BROAD·For Humanity's Future

Clean Central Air Conditioning to Public Buildings

Presentation for ADB webinar

Johnny Zhou, BROAD Group
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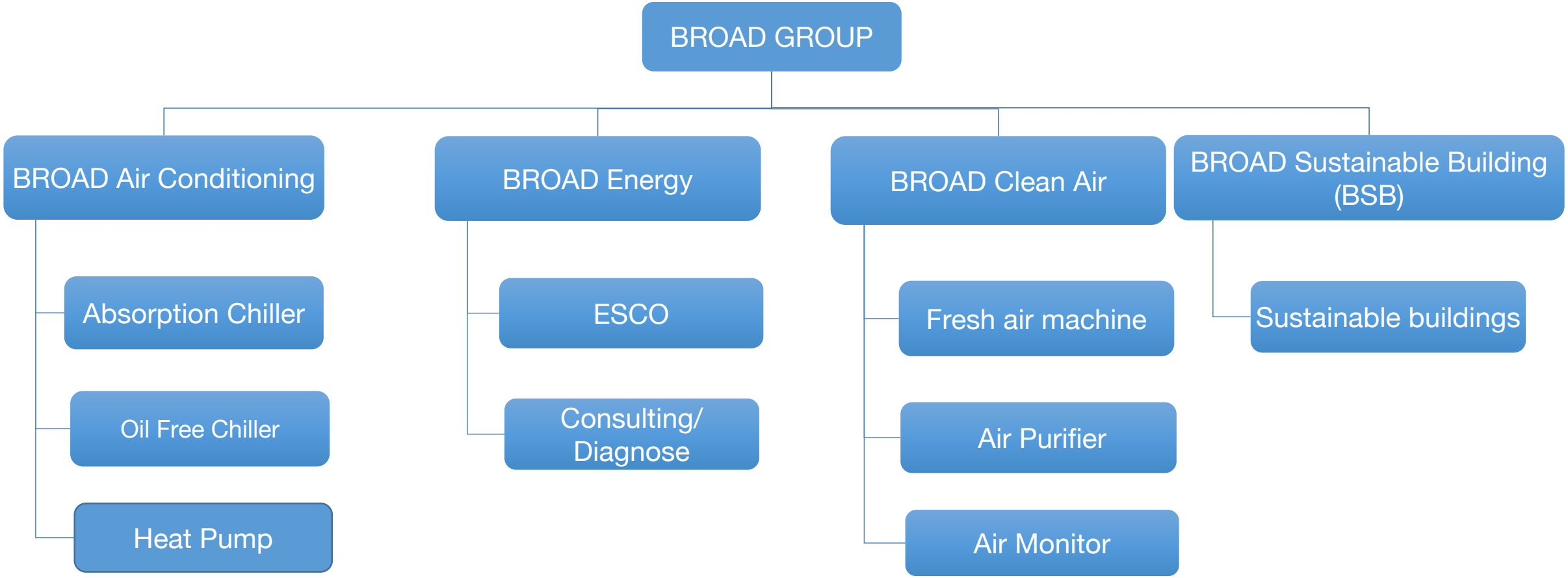
About BROAD

- BROAD Group, established in 1988, more than 3,000 employees, more than 400 research staffs.
- Headquartered in Changsha, China.
  - 26 subsidiaries in big cities in mainland China.
  - 8 of wholly-owned overseas subsidiaries (New Jersey, Los Angeles, Paris, Melbourne, Seoul, New Delhi, Karachi, Jakarta).
  - more than 20 representative offices in countries such as Germany, Spain, Japan and Singapore, etc.
- 30,000+ installations in 80+ countries worldwide.

BROAD Town

BSB Town

About BROAD


BROAD GROUP
BROAD Air Conditioning
Absorption Chiller
Oil Free Chiller
Heat Pump
BROAD Energy
ESCO
Consulting/ Diagnose
BROAD Clean Air
Fresh air machine
Air Purifier
Air Monitor
BROAD Sustainable Building (BSB)
Sustainable buildings

Central Air Conditioning Technologies

Absorption chiller	
Cooling capacity	66RT to 3300RT
Energy source	Fuel (NG, LPG, Diesel, etc.) Exhaust gas, Steam, Hot water
Function	Cooling, Heating, Hot water

Oil Free Magnetic Bearing Centrifugal Chiller	
Cooling capacity	120RT to 1200RT
Energy source	Electricity
Function	Cooling, Heating

Heat Recovery Clean Fresh Air Machine	
Fresh air volume	1000m3/h to 50000m3/h
Function	Fresh air ventilation; air purification, fresh air heat recovery, air quality detection

Absorption Chiller System

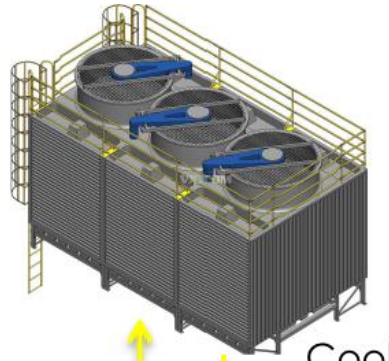
Fuel (NG, Diesel, LPG, Biogas, etc.)

Exhaust gas (300℃ to 500℃)

Steam (0 bar to 10bar)

Hot water (90℃ to 180℃)

Energy source can be single or multiple



Cooling tower

Hot water tank

Hot water supply/return

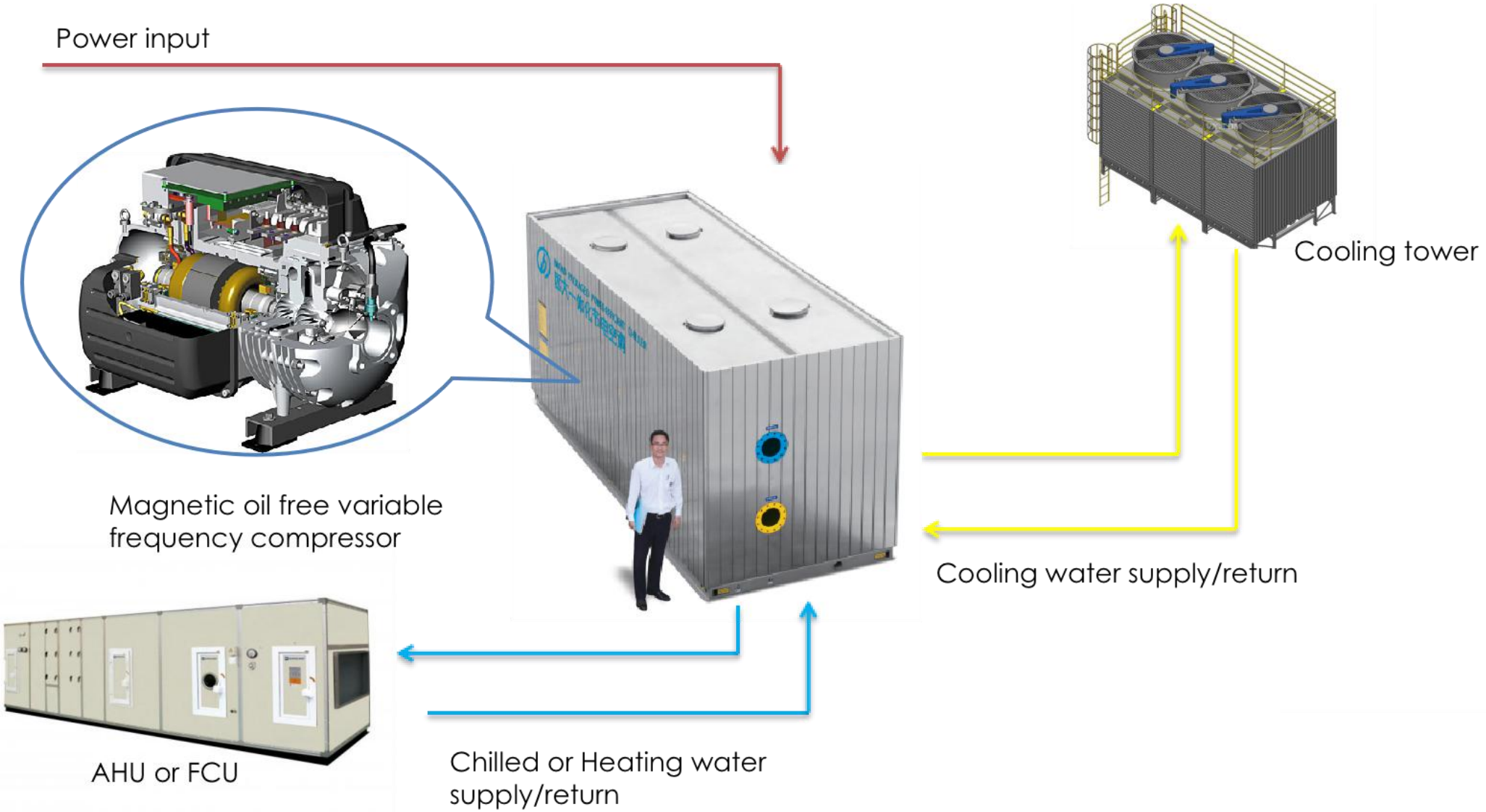
AHU or FCU

Chilled or Heating water supply/return

BROAD Packaged Chiller System

Cooling water supply/return

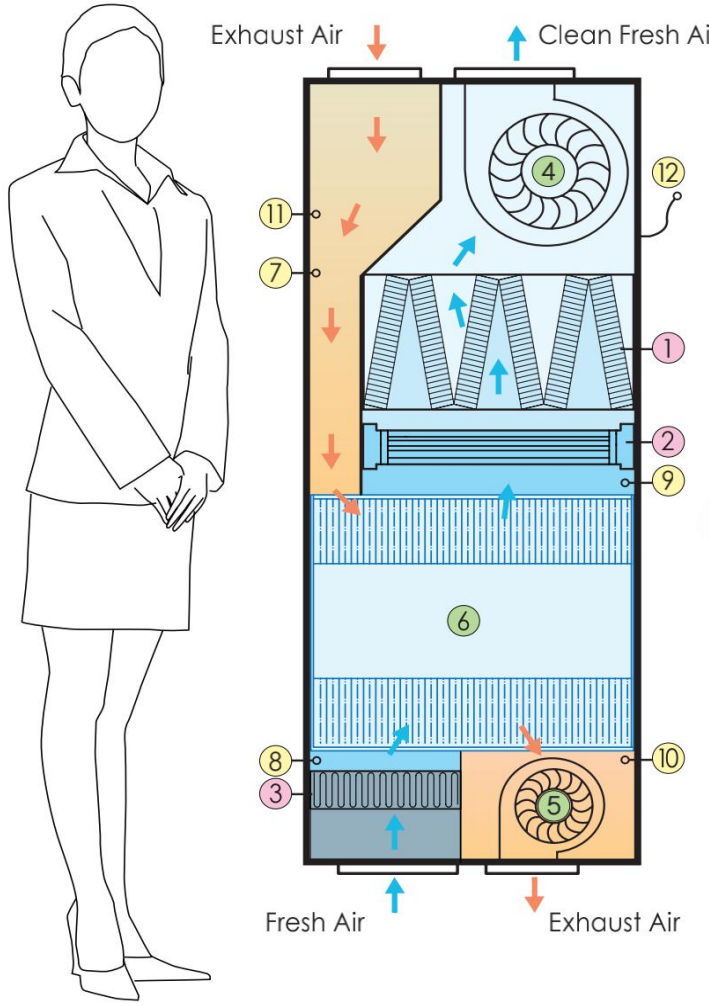
Oil Free Magnetic Bearing Centrifugal Chiller System



Heat Recovery Clean Fresh Air Machine

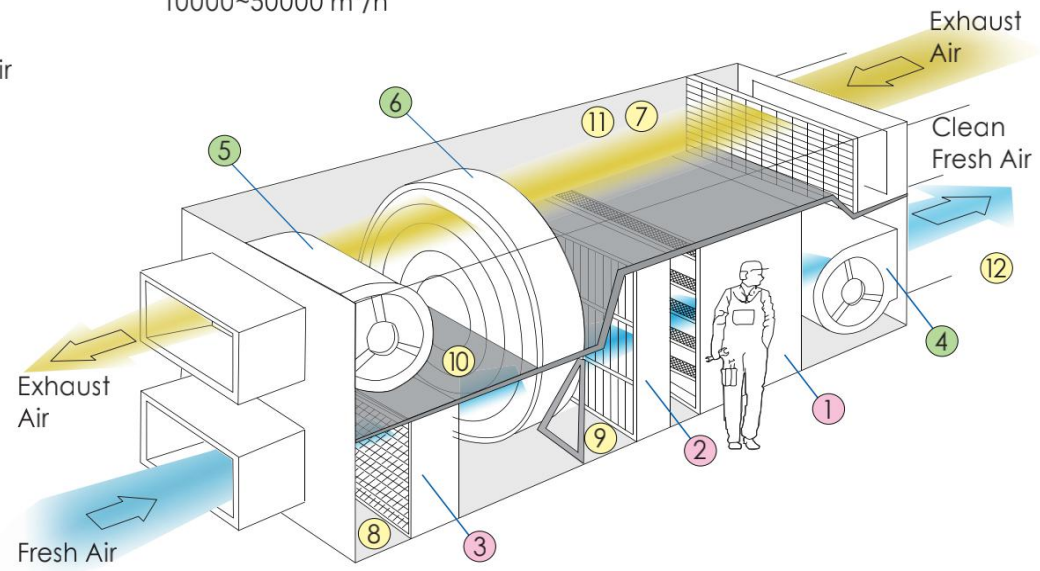
Small and Medium Models

260~3000 m^3/h



Large Model

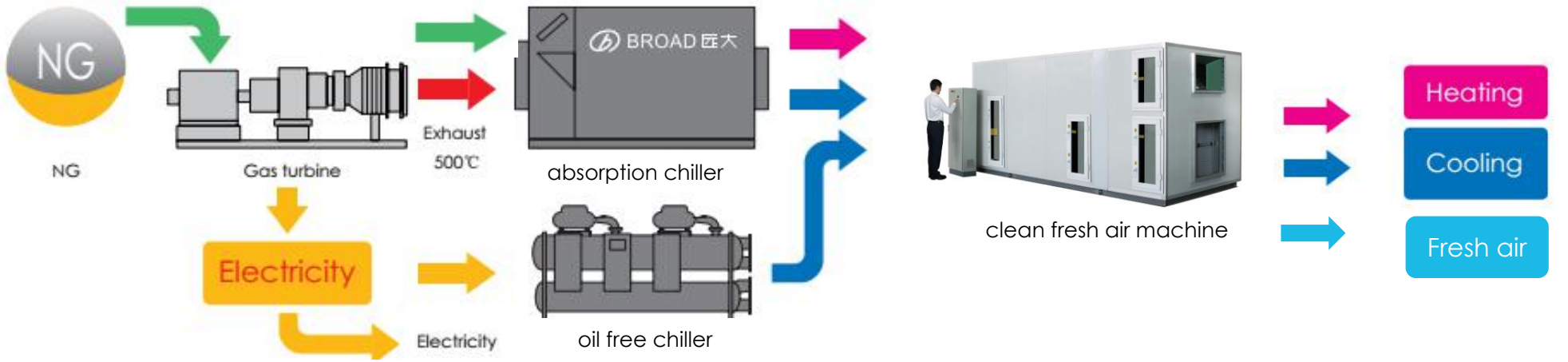
10000~50000 m^3/h



1 HEPA Filter (Teflon)	7 Indoor Temp. Sensor
2 Electrostatic Cleaner (aluminum alloy plate and tungsten filament)	8 Outdoor Temp. Sensor
3 Coarse Filter (stainless steel net)	9 Fresh Air Temp. Sensor
4 Fresh Air Fan	10 Exhaust Air Temp. Sensor
5 Exhaust Air Fan	11 Indoor CO_2 Sensor
6 Air Heat Exchanger (polymer material)	12 Human Infrared Sensor

Important note: BROAD clean fresh air technology is BROAD patented, any counterfeit will be sued

Clean Central Air Conditioning System



Clean in energy source

- Natural gas
- Waste heat recovery
- Renewable energy for electricity

Clean in cooling/heating process

- Refrigerant: pure water/ODP=0
- NO_x emission ≤30mg/Nm^3

Clean in output

- 99.9% PM2.5 purification
- 100% fresh air to avoid cross contamination
- Ducting easy maintenance

Clean Central Air Conditioning System in Public Buildings-Hospital Case

Shanghai Pubin Children's Hospital

- The hospital has not only high demand for cooling in the summer, but also heating in winter and hot water for sanitary use
- The hospital requests the minimization of power demand and energy consumption for the building
- The hospital requests 100% fresh air specially for the consideration of children
- The hospital requests million level air purification in operation rooms

Clean Central Air Conditioning System in Public Buildings-Hospital Case

Clean Central Air Conditioning Solution

Gas as the energy source for CAC
- Greatly reduce power demand
- Low NO_x emission

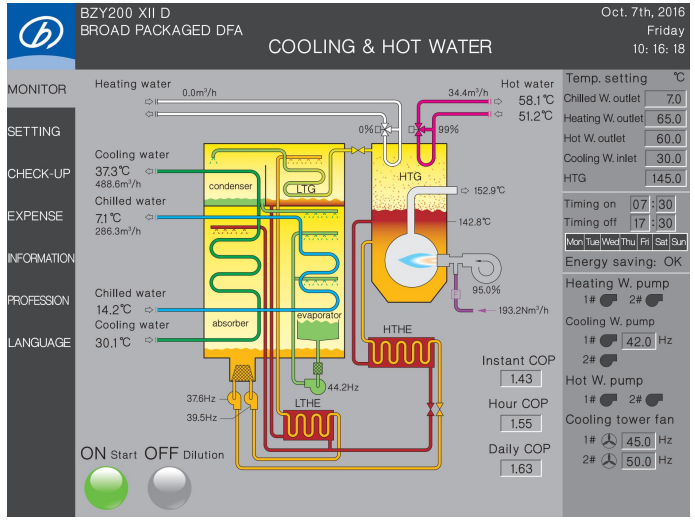
Three functions in one chiller
- Meet demand of cooling, heating and hot water
- Free hot water from cooling
- Investment & energy consumption minimize

Clean fresh air
- 99.9% PM2.5 purification
- 100% fresh air without mixture of exhaust air
- 80% heat recovery from exhaust air

Control System in Clean Central Air Conditioning System

Control system for the chiller

- Flow meters are installed on all pipes (fuel, chilled/heating water, cooling water, hot water) to reflect the energy efficiency directly or indirectly
- The touch screen real-time displays (and records) cooling capacity and energy efficiency
- Intelligent Control System (ICS) realizes operator free for chiller and water distribution system
- Interfaces for chiller, pumpset, cooling tower, outdoor enclosure, internet monitoring, BMS and multi-unit control, etc
- Internet Monitoring System actualizes fault prediction, analysis, trouble shooting and energy-saving management by 24/7/365.



Control System in Clean Central Air Conditioning System

Control system for the fresh air

Self-controlled Freshness

Fresh air volume is automatically adjusted as per indoor CO2 concentration level, preventing O2 deficiency.

- ·Energy-saving Mode

Equipped with sensors, the machine automatically turns on /off based on human detection

- Timer

Auto on/off as per user's will

- Energy Consumption Record

Real time and history of recovered heat, as well as power consumption of the fan available for view

- Fault Diagnosis

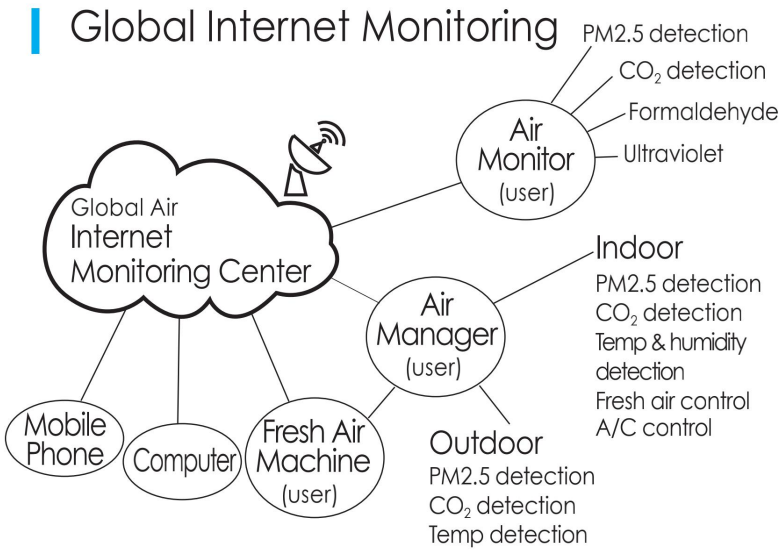
Auto fault diagnosis, O2 deficiency alarm, cleaning reminder, etc.

- Mobile Control

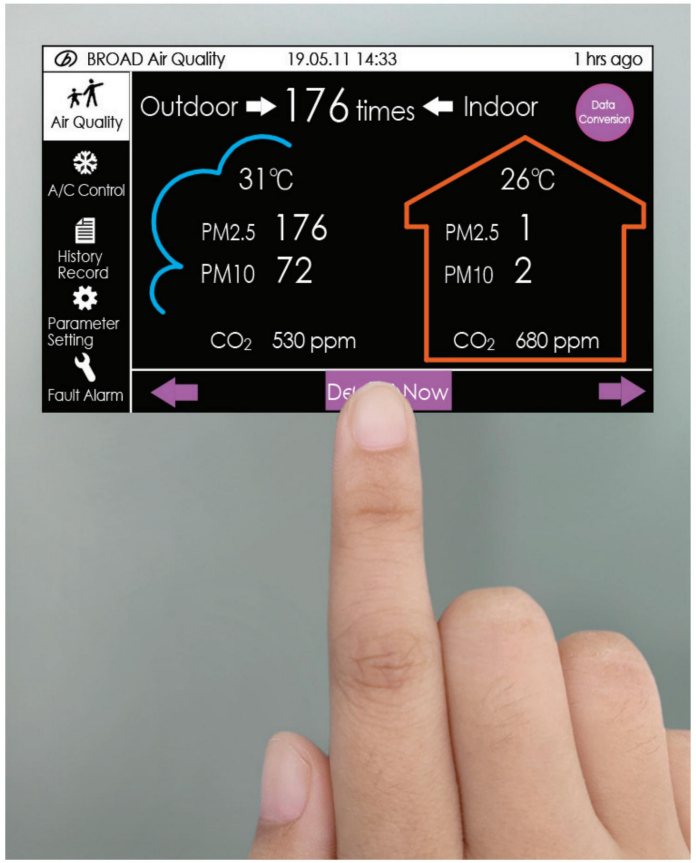
With the APP of BROAD Air, users can use their mobile phones and computers to check indoor air quality and energy consumption data, turn on/off the machine, or adjust the fresh air volume.

Control System in Clean Central Air Conditioning System

Control system for the fresh air



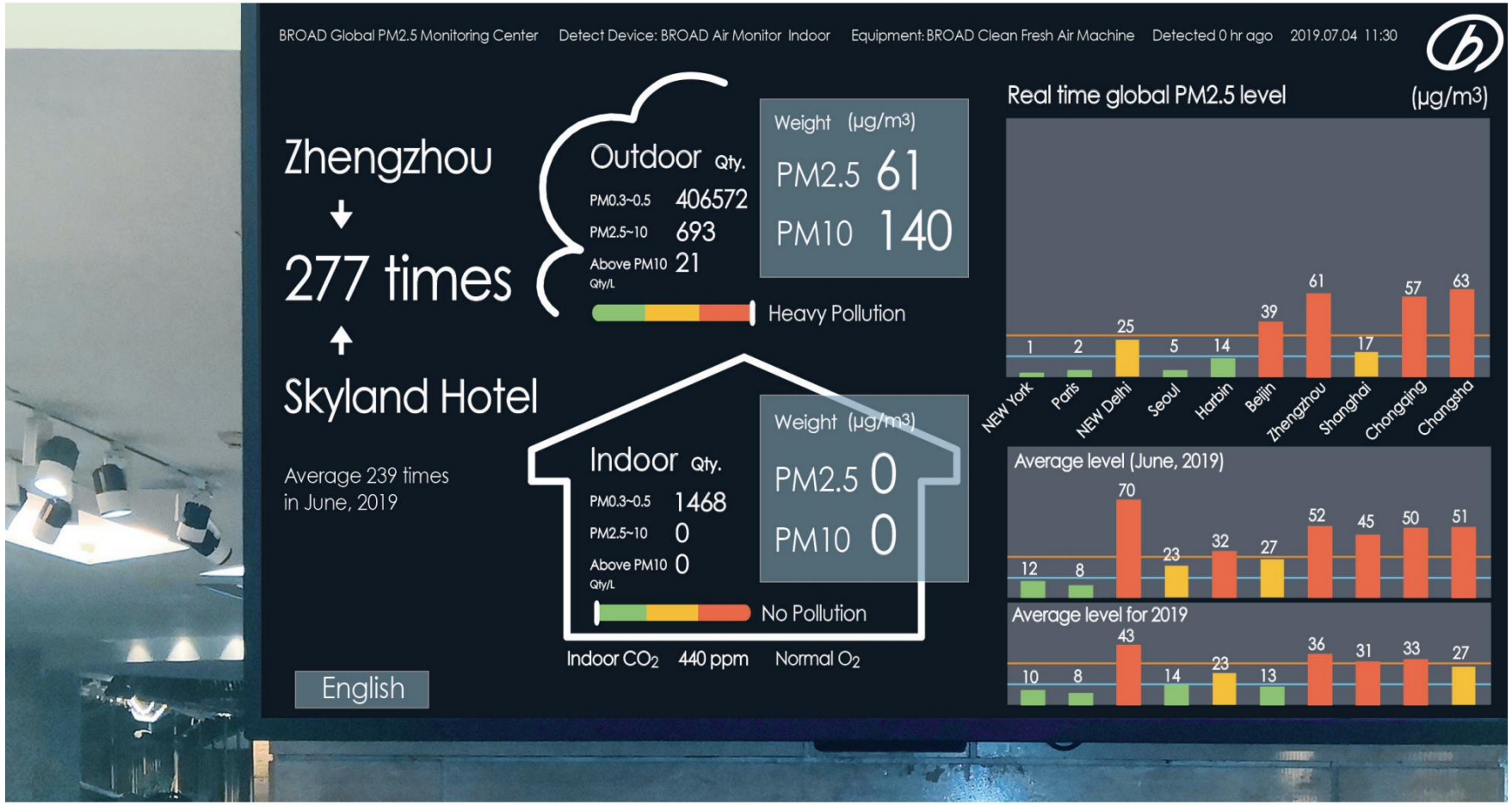
The Global Internet Air Monitoring Center located at BROAD headquarters



As an optional device for families, hospitals and hotel rooms, the BROAD Air Manager can monitor and control fresh air and air conditioning.

Control System in Clean Central Air Conditioning System

Control system for the fresh air



Air monitoring screen is set up prominently in the lobby of each building so that occupants can have clear comparisons of the air they breathe and the air around the world.

Welcome to visit BROAD

Johnny Zhou

Email: zhoujl@broad.net

Tel: +86-13907327851