

# 设备智能监测与故障诊断分析系统

Intelligent Equipment Monitoring and Fault Diagnosis Analysis System

实时监控 智能诊断 精准预警

Real-time Monitoring · Intelligent Diagnosis · Precise Early Warning



昆明嘉和智慧科技有限公司

Kunming Jiahe Intelligent Technology Co., Ltd.

# 行业背景

## INDUSTRY BACKGROUND

在石油、煤化、冶炼、长输管网、硫磷矿产等诸多重工业领域，关键设备常年在高温、高压、强腐蚀与复杂载荷的严苛环境中持续运行。电机、泵组、压缩机、轴承等核心部件，不仅承担着生产的连续性，更直接关系到人员安全与环境风险。实际运行中，设备状态易受工艺波动、介质变化、疲劳老化及人为操作等多重因素影响，局部故障若未能及时发现，往往引发连锁反应，造成非计划停机甚至严重事故，带来重大的经济损失与社会影响。

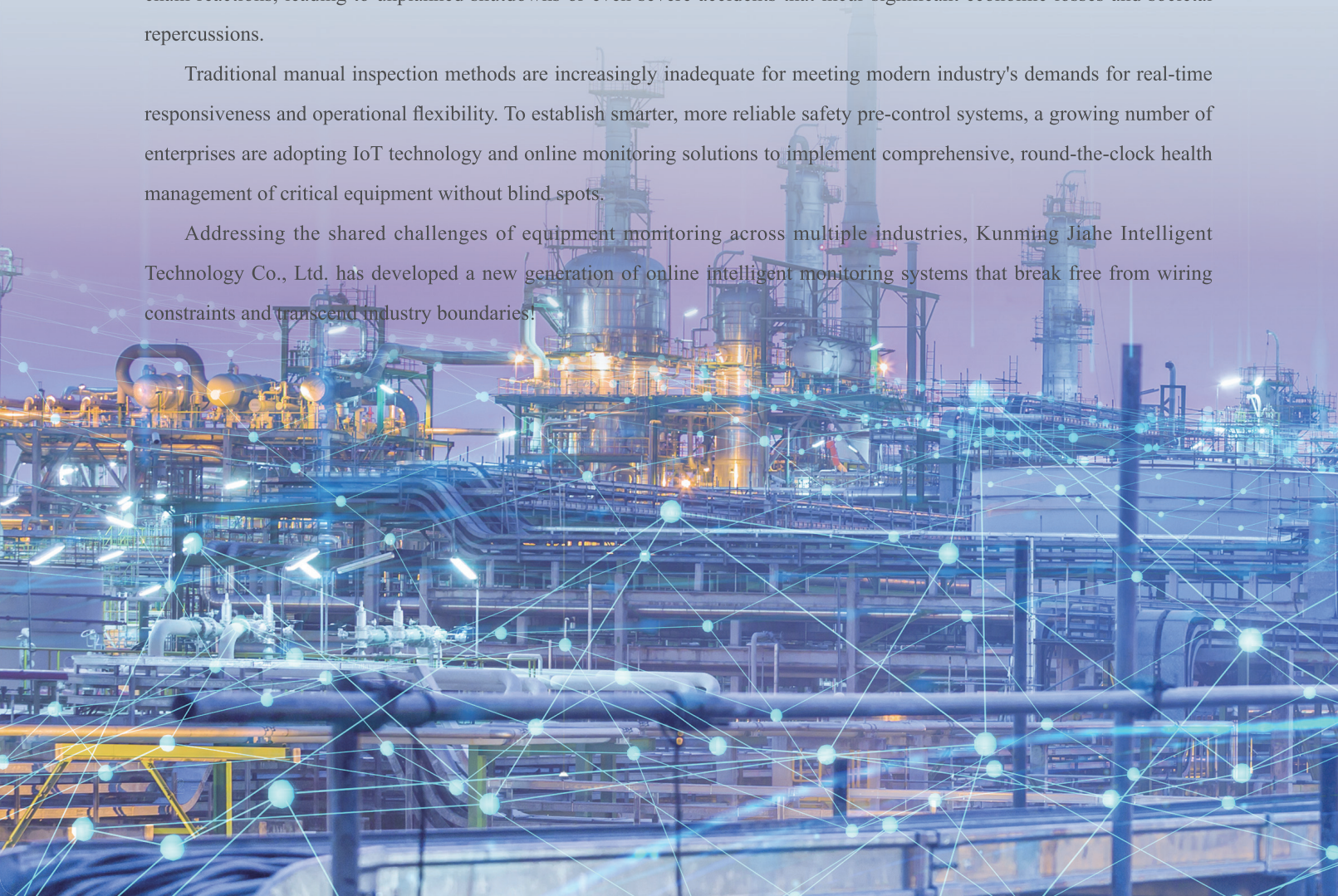
依赖传统人工点检等监测方式，已难以适应现代工业对实时性与灵活性的要求。为构建更智能、更可靠的安全预控体系，越来越多的企业开始引入物联网技术与在线监测手段，对关键设备实施全时段、无盲区的健康管理。

面对多行业设备监测的共同挑战，昆明嘉和智慧科技有限公司以新一代在线智能监测系统，打破布线束缚、跨越行业边界！

In numerous heavy industrial sectors such as petroleum, coal chemical processing, metallurgy, long-distance pipeline networks, and sulphur and phosphorus mining, critical equipment operates continuously under the demanding conditions of high temperatures, high pressures, severe corrosion, and complex loading patterns. Core components such as motors, pump sets, compressors, and bearings not only ensure production continuity but also directly impact personnel safety and environmental risks. During actual operation, equipment condition is susceptible to multiple factors including process fluctuations, medium changes, fatigue ageing, and human error. Failure to detect localised faults promptly often triggers chain reactions, leading to unplanned shutdowns or even severe accidents that incur significant economic losses and societal repercussions.

Traditional manual inspection methods are increasingly inadequate for meeting modern industry's demands for real-time responsiveness and operational flexibility. To establish smarter, more reliable safety pre-control systems, a growing number of enterprises are adopting IoT technology and online monitoring solutions to implement comprehensive, round-the-clock health management of critical equipment without blind spots.

Addressing the shared challenges of equipment monitoring across multiple industries, Kunming Jiahe Intelligent Technology Co., Ltd. has developed a new generation of online intelligent monitoring systems that break free from wiring constraints and transcend industry boundaries!



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# 企业介绍

## COMPANY PROFILE

昆明嘉和智慧科技有限公司是一家工业低碳服务提供商，国家高新技术企业、专精特新小巨人企业，服务于硫磷化工、有色冶炼、石油化工、煤化工、精细化工等领域。为践行国家“双碳”发展战略，公司依托工信部《智能化泵站大数据中心》，运用阿尔斯通创为实——全球领先的机组智能监测、故障诊断技术，结合嘉和集团近三十年机泵设备研发、设计、生产装配、运维服务、升级优化等经验，模拟各类转动设备运行故障状态，建立丰富故障案例模型，赋能企业设备全生命周期管理。

公司联合国家节能中心、北京大学、清华大学等主管部门及科研院所，合作近百位专家学者形成强大技术支撑，整合全球领先的节能低碳技术，提供具有国际先进水平的定制化高效节能设备、智慧运维、智慧节能服务，助力客户实现“节能减碳、降本增效”的绿色发展目标。

Kunming Jiahe Intelligent Technology Co., Ltd. is an industrial low-carbon service provider, recognized as a National High-Tech Enterprise and a Specialized, Refined, Distinctive, and Innovative “Little Giant” Enterprise. It serves sectors including sulfur and phosphorus chemical engineering, non-ferrous metallurgy, petrochemicals, coal chemical engineering, and fine chemicals. To advance China's dual-carbon development strategy, the company leverages the Ministry of Industry and Information Technology's Intelligent Pump Station Big Data Center. It employs Alstom's Chuangweishi—a globally leading unit intelligent monitoring and fault diagnosis technology—combined with Jiahe Group's nearly three decades of expertise in pump equipment R&D, design, manufacturing, assembly, operation, maintenance, and optimization. This enables simulation of various rotating equipment operational faults, establishing a comprehensive fault case model to empower enterprises with full lifecycle equipment management.

Collaborating with authorities and research institutions including the National Energy Conservation Center, Peking University, and Tsinghua University, the company has assembled a team of nearly 100 experts and scholars to form robust technical support. By integrating globally leading energy-saving and low-carbon technologies, it delivers customized high-efficiency energy-saving equipment, smart operation and maintenance, and intelligent energy-saving services at internationally advanced levels. This empowers clients to achieve their green development goals of “energy conservation, carbon reduction, cost reduction, and efficiency enhancement.”



## ► 企业荣誉 Corporate Honours



## ► 技术实力 Technical Capability



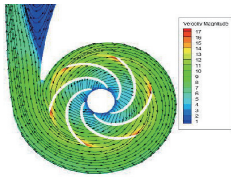
## ► 研发实力 R&D Capabilities

嘉和依托工信部“机泵大数据中心”“工业互联网试点示范项目”，成立云南省新型研发机构云南流体规划研究院，致力于流体工程装备研发及全生命周期管理，全面提高工业低碳和客户服务水平。

Jiahe leverages the Ministry of Industry and Information Technology's “Machinery and Pump Big Data Center” and “Industrial Internet Pilot Demonstration Project” to establish the Yunnan Fluid Planning Research Institute, a new R&D institution in Yunnan Province. Dedicated to fluid engineering equipment R&D and full lifecycle management, it comprehensively enhances industrial low-carbon capabilities and customer service standards.

### 四大中心 Four Major Centers

#### 虚拟模拟仿真研究中心 Virtual Simulation Research Center



研发：西门子的 PLM 全生命周期管理软件  
设计：NX 设计软件  
分析：CFD 等专业分析软件

R&D: Siemens PLM Software for Full Lifecycle Management  
Design: NX Design Software  
Analysis: Specialized Analysis Software such as CFD

#### 新材料研究中心 New Materials Research Center



致力于耐腐蚀、耐磨蚀、耐高低温特种金属材料的研究开发、新型超高分子聚乙烯材料研究开发、金属基陶瓷复合材料研究开发、碳纤维复合材料研究开发。

Committed to the research and development of corrosion-resistant, abrasion-resistant, and high/low-temperature-resistant specialty metallic materials; novel ultra-high molecular polyethylene materials; metal-matrix ceramic composites; and carbon fiber composites.

#### 智慧节能系统研究中心 Smart Energy-saving Center



围绕低碳能源技术、发展战略和技术路线的研究整合资源、凝练方向、发挥学科优势，致力于智慧节能系统研究开发，实现国际领先的能效水平。

Research on low-carbon energy technologies, development strategies, and technical pathways integrates resources, refines research directions, and leverages disciplinary strengths to advance the development of intelligent energy-saving systems, achieving internationally leading energy efficiency levels.

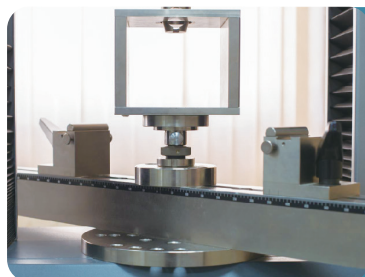
#### 低碳技术国际联合研究中心 Low-carbon Technology International Joint Research Center



依托于昆明理工大学，联合嘉和科技、北京理工大学、北京航空航天大学等国内院校企业以及英国伯明翰大学、德国克劳斯塔尔工业大学等国外院校共同深化产学研合作，致力于节能减排技术和工程装备研发。

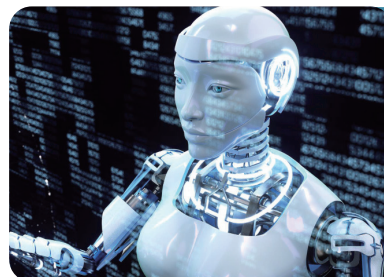
Leveraging Kunming University of Science and Technology, we collaborate with domestic institutions and enterprises including Jiahe Technology, Beijing Institute of Technology, and Beihang University, alongside international partners such as the University of Birmingham and Clausthal University of Technology in Germany, to deepen industry-academia-research cooperation. We are dedicated to the research and development of energy-saving and emission-reduction technologies and engineering equipment.

### 两大实验室 Two Major Laboratories



#### 力学性能实验室

Mechanical  
Properties Laboratory



#### AI 技术应用 重点实验室

AI Technology  
Applications  
Key Laboratory

## ► 认证体系 Certification System

- ▶ 信息安全管理体系认证 Information Security Management System Certification
- ▶ 能源管理体系认证 Energy Management System Certification
- ▶ 知识产权管理体系认证 Intellectual Property Management System Certification
- ▶ 能量系统优化服务认证 Energy System Optimisation Services Certification
- ▶ 工业节能技术服务认证 Industrial Energy Efficiency Technical Services Certification
- ▶ 电机系统节能服务认证 Motor System Energy Efficiency Services Certification
- ▶ 质量管理体系认证 Quality Management System Certification
- ▶ 环境管理体系认证 Environmental Management System Certification



## ► 知识产权 Intellectual Property

荣获专利 **100** 余项 Awarded over 100 patents



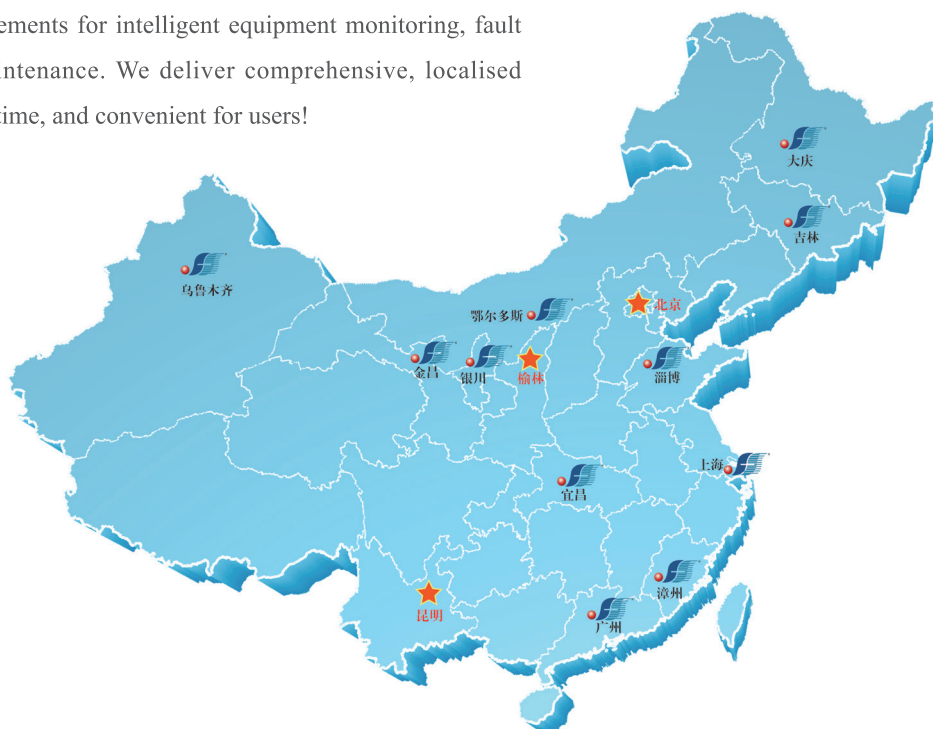
# 市场与服务

## MARKET & SERVICE

### ► 服务 Service

公司服务网络辐射全国，及时响应并满足客户设备智能监测、故障诊断、设备运维等个性化服务需求，为用户提供智能、实时、便捷的全方位在地服务！

The company's service network spans the nation, promptly addressing and fulfilling clients' bespoke requirements for intelligent equipment monitoring, fault diagnosis, and operational maintenance. We deliver comprehensive, localised services that are intelligent, real-time, and convenient for users!



### ► 服务内容 Service Offerings

- **智能诊断**——海量故障数据 + 先进算法模型
- **远程专家诊断**——“嘉和机泵诊断中心”365天在线看护服务
- **嘉和机械节能专家诊断**——联合行业领先的设备制造企业与科研院所专家助力
- **现场服务**——提供设备状态监测诊断、智慧运维、智慧节能一体化专业服务
- **Intelligent Diagnostics** — Massive fault data + advanced algorithmic models
- **Remote Expert Diagnostics** — ‘Jiahe Machinery Pump Diagnostic Centre’ 365-day online monitoring and maintenance service
- **Jiahe Machinery Energy Efficiency Expert Diagnostics** — Leveraging expertise from industry-leading equipment manufacturers and research institutes
- **On-site Services**— Providing integrated professional services encompassing equipment condition monitoring diagnostics, intelligent operation and maintenance, and smart energy conservation

► 服务领域 Service Areas



石油化工  
Petrochemical



煤化工  
Coal Chemical Industry



硫磷化工  
Sulphur and Phosphorus Chemicals



电力行业  
Electricity Industry



长输管网  
Long-Distance Transmission Network



有色冶炼  
Non-Ferrous Smelting

# 主营产品

## MAIN PRODUCTS

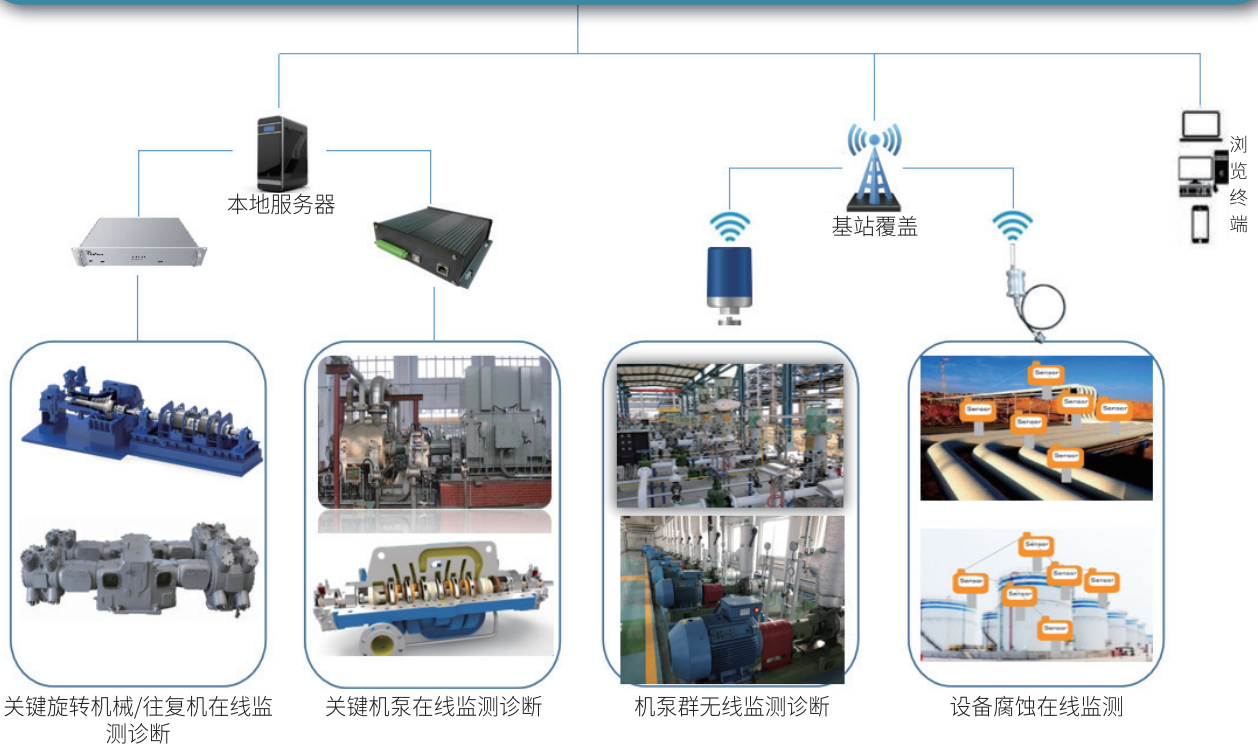
### ▶ 智能监测诊断系统 Intelligent Monitoring and Diagnostic System

嘉和智慧智能监测诊断系统是基于一物联网、大数据、人工智能等技术，针对转动静设备提供全厂覆盖的智能感知、智能预警、智能分析预判、能效分析的“综合设备的全生命周期智能管理系统”。



Jiahe Intelligent Monitoring and Diagnostic System is a comprehensive, full-lifecycle intelligent equipment management solution. Leveraging IoT, big data, and artificial intelligence technologies, it delivers plant-wide intelligent sensing, early warning, predictive analysis, and energy efficiency assessment for rotating and static equipment.

## 客户私有平台 / 云平台 Customer Private Platform/Cloud Platform



## ► 无线温振一体化传感器

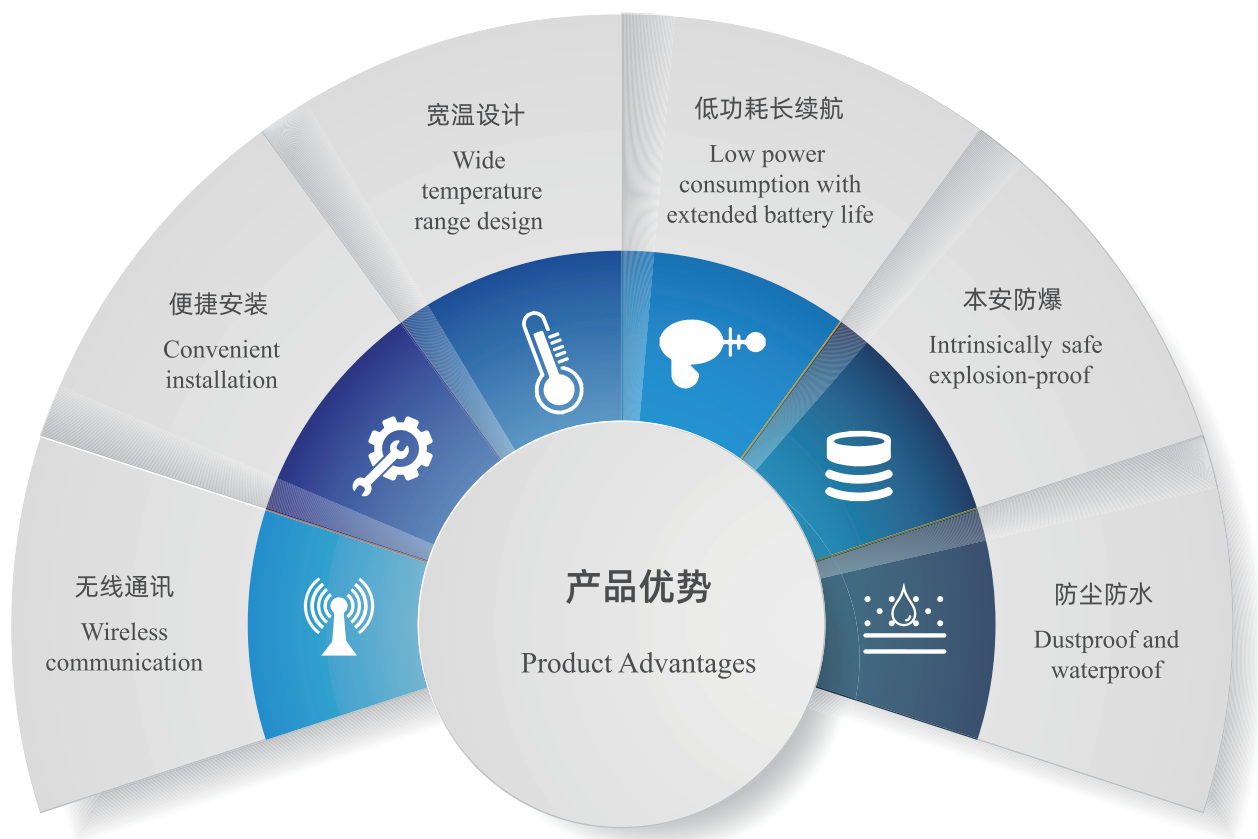
### Wireless Temperature and Vibration Integrated Sensor

适用范围：工业现场动静设备在线监测。

Scope of Application: Online monitoring of stationary and rotating equipment in industrial settings.

可同时监测测点 X、Y、Z 三个方向振动及壳体温度，频率范围 Z 轴 0~20000Hz，X、Y 轴 0~6000Hz 超高频响，满足采集数据精度高、诊断可靠性高等特点。支持 LoRa、Zigbee、4G、NB-iot、Cat1 等多种无线数据传输方式，满足不同安装环境的数据传输要求，通过监测数据可有效掌握设备状态，诊断设备故障，做到预知性的维修维护。

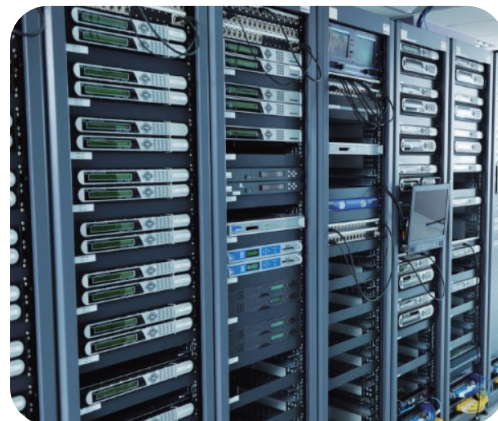
Simultaneously monitors vibration across X, Y, and Z axes alongside housing temperature. Frequency range: Z-axis 0–20,000 Hz, X/Y-axes 0–6,000 Hz with ultra-high frequency response. Delivers high data acquisition accuracy and reliable diagnostics. Supports multiple wireless data transmission methods including LoRa, Zigbee, 4G, NB-IoT, and Cat1, accommodating data transmission requirement under diverse installation environments. Monitoring data enables effective equipment condition assessment, fault diagnosis, and predictive maintenance.



## ► 大机组有线监测 Wired Monitoring of Large Units

适用范围：汽轮发电机组、水轮机、大型压缩机等。

Scope of application: Steam turbine generator sets, hydro turbines, large compressors, etc.



滑动轴承监测  
Sliding bearing monitoring

8 路键相、48 路振动频谱、24 路过程工艺量  
8 key phase channels, 48 vibration spectrum channels, 24 process parameter channels

产品优势  
Product Advantages

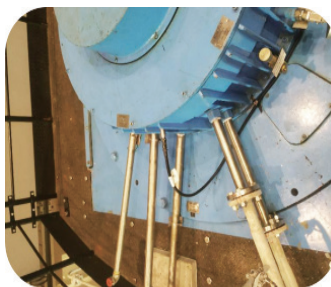
有线秒级实时监测  
Wired real-time monitoring at second-level resolution

处理能力强大、高速启停机采样  
Robust processing capability with high-speed start/stop sampling

## ► 辅机有线监测 Auxiliary Equipment Wired Monitoring

适用范围：透平机、风机、关键机泵、提袋机、送风机、齿轮箱等。

Scope of application: Turbines, fans, critical pumps, bag-lifting machines, blower fans, gearboxes, etc.



产品优势  
Product Advantages

有线 / 半无线秒级实时监测  
Wired/semi-wireless real-time monitoring at sub-second intervals

包络冲击先进算法、零相位校正专利技术  
Advanced envelope shock algorithms and patented zero-phase correction technology

1 路键相、16 路振动频谱 / 16 路过程工艺量  
1 key phase channel, 16 vibration spectrum channels/16 process parameter channels

## ▶ 手持点检仪 Handheld Inspection Device

适用范围：所有旋转类设备日常巡检。

Scope of Application: Routine inspections of all rotating equipment.



手持点检仪小机身，功能强，搭配振动传感器可进行振动数据采集、故障预警，实现巡检更精准、更高效，故障早发现，管理更轻松。

Compact handheld inspection device with robust functionality. When paired with a vibration sensor, it enables vibration data collection and fault early warning, delivering more precise and efficient inspections. Early fault detection simplifies management.



## ► 单/多通道电磁超声在线测厚仪

### Single/Multi-Channel Electromagnetic Ultrasonic Online Thickness Gauge

适用范围：金属管道、储罐、压力容器等。

Scope of application: Metal pipelines, storage tanks, pressure vessels, etc.



单 / 多通道电磁超声腐蚀在线监测仪是一款非接触式厚度测量仪，可实现管道、储罐、压力容器等设备厚度连续监测。可监测工件材质：碳钢、铸钢、合金钢、不锈钢、铜、铝、钛等导体材料。

Single/Multi-Channel Electromagnetic Ultrasonic Corrosion Online Monitor is a non-contact thickness gauge enabling continuous thickness monitoring of pipelines, storage tanks, pressure vessels and similar equipment. Applicable materials include: carbon steel, cast steel, alloy steel, stainless steel, copper, aluminium, titanium and other conductive materials.

## 产品优势

### Product Advantages

无线通讯	Wireless communication
无需耦合	No coupling required
宽温设计	Wide temperature range design
防爆	Explosion-proof
可埋地	Suitable for underground installation
IP68 防护	IP68 protection
多通道数据采集	Multi-channel data acquisition
多样化安装	Versatile installation options

## ► 笔式电磁超声与涡流复合测厚仪

### Pen-Type Electromagnetic Ultrasonic and Eddy Current Composite Thickness Gauge

适用范围：金属或导磁性材料。

Scope of Application: Metal or ferromagnetic material.



## 产品优势

### Product Advantages

多种金属材料测厚

Thickness measurement of multiple metallic materials

电磁超声测厚与涡流涂层测厚

Electromagnetic ultrasonic thickness gauging and eddy current coating thickness measurement

无需打磨工件表面

No surface grinding required

无需耦合剂

No coupling agent required

非接触式测量

Non-contact measurement

高温测厚

High-temperature thickness measurement

体积小

Compact size

携带方便

Portable design

无线连接平板电脑等智能终端

Wireless connectivity to tablets and other smart devices

## ▶ 大提离电磁超声高温腐蚀检测仪

### Electromagnetic Ultrasonic High-Temperature Corrosion Detector for Large lift-off

适用范围：金属或导磁性材料。

Scope of Application: Metal or ferromagnetic material.



#### 产品优势

Product Advantages

多种金属材料测厚

Thickness measurement of multiple metallic materials

大提离、穿防腐层（或涂层）

Large lift-off depth through anti-corrosion layers (or coatings)

耐粗糙表面，无需耦合剂

Resistant to rough surfaces, no coupling agent required

非接触式测量

Non-contact measurement

高温测厚

High-temperature thickness measurement

大功率

High power output

高厚度工件测量

Measurement of workpieces with high thickness

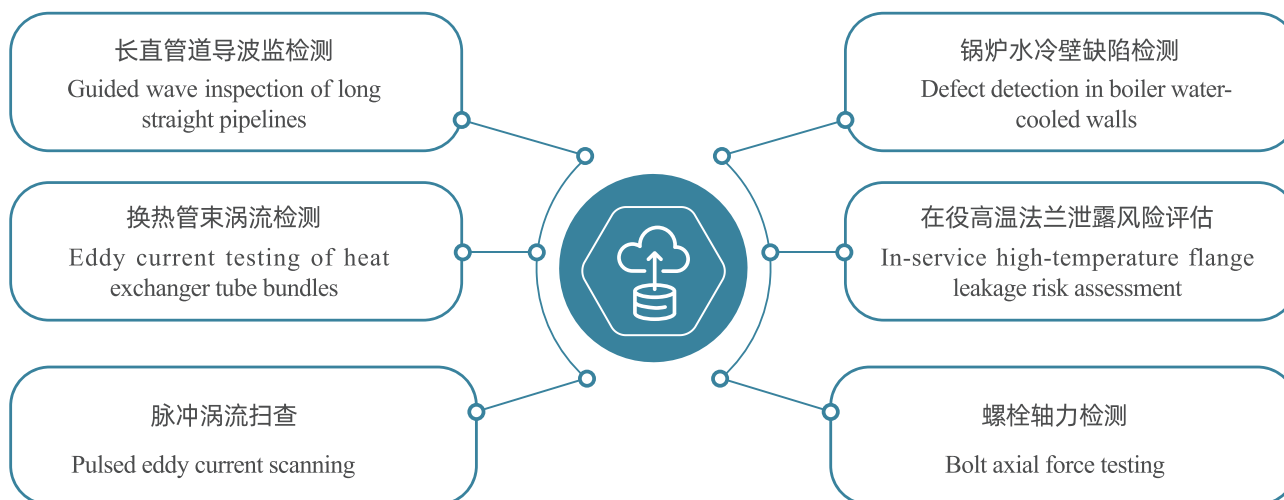
## ► 自动爬壁机器人 Automatic Wall-Climbing Robot

适用范围：可携带笔式测厚仪，用于对危险石化环境中的碳钢储罐和高架管道进行超声无损检测。

Scope of Application: Portable pen-type thickness gauges may be employed for ultrasonic non-destructive testing of carbon steel storage tanks and elevated pipelines within hazardous petrochemical environments.



## ► 无损检测技术服务 Non-Destructive Testing Services



# 应用案例

## APPLICATION CASE

某磷化工企业设备状态监测与故障诊断平台

Equipment Condition Monitoring and Fault Diagnosis Platform for a Phosphorus Chemicals Enterprise



某有色冶炼管道腐蚀监测

Corrosion Monitoring of Piping Systems in a Non-Ferrous Smelting Facility



# 合作伙伴 PARTNERS



中国石油



中国有色集团  
CNMC



云天化集团  
YUNTIANHUA GROUP



国家能源集团  
CHN ENERGY



中国瑞林  
NERIN



中国石化  
SINOPEC



CHALCO  
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湖北宜化  
HUBEI YIHUA



中煤



ENFI  
中国恩菲



CNOOC  
中国海油



CHINALCO  
中国铝业



贵州磷化集团  
GUIZHOU PHOSPHATE CHEMICAL GROUP



山东能源集团  
SHANDONG ENERGY GROUP



(EC)<sup>2</sup>



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紫金矿业  
ZIJIN MINING



GARSONI<sup>®</sup>  
嘉施利



VNCC 云南煤化工



CATL  
宁德时代



WANHUA



通山有色



史丹利<sup>®</sup>  
STANLEY



榆能集团  
YUNENG GROUP



力勤 LYGEND



华友钴业  
HUAYOU COBALT



BNMCC  
白银有色集团



祥云集团



youser 陕西有色



盐湖钾肥



BAOWU  
宝武集团



西部矿业  
WESTERN MINING



CHANHEN 川恒  
精·关爱·生活



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 中国（云南）自由贸易试验区昆明片区经开区拓翔路 208 号  
No. 208 Tuoxiang Road, Kunming Area, China (Yunnan) Pilot Free Trade Zone

 0871-67413111/65638866

 xiaoshou@jhpumps.com

 [Http://www.jhpumps.com](http://www.jhpumps.com)