Rogerwell
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Rogerwell Control System (Guangzhou) Co., Ltd.

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Innovative

Efficient

Energy Saving

Mission

Focusing on building equipment and energy management, contributing to corporate energy saving and emission reduction, and becoming an outstanding equipment and energy management system service provider in China.

Vision

To serve society with technology and become a pioneering enterprise. To establish ourselves in the industry with professionalism and to advance hand-in-hand towards the future.
Our mission is to make service excellent, and our reputation ensures the legacy of our service.

Quality Service System

Always from customer needs
Adhering to the marketing tenet of "green environmental protection, quality first, keeping promises, service first, customer satisfaction" to provide customers with overall solutions

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COMPANY INTRODUCTION

Rogerwell Control System (Guangzhou) Co., Ltd. was established in **2010**. The company's main business includes the R&D and production of building automation systems, energy management systems, server room monitoring, environmental monitoring systems, low-voltage variable frequency cabinets, energy-saving control cabinets, and low-voltage electrical complete sets. We provide customers with preliminary design, system debugging, equipment, and system maintenance services.

In **2011**, we were the first to develop ARM platform-based BACnet products. Our R&D personnel developed air conditioning automation systems, building automation systems, and energy billing and management systems based on building automation. We are a high-tech enterprise with independent intellectual property rights and R&D capabilities. Adhering to the spirit of dedication, focus, and professionalism, we delve into core energy-saving technologies, overcome numerous challenges, and achieve innovative applications of IT, database, and automatic control technologies in energy saving, emission reduction, and building intelligence. We have solved the problem of system integration for energy data across regions, systems, and professions, thereby achieving low-input, high-output, and effectively scalable energy-saving results.

This technology provides an all-weather dynamic energy management control optimization solution based on computer technology for building energy conservation in various fields such as construction, industry, and transportation. It involves real-time dynamic monitoring of energy data from thousands of energy-consuming nodes dispersed across regions through computer networks. This enables statistical analysis and trend prediction of energy data flows and energy material flows between regions, buildings, and equipment. It facilitates sorting, optimization, control, and rational allocation, forming overall energy control, optimization, service, and redistribution for building clusters, regional distributed energy, and individual buildings. Simultaneously, it senses the operational status and fault alarms of various energy-consuming devices or equipment in different regions. Based on professional strategies, it achieves adaptive control optimization of energy-consuming equipment processes, logic, and procedures, maximizing energy saving and emission reduction while meeting normal demands.

Rogerwell is the first domestic company to promote a BACnet protocol-based energy-type plus time-type air conditioning billing system, which can be seamlessly connected with building automation systems, facilitating equipment management and energy consumption management. Rogerwell formulates optimal detection, control, and energy-saving solutions for customers, applying rich field experience and professional knowledge to serve them, and can develop unique products for customers. We are not just product suppliers; we also provide comprehensive solutions, consulting, and training services, becoming a partner that satisfies customers.

From **2014 to 2019**, Rogerwell was awarded "Top Ten Brands of Building Equipment Monitoring Systems" by "Intelligent Building" magazine for six consecutive . From **2021 to 2024**, it was awarded "Top Ten National Brands of Building Equipment Monitoring Systems," "Top Ten Ingenuity Product Brands for Intelligent Lighting Systems," and "Top Ten Ingenuity Product Brands for Building Energy Efficiency Supervision Systems" by the same magazine for four consecutive . In **2016**, it was awarded "Guangzhou Science and Technology Innovation Little Giant Enterprise." In **2017, 2020, and 2023**, it was recognized as a "National High-Tech Enterprise" three times. In **2022**, it was rated as an "Innovative Small and Medium-sized Enterprise." In **2023**, it was rated as a "Specialized, Refined, Unique, and New (SRUN) Small and Medium-sized Enterprise."

DEVELOPMENT HISTORY

2024
* Launched Internet of Things integrated controller, 4G air conditioner thermostat
* "Intelligent Building" magazine as the construction equipment management system ten new brand enterprises
* Intelligent Building magazine named the building energy efficiency supervision system ten ingenious product brand enterprises

2023
* Rated as specialized and special new small and medium-sized enterprises
* Third National High-tech Enterprise
* by the "intelligent building" magazine as building equipment management system top ten cutting-edge brand enterprises
* by the "intelligent building" magazine as intelligent lighting system top ten ingenuity products brand enterprises

2022
* Rated as innovative SMEs
* Upgrade the original controller system, all support dual protocol
* "Intelligent Building" magazine as the construction equipment management system ten national brand enterprises
* Intelligent Building magazine named intelligent lighting system top ten ingenious products brand enterprises

2021
* Introduce dual protocol without programming air conditioning controller
* "Intelligent Building" magazine as the construction equipment management system ten national brand enterprises
* By the "intelligent building" magazine as the top ten intelligent lighting system ingenuity product brand enterprises

2020
* Guangdong Equity Exchange Center listed
* The second national high-tech enterprise
* Director of Guangdong HVAC Association, member of China Construction Industry Association

2019
* Launch of strong and weak electricity integration energy efficiency control box
* "Intelligent Building" magazine as the construction equipment monitoring system top ten ingenious products brand enterprises
* Director of Guangdong HVAC Association, member of China Construction Industry Association

2018
* Launch air conditioning energy efficiency controller
* "Intelligent Building" magazine as the construction equipment monitoring system top ten ingenious products brand enterprises

2017
* Rated as national high-tech enterprise
* "Intelligent Building" magazine as the construction equipment monitoring system top ten ingenious products brand enterprises

2016
* Guangzhou science and technology innovation small giant enterprise title
* Energy Management System TOP Brand Product by Intelligent Building Magazine

2015
* Development of Smart Sensors with BACnet Protocol
* Energy Management System TOP Brand Product by Intelligent Building Magazine

2014
* Develop an autonomous controller programming kernel
* Intelligent Building magazine as building equipment monitoring system top ten brand enterprises

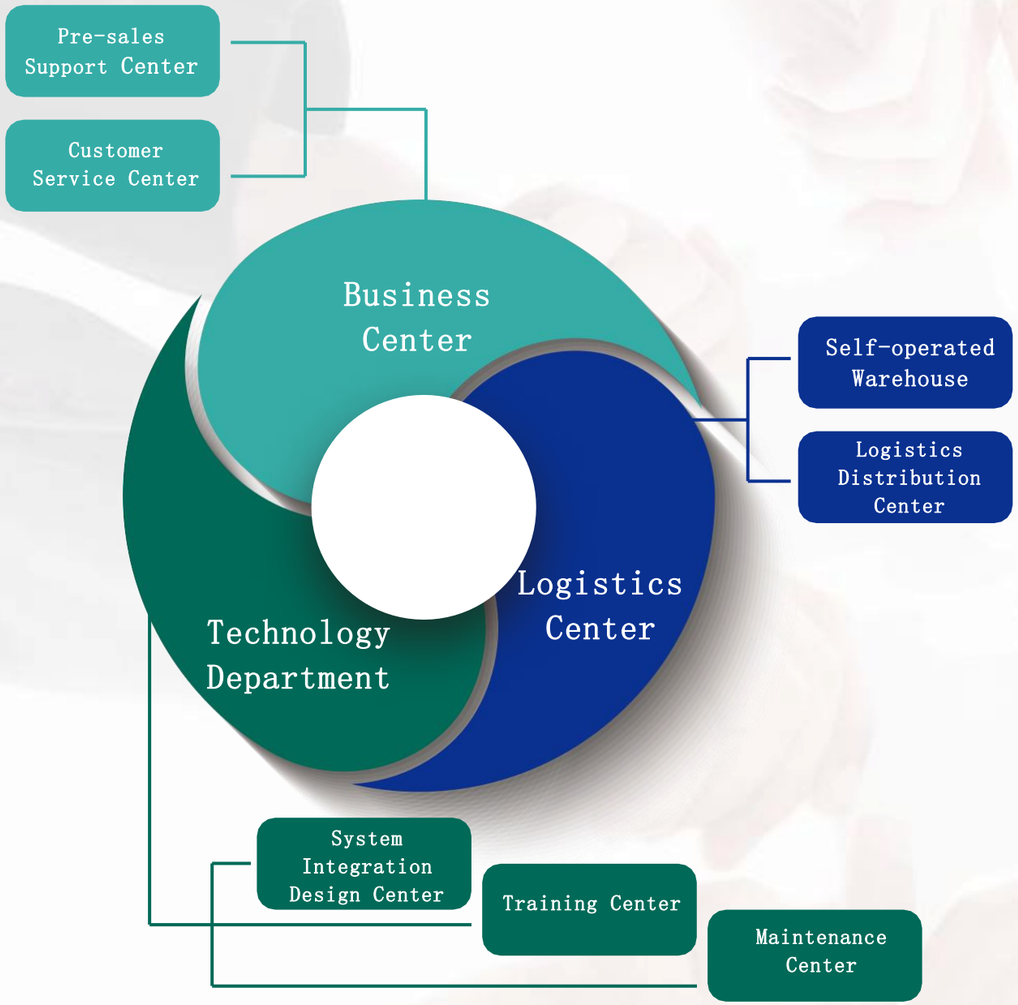
2013
* The first domestic BACnet protocol thermostat was developed.

2012
* The first domestic BACnet building automation system was developed.

2011
* Self-development of building automation system

Founded in 2010

SERVICE TEAM



OUR SERVICES

Pre-sales

- Intelligent solution design
- Selection and configuration
- Preliminary plan Explanation
- Bid Support
- Site Investigation

On sale

- Detailed Design
- Technical Consultant
- Installation Guidance
- On-site Commissioning
- System Trial Operation
- Technical Training

After sale

- Technical Guidance/Tracking
- Maintenance
- Routine Inspection
- After-sales Training

HONORS

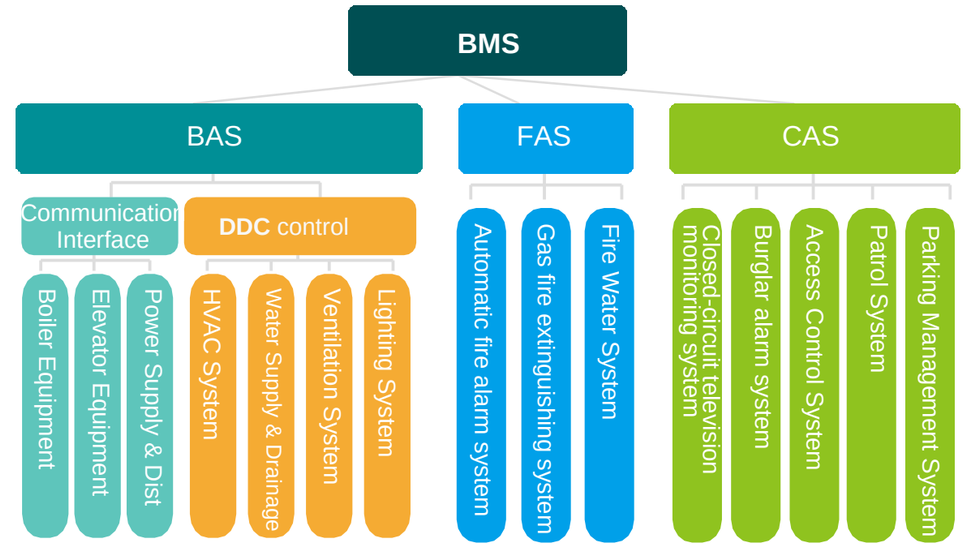
QUALITY CERTIFICATES

SOFTWARE COPYRIGHT CERTIFICATES

PATENT CERTIFICATES

BUILDING FACILITY MANAGEMENT SYSTEM

Rogerwell's **PCEMS** software is a suite applied to energy management. Developed using Microsoft's latest tools (Visual C#, MFC, ActiveX, and .NET), it features a mature human-machine interface standard and .NET's security features. PCEMS's modular design offers complete system control for both large energy systems and small users. Its openness allows powerful integration with various existing systems and processes.



PCEMS offers wide applicability through high performance, modular design, and flexible networking. It supports comprehensive automation solutions while adhering to industrial standards. The system runs on Windows platforms (server/client) and uses Fast Ethernet with TCP/IP. It provides ODBC, API, SQL interfaces and supports BACnet/OPC/Lonworks/KNX protocols. Thin-client access via WebVIEW with security controls enables intranet/internet deployment.

PCEMS System Features

- **Professional graphical human-machine interface**
- **Flexible standard reporting**
- **Extensive historical data and trend charts**
- **High-performance real-time/historical database**
- **Powerful application development tools**
- **Multi-workstation support (local and remote)**
- **Multi- server capabilities for large high- end users**
- **Hot redundancy function**
- **ACTIVEX technology**

Modular structure offers high performance-price ratio and good system scalability, from single PCEMS node systems to integrated multi-system applications.

PCEMS System Advantages

- **Provides a mature and advanced Building Management System (BMS)**
  BMS system shall embody mature and reliable performance and advanced technology in both system network structure and integrated system software.
- **Distributed System Design**
  The building area is large, the monitoring equipment is widely distributed, and the system design needs to fully consider these characteristics to form a distributed control system.
- **High Security and Reliability**
  PCEMS system software provides high security measures, high reliability system structure design and system software configuration.
- **Advanced Management Platform**
  PCEMS software provides efficient, advanced management functions, good user interface, etc.
- **System Integration and Linkage**
  Integrates related subsystems on the PCEMS management platform for coordinated control.
- **Fast response of system**
  Especially for security systems, ensuring timely alarm information and image display.
- **Modular Software and Hardware**
  Facilitates flexible system design and future expansion.

The PCEMS architecture is based on a client-server model. The database server provides high-performance real-time data processing, offering real-time information to local and networked workstations or other applications (reports, relational databases). Hot backup servers and redundant structures ensure reliable operation for applications with special stability requirements. It supports various standard network types and structures, from Fast Ethernet (TCP/IP) to WANs, catering to different needs.

Operation interface

Web-based design, professional graphical operation interface, E-mail and 4G/5G network support. Fully embodies a "human-centered" interface design philosophy, allowing operators to concentrate on equipment and event monitoring, enhancing system operation convenience and universality from a human perspective. Rich alarm level settings effectively filter low-level alarm processing. Multi-level operation page settings and delayed automatic logout functions fully reflect subsystem security.

real-time database

PCEMS's real-time database records extensive equipment data and a large amount of historical data. Recording intervals can be set from seconds to 24 hours based on user needs. Alarm and event data are automatically logged into classified alarm/event databases for easy querying.

Data in the real-time database can be used for trend graphs, user schematics, report generation, applications, enterprise-level analysis, and more.

Alarm Management

PCEMS provides comprehensive alarm management, enabling users to clearly obtain and process alarm events. In addition to all standard alarm records of a universal central monitoring system, PCEMS offers enhanced functions like user-defined alarm sounds, automatic alarm-triggered screen jumps, and alarm printing.

Each point in PCEMS can be set with different alarm conditions. Analog points have four alarm conditions, each with different priorities (e.g., high value, low value, deviation high/low, rate of change, sensitivity high/low). Digital points have one alarm condition.

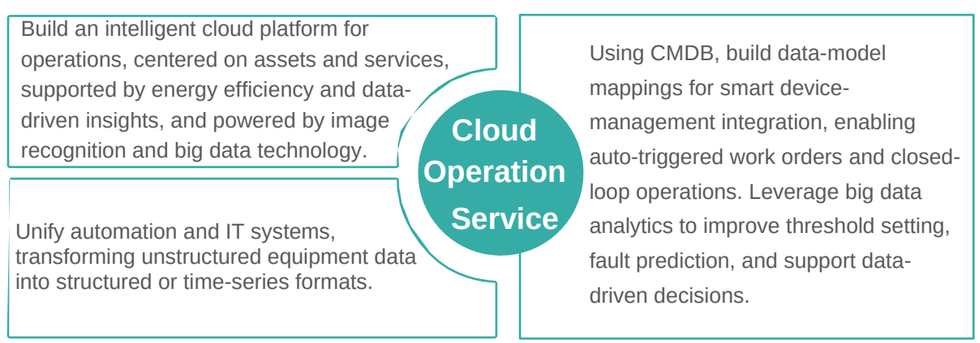
Device Interface

PCEMS has good support for connecting to third-party products, providing users with complete building control equipment management solutions. Standard interfaces include:

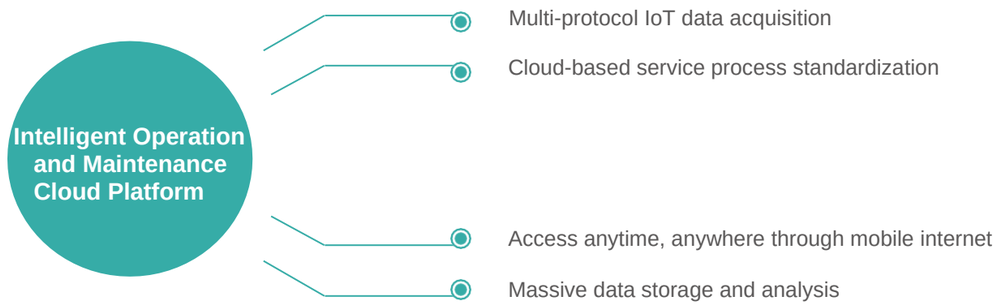
- **BACnet**
  PCEMS can connect to products that support the BACnet protocol. Including analog and digital point of reading and writing.
- **Lonworks**
  PCEMS can connect products that support Lonworks protocols. Including analog and digital point of reading and writing.
- **OPC**
  PCEMS efficiently and easily connects a large number of existing and upcoming devices and systems through OPC servers.
- **KNX**
  PCEMS can connect lighting system products that support the KNX protocol.

CLOUD OPERATION AND MAINTENANCE SERVICES FOR FACILITY MANAGEMENT SYSTEM

Cloud Operation And Maintenance Service



Intelligent Operation and Maintenance Cloud Platform for Electromechanical Equipment Management



What Problems Does Cloud Platform Solve for Users?

Smart Maintenance represents the intelligent, digital, and information-driven transformation of equipment maintenance management.

An upgrade and evolution of traditional operations through data collection, recognition, and analysis technologies.

Enables intelligent, automated fault detection in business systems.

Automatically identify potential risks during equipment operation and issue real-time alerts for faults as they occur.

Creates a worry-free, reliable operation and maintenance environment.

Smart maintenance helps solve resource optimization and service upgrade challenges, with 7×24×365 remote monitoring and localized service teams.

Product Overview

Cloud Platform

- Real-time monitoring of MEP equipment
- Comprehensive data collection and analysis
- Data-driven optimization of control strategies

Management System

- Proprietary equipment monitoring system with independent intellectual property
- Compatible with most manufacturers' devices for seamless replacement
- 4G IoT edge deployment — no wiring required

Maintenance Service

- 7×24 Remote Operations Center with online repair reporting anytime, anywhere
- Local service teams for on-site support
- Scheduled maintenance and emergency repairs
- Remote expert diagnosis and rapid fault resolution
- Nationwide spare parts distribution

Our Advantage

Fully self-developed cloud platform, software, and hardware for smart MEP maintenance — supports international standards and compatible with major control systems.

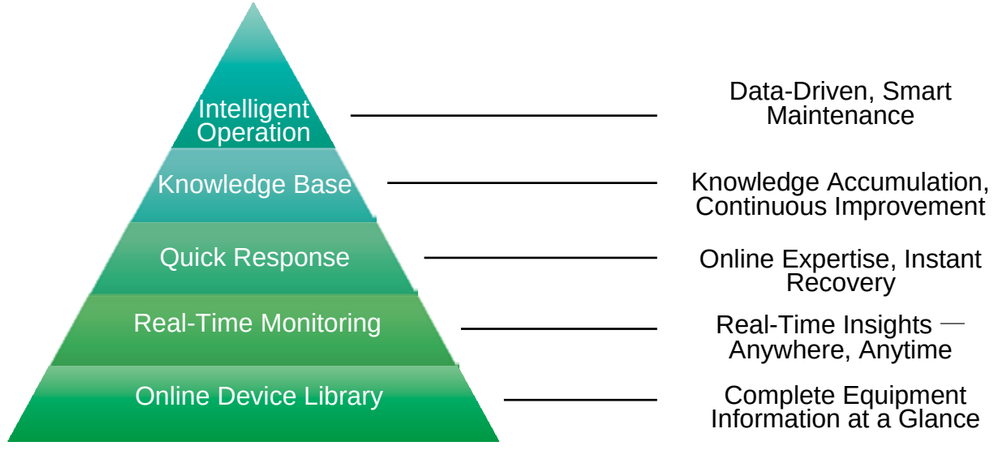
Product Advantages

Platform Advantages

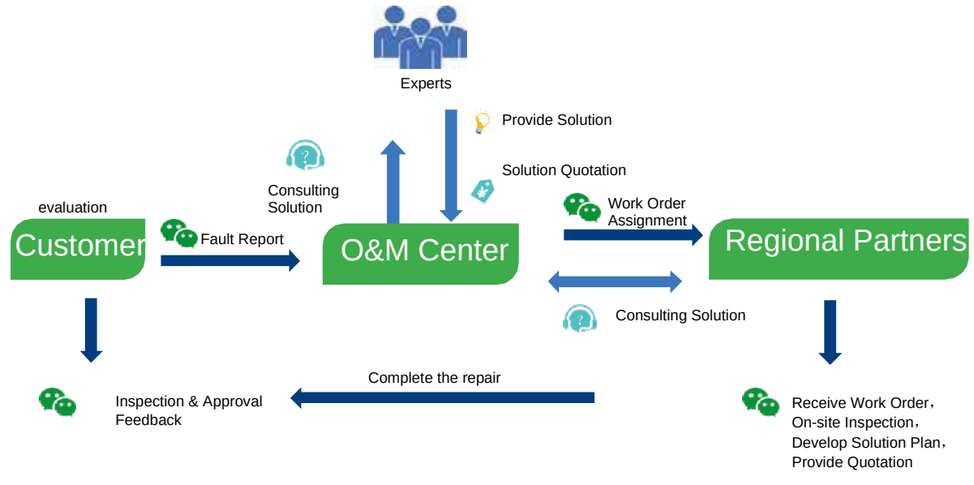
Technical Advantages

We have extensive expertise in MEP equipment control systems, including product knowledge, maintenance, and commissioning technologies.

Customer Value



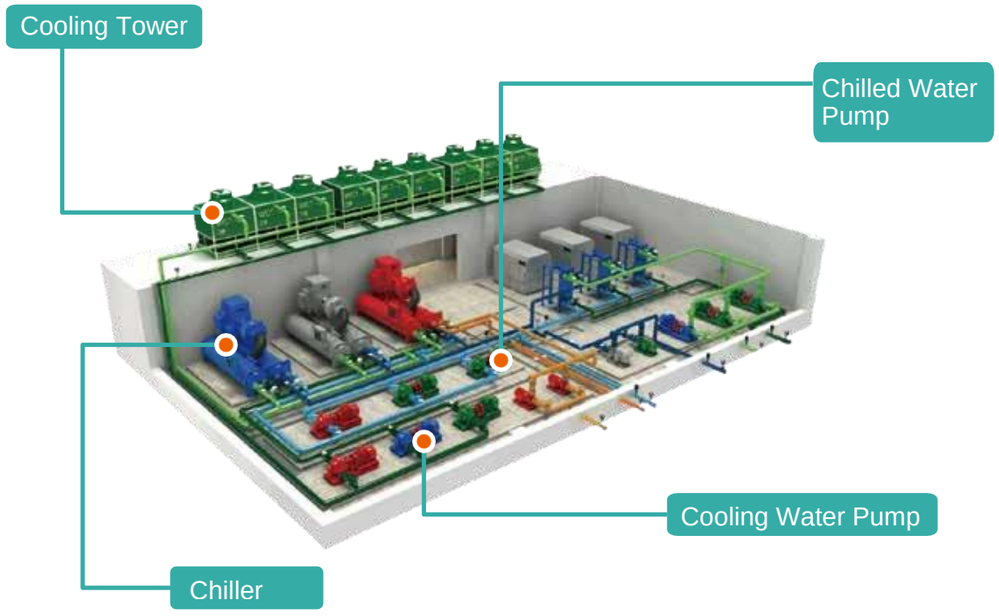
Operation Model



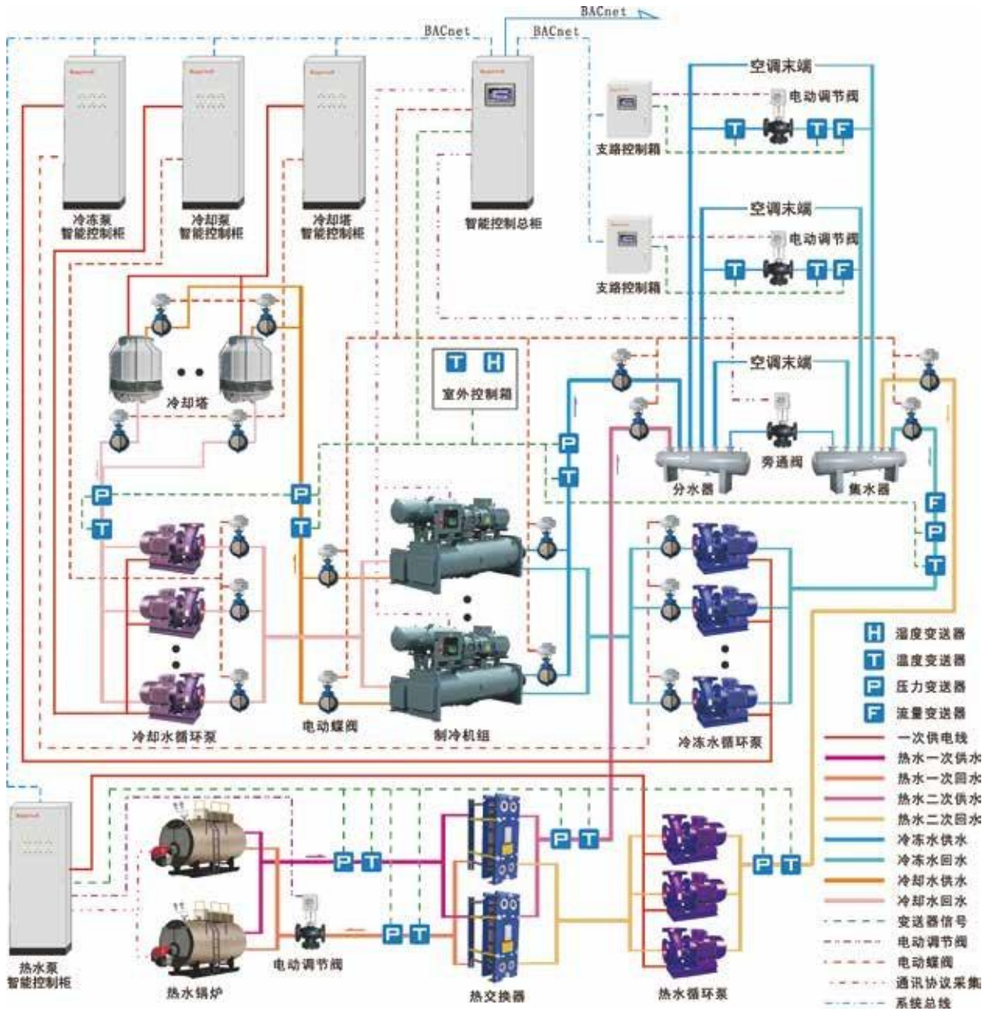
EFFICIENT CHILLER PLANT

High-Efficiency Intelligent Control System for Chiller Rooms

- High-precision energy measurement and energy consumption analysis machine
- Room cooling capacity matching optimization control strategy
- Equipment operation curve optimization matching
- Guidelines for Expert Operating Mode
- Scheduled & Fault-Driven Equipment Rotation
- Cloud data and cloud maintenance function
- Precision Prediction and Control with Embedded AI Technology

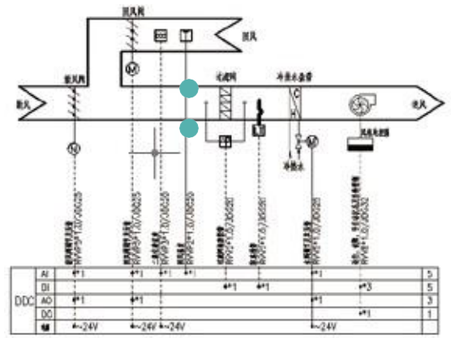


Intelligent Control System Structure for High-Performance Cooling/Heating Facility Room



INTEGRATED CONTROL PANEL

Networked Air Conditioning Energy Saving Control Box (PCP-EN-E)



Schematic

Product Features

- Integrated Power and Low-Voltage System
- Integrated smart meter and energy metering function
- Touch screen local display and control function
- Ethernet network communication interface (BACnet IP)
- Air conditioning temperature and humidity control
- Saves construction costs
- Easy to maintain

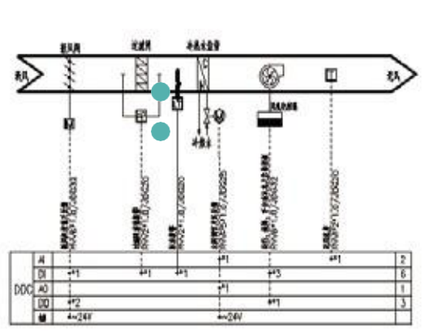
Functional Description

The system adjusts the electric water valve opening based on the deviation between measured and setpoint return air temperature using PID control, to maintain desired room temperature.

- In cooling mode: reduce chilled water flow if temperature is below setpoint; increase flow if above.
- In heating mode: reduce hot water flow if temperature exceeds setpoint; increase flow if below.

Interlocking logic ensures proper sequence of damper and fan operation during startup/shutdown. The water valve closes automatically when the fan stops. Frost protection triggers alarms and closes the outdoor air damper while opening the coil valve. Filter blockage generates an alarm for cleaning. CO_2 level feedback controls outdoor air damper position to ensure indoor air quality and energy efficiency. Local color touchscreen enables start/stop control, with optional remote access.

Air Conditioning Energy Efficiency Control Box (PCP-EN-1)



Schematic

Product Features

- Integrated Power and Low-Voltage System
- Integrated smart meter and energy metering function
- LCD screen local display and control function
- Intelligent communication interface (BACnet MS/TP)
- Air conditioner temperature control
- Saves construction costs
- Easy to maintain

Functional Description

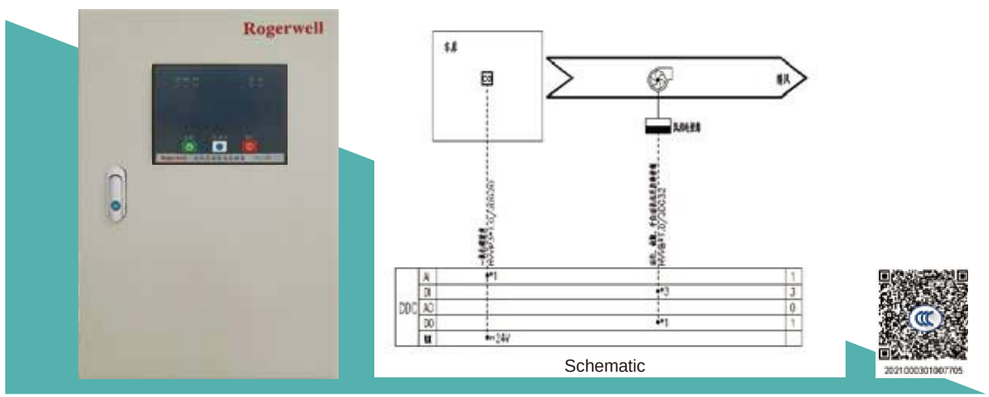
The system adjusts the electric water valve using PID control based on the temperature deviation between the measured and setpoint values in the duct, to maintain the desired temperature.

Interlocking Logic:

- At startup: open outdoor air damper before starting the fan.
- At shutdown: stop the fan before closing the damper.
- The water valve closes automatically when the fan stops.
- Frost protection triggers an alarm, and the coil valve opens automatically.

An alarm is triggered when the pressure difference across the air filter is too high, indicating the need for cleaning. The system supports both **local operation** and **remote control**.

Fan Energy Efficiency Control Box (PCP-EN-2)



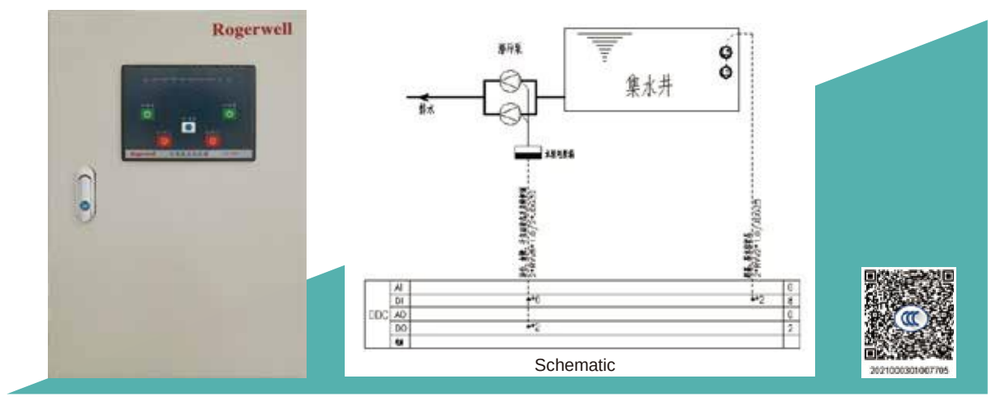
Product Features Product Features

- Integrated Power and Low-Voltage System
- Integrated smart meter and power metering function
- CO or CO2 concentration detection and control
- Intelligent communication interface (BACnet MS/TP)
- Local display and control function
- Saves construction costs
- Easy to maintain

Functional Description

1. Automatic start/stop of supply/exhaust fans based on CO or CO2 concentration vs. setpoint to ensure air quality and save energy.
2. Monitors fan status and alarms on fault.
3. Remote communication capability for monitoring.

Water Pump Energy Efficiency Control Box (PCP-EN-3)



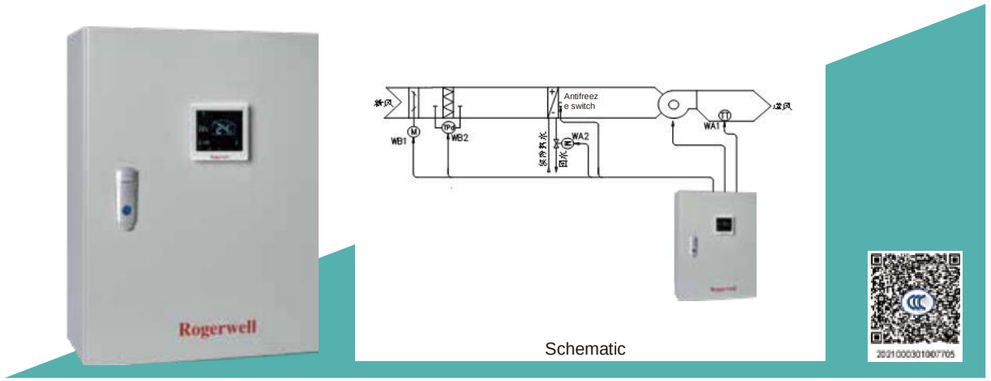
Product Features Product Features

- Integrated Power and Low-Voltage System
- Integrated smart meter and power metering function
- Ultra-high level alarm function
- Automatic time fault rotation function
- Intelligent communication interface (BACnet MS/TP)
- Liquid level automatic control
- Local display and control function
- Saves construction costs
- Easy to maintain

Functional Description

1. Automatic start/stop of submersible pumps based on sump liquid level. High level starts one pump; ultra-high level starts both pumps and alarms. Low level stops pumps.
2. Monitors pump status and alarms on fault.
3. Automatic time-based duty cycling for balanced pump operation. Local manual override and remote communication.

Intelligent air conditioning control box PCP-EN-AHU



Product Features

- 3 operation modes: Cooling, Heating, Ventilation
- Built-in timer: 2-time period scheduling
- Filter differential pressure alert
- Anti-freeze switch protection
- Fan on/off control
- Temperature monitoring & water valve control
- Damper interlock with built-in program (no programming required)
- Supports BACnet MS/TP or Modbus RTU
- IoT ready: Connects to Rogerwell Cloud Controller for mobile control

Function Description

1. Startup sequence: Open air damper (DO1=1), delay 2s, start fan (DO0=1).
2. Shutdown sequence: Close air damper (DO1=0), delay 2s, stop fan (DO0=0) and close water valve (AO0=0).
3. When fan running (DI0=1), automatically adjust water valve (AO) based on temperature (AI0).
4. Supports cooling, heating, ventilation modes (in ventilation mode, AO no output).
5. Fault alarm: If fault detected (DI1=1), automatically shut down (DO0=0).
6. Freeze protection alarm: If freeze stat trips (DI3=1), directly open water valve 50%.
7. Differential pressure switch warning: If DP switch activates, display warning signal on panel.

PRODUCTS
Controller/Sensor Series Products

PC-NET Network Controller

Functional Parameters

> Network Controller
> AC/DC 24V working voltage
> 1 RJ45 support BACnet IP and Modbus TCP/IP
> 2 RS485 support BACnet MS/TP and Modbus RTU
> BACnet router function
> Support Modbus and BACnet bidirectional gateway function
> Free Programming
> Can be connected to alarm, lighting, air conditioning equipment
> Each network controller supports 64 devices and 1000 physical points
> With router, communication converter, intelligent controller three-in-one function

Network Controller PCC3216

Functional Parameters

> General purpose network controller
> AC/DC 24V working voltage
> 1 RJ45 interface, 2 RS485 interface
> 16 Universal Input UI(NTC10K/0-10V/4-20mA)
> 16 digital input DI
> 8 analog outputs AO(0-10V)
> 8 relay output DO(220V 3A)
> Support Modbus TCP, BACnet IP, MQTT protocol, support RJ45 touch screen connection
> Port1 supports Modbus RTU only supports 03 function code short integer read-only supports up to 50 points (storage AV101-150) can be used for water and electricity meter communication
> Port2 supports up to 5 expansion modules (PCC3216, PCC2412, PCC2010 can be mixed and matched) and the maximum point support is 96DI 96UI 48DO 48AO
> Suitable for constant temperature and humidity air conditioning control and air conditioning group control

Network Controller PCC2412E

Functional Parameters

> General purpose network controller
> AC/DC 24V working voltage
> 2 RJ45 interface, 2 RS485 interface
> 8 universal inputs UI(NTC10K/0-10V/4-20mA)
> 16 digital input DI
> 6 analog outputs AO(0-10V)
> 6 relay output DO(220V 3A)
> Support Modbus TCP, BACnet IP, MQTT protocol
> Support touch screen connection
> 1 RS485 port can be equipped with 5 R-BUS expansion modules
> 1 RS485 port Modbus RTU master station communication

Controller PCC2412

Functional Parameters

> Fieldbus controller
> AC/DC 24V working voltage
> 2 RS485 interfaces
> 14 digital input DI
> 10 universal inputs UI(NTC10K/0-10V/4-20mA/dry contact)
> 6 relay output DO(220V 3A)
> 6 analog outputs AO(0-10V)
> Support BACnet MS/TP and Modbus RTU
> Support connection RS485 touch screen
> Dual CPU logic and communication independent execution
> Suitable for more complex air conditioning control

Controller PCC2010

Functional Parameters

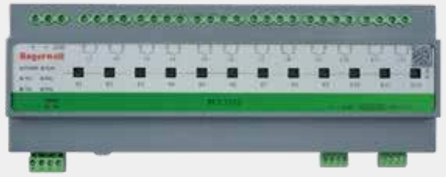
> Fieldbus controller
> AC/DC 24V working voltage
> 2 RS485 interfaces
> 16 digital input DI
> 4 universal inputs UI(NTC10K/0-10V/4-20mA/dry contact)
> 8 relay output DO(220V 3A)
> 2 analog outputs AO(0-10V)
> Support BACnet MS/TP and Modbus RTU
> Support connection RS485 touch screen
> Dual CPU logic and communication independent execution
> Suitable for simple air conditioning control, water collection well monitoring, air supply and exhaust fan monitoring

Controller PCC1406

Functional Parameters

> Fieldbus controller
> AC/DC 24V working voltage
> 2 RS485 interfaces
> 10 digital input DI
> 4 universal inputs AI(NTC10K/0-10V/4-20mA/dry contact)
> 4 relay output DO(220V 3A)
> 2 analog outputs AO(0-10V)
> Support BACnet MS/TP and Modbus RTU
> Support connection RS485 touch screen
> Dual CPU logic and communication independent execution
> Suitable for simple air conditioning control, water collection well monitoring, air supply and exhaust fan monitoring

Lighting switch controller PCL1212



Functional Parameters

> Field lighting controller
> DC 24V working voltage
> 2 RS485 interfaces
> 2 digital input DI
> 12 relay output DO(220V 20A) with manual switch
> Support BACnet MS/TP and Modbus RTU
> Support to connect RS485 scene panel

Lighting switch controller PCL0808

Functional Parameters

> Field lighting controller
> DC 24V working voltage
> 2 RS485 interfaces
> 2 digital input DI
> 8 relay output DO(220V 20A) with manual switch
> Support BACnet MS/TP and Modbus RTU
> Support to connect RS485 scene panel

Lighting Switch Controller PCL0404

Functional Parameters

> Field lighting controller
> DC 24V working voltage
> 2 RS485 interfaces
> 2 digital input DI
> 4 relay output DO(220V 20A) with manual switch
> Support BACnet MS/TP and Modbus RTU
> Support to connect RS485 scene panel

Multi-Function Controller AC703

Functional Parameters

> Multi-function controller
> AC/DC 24V working voltage
> Built-in clock, support 2 time period switch function
> Built-in multi-function control program
> 4 digital input DI
> 2 Universal Inputs AI(1 NTC10K, 1 0-10V)
> 2 relay output DO(220V 3A)
> 2 analog outputs AO(0-10V)
> Support BACnet MS/TP or Modbus RTU protocol
> Support multiple functions of equipment control (air conditioning, fans, pumps, etc.)
> Built-in curing program, no programming required

Air Conditioning Energy Efficiency Controller PC-AHU

Functional Parameters

> Air conditioning energy efficiency controller
> AC/DC 24V working voltage
> LCD display, field operation button
> 6 universal input AI (NTC10K/0-10V/4-20mA/dry contact)
> digital input DI
> 4 analog outputs AO(0-10V)
> 4 relay output DO(220V 3A)
> 2 RS485 interfaces, 1 support BACnet MS/TP,1 support Modbus RTU meter and energy meter

4G IoT Integrated Controller PCC2010ET

Functional Parameters

> 3 RJ45 interface, 2 RS485 interface
> inch touch screen
> DC 24V working voltage
> 12 universal input AI(NTC10K/0-10V/4-20mA/dry contact)
> 8 digital input DI
> 6 analog outputs AO(0-10V)
> 4 relay output DO(220V 3A)
> Support Modbus TCP, BACnet IP, MQTT protocol
> 1 RS485 port can be equipped with 5 R-BUS expansion modules
> 1 RS485 port Modbus RTU master station communication
> Support 4G wireless communication, data can be connected to the cloud server

4G IoT Multi-function Controller AC703-4G

Functional Parameters

> 4G multi-function controller
> AC/DC 24V working voltage
> 4G wireless communication, MQTT protocol
> Built-in clock, support 2 time period switch function
> Built-in multi-function control program
> 4 digital input DI
> 2 Universal Inputs AI(1 NTC10K, 1 0-10V)
> 2 relay output DO(220V 3A)
> 2 analog outputs AO(0-10V)
> Support connection cloud server and mobile phone APP, remote monitoring
> Support multiple functions of equipment control (air conditioning, fans, pumps, etc.)
> Built-in curing program, no programming required

4G IoT Air Conditioning Thermostat PCC-FCU-4G

Functional Parameters

> 4G air conditioner LCD thermostat
> AC220-240V, 50/60Hz working voltage
> LCD large screen touch LCD display
> Fan three speed switch
> MQTT wireless transmission protocol, can connect to the cloud platform
> Set temperature range: 10 ℃-40 ℃
> Power consumption:<2W/0.5W
> Load current:<3.15A
> Temperature control accuracy: ± 1 ℃
> Temperature sensor: NTC

4G IoT PLC Module RC20-4G

Functional Parameters

> 4G PLC Module
> DC 24V working voltage
> Cortex M4 CPU
> Compact design, space saving
> Built-in 4G communication module, support MQTT protocol
> 2 RS485 ports, 1 RS485 port can be extended with 5 expansion modules (RM20/RM24) and 1 485 port as Modbus master station communication port, which can be connected to water and electricity meters or Modbus equipment.
> independent intellectual property rights programming kernel, graphical programming interface, simple and easy to use.
> Can take up to 100 physical points
> Comes with 20 I/O points (6AI/6DI/4AO/4DO)

PLC Module RC20

Functional Parameters

> PLC Module
> DC 24V working voltage
> Cortex M4 CPU
> Compact design, space saving
> 1 RJ45 interface, support BACnet IP, Modbus TCP, MQTT protocol
> 2 RS485 ports, 1 RS485 port can be extended with 5 expansion modules (RM20/RM24) and 1 485 port as Modbus master station communication port, which can be connected to water and electricity meters or Modbus equipment.
> independent intellectual property rights programming kernel, graphical programming interface, simple and easy to use.
> Can take up to 100 physical points
> Comes with 20 I/O points (6AI/6DI/4AO/4DO)

PLC Expansion Module RM20

Functional Parameters

> PLC Expansion Module
> DC 24V working voltage
> Cortex M4 CPU
> Compact design, space saving
> 1 RS485 port, can be connected to RC20 or RC30 CPU module
> Comes with 20 I/O points (6AI/6DI/4AO/4DO)

PLC Expansion Module RM24

Functional Parameters

> PLC Expansion Module
> DC 24V working voltage
> Cortex M4 CPU
> Compact design, space saving
> 1 RS485 port, can be connected to RC20 or RC30 CPU module
> 24 I/O points (16DI/8DO)

Air conditioning thermostat PCC-FCU-M

Functional Parameters

> Air conditioning LCD thermostat
> AC220-240V, 50/60Hz working voltage
> Set temperature range: 10 ℃-40 ℃
> Power consumption:<2W/0.5W
> Load current:<3.15A
> Temperature control accuracy: ± 1 ℃
> Temperature sensor: NTC

Temperature and Humidity Sensors PCT/RH3 Series

Functional Parameters

> AC/DC 24V working voltage
> Output: O-1OV, 4-2OmA, Modbus (optional)
> accuracy: ± 2%,±% (optional)
> Humidity: O ~ 1OO%RH
> temperature: o ~ o ℃, o ~ 1oo ℃,-4o ~ o ℃ (can be customized)
> Type: indoor type/duct type/outdoor type

Temperature Sensors PCT/4 Series

Functional Parameters

> Sensitive element: Thermistor NTC10K
> accuracy: 0.2 ℃ @ 0℉/21.1 ℃
> Operating temperature:-40℉/-40 ℃ to 210℉/100 ℃
> Type: indoor type/air duct type/water pipe type

Indoor CO Sensor PCT-CO-R

Functional Parameters

> AC/DC 24V working voltage
> Range: 0-200ppm
> accuracy: + (10ppm + 5% reading value)
> Working temperature: 0~50 ℃
> Working humidity: 0 ~ 95% RH (no condensation)
> Output: 0-10V or 4-20mA (optional)
> 2 RS485 interfaces
> Support BACnet MS/TP or Modbus RTU

Indoor CO2 Sensor PCT-CO2-R

Functional Parameters

> AC/DC 24V working voltage
> Range: 0-2000ppm
> accuracy: + (50ppm + 5% reading value)
> Working temperature: 0~50 ℃
> Working humidity: 0 ~ 95% RH (no condensation)
> Output: 0-10V or 4-20mA (optional)
> 2 RS485 interfaces

Level Switches PC-WLS

Functional Parameters

> Working temperature: 0 ℃ ~ 80 ℃
> Contact capacity: 16(8)A @ 250VAC or 4A @ 380VAC,SPDT
> Control range: ≥ 0.2m
> Working life: ≥ 50000
> Lead length: 5 meters

Water flow switch WFS1001

Functional Parameters

> Material: stainless steel
> Fluid temperature: 1 ℃ ~ 120 ℃
> Maximum fluid pressure: 1.6MPa
> Contact capacity: 7.5A @ 250VAC,SPDT
> Interface thread: 1 "NPT

Pipe Pressure Sensor PTJ204

Functional Parameters

> AC/DC 24V working voltage
> Range: 0-0.2MPa ~ 60MPa
> Output: 0-10V or 4-20mA (optional)
> Working temperature:-40 ℃ ~ 85 ℃
> Medium temperature:-20 ℃ ~ 85 ℃
> Temperature compensation:-10 ℃ ~ 70 ℃
> Seismic performance: 10g(20...2000Hz)

Antifreeze Switch PCT/TC5031

Functional Parameters

> Working environment temperature:-10~70° C
> Maximum temperature resistance of sensitive elements: 80° C
> Electrical contact: SPDT single pole double throw switch (low temperature disconnection)
> open circuit temperature range: 1.0~7.5 ℃
> temperature return difference: 4.5~5.5 ℃
> Inductive load: max. 4A/250VAC, max. 8A/125VAC
> Non-inductive load: max. 5A/250VAC, max. 6A/125VAC
> Electrical connection: 3 screw terminals (1: normally open, yellow; 2: common, red; 3: normally closed, blue)

Air valve actuator PCV-10/15/20/30 AF/DF

Functional Parameters

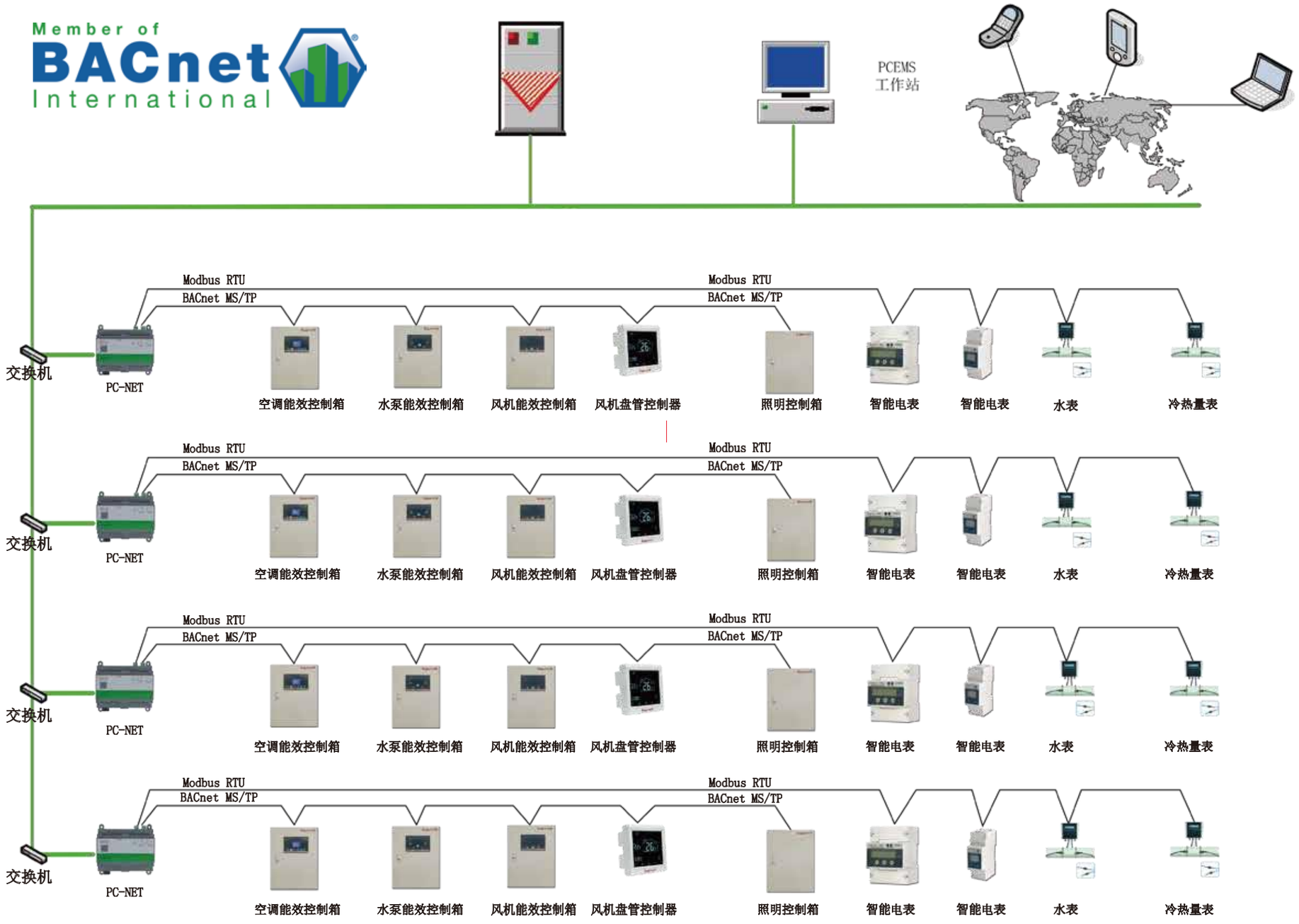
> Power consumption: 4.5W (running),0.5W (standby)
> Working temperature:-20 ℃-50 ℃
> Working humidity: 0-95% RH
> Output torque: 10/15/20/30Nm
> Power supply: 24VAC/DC
> Control mode: analog control 0(2)-10VDC/0(4)-20mA switch control 2 point control/3 point control

PCT/DPS205B Differential Pressure Switches

Functional Parameters

> Action pressure difference: 50-500Pa adjustable
> Working temperature:-20 ℃ ~ 85 ℃
> Contact capacity: 1.5A @ 250VAC,SPDT

System Architecture



Regional Controller

Building Equipment Management
Energy Saving Control
Air Conditioning Usage Billing

Lighting Control

Energy Metering

System Architecture Diagram of Intelligent Systems for Green Buildings

FUNCTIONS OF THE ENERGY MANAGEMENT PLATFORM

01 **Enterprise basic information**
Basic attributes of the enterprise, including industry classification, product and output management, industry energy consumption management, etc.

02 **Enterprise Energy Basic Information**
Energy consumption structure management, energy network management, key energy equipment management, metering equipment

03 **Monthly Statistics Management**
Single or Multi-Energy Analysis for Specific Period, Industry Comparison Analysis, Historical Energy Consumption Comparison, Energy Analysis Charts (Pie, Bar, Line, etc.)

04 **Energy Monitoring**
According to the monitoring of the energy flow diagram, according to the monitoring of the energy network.

05 **Main energy consumption equipment operating efficiency analysis**
Monitoring and analysis of the operating efficiency of the main energy consumption equipment.

06 **Main Energy Consumption Index Management**
Product Energy Index Management, Product Energy Cost Control, Unit Output & Value Energy Management.

07 **Energy Analysis Management**
Monthly Production Statistics (Product Output, Industrial Output Value, Added Value), Energy Cost Statistics(Energy Purchase, Consumption, and Balance Management)

08 **Event Management**
Push notification of abnormal events, alarm of abnormal events, etc.

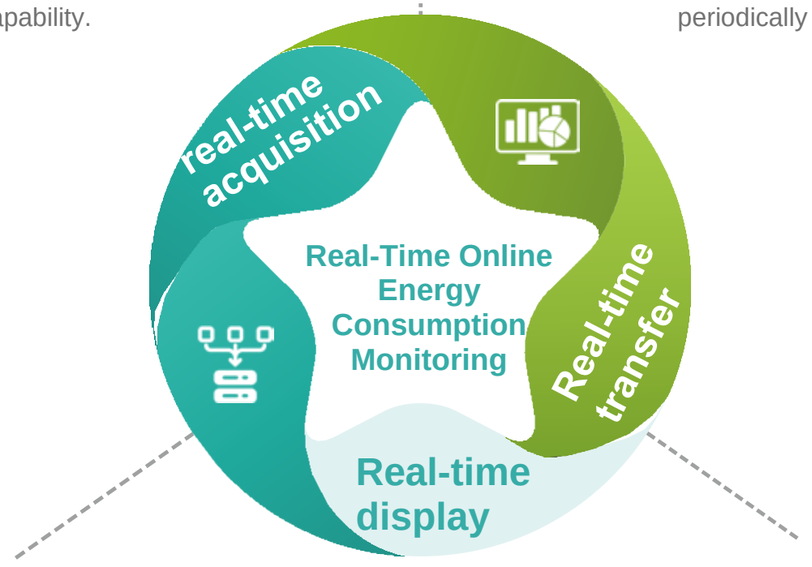
09 **User and Role Management**
Role Classification Management, Authorization Management, Group Management

10 **Industry/Regional Energy Consumption Analysis**
Group energy-consuming enterprises (by industry/region) for relevant energy consumption analysis.

SPECIFIC OF THE ENERGY MANAGEMENT PLATFORM

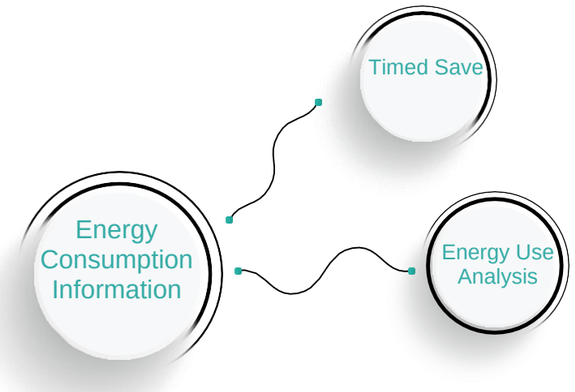
On-site energy metering points set up in compliance with GB/T 17167, covering primary, secondary, and key energy users, with real-time transmission capability.

A field metering network is built to collect and transmit energy data to a cloud data center via communication protocols. Existing EMS systems can also send data periodically to the cloud.



Energy data from multiple sites is displayed via a web-based platform hosted in the cloud.

SUMMARY AND ANALYSIS OF ENERGY CONSUMPTION

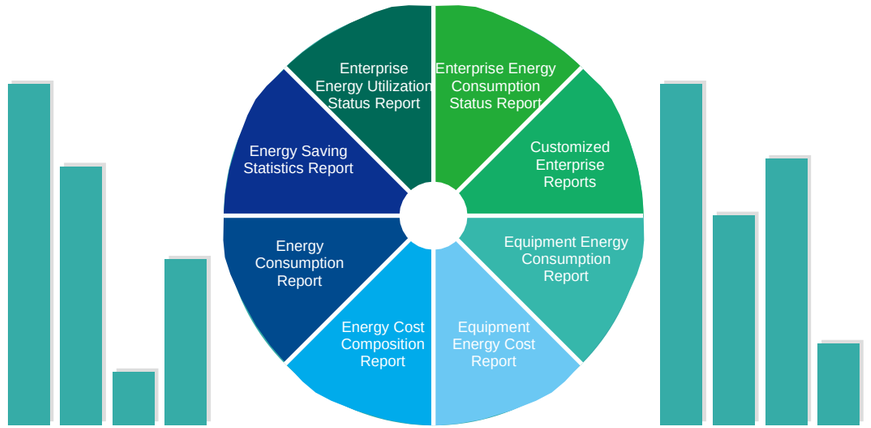


Based on industry standards (e.g., 15-minute monitoring intervals for buildings), the system collects and reports energy data every 5 minutes, with data storage also based on a 5-minute sampling cycle.

A. Energy Curve Analysis
B. Equipment Energy & Efficiency
C. Area Energy Analysis
D. Energy Cost Analysis
E. Product Energy Analysis
F. Overall Energy Summary
G. Energy Structure
H. Unit Value Energy

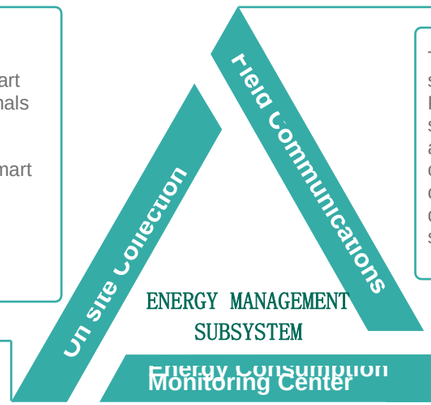
ENERGY MANAGEMENT FUNCTION

REPORT OF ENERGY MANAGEMENT



ENERGY MANAGEMENT SUBSYSTEM

The system uses PC-NET controllers to convert non-smart meters' analog and pulse signals into standardized digital communications, enabling seamless integration into a smart sensor network for real-time energy monitoring.



The field communication subsystem includes controllers, PC-NET protocol converters, smart and non-smart sensors, and uses wired/wireless communication. PC-NET connects via Ethernet and can directly send data to PCEMS in single-unit deployments.

The energy monitoring center is built on the company’s internal IT network, with hardware including servers and communication devices. The software uses SQL Server or Oracle for backend data management, and advanced applications for real-time energy data collection, analysis, and reporting.

Commercial Complex

Project Name: Greenland Center Plaza, Taiyuan, Shanxi

Monitoring contents: Building automation system

Other project cases

- Greenland Central Plaza, Taiyuan, Shanxi
- Aoyuan Plaza, Jiangmen, Guangdong
- Zhongdai International Plaza, Guangzhou
- Wanda Plaza, Quanzhou, Fujian
- Shenzhen Animation Building
- Xinyue Bay Mansion, Zhuhai
- Vanke Center Siryou, Guangzhou
- Guangzhou Daily Science & Culture Center
- R&F Ying Sheng Plaza
- R&F Ying Tai Plaza
- R&F Ying Xin Plaza
- Chengmei Plaza, Chengdu
- Yibin Railway Station Plaza
- Xinhong O-Film Guangwan Science & Innovation Center
- Bridge Commercial Complex, Cambodia
- ……

Hospital

Project Name: Chengdu Military General Hospital of Sichuan Province

Monitoring contents: Air conditioning unit, water supply and drainage, air supply and exhaust and other equipment monitoring system

Other project cases

- General Hospital of Chengdu Military Region, Sichuan
- Guigang People's Hospital, Guangxi
- Xishan Hospital, Taiyuan, Shanxi
- The Second People's Hospital of Nanning
- Huaining Maternal and Child Health Care Hospital
- The Second Affiliated Hospital of Sun Yat-sen University
- The Third Affiliated Hospital of Guangzhou University of Chinese Medicine
- Chengbei Fifth Generation Branch, Deyang People's Hospital
- Suizhou Central Hospital
- Hengzhou People's Hospital
- Xi'an Honghui Hospital
- Linfen Central Hospital
- Dujiangyan Honghui Hospital
- Xingwen County People's Hospital
- Tangshan Traditional Chinese Medicine Hospital
- ……

Hotel

Project Name: Kingston Hotel, Zhangpu, Fujian

Monitoring contents: Chiller room group control system, water pump frequency conversion control cabinet and energy consumption management analysis system

Other project cases

- Kingston Hotel, Zhangpu, Fujian
- Magnolia DeStay Hotel, Xiamen
- Malindan Hot Spring Hotel, Qingyuan
- Yunsila Hotel, Guangzhou
- Shangri-La Hotel, Sanya
- Crown Hotel, Fangchenggang, Guangxi
- Qiliping Hotel, Emeishan, Sichuan
- Harbour Hotel, Chongqing
- Bomei Resort Hotel, Sanya, Hainan
- Greenland QUINTA Hotel, Datong
- Rizhao Hotel, Shucheng, Anhui
- Renyuan Hotel, Zhoushan, Zhejiang
- Zigong Salt Culture Hotel
- Expo Falls Hotel, Chengdu World Horticultural Exposition Site
- The Wellesley Hotel, Meixihu, Changsha
- ……

Government

Project Name: Energy-saving Renovation Project of Guangdong Higher People's Court

Monitoring contents: Networking fan coil temperature control system, fresh air conditioning unit frequency conversion control system

Other project cases

- Guangdong Provincial Higher People's Court
- Office Building of Democratic Parties, Guangdong Province
- Nanning Intermediate People's Court
- Nanning Great Hall of the People
- Nanchong Intermediate People's Court
- Guangxi Autonomous Region Social Security Administration
- U.S. Consulate General in Guangzhou
- Nanning Customs
- Phase II of Hainan Provincial Government Service Center
- Chenghua New Economy Industry Service Center
- Western Planning and Management Service Center
- Shijing Port of Entry, Nan’an
- Entry-Exit Inspection and Quarantine Center, Deyang
- Chengdu Base of China Academy of Engineering Physics
- Planning and Renovation of Haifu Compound for Hainan Provincial Agencies
- ……

Campus

Project Name Campus of Harbin Institute of Technology (Shenzhen)

Monitoring contents: Chiller Room Group Control System

Other project cases

- Harbin Institute of Technology, Shenzhen Campus
- University of Macau, Hengqin Campus, Zhuhai
- Guangdong University of Technology, Jieyang Campus
- Xuefu Campus, Sichuan Technician College of Science and Engineering
- School of Biosciences Laboratory, Xiamen University
- Chuanjiu College, Sichuan Vocational College of Chemical Industry
- Luding Bridge Branch, Sichuan Long March Cadre College, Garze Prefecture
- Biomedical and Health Research Center, Hainan University
- Sichuan Tourism College
- Donghu College, Wuhan
- Jiujiang New City Primary School
- Hongnian Campus, Shishi United Secondary School, Chengdu
- Advanced Materials Research Building, Sichuan University
- Xingwen County Vocational and Technical College
- Sichuan Sports School
- ……

Transportation

Project Name: Terminal T2 of Guangzhou Baiyun Airport

Monitoring contents: Equipment monitoring system, environmental monitoring system

Other project cases

- Terminal 2, Guangzhou Baiyun International Airport
- Hohhot Baita International Airport
- International Terminal Renovation Project, Sanya Phoenix International Airport
- Chao Shan International Airport, Guangdong
- Guangzhounan Railway Station (High-Speed Rail)
- Meizhouxi Railway Station (High-Speed Rail)
- Luzhou Railway Station (High-Speed Rail)
- Luxian Railway Station (High-Speed Rail)
- Yibindong Railway Station (High-Speed Rail)
- Chongqingdong Railway Station (High-Speed Rail)
- Lagos Station, Nigeria
- Beihai International Passenger Port
- Zhanjiang Xuwen Roll-on/Roll-off (Ro-Ro) Passenger and Cargo Terminal
- Ningxia Expressway Management Center
- Nanning Rail Transit Management Center
- ……

Factory

Project Name Sino-Korea Joint Venture Intelligent Display Standardization Plant in Yueyang

Monitoring contents: Cold and heat source group control, air pressure station group control, constant temperature and humidity monitoring (MAU + DCC + FFU), differential pressure monitoring of clean plant, pure water system monitoring, vacuum system monitoring, energy management, dual redundancy of controller and server

Other project cases

- Sino-Korean Joint Venture Smart Display Standardized Plant, Yueyang
- Shenzhen Eastern Environmental Power Plant
- Mawan Power Plant, Shenzhen
- Blue Moon Factory, Tianjin
- ManKenton Factory, Beijing
- Refrigeration Room Renovation Project, Guangzhou Cigarette Factory
- San’an Optoelectronics Factory, Quanzhou, Fujian
- Phase II of Anrui Photovoltaics Factory (Wuhu)
- New Guanghong Tech Plant, Huizhou
- Shidai Shuncheng Industrial Plant
- Huagong Gaoli Electronics Plant, Xiaogan
- Decun Fast Electronics Factory, Guilin
- Fenghuang River Second Ditch Reclaimed Water Plant
- FAW Jiefang Southern New Energy Base
- High-End Manufacturing Plant of China Condesign for Cement
- ……

Others

Project : Sichuan Tianfu New District Citizen Center

Monitoring contents: Building automation system, intelligent lighting system, energy management system, etc.

Other project cases

- Tianfu New Area Civic Center, Sichuan
- Longkou Civic Center
- Xiangyang Sports Center
- Wuhan Health & Wellness Center
- Liangshan National Fitness Center
- Lucheng National Fitness Center
- Southwest Cycling Sports Center
- Southern Visitor Center of Leshan Giant Buddha Scenic Area
- Prefectural Telecom Equipment Room
- Yichang Telecom Building
- Shenshan Data Center
- Hohhot Cloud Computing Center
- Cloudwise IDC Room, Nansha, Guangzhou
- Liuzhou Convention and Exhibition Center
- Ya’an Panda Convention and Exhibition Center
- ……