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| HUIJUE NETWORK-----Outdoor shelter |       |  |
| Outdoor shelter                    | Model |  |

## Outdoor Shelter

### 1. Overview

The solution of outdoor integrated shelter room can meet the needs of outdoor station construction on the roof, mountain area, roadside, community, and village and so on. The advantages are, such as convenient for quick installation, short period of station construction, wide range of application, not limited by geographical location and outdoor environment, saving land cost, easy to move and reuse, etc. It is an outdoor shelter room that can provide mechanical and environmental protection for internal communication equipment. It can be produced in the factory, convenient for transportation and easy for on-site installation.

The applications of the outdoor integrated shelter: mobile base station room, network access room, an area network, IP room, microwave relay station room, and small room used in other industries.

The shelter system is mainly consisted of: environmental monitoring system, power distribution system, safety management system, and communication connection system;



#### The shelter body:

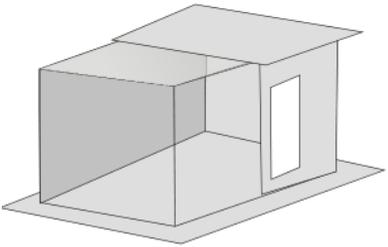
The shelter body system is consisted of housing structure, lighting, wiring ladder, floor and the feeder cable window.

The machine room is composed of bottom frame, slot, column, crossbeam, panel, etc.

The options of the panel's materials: pre coated color steel plate, high-strength fiberglass, etc., and core materials can be polyurethane, extruded polystyrene, ordinary polystyrene, etc. It can meet the needs of different environments through scientific combination.

The shelter types could be: movable board room, iron armor room, container room, non-metallic assembly room, etc.

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| Shelter structure   | Wiring ladder   | Lighting system   |
|  |  |   |
| Feeder cable window   | Anti-static floor   |   |

## 2. The parameters of the shelter

Environmental temperature: -40℃--+60℃

Relative humidity: 5%-99%

Floor load-bearing: 6kN/M

Fire-proof performance: It conforms to the requirements of class A and class B2 in GB8624-1997 classification method for combustion performance of building materials.

Protection level: IP65

Wind resistance: 45m / s strong wind (more than 12 wind)

Seismic performance: the frame module structure design can resist level 8 earthquake;

Anti corrosion performance: meet the requirements of 500 hours salt spray test;

Lightning protection performance: the shelter adopts multi-channel, multi-contact circular grounding protection;

Connection features: concealed screw design, no exposed screws inside and outside the shelter;

Door lock intelligent management: intelligent access control management system, protection level IP65;

Product life: no less than 20 years;

Thermal insulation (energy saving) performance: polyurethane thermal insulation material is used as wall filling material, with thermal conductivity of 0.02kcal/m · h · °C

## 3. Introduction of the housing

### *The protection of the housing*

- The bottom frame adopts all steel structure, concealed screw design, aluminum profile as column, and stainless steel angle bars are used to cover the inside and outside to form a concealed overall frame structure.

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- The column is designed with concealed pull-out bolts, which can beautify the environment when improving the bearing capacity, wind resistance and seismic resistance of the room.
- Customized professional outdoor steel safety door, equipped with outdoor rainproof, sand proof and anti-theft lock. The intelligent access control system can also be selected to conduct authority management and alarm monitoring of illegal door opening.
- The invisible strengthening frame will be added to the safety door, to make the connection between the door and the room body is stronger.



### ***The environmental monitoring system of the shelter***

Consisting of room remote monitoring system (FSU), network management intelligent air conditioning unit and air exchange fan unit, which are built with full intelligent automatic monitoring management.

Realtime environment monitoring system:

Real time collection and control of the ambient temperature and temperature parameters of the machine room;

Real time acquisition of power supply status and safety status parameters of the machine room;





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### ***Air conditioning network monitoring management***

The air conditioning function is controlled by the management of the monitoring equipment in the machine room. When the temperature in the machine room exceeds the specified temperature, the double machine rotation mode can be adopted. When the ambient temperature is too high, the double machine work at the same time. In case of city power failure, when the temperature in the machine room exceeds the specified temperature, start the air exchange fan unit to cool down.



### ***Intelligent call recovery and self starting function.***



### ***Shelter power distribution system***

Power distribution management system are composed of: power distribution box, DC power supply, battery and UPS, or optional diesel generator set or solar power supply device.



AC power distribution Enclosure



DC power system



Battery pack

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**Shelter security system**

The safety management system consists of lightning protection and grounding subsystem, fire protection, anti-theft, environment and other systems.

Lightning protection and grounding subsystem: including lightning protection box and grounding busbar in the machine room, providing reliable lightning protection and grounding protection for main and supporting equipment in the machine room.

Smoke sensor, temperature sensor, immersion sensor and infrared sensor are used to cooperate with the remote monitoring system of the computer room to manage the fire alarm, anti-theft alarm and immersion alarm of the computer room.



Copper bar



Firefighting facility



Water immersion sensor



Video transmission equipment



Smoke sensor



Temperature & humidity sensor



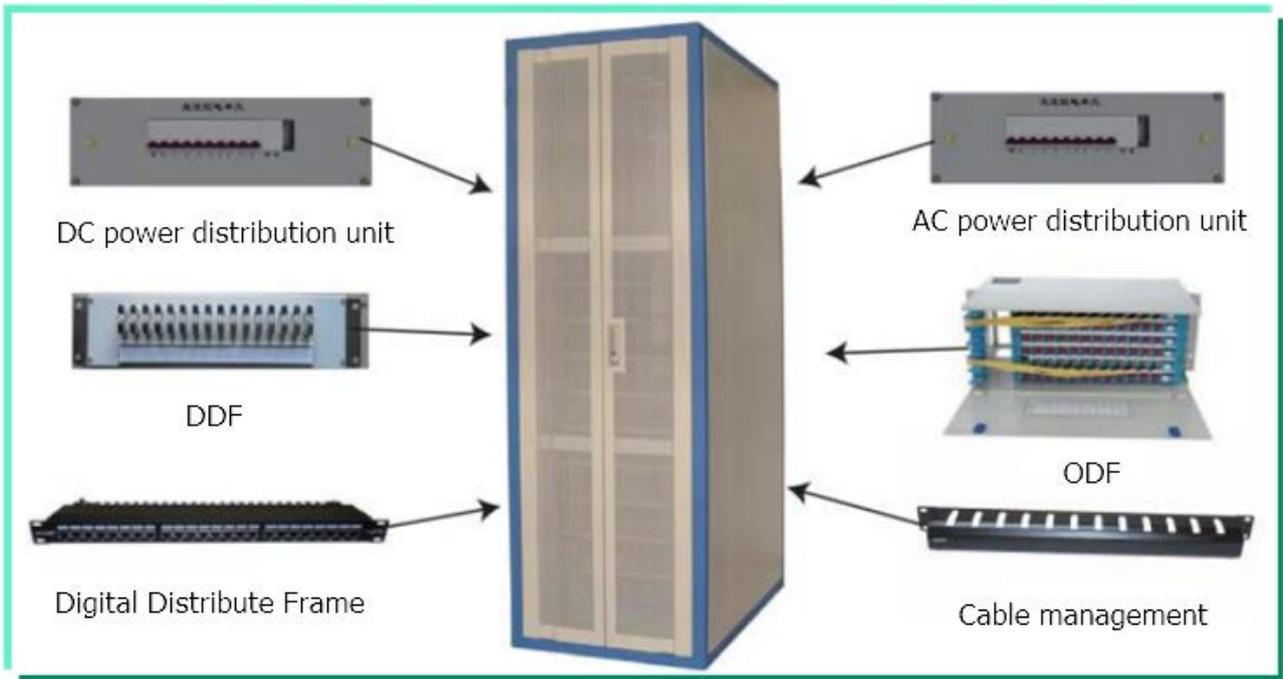
Infrared sensor

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**Shelter communication system**

The communication connection system is consisted of: integrated cabinet, power distribution unit, ODF unit, DDF unit, line management rack and other equipment;

The integrated cabinet is a standard 19 inch structure, which can be installed with various communication modules, and can be combined into an integrated distribution cabinet, or a network cabinet with equipment tray and cooling fan.

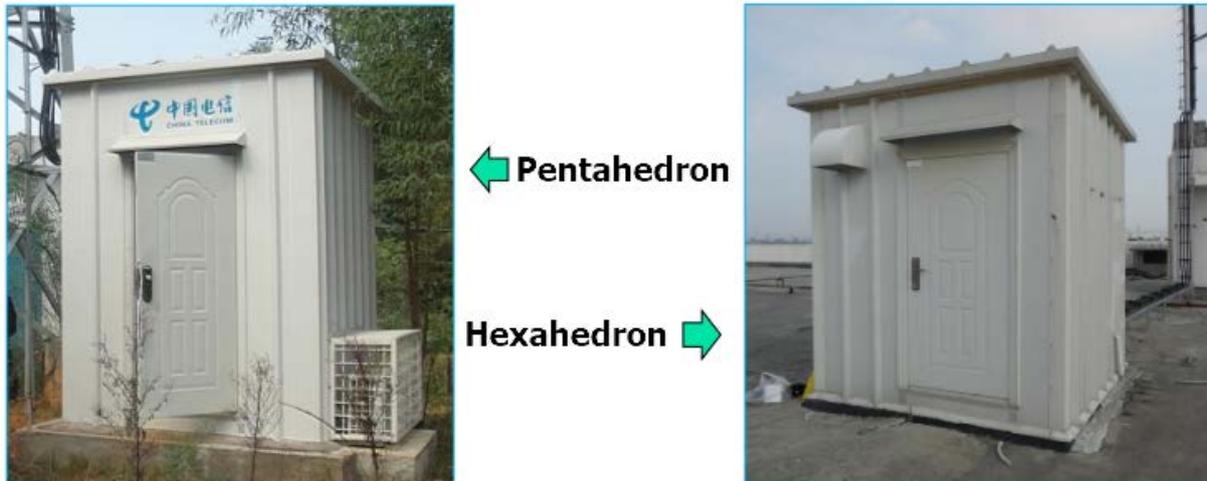


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#### 4. Different types of shelters

##### ***Armor shelter***

On the basis of the original color steel machine room, the iron armour machine room enhances the outer layer's anti breaking force, effectively stops the conventional vandalism, is more resistant to high temperature, and has a longer service life. It can be used as communication room, equipment room, integrated center room, etc.



##### **Product features:**

1. It's suitable for sites in severe weather and high-risk areas;
2. Plate type installation, convenient for assembly, quick formation, and could improve the speed of sites construction.
3. There is no exposed mounting screw, and the anti-theft performance is about 2-4 times that of ordinary color steel plate room.
4. The outer plate material is 1.6mm aluminum zinc plate with strong strength and good heat insulation effect; the inner layer is made of 75mm ~ 100 color steel sandwich plate heat insulation material.



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**Performance of armor shelter room:**

The thickness of the external panel is increased and the safety is good: the wall panels and roof panels of the machine room are made of three layers of sandwich panels. The effective thickness of the board is 75mm (without corrugating). The outer panel is a double-layer 0.8mm color steel plate (two layers of 0.8mm colored steel sheets are pressed with metal adhesive), the inner panel is 0.5mm thick color steel sheet, and the heat transfer coefficient of sandwich panel core material is polyurethane or phenolic foam, which is not greater than 0.034W/. (m2. K), performance in accordance with 5.2 of GB / T 23932





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### Container Shelter

#### Structure of Contrainer Shelter:

The shell is a standard container shape. The whole assembly is completed in the factory by using the color steel sandwich panel and metal structure parts. The base station machine room can be transported as a whole. The machine room can add external iron armour as required, which is a safer and more convenient.

#### Product features:

1. The structure is firm and modularly designed;
2. The overall structure, fast lifting and convenient transportation improve the speed of base station construction;
3. The station site can be moved quickly;



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### Non-metallic Assembly Shelter

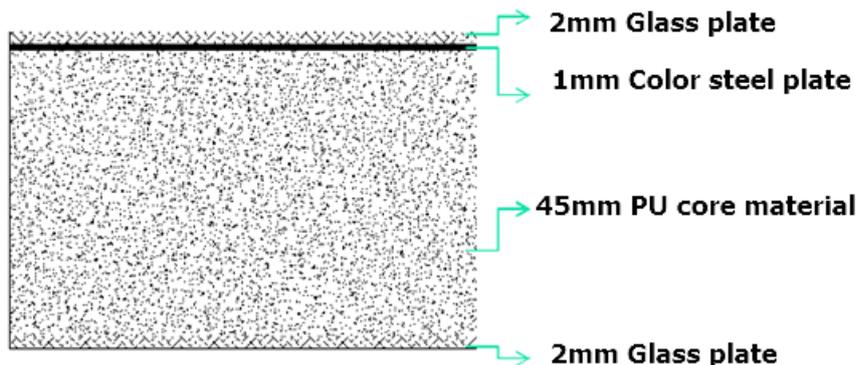
#### Structure:

Non metallic assembly shelter: it refers to the integrated equipment which is directly under the influence of climate environment and is made of non-metallic materials and assembled by standardized modules. It can be equipped with communication equipment, transmission equipment, power supply equipment, monitoring equipment, battery and other supporting equipment, and can provide reliable mechanical and environmental protection for the normal operation of internal equipment, with low comprehensive heat transfer coefficient, Modular on-site assembly.



#### Performance of the Non-metallic assembly Shelter

The shelter adopts composite sandwich panel, which is composed of non-metallic surface, metal surface and heat insulation core material (PU) bonded between two non-metallic surfaces.



#### Non-metallic material:

- 1.) Punching shear strength:  $\geq 90\text{Mpa}$ ; tensile strength:  $\geq 90\text{Mpa}$ ; bending strength:  $\geq 150\text{MPa}$ ;
- 2.) Hardness of Babbitt:  $\geq 50$ ;
- 3.) Temperature resistance limit:  $-40\text{ }^{\circ}\text{C}$  to  $+120\text{ }^{\circ}\text{C}$ ; self extinguishing material;

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4.) Thermal conductivity:  $\leq 0.3w / (M2 \cdot K)$ ;

5.) No stress crack, no coating peeling, no peeling and no color change after corrosive liquid test;

6.) The exposed non-metallic parts have no cracks, pinholes, damages and other phenomena after the simulated solar radiation test;

**On-site Assembly:**

|   |  |
|---|--|
| 1. Place the fixed base   | 2. Assemble the walls  |
|   |   |
| 3. Installing internal components   | 4. Assembly of the shelter is completed  |
|  |  |



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**Beautiful/Decorated Shelter Room**

In order to keep pace with the rapid development of domestic informatization and the continuous expansion of wireless information network, building more reliable, safe and convenient base station is of milestone significance. In order to adapt to the overall style requirements of the city and scenic area, the base station needs to be decorated with beautifying rooms to match the surrounding environment.

