FusionModule800 3.0

Smart Small Data Center Solution

Leading Energy Digitalization for a Smart and Sustainable World

HUAWEI

Contents

HUAWEI

Challenges of Traditional Small DC

Design take at least one week

Design period——Choose equipment from different vendor

- Brand selection
- Type and capacity selection
- Solution design
- Drawing design

Construction take at least 10 Days

Delivery-Multiple Suppliers 1. Different delivery period of devices, time-consuming

2.Devices are assembled on site, long construction period

Step1

Devices arrival from different manufacturers

Step2

Devices such as UPS, A/C,PDU are assembled on site

Step3

Cable are connected on site

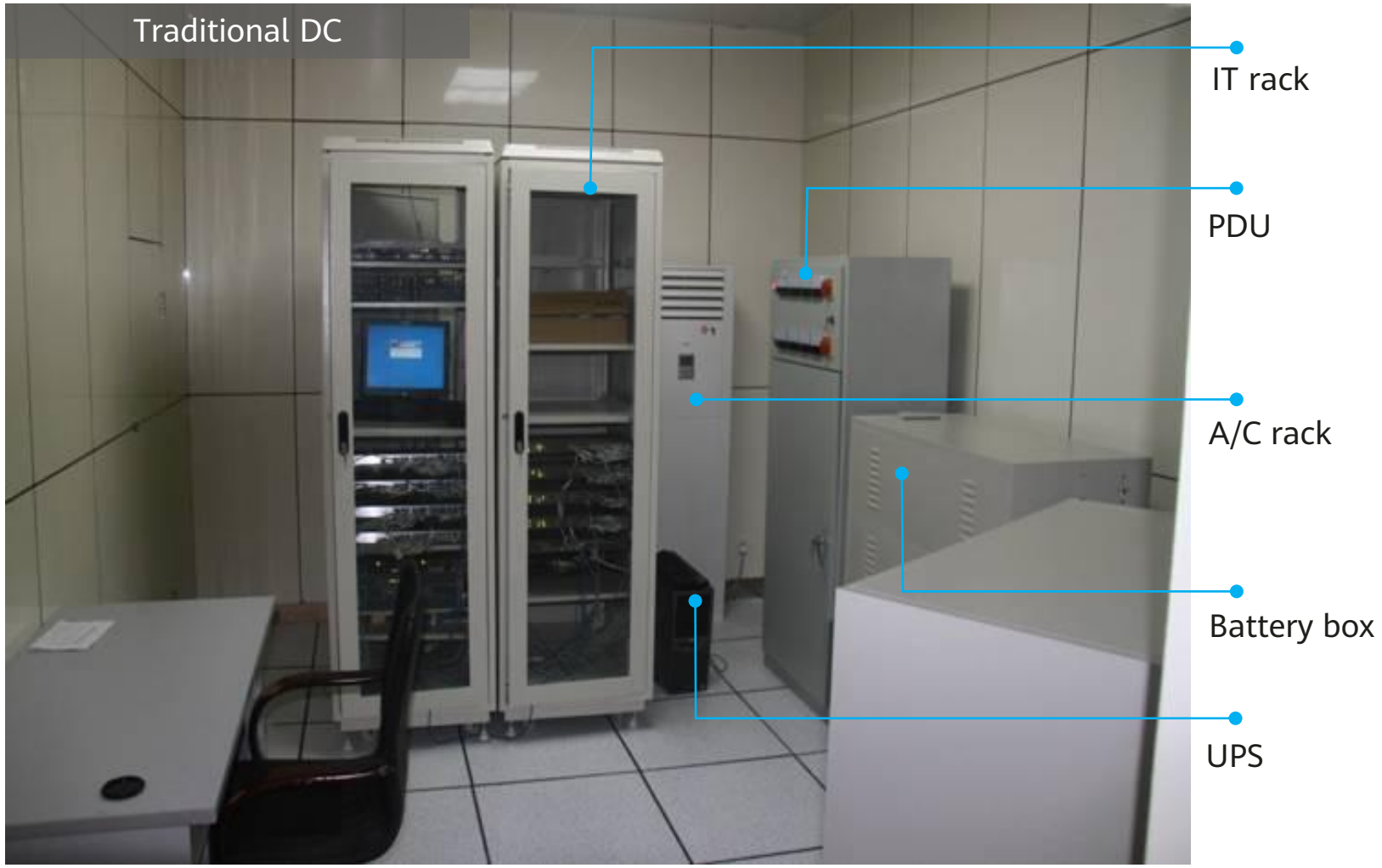
Step4

System Commissioning

TTM
10 days
~
30 days




Low Integration, Large Footprint

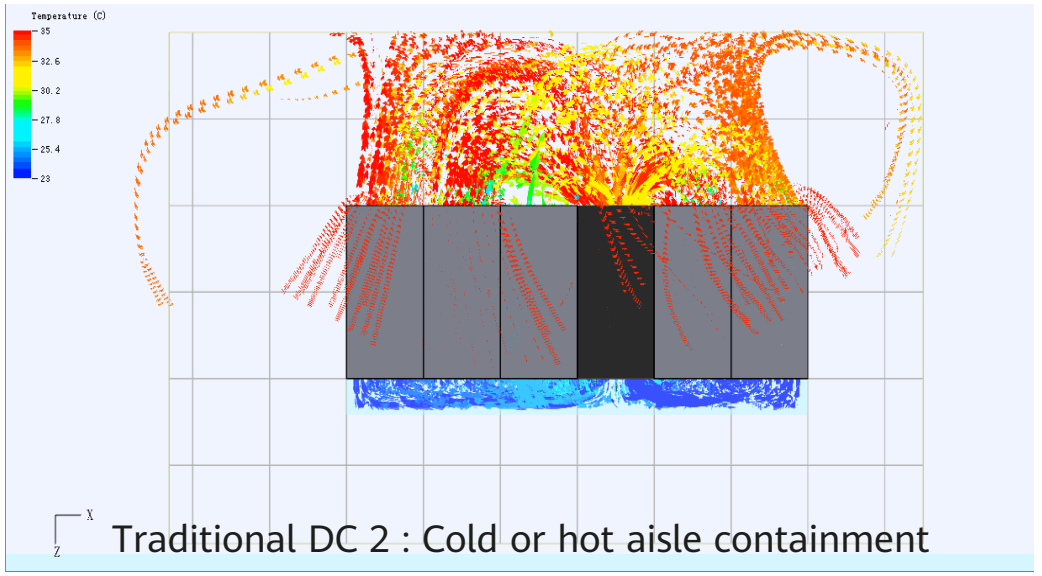


Traditional DC:

- UPS, PDU, IT racks, air conditioner are independent deployment
- Low integration
- Large footprint

Low Cooling Utilization, High Power Consumption


Traditional DC 1:Open space



Traditional DC 2 : Cold or hot aisle containment

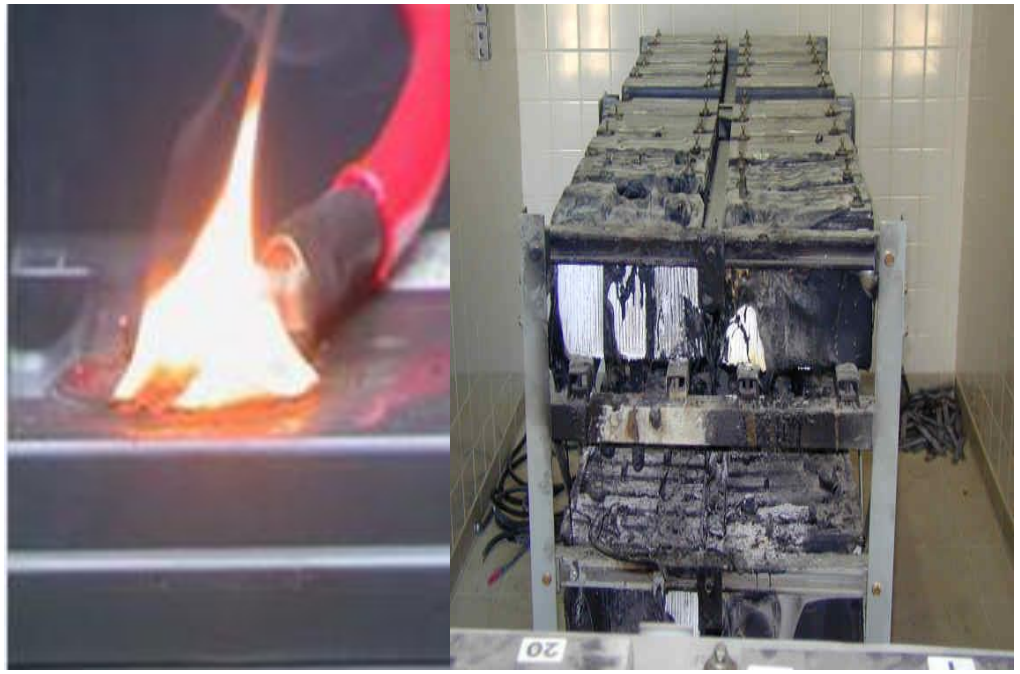
Traditional DC:

- Open space, air conditioner cools the environment firstly;
- Room-level A/C, cold and hot airflow mixing together, low cooling efficiency.

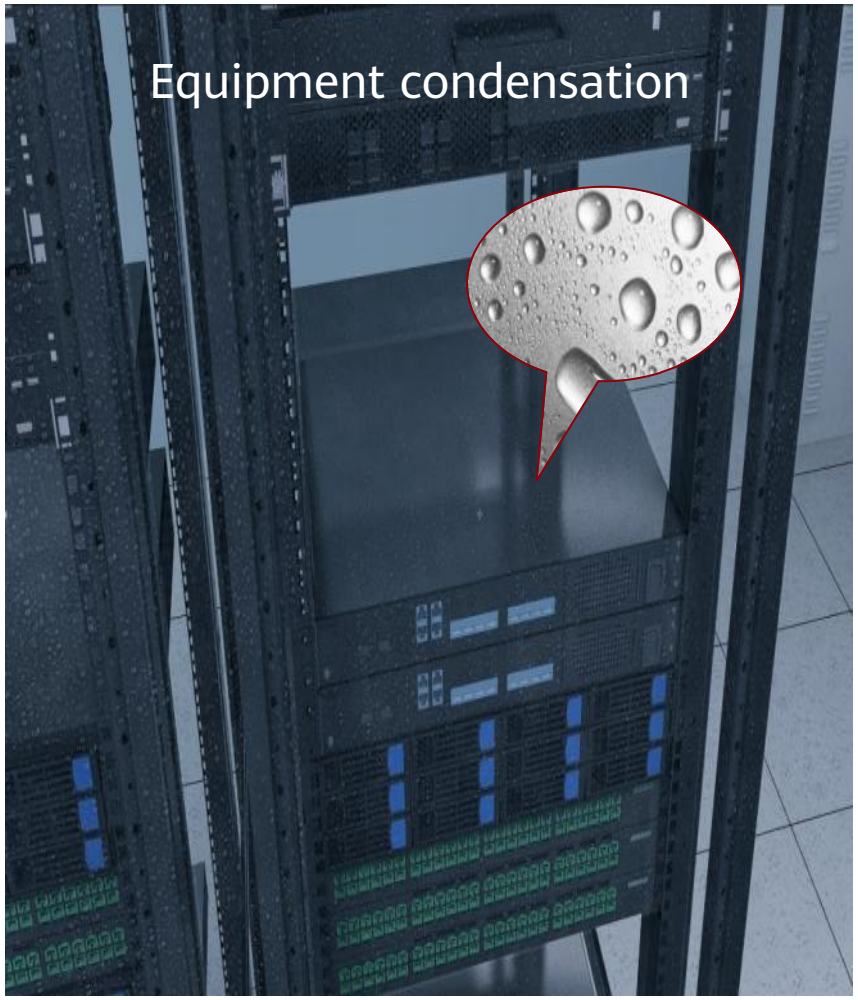
Cold or hot aisle containment:

- Need to save the energy and reduce the noise

Battery On Fire, Equipment Condensation



Case: April 4, 2017, Beijing University of Posts and Telecommunications , DC battery on fire, resulting in many colleges and universities network interruption



Manual Inspection, Fault Location Difficulty , High O&M Costs

Multiple-DC O&M:

- No remote monitoring, on-site inspection
- Risk can not be identified in advance, fault passive processing
- Failure can not quickly remote location, a single network failure at least need to go to the site 2 times
- Multiple DCs,
  Travel costs are high and slow response
- The O&M personnel are not fully covered, and the fault response time is at least one day.

HUAWEI

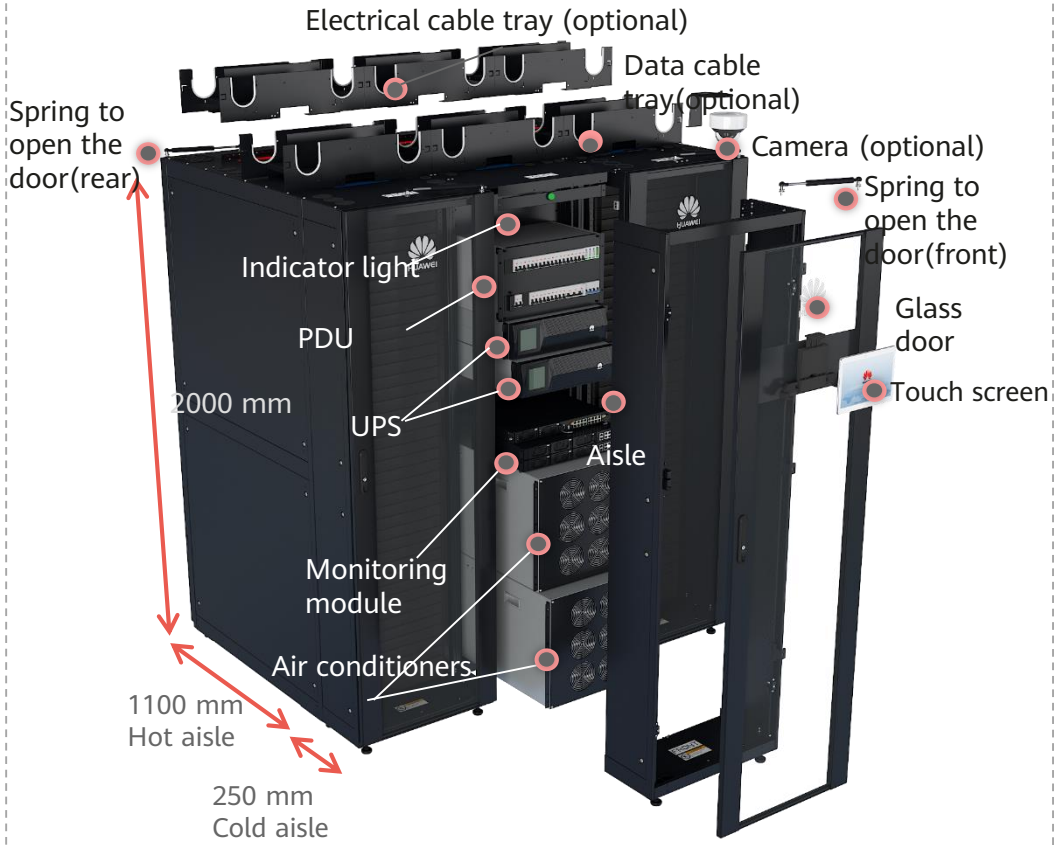
Contents

HUAWEI

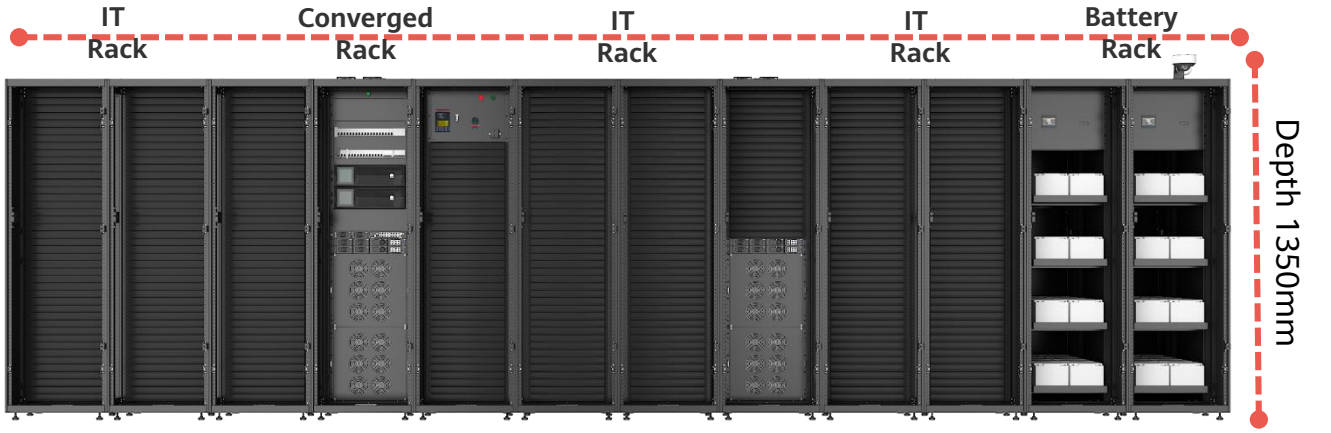
Huawei Small DC Solution
FusionModule800

Overview of FusionModule800 C20

Integrated architecture



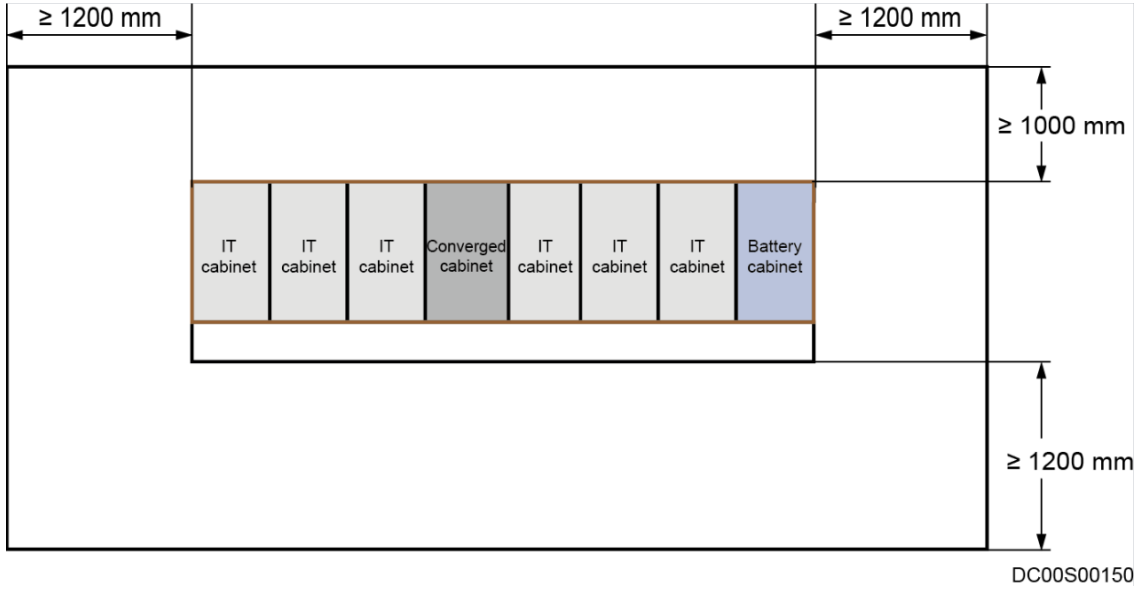
- **Total IT racks: 0~10** rack(Total racks:1~12)
- **Cooling: Rack A/C**（12.5kW/pcs)
- **Cold and hot aisle containment:** Cold aisle containment 250mm+1100mm hot aisle containment.
- Maximum IT load:**≤25kW**（T1&LT), **≤21kW**（T3),
- Power density per Rack **≤7kW**(T1&LT), **≤6kW**(T3)



Maximum racks configuration: 1≤N≤12 (Latin America is different)

HUAWEI

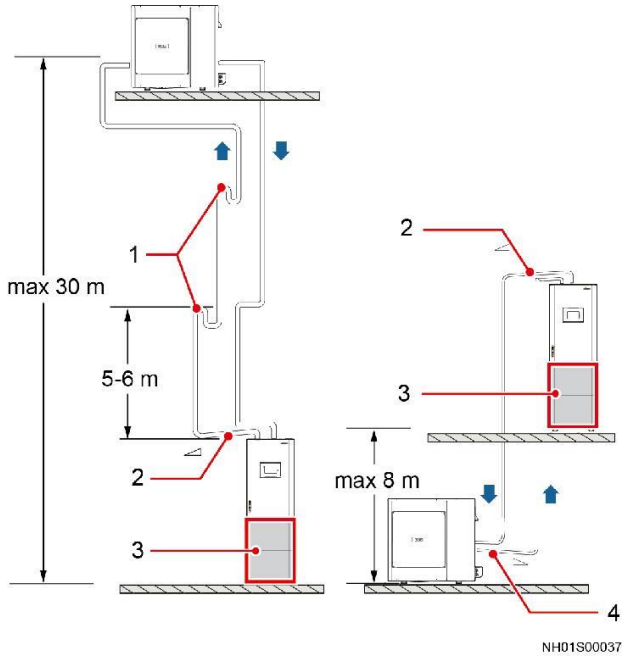
FusionModule800 : Space requirements of installation



Installation Requirements	
Height from the ceiling to the concrete floor	≥2.6m
Applicable scenarios	Small & medium DC
Door in DC	Height: >2.2m; Width: >0.9m
Installation Mode	Supports the installation of the concrete floor, raised floor
Height of the raised floor (downwards pipe)	≥250mm

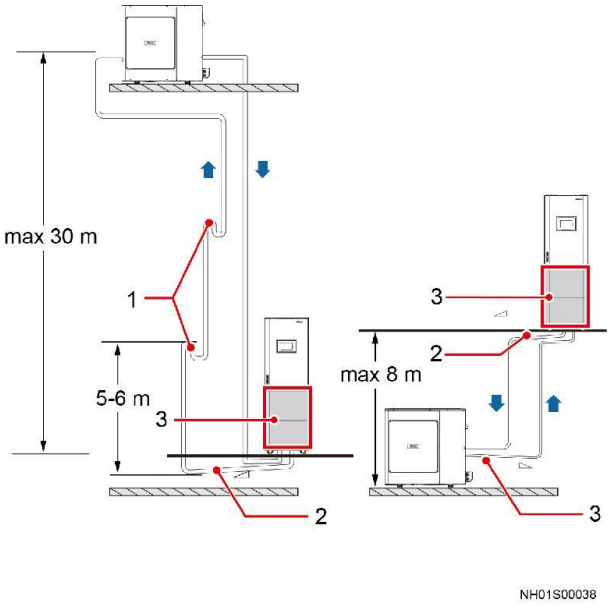
FusionModule800: Installation Requirements of Air conditioner

Installation rule :Upwards pipe



(1) Oil trap (2) Tilted gas pipe
(3) Indoor unit (4) Tilted liquid pipe

Installation rule: Downwards pipe



(1) Oil trap (2) Tilted gas pipe
(3) Indoor unit (4) Tilted liquid pipe

Refrigerant and refrigerant oil		
Pipe length	Refrigerant	Refrigerant oil
≤30m	Delivered with the outdoor unit	Prefilling
30m<L≤80m	To be purchased	Prefilling
The maximum length of the pipe which connecting with the indoor unit and outdoor unit is less than 80 m.		
>80m	Contact Huawei engineers.	

Remarks:
Refrigerant leakage may be caused by frostbite. Take protective measures (such as antifreeze gloves) when handling refrigerant.

Standard solution, Simplified design

BC6/7 : Intelligent power distribution

IT load	≤8.5KW(T1&LT) ≤7kW（T3）	8.5kW~17KW（T1&LT） 7kW~14kW(T3)		17kW~25KW(T1&LT) 14kW~21kW(T3)	≤8.5KW(T1&LT) ≤7kW（T3）	8.5kW~17KW（T1&LT） 7kW~14kW(T3)
BC1	BC2	BC3	BC4	BC5	BC6	BC7

HUAWEI

Basic Configuration Introduction

Note:

- The non-redundancy A/C solution can be used only in Tier 1 DC. NO-redundant A/C solution are not suitable for Operators' s DC
- ATS is optional ,installed onsite. (will delivered in November.2019,can't proposed for early projects before November)
- RPDU(choose one): Common: IEC or GB(optional). Intelligent: Only IEC is supported.
- T1: -20℃~+45℃; LT: -40℃~+45℃; T3: -10℃~+55℃

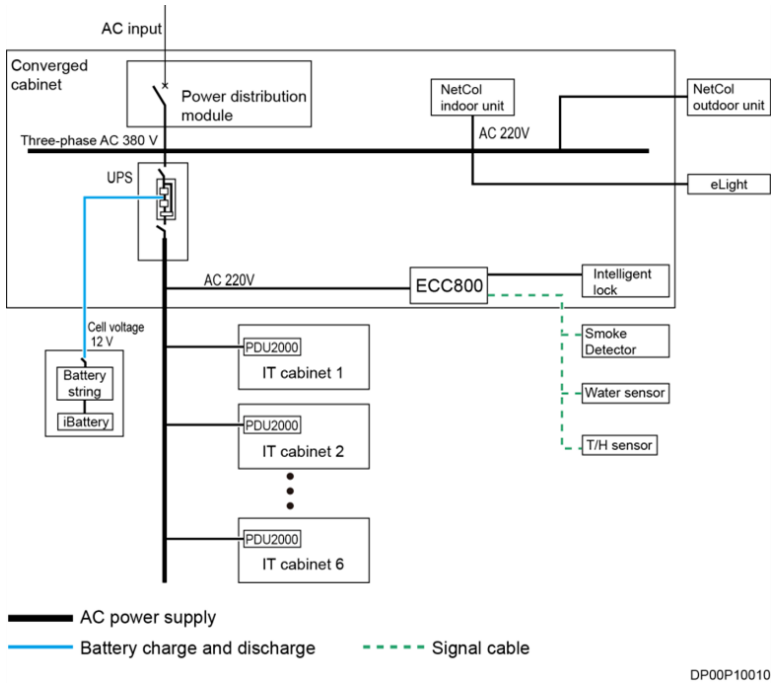
IT load	≤8.5KW(T1&LT) ≤7kW（T3）		8.5kW~17KW（T1&LT） 7kW~14kW(T3)		17kW~25KW(T1&LT) 14kW~21kW(T3)	≤8.5KW(T1&LT) ≤7kW（T3）	8.5kW~17KW （T1&LT） 7kW~14kW(T3)
Configuration	BC1	BC2	BC3	BC4	BC5	BC6	BC7
Structure	Cold and hot aisle containment						
UPS(KVA)	10+0	10+10	20+0	20+20	20*2+0	10+10	20+20
Air conditioner	1+0	1+1	2+0	2+0	3+0	1+1	2+0
Heating and humidification quantity	0	1	1	1	1	1	1
Intelligent PDU	NO	NO	NO	NO	NO	YES	YES
Power input	Single input is default , ATS is Optional						
Number of IT output	4	12	12	12	20	12	12
Standard	Temperature sensor, Smoke sensor, SMS alarm, Local app on the mobile phone, PAD, intelligent door lock, ECC800						
Optional	ATS,(intelligent/ no-intelligent）RPDU, Video system, battery, ibattery,IT rack, remote app on the mobile phone,, network rack Water sensor						
Remark	A/C Non-redundant		A/C Non-redundant	A/C Non-redundant	A/C Non-redundant		A/C Non-redundant

Modular design for PDU, meeting different application scenari

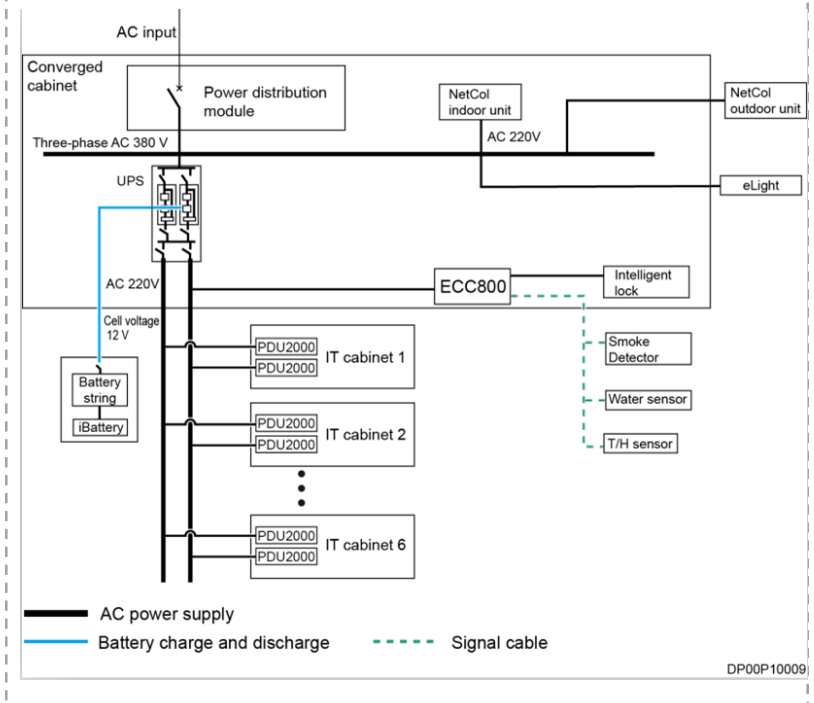
Indicator module		Power distribution module	PDU1	Power distribution module	PDU2	Power distribution module	PDU3	Power distribution module	PDU4	Power distribution module	PDU5	Power distribution module	PDU6	Power distribution module	ATS
Height	1U	Height	3U	Height	6U	Height	6U	Height	6U+3U	Height	6U+4U	Height	6U+3U	Height	8U
Typical configuration	BC1~BC7	IT path	4	IT path	12	IT path	12	IT path	20	IT path	12	IT path	120V: 8 208V: 8	IT path	NA
Latin America	ATO6~8	Main switch	63A	Main switch	100A	Main switch	100A	Main switch	125A	Main switch	100A	Main switch	None	Main switch	125A
		IT load	≤8.5kW	IT load	≤8.5KW	IT load	≤8.5 or ≤17kW	IT load	≤25kW	IT load	≤17kW or ≤8.5kW	IT load	≤7.5kW or ≤15kW	IT load	NA
		A/C input switch	1PC	A/C input switch	2PCS	A/C input switch	3PCS	A/C input switch	4PCS	A/C input switch	3PCS	A/C input switch	3PCS	A/C input switch	NA
		BC1		BC2		BC3/4		BC5		BC6,BC7		ATO:6,7,8		Optional	
		Non-intelligent PDU								Intelligent PDU		Dedicated for Latin America			

Electrical system :Support the topology of N/N+1

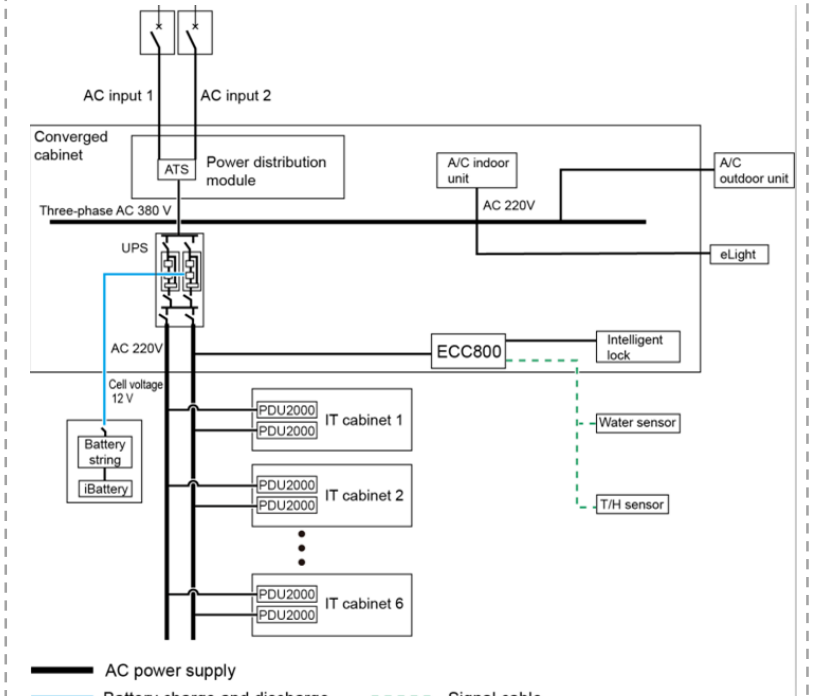
Electrical system : N



Electrical system : N+1 topology (without ATS*)



Electrical system : N+1 topology (with ATS*)



1. A/C supply from Utility power, UPS supply to IT load,ECC800,PAD.
2. The ATS is configured when dual power input ((ATS will delivered in November.2019,can't proposed for early projects before November))
3. The 10kVA UPS parallel system cannot share battery. The 20kVA UPS parallel system can share battery.

Rack-mounted 95% High Efficiency UPS Ensures Reliable Power

Supports 3 kinds of back up types, 15min-30min back up time

Parameter	10kVA	20kVA
Maximum efficiency	94.5%	95%
Input voltage	138V AC~485V AC, 40~70HZ	
Surge protection	C-level SPD	
Height	2U	3U
Output power factor	0.9	0.9
Installation Mode	Rack-mounted	
Authentication	CE, CB, TUV efficiency test, RoHS, REACH, WEEE, ECA certification (UK)	

Battery pack 9AH

- Height：3U
- Voltage：240V
- Quantity：maximum 8 pcs

Battery cabinet

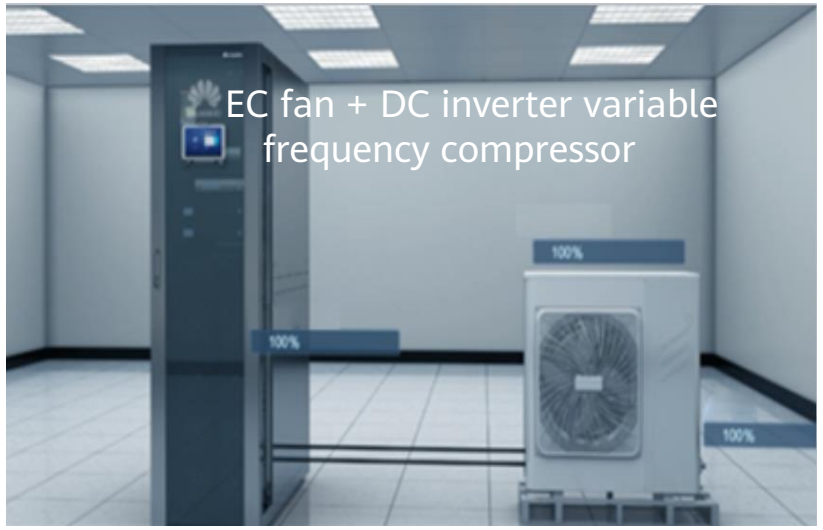
- Battery capacity：26AH/40AH/65AH/100AH
- Quantity：
  In the module1~2pcs
  Out of the module 1-4pcs
- Optional iBattery function

Battery rack

- Battery capacity：26AH/40AH/65AH/100AH
- Quantity：1~2pcs

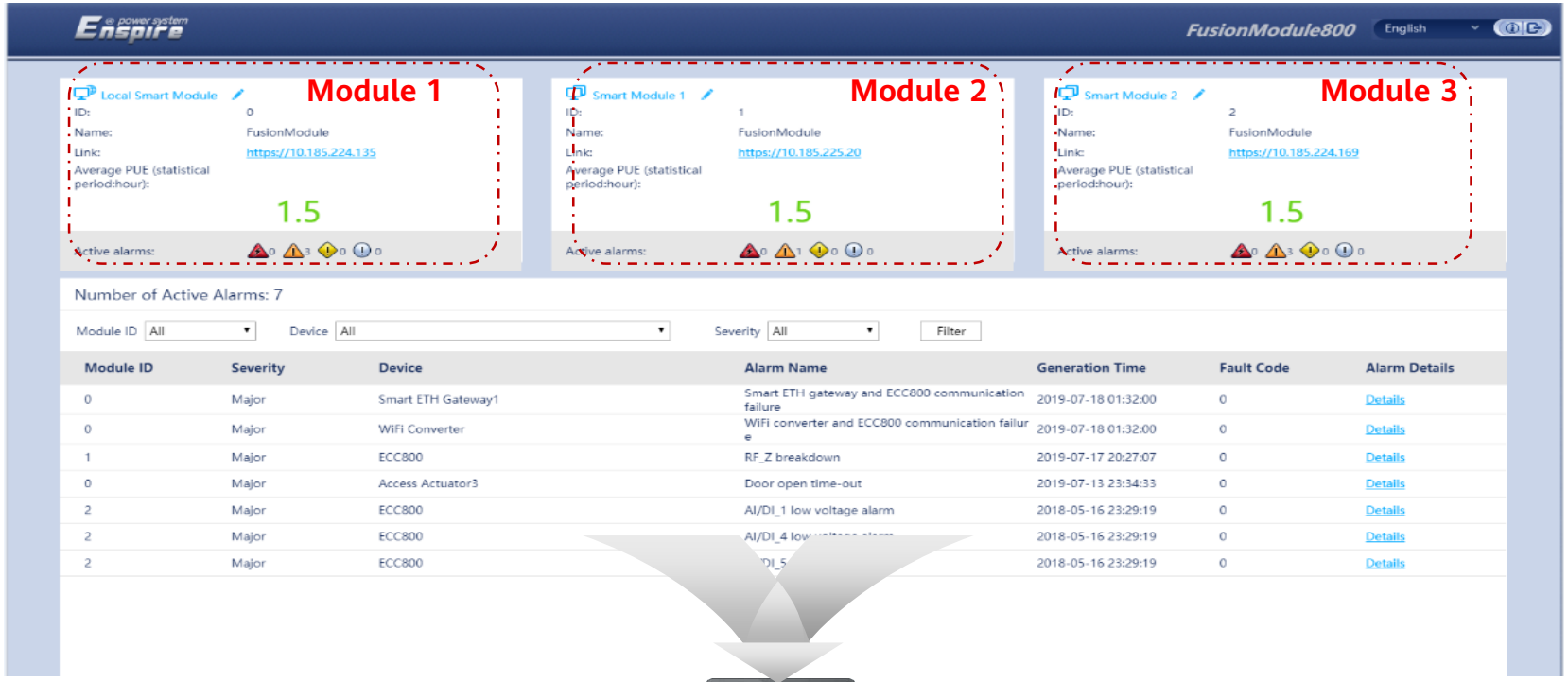
HUAWEI

Rack-mounted Air Conditioner, DC Inverter Cooling



Overall	Parameter
Operating temperature of the outdoor unit	• T1：–20° C~45° C • LT:–40° C~45° C • T3：–10° C~55° C
The vertical distance betweenbetween indoor and outdoor unit	-8-30m
Maximum length of one-way pipe	≤80m
Cabling and Pipe mode	Upward and downward routing.
Certification	REACH、RoHS、CE、CB、EAC 、SASO
Item	**Indoor Unit**
Power system	220/230/240Vac, 50Hz, and 1Ph+N+PE
Maximum current	17.3A with heating and humidification 3.3A without heating and humidification
Cooling mode	Air-cooled (horizontal air flow)
Refrigerant	R410A
Cooling capacity	12.5kW
Fan Type	EC fan
Maximum airflow	2600m3/h
Installation Mode	Rack-mounted
Temperature control unit	**Outdoor unit**
Maximum working current	T1;24A. T3;30A. LT:30A
Number of fans	1 (T1&LT), 2 (T3)

Standard configuration ECC can support 2-3module centralized monitorir



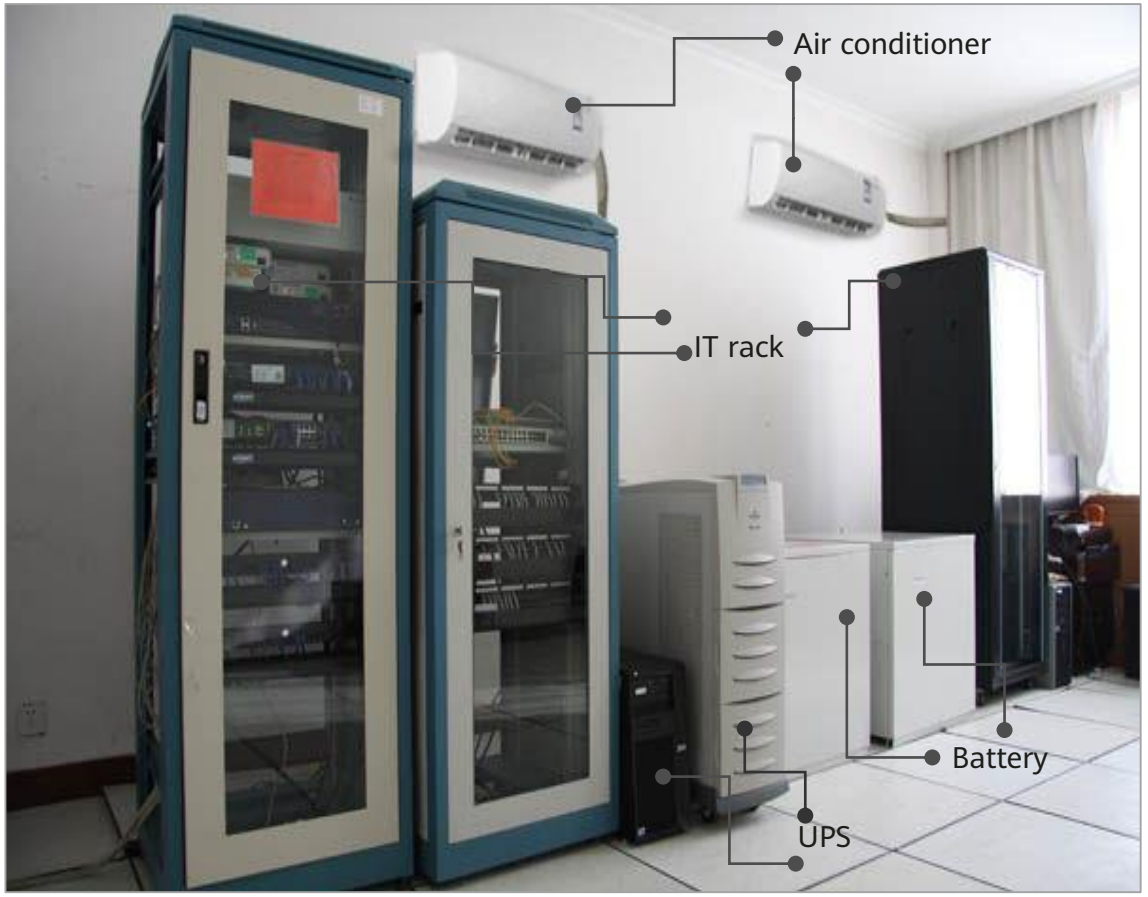
HUAWEI

Contents

HUAWEI

Branch offices and Edge DCs: Components are pieced together VS All-in-one design

Traditional construction mode



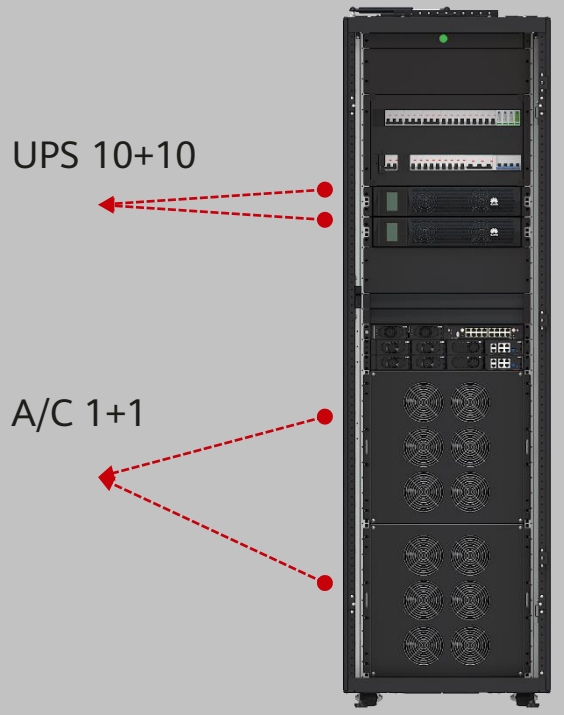
VS

FusionModule800 : All-in-one design
Simple, Efficient, Reliable

HUAWEI

3 Step VS 30 Step, Save at Least 90% Design Time

3 step

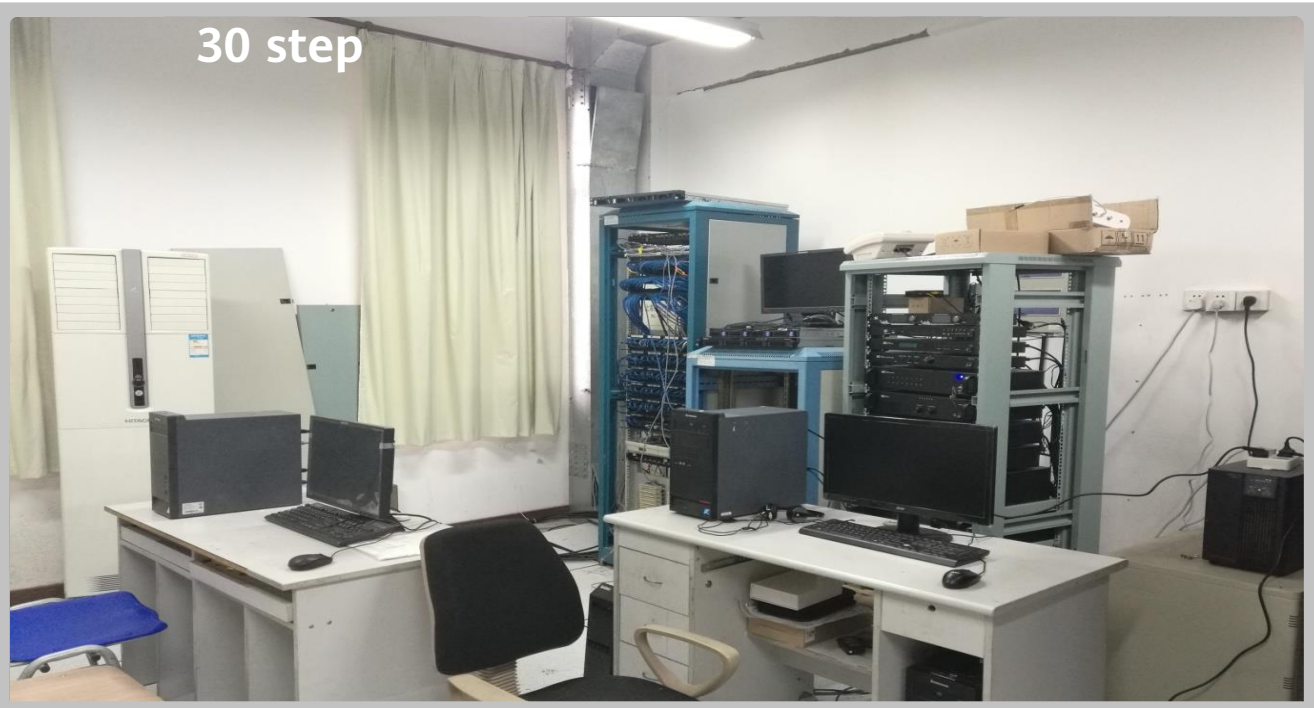


Confirm **3** variable：

1、Total load；2、Redundance;
3,others(IT rack, backuptime...)

VS

30 step



Confirm 30 variable：

1、Brand Choice: UPS, air conditioners, cabinets, batteries, monitoring ... (10 step)
2、Model and capacity selection: UPS, air conditioners, cabinet, batteries...(15 step)
3、 Solution Design: Load, cooling capacity, part redundancy or not... (5 step)
4、Drawing design

Quick Installation in 4 Hours, 2 Days business on line

Traditional construction mode

Design	Site integration equipment	Equipment installation	Commissioning acceptance	Run

10 days business on the line

FusionModule800

Typical configur-ation	Integration transport	Rack combination	Simple Commiss-ioning	Run

Saving 80% of the installation time

2 days business on line

Factory prefabricated, packed

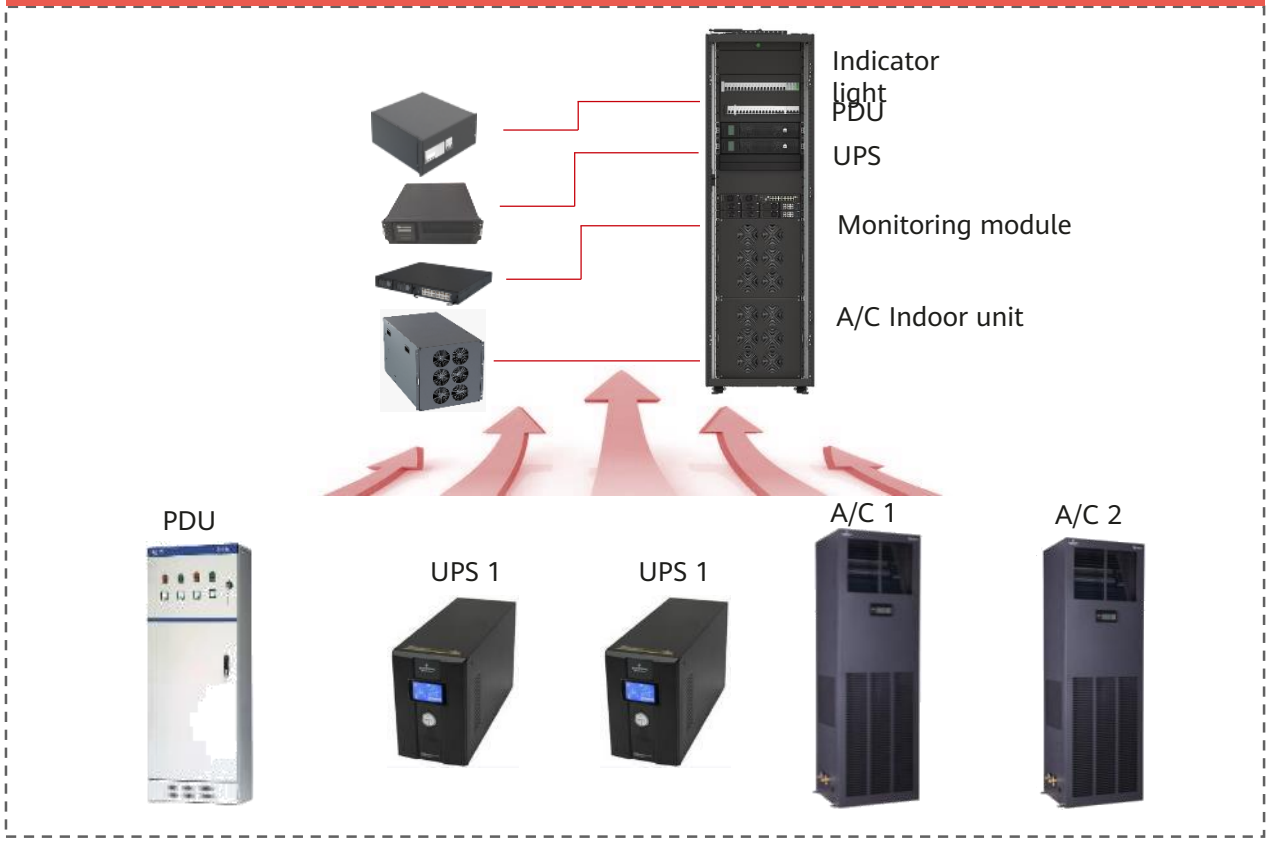
Simple cabinet combination

The construction is complete

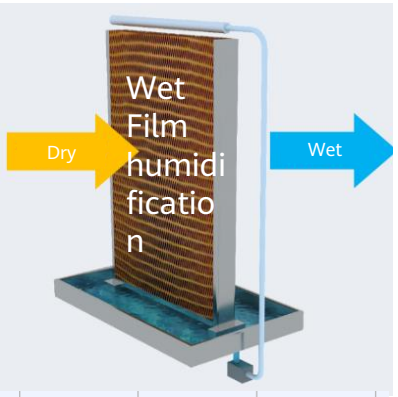
Two days of service rollout

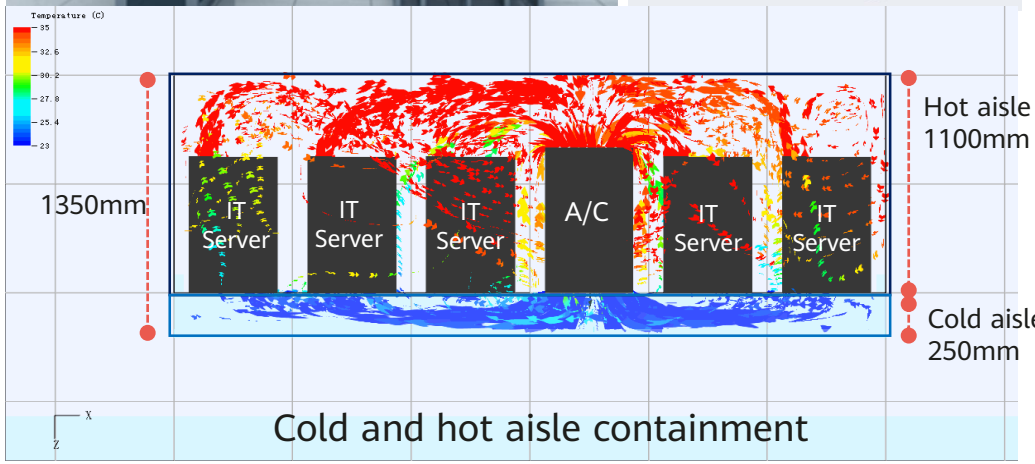
All-in-one design, Saving at Least 2 racks Footprint, Low PUE

All-in-one Design



Low PUE, Saving 8600 USD per year



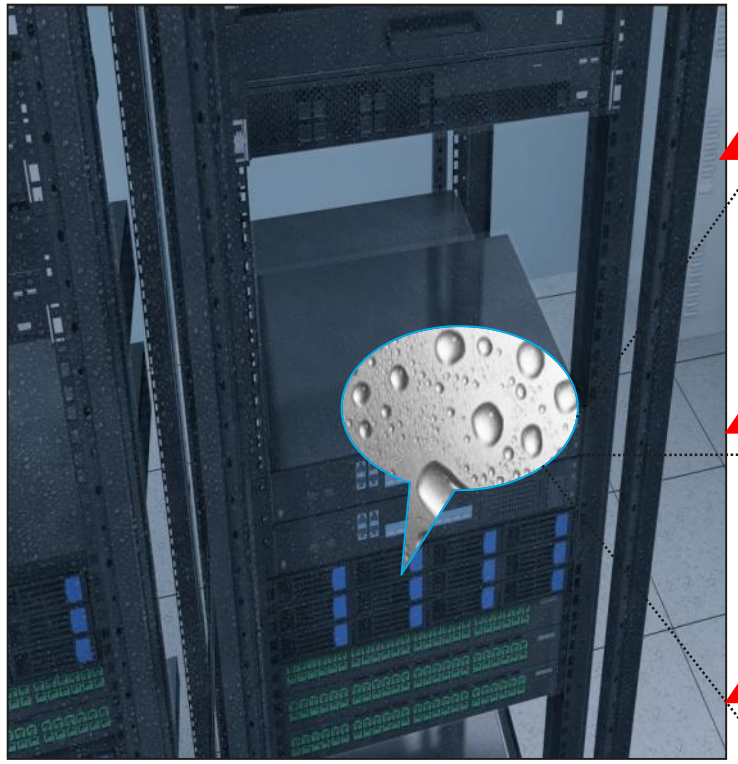


Remarks: Saving 8600USD per year (IT load: 25KW , Load rate: 60%; Traditional solution: PUE 1.8)

HUAWEI

Low-load Dehumidification Prevents Condensation

Low load easy to cause condensation which have 3 risk



- Short-circuit of live equipment leads to safety incidents.
- Reduced creepage distance easily results in electric shock.
- Component rust corrosion shortens the product life.

Ordinary A/C

When the load is less than 20%, the dehumidification is stopped

VS

Huawei A/C

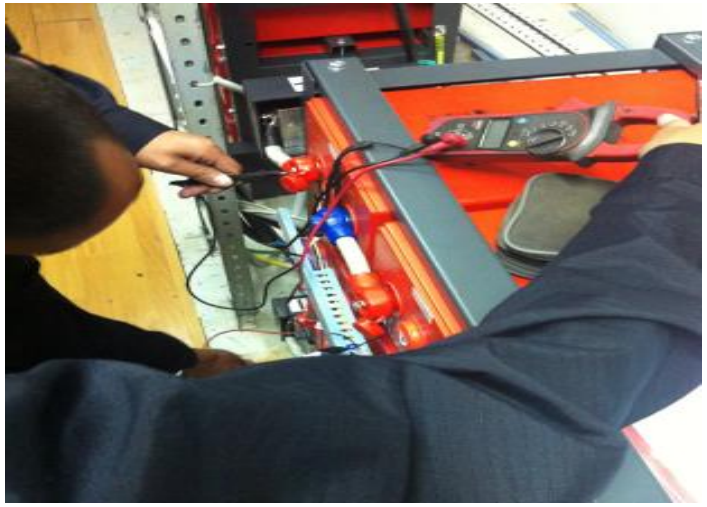
Patented design, 10% low load, still reliable dehumidification, "0" condensation

Note: Traditional DC is generally deployed dehumidifier in the computer room

HUAWEI

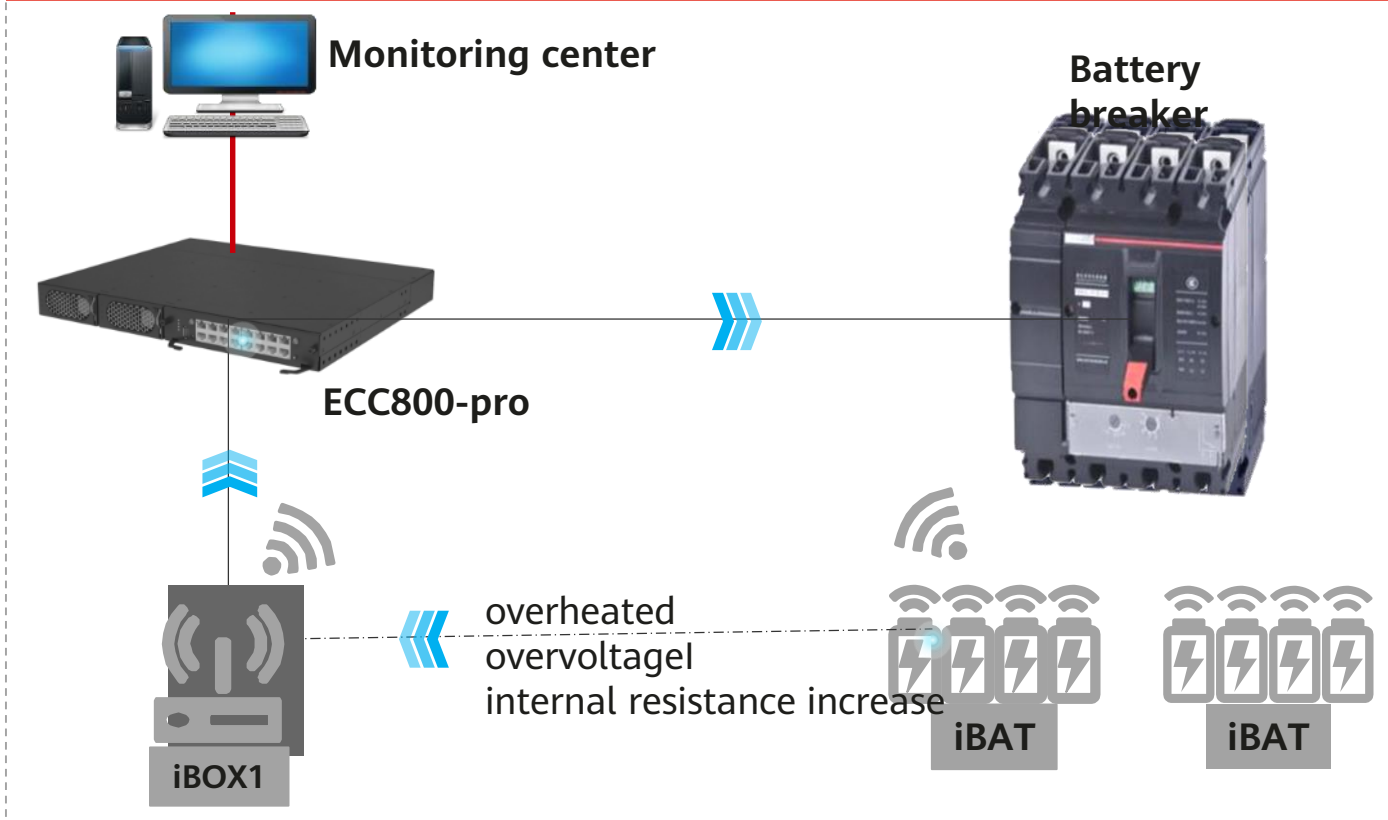
iBattery: Detect early Fault and Prevent Fires

Battery on-site inspection



Vs

Battery intelligent management system



- Each battery internal resistance, temperature, voltage, current real-time monitoring
- Battery fault signal wireless upload, battery overheating intelligent shutdown

HUAWEI

Automatically open the door to dissipation overheat and link with fire extinguishing system

Temperature exceeds the threshold.

A/C failure

Smoke alarm

Emergency heat dissipation

Fire fighting linkage

Open the rear door firstly and then the front door

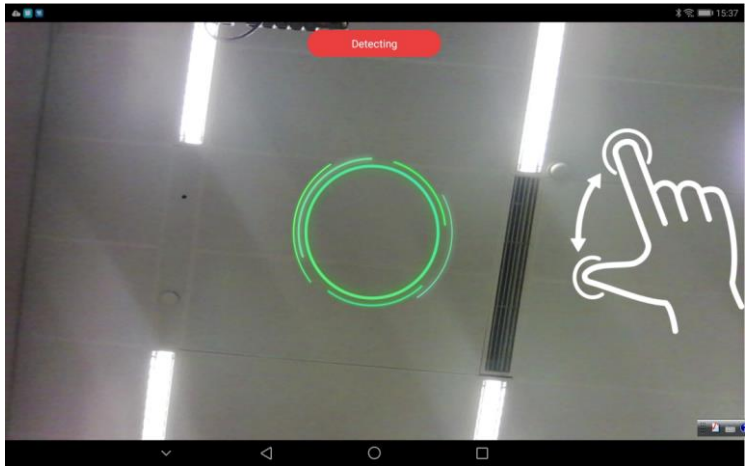
All doors will automatically open when fire alarm generation

HUAWEI

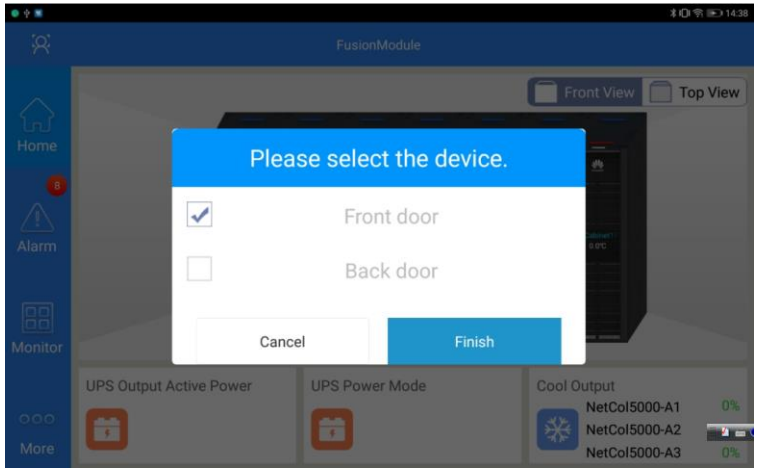
Password-free login for facial recognition on local

Facial recognition login

- Log in the local PAD without password or card swiping



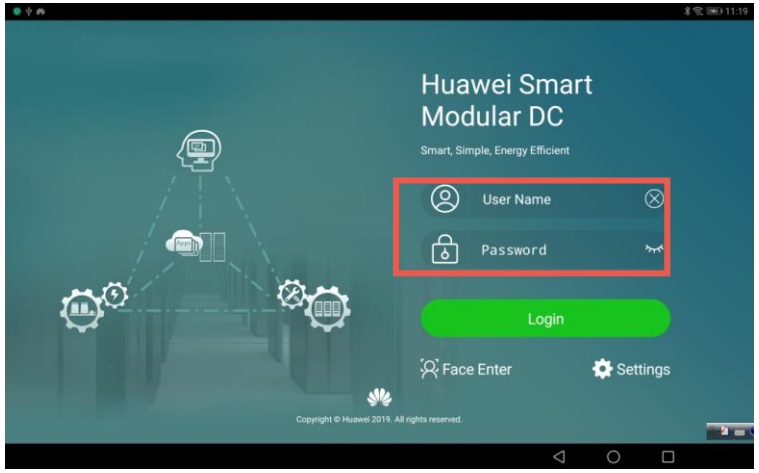
- Log in the PAD, open rack door automatically after secondary approval



VS

Traditional password login

- Manually entered :easy to forget the password.



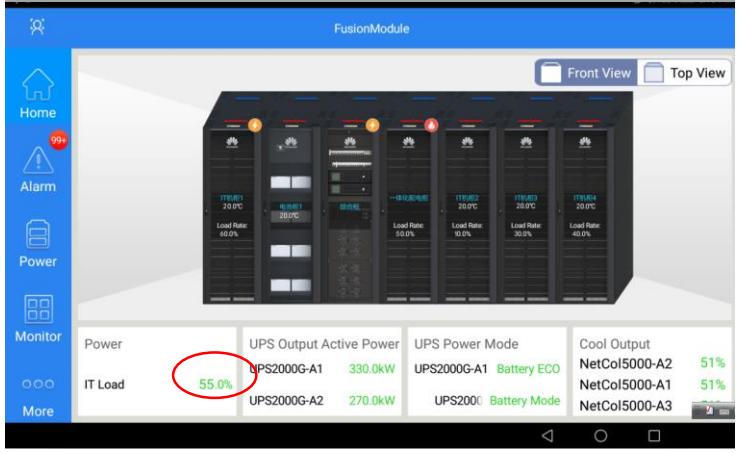
- The mechanical key is easy to lose.

HUAWEI

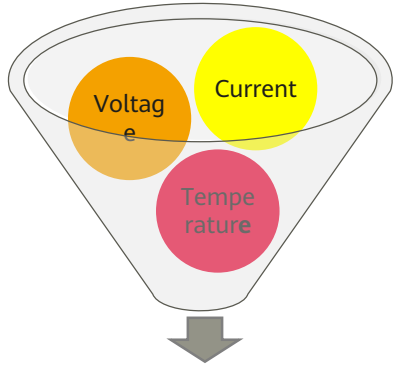
Intelligent PDU: online maintenance, PUE & load rate monitoring

PUE

Load Rate



Intelligent PDU

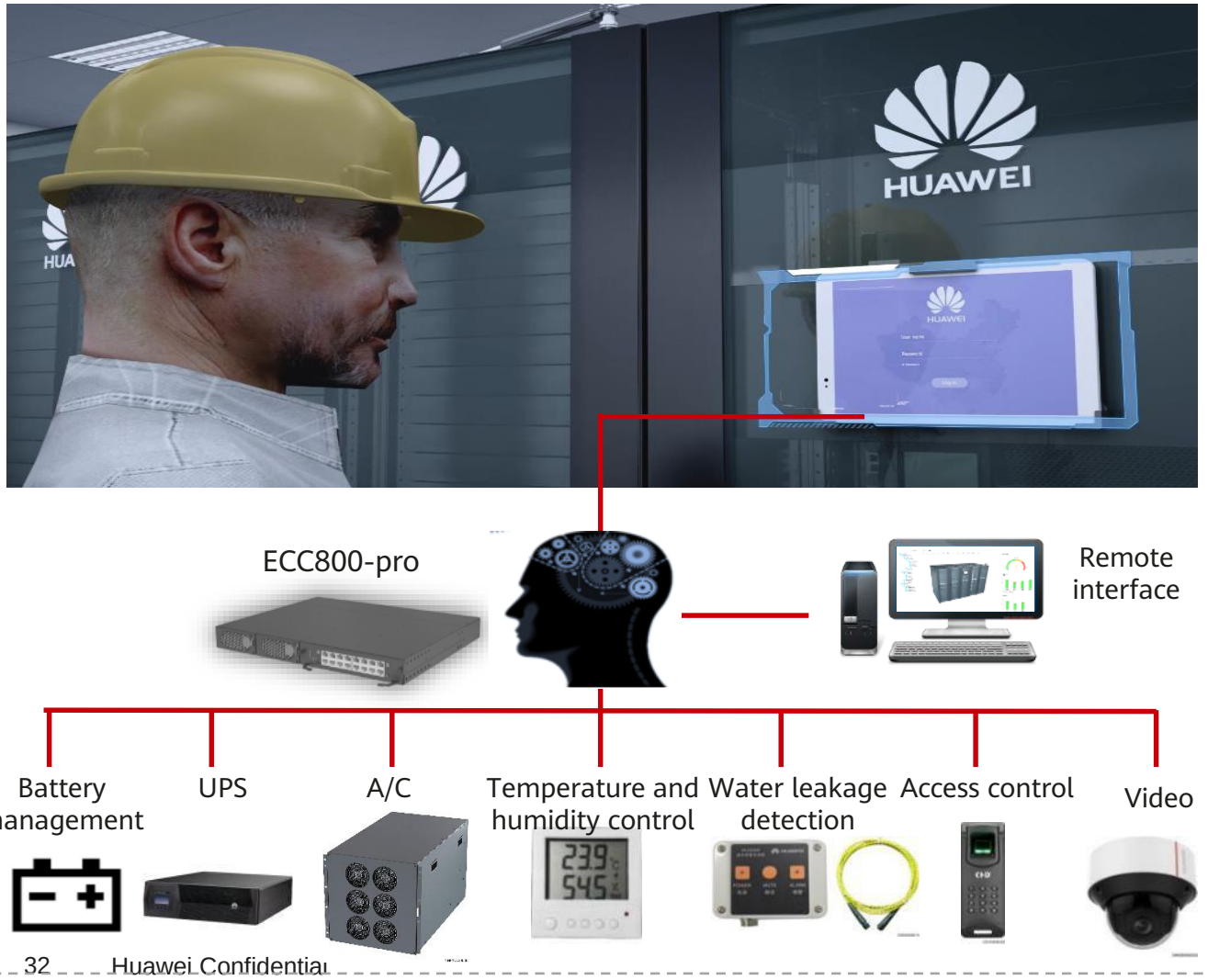


- The system can Monitors the general mains input voltage, frequency, current, and power, as well as the UPS input voltage, frequency, current, switch temperature, and so on.
- The system can monitors the current, electric energy, and switch status of power distribution branches of IT equipment and A/C , calculated the PUE and load rate.
- Displays the PUE value of the smart module in a data dashboard, allows you to view the historical PUE curve.

Only BC6,BC7 have this function

HUAWEI

From N to 1, Simplified Monitoring System



Local O&M

- **One brain:** The ECC800-Pro can monitoring each subsystem
- **One interface:** Monitoring All Subdevices on a Local 10-inch PAD

Remote monitoring

- **One mobile phone**: Fault information: SMS alarm on the mobile phone
- **One network:** Remote monitoring on Web

Multiple DCs can be remotely managed in DCIM

- Huawei DCIM can remote managed multiple DCs. The site visits decreases by 50%, and fault responses increases by 75%.
- Quick fault locating: The spare parts are correctly carried. The number of site visits is twice, and the travel expense is reduced by 50%. Fault response time: 8 hours and 2 hours

Mission of Network Energy Product Line

Leading Energy Digitalization for a Smart and Sustainable World

Efficiency

Reliability

Smart O&M

Thank you.

Bring digital to every person, home, and organization for a fully connected, intelligent world.