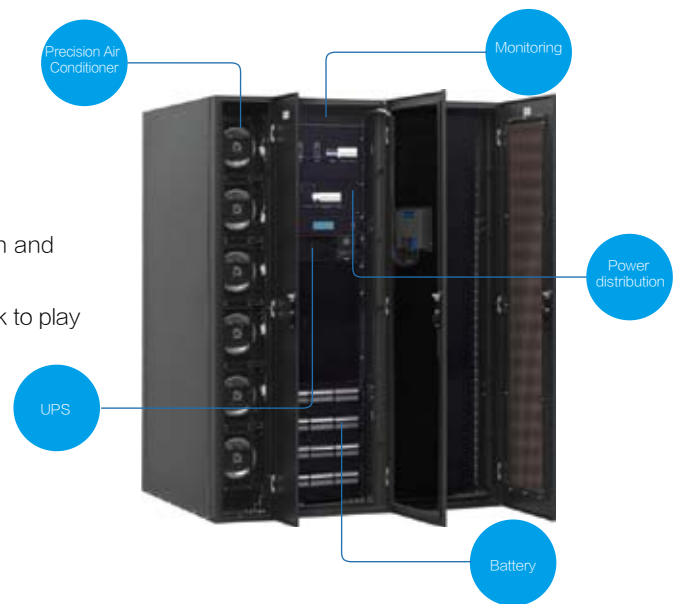
Safe



IDU Product Features

• Quick Deployment

- Full integration of IT cabinet, UPS, battery, power distribution and precision cooling system.*
- Modular components following international standards are quick to play within one day and greatly shorten the business on line cycle.



• Energy-efficient*

- Fully enclosed structure, sealing both hot and cold ventilation channels, greatly reduced the energy consumption.
- Inrow air conditioning close to heat source delivering air flow accurately to where desired.
- Efficient modular UPS.



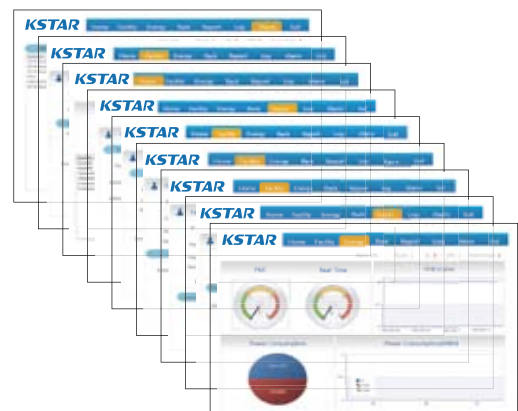
Modular UPS



Inrow Precision Air Conditioner

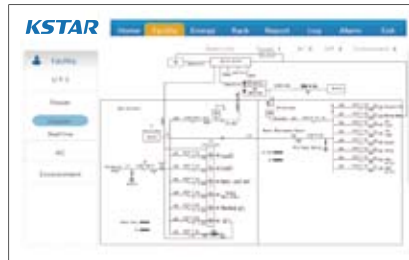
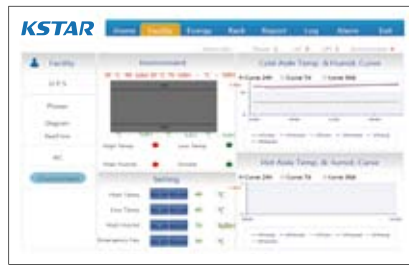
• Smart Management

- Centralized monitoring platform with local display watching the power status, temperature&humidition status, and each sub-system conditions.
- Powerful reporting capabilities.
- Support 365 days 7x24-hour unattended, remote monitoring. Minimize IT operation and maintenance costs.
- Only with air conditioner machine has the function.





• Safety & Reliability

- Closed micro-environment which is dust-proof and noise cancelling reduces the the IT equipment failure rate and extends the IT system life cycle.
- N+1/2N redundant design. The continuous power supply with back up battery guarantees stable IT equipment operation.
- Multi-stage automatic alarm function. Real-time cabinet condition monitoring.
- Emergency ventilation system will be open when the AC in failure.
- Automatic fire extinguishing system.



Technical Specifications

Specifications Description	With Air Conditioner			Without Air Conditioner		
	IDU-06AN	IDU-10AN	IDU-15BN	IDU-06AO	IDU-10AO	IDU-15BO
Product Form						
						
Appearance Features	Closed door ,D:1280mm H:2000mm			Mesh door ,D:1100mm. H:2000mm		
External dimension W×D×H (mm) *	1500×1280×2000	1500×1280×2000	2100×1280×2000	1200×1100×2000	1200×1100×2000	1800×1100×2000
W×D×H (mm)	IT Cabinet dimension / Default one is 600MM .Number can be configured					
Available Space	42U					
Power						
Power Cabinet Dimension W×D×H (mm)	600×1100×2000					
Input power	220V/1Ph/50Hz	220V/1Ph/50Hz	380V/3Ph/50Hz	220V/1Ph/50Hz	220V/1Ph/50Hz	380V/3Ph/50Hz
Power Input Mode	Support Up Down Input					
Input switch	100A/1P	100A/1P	80A/3P	100A/1P	100A/1P	80A/3P
UPS Capacity (Module/Rack optional)	6kVA	10kVA	15kVA	6kVA	10kVA	15kVA
Back up Time	15 min, 1hour,2hours optional					
Cooling (Only with air conditioner)						
Total Cooling Capacity (KW)	5	7.5	12.5	-		
Cooling Dimension W×D×H (mm)	300×1100×2000			-		
Quantity	1			-		
Monitoring						
local display	10' Screen					
Temperature and humidity sensors	yes					
Smoke sensors	yes					
Water detection	yes			-		
UPS	yes					
Power distribution monitoring	yes					
Cooling	yes			-		
Emergency ventilation	yes			-		
Fire Extinguisher						
Extinguisher Gas	10L (3kg) , FM200			-		

Notes: IDU product solutions can be customized depending on the number of cabinets, different backup time, UPS, air conditioning.

* Standard product includes one power cabinet, one IT cabinet and one air conditioner(optional), and can be customized.

Integrated Data Center Module(IDM)

IDM integrates cabinets, power supply and distribution system, cooling system, monitoring system, cabling system. As an All-In-One solution, IDM features quick deployment, energy Efficiency, smart management, safety and reliability.

Rapid

Quick De

- Full integration of IT cabinet, UPS, battery, cooling system.
- Modular components following international standards and greatly shorten the business cycle.
- Can be installed on a concrete floor, without the need for engineering tasks.

Safety and Reliability

- N+1/2N redundant design. The continuous power supply with back up battery guarantees stable IT equipment operation.
- Multi-stage automatic alarm function. Real-time system condition monitoring.
- Containment top panel can be opened by the fire system

Intelligent

Smart man

- Centralized monitoring platform makes it easy to monitor power and temperature & humidity status.
- Powerful reporting capabilities.
- 365 days 7x24-hour unattended, remote maintenance costs.



Deployment

ary, power distribution and precision
ional standards are quick to play within 7
on line cycle.
which greatly simplifies the corresponding

Economic

Energy-efficient

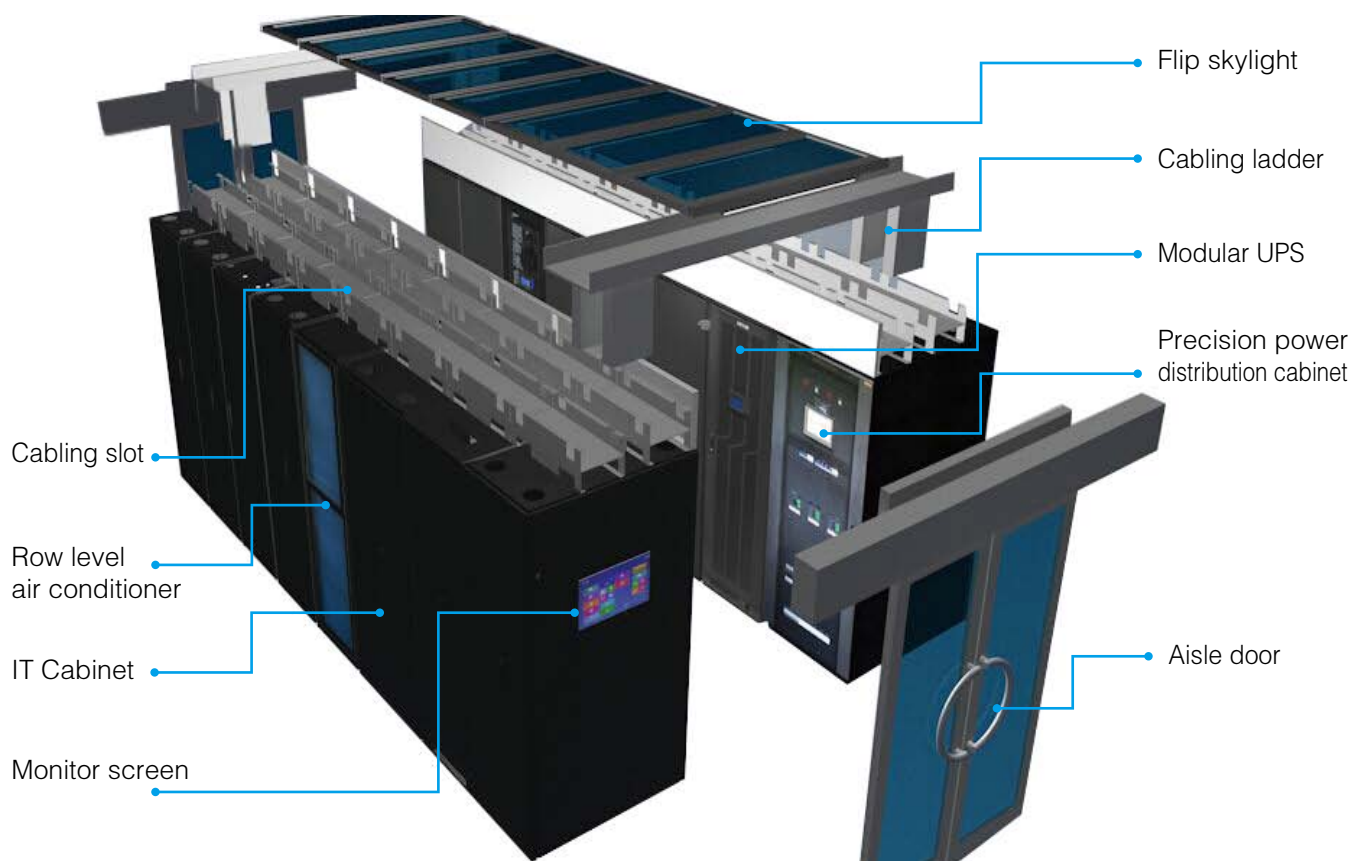
- Sealing hot or cold ventilation channels, greatly reduced the energy consumption.
- Inrow air conditioning close to heat source delivering air flow accurately to where desired.
- Efficient modular UPS.
- High density. A single cabinet supports a maximum 15 kW to meets various customer requirements.

Efficient

Management

s us know the data center environment,
tus in real-time.
ote monitoring. Minimize IT operation and





Power distribution system — UPS

• Product feature

- Adopt 19 inch standard cabinet, the appearance is the same as the IT cabinet and row level air conditioner
- UPS module adopts independent control system, the fault module can be separated automatically ;
- The UPS capacity can be expended from 20 to 520KVA , that meets the requirement of on-demand deployment, and flexible expansion for data center;
- N+X parallel redundancy, support maximum 4 sets unit parallel connection
- The efficiency of the modular UPS is 95%, the efficiency of ECO mode is 98%, high efficiency and energy saving.



Power distribution system — Precision power distribution cabinet

• Product feature

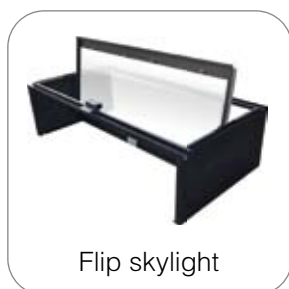
- Adopt 19 inch standard cabinet, the appearance is the same as the IT cabinet and row level air conditioner
- Operation from the front, maintenance from the back, simple and convenient
- Support voltage monitoring, power failure sound and light alarm function
- EPO function is optional, you can cut down the power in emergency situation.
- With Modbus communication protocol, the UPS can be connected to the monitoring system easily for energy consumption statistics and analysis
- The hot swapped output circuit breaker which can be maintained when the power is uninterrupted is optional.
- Using modular and standard structure parts to greatly reduce the maintenance costs
- You can cut down the power of different level load through PLC or monitoring system.



Cabinets and containment cold aisle

• Product feature

- Products accord with ANSI/EIA; RS-310-D; IEC297-2; DIN41491:PART1; DIN41494; PART7; GB/T3047.2-92; compatible with ETSI standard
- The front and back doors have honeycomb six angle net hole, through hole rate is 75%
- With quality SPCC cold rolled steel and nine-floded frame, static load bearing of the cabinet is 1300 kg
- Different size of cabinets are perfectly compatible with containment aisle system
- Selection of accessories are varied



Flip skylight



Aisle door



Windshield brush



Cabling slot



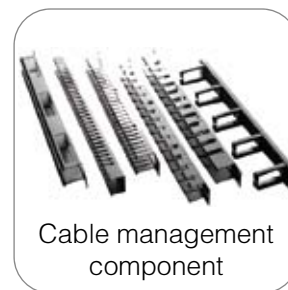
PDU



Component for
cabinet parallel



Blank plate



Cable management
component

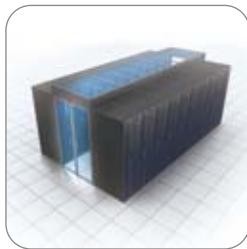
Cooling system

- Product feature

- Adopt 19 inch standard cabinet, the appearance is the same as the IT cabinet and power distribution cabinet
- Front airflow supply and return to back, running with cold or hot aisle for the highest efficiency.
- Support air cooling, water cooling, chilled water units, cooling capacity is from 20 to 60KW
- Variety of energy-saving components combination for the best energy saving effect: frequency conversion compressor, EC fan, electronic expansion valve, outdoor unit with stepless speed regulating fan, etc.
- 37°C high return air temperature design, sensible heat ratio is 100%



Energy saving application of cooling system



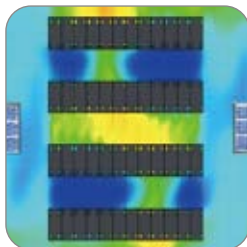
- Cold / hot containment aisle system

The cold air and hot air are isolated to avoid the hot spot in the data center, through improving the cooling efficiency by increasing supply airflow temperature and return airflow temperature, the power density of the cabinet can be up to 15KW to reduce the area of data center and save construction costs



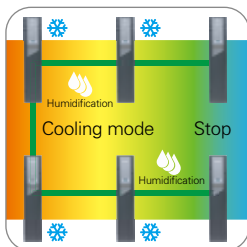
- Row level airflow cooling

Air conditioner is deployed by the IT cabinet near the heat source to improve the power density of the cabinet, reduce cooling capacity loss, increase supply airflow temperature and return airflow temperature, high efficiency and energy saving



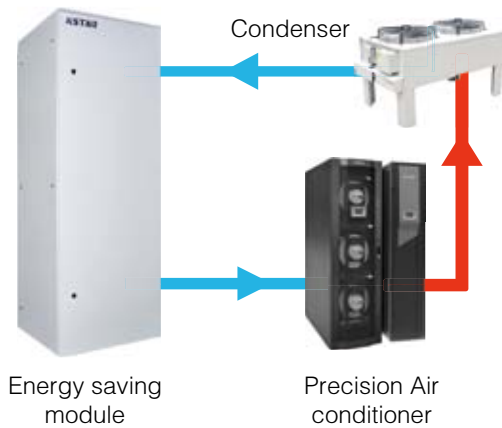
- Data center CFD simulation

Using Computational Fluid Dynamics (CFD) software to simulate the layout of the data center can predict the temperature of the room, air flow path and the cooling effect, avoid wasting cooling capacity and the appearance of hot spots, provide the perfect layout solution.



- Group control function of multiple air conditioners

Multiple air conditioners which are running in the intelligent rotating mode can avoid one unit is cooling but another is heating, one unit is humidifying but another is dehumidifying, improving the cooling efficiency.



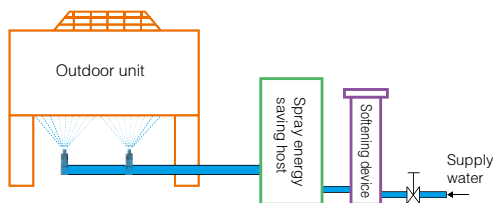
• Fluorine pump intelligent dual cycle system

Compressor running mode:

When outdoor environment temperature is higher than the temperature of indoor, or the temperature isn't satisfied with the condition for fluorine pump start up in summer or over season. At this time, turn on the compressor, the air conditioner works as normal.

Fluorine pump energy saving running mode:

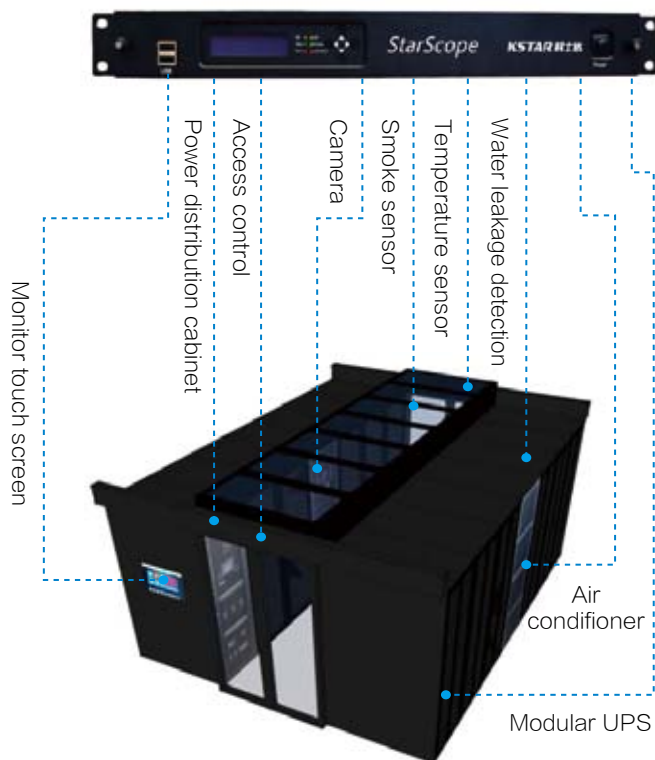
When outdoor environment temperature ($\leq 15^{\circ}\text{C}$) is lower than the temperature of indoor, or the temperature is satisfied with the condition for fluorine pump start up in winter or over season. At this time, turn off the compressor, turn on the fluorine pump system for cooling.



• Outdoor unit sprayed technology

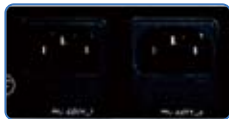
Outdoor unit sprayed energy-saving technology is that the atomizer which is equipped behind the outdoor unit sprayed water mist, when the water mist evaporates, it can absorb lots of heat to reduce air conditioner outdoor unit inlet airflow temperature and improve the cooling effect of the outdoor unit. In summer, the technology can effectively make the compressor run stably to improve the cooling efficiency and save energy.

Monitoring system



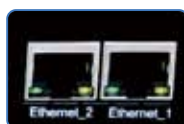
Hardware and feature

Dual power supplies+ Dual Network Port, More Safe and More Reliable



Support to be connected with two power supplies at the same time, helps to reduce the alarm failures when electricity is off;

And designed of 2 Ethernet ports ,enable to get physical isolation of LAN/WAN, for this redundancy configuration greatly guarantee the links reliability.



N-G voltage monitoring module

Wipe out the grounding danger of server room.



Ultra long backup battery

Auto charge/discharge, recyclable use ,12-hours battery life.



Water Leakage (Non-Locating)



Switch Monitoring



Surge Protect Switch



Smoke



Door Contact



Infrared Intrusion

Dry -contact extending,RJ11 distinction, standardized interface;

Provides & dry contacts extending, able to connect water leakage (non-locating), surge protect switch detector, limited current switch detector, infrared intrusion detector, door contact, smoke sensor, etc, 360° comprehensive protect your data center.

Centralized network monitoring of video and access control ,intuitive and clear;

Ultra long backup battery continuous working 12 hours if electricity power off.

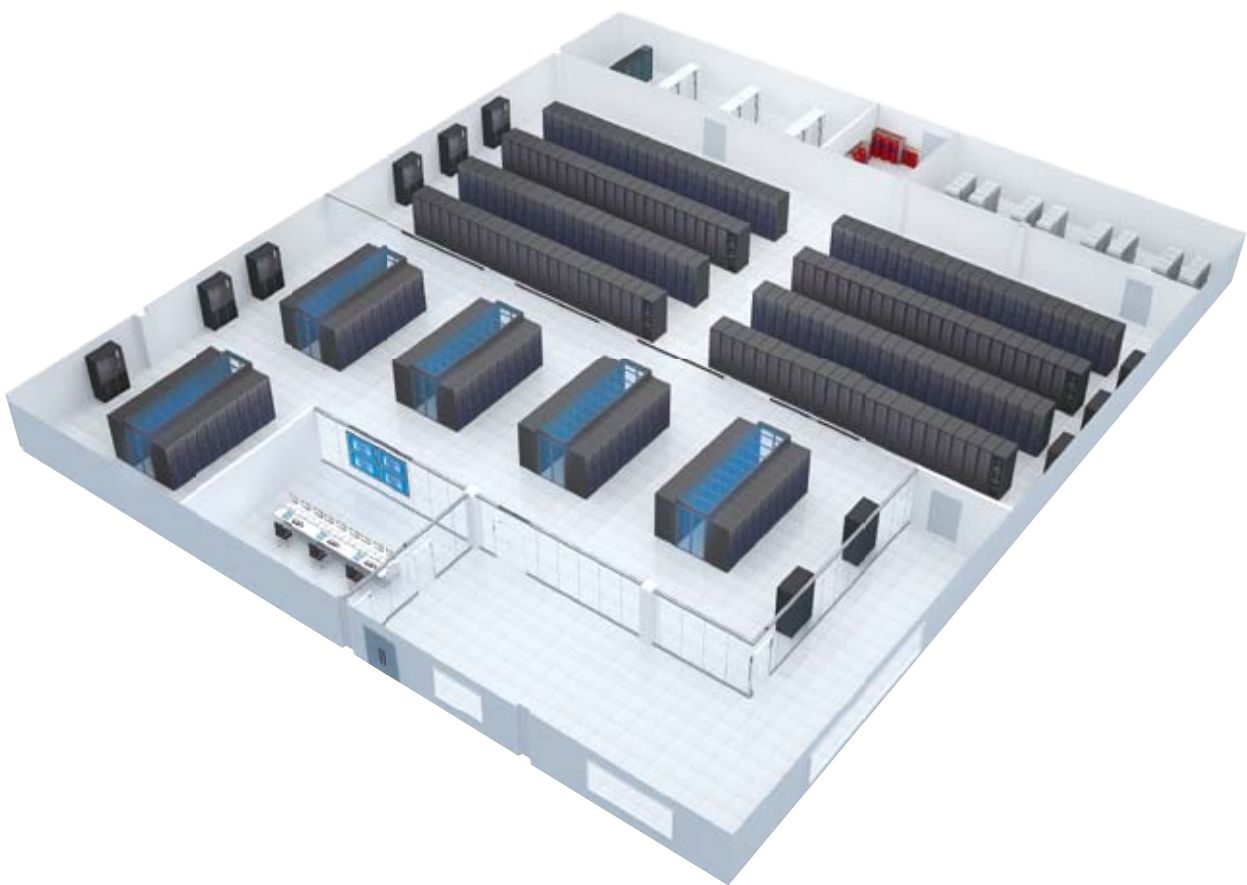
Completely eliminate grounding hidden danger via N-G voltage monitoring ;

Standardized interface ,easy to connect ,fast to install.

Large-scale Data Center Solution(IDR)

IDR (Integrated Data Center Room), the medium to large data center solution which integrates precision air conditioning, precision power distribution, rack, cold aisle containment system.

Solutions include: power supply and distribution system solution, cooling system solution, cabinets and cold aisle solution, monitoring and management solution, and CFD simulation. We provide strong support to the core products solution consulting and design in the medium to large data center construction.





LCD display
Elegant and clear



32G SD Card
Support 3~5 years
history events and
data records storage

USB Connection



Voice Dialing Alarm Module

SMS Notification



Sound-Light
Alarm

Multiple Alarm notification, Every Moments With Security

Able to choose a proper alarm notification,
guarantee safety and reliable under 7 × 24
hours , unattended operation.



UPS



Precision Air
Conditioning

Standardized Interface:

- UPS monitoring normally is through DB9-type connection, StarScope provides DB9-type communication port.
- Precision air condition normally is through RS485 for communication , StarScope provides optimized RJ45 type communication.

Powerful extending function, provide 8 ports of RJ45 extending

Max Support 60 Temperature & Humidity sensors, 2 water leakage monitoring (locating), 8 switch monitors of power distribution monitoring 2 generator monitoring , 2 general power distribution monitoring or 2 precision power distribution monitoring.



Generator



Electricity Meter



Precision Air Conditioning



Common Air
Conditioning Monitoring



Power Distribution
Switch Monitoring



Water Leakage
Monitor (Locating)



Temp &
Humid Sensor

Company Profile



Founded in 1993, Shenzhen KSTAR Science & Technology Co., Ltd (Stock Code:002518) is a National Torch Plan Key High-tech Enterprise, and also a pioneer of UPS industrial and a total solution provider for Data Center Critical Infrastructure & Photovoltaic Inverter Systems in Mainland China. KSTAR is fully committed to the R&D and has been providing high-quality products with full service to over 90 countries and regions worldwide, leading the industrial development with innovation.

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| ③ | ③ KSTAR Industrial Park at Guanlan Fuyuan industrial Zone, Shenzhen, China |