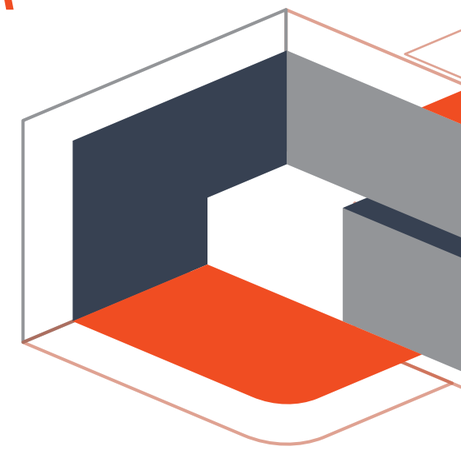
ZENITH
MINING & CONSTRUCTION

CONTROL SYSTEM
配套电气系统

we pursue the zenith of technology and quality



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上海西芝矿山工程机械有限公司
Shanghai Zenith Mining and Construction Machinery Co., Ltd.
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DELIXI ELECTRIC 德力西电气

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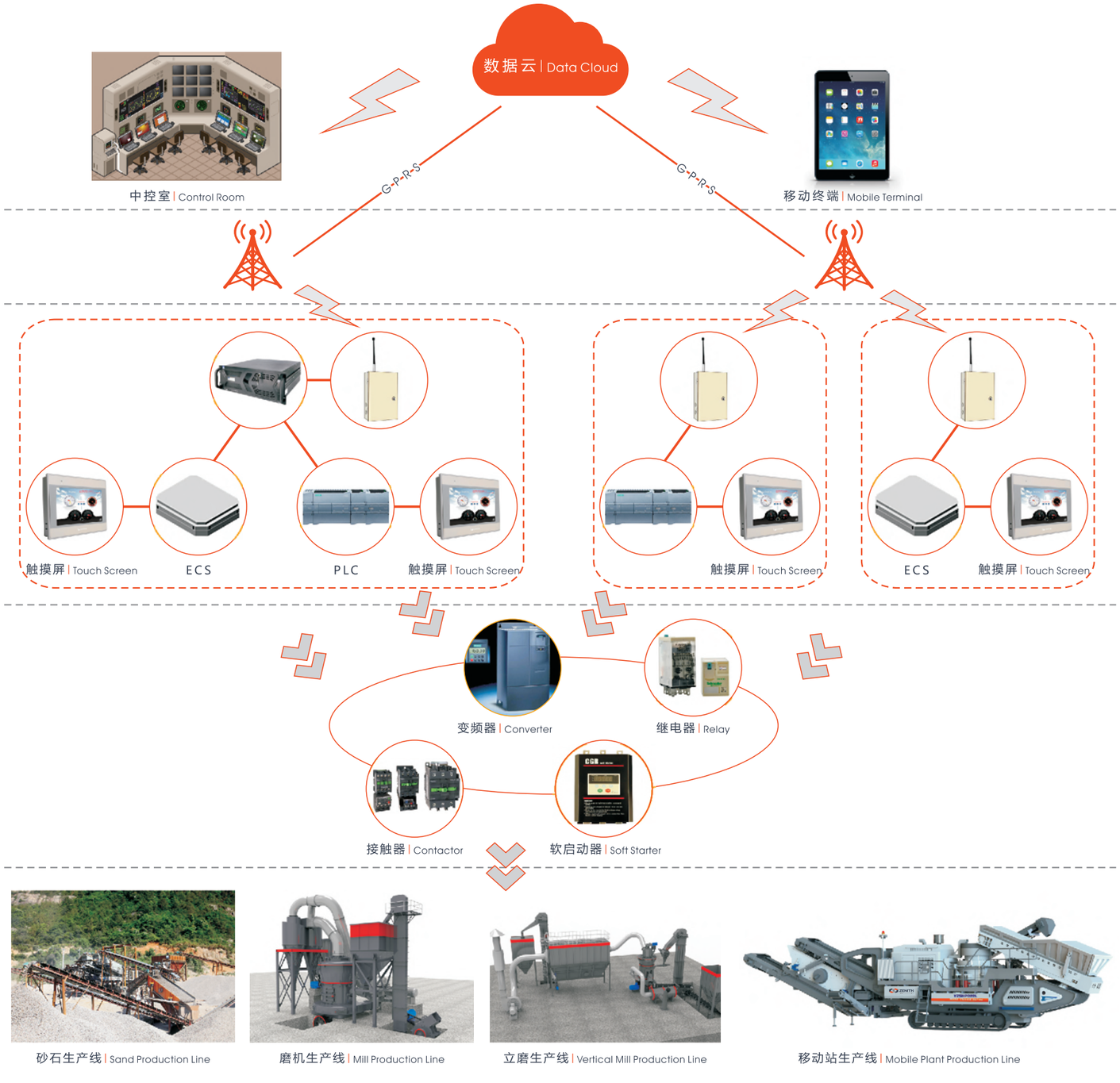
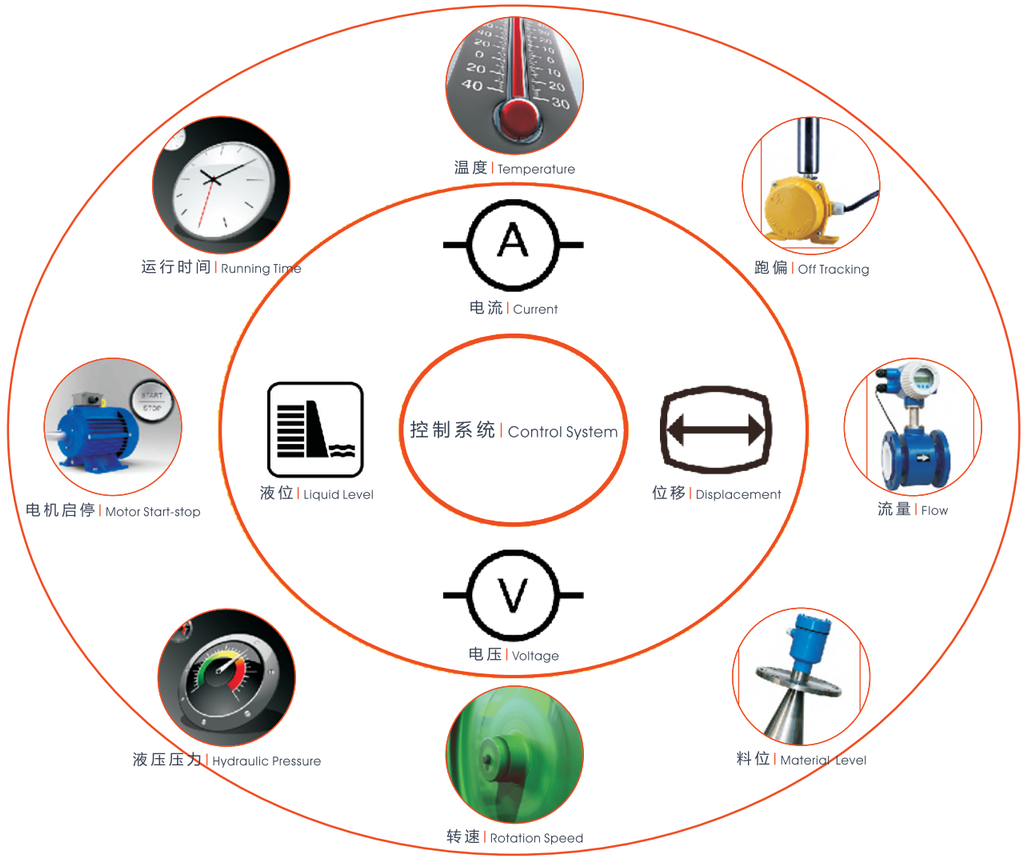
Our Electrical System
我们的电气系统

我公司设计的配套电气系统主要包括以下几个部分：数据层、传输层、控制层、执行层。数据层主要包括数据中心和各个移动终端，通过数据层，可以随时随地的查看设备的运行状况；传输层主要指目前被广泛使用的GPRS网络，该网络具有传输速度快，数据安全等特性，肩负起了数据传输的任务；控制层主要指各个控制单元及无线发射单元，控制单元可以是采用工业计算机和PLC的分布式控制系统（DCS），也可以是直接使用PLC或ECS控制的小型控制系统，多样的控制层适用于各种规模的现场；执行层主要指直接参与设备运行的各个电气元件，例如软启动器、变频器、接触器、继电器等等，这些设备保障了设备的稳定运行。

The supporting electrical system designed by our company mainly includes such parts as: data layer, transport layer, control layer and execution layer. The data layer mainly includes the data center and all mobile terminals, and the equipment running status can be checked anywhere at any time through the data layer; the transport layer mainly refers to the GPRS network widely used at present and this network has such features as fast transmission and reliable data security, able to be competent for data transmission; the control layer mainly refers to all control units and wireless transmission units, the control unit can be the distributed control system (DCS) that adopts an industrial computer and a PLC, and also can be the small control system directly use PLC or ECS to control, and moreover a variety of control layers are suitable for all kinds of sites different in size; the executive layer mainly refers to various electric elements directly participating in equipment operation, such as soft starter, converter, contactor and relay, which can guarantee the equipment stable operation.



Our Control Coverage
我们的控制内容



配套电气系统依据设备的运行特点进行设计，除了控制设备的启停、采集电压电流之外，还能根据工艺流程和客户需求对一些特殊参数进行监测，例如温度、转速、料位、液位等，这些运行数据将会显示到特定的显示单元，方便用户查看。

The supporting electrical system is designed according to the equipment operation characteristics, able to control the equipment start-stop and collect voltage and current, and also monitor some special parameters according to the technological process and customer demands, such as temperature, speed, material level and liquid level, all of which will be displayed on a specific display unit to facilitate users' check.

Our Advantages
我们的优势

- 先进的启动控制方式 / Advanced Startup Control Mode
- 全面的保护 / Comprehensive Protection
- 高精尖的控制单元 / High-grade, Precision And Advanced Control Unit
- 多样的柜体 / A Variety Of Cabinets

01 先进的启动控制方式
Advanced Startup Control Mode

针对不同的设备和使用环境，我们采用了多种启动和控制方式，例如直接启动、星三角启动、自耦减压启动等，同时为了满足大功率电机的启动要求，满足特殊设备的控制要求，我们还提供了以下启动和控制方案。

According to different equipment and use conditions, we have adopted a variety of startup and control modes, such as direct startup, star–delta starting and autotransformer starting; moreover, in order to satisfy the requirements for startup of the high power motors and control of some special equipment, we have also provided such startup and control solutions as follows.

高压启动 / High-voltage Startup

对于大功率电机和有特殊要求的客户，可以采用高压启动柜，该启动方式的启动电流小，扭矩大、启动平稳，可以极大程度的保护大功率设备，高压启动柜可以选择高压软起、高压变频等方式。

For high-power motors and such customers who have special requirements, a high-voltage starter cabinet can be used, which features small starting current, large torque and stable startup, able to greatly protect high-power equipment; the high-voltage starter cabinet can adopt such modes as high-voltage soft startup and high-voltage frequency conversion.

软启动器启动 / Soft Starter Startup

启功软起 | Soft Startup

内置多种可选的启动模式，可以根据设备的负载情况和现场的电网情况进行合理配置，保障设备的正常启动和运行，同时也减少了电机启动对电网和电机自身的冲击，延长了电机的使用寿命。

A variety of optional built-in startup modes can be reasonably configured according to the equipment load conditions and the on-site power grid conditions to ensure the equipment normal startup and running reduce the impact of the motor startup on the power grid and the motor itself and thus extend the motor service life.

变频启动（可调速）
Variable Frequency Startup（Speed Adjustable）

西门子变频器 | Siemens Converter

变频器可实现恒功率、恒转矩、指定转速启动等，也是目前公认的最佳的调速设备。将变频器加入到调速系统中，可以调高设备的工作效率，提高设备的自动化程度，同时可以在最大程度上对电机进行保护，延长设备的使用时间。

VFD (Variable-Frequency Drive) realizes constant power, constant torque, specified rotation, and is acknowledged as the optimal speed control device at present.Adding a converter to a speed control system can increase the equipment efficiency, improve the degree of the equipment automation, and simultaneously protect motors to the maximum extent for longer service life of the equipment.

步进调速 / Step-by-step Speed Governing

该调速方式配合步进电机使用，具有：控制精度高，启停和反转响应快，转速调节范围大等优势，适用于控制要求高的调速机构或位置控制机构。

This speed governing mode matched with a stepping motor can achieve such advantages as follows: higher control precision, faster start-stop and inversion response, wider range of speed governing and larger start-stop torque, applicable to such speed governing or position control mechanisms featuring higher control requirement.

伺服调速 / Servo Speed Governing

伺服调速适用于多种场合，可进行精确的位置和速度控制，其具有较大的启动转矩，具有较强的抗过载能力，速度变化时响应快。

The servo speed governing applicable to a variety of occasions can achieve accurate position and speed control, featuring larger starting torque, stronger overload resistance and faster response to speed changes.

02 全面的保护 Comprehensive Protection

设备的运行过程中，可能会因为各种各样的因素（例如人为因素、环境因素等）出过载、缺相等情况，在出现这些状况时，如果有全面的保护系统，则将大大降低意外情况带来的损失，我们的电气系统在设计之初就进行了全面的考虑，将各类保护加入到控制系统当中，除了常用的热继电器之外，我们还有以下器件可选。

During the process of the equipment operation, some unexpected conditions may occur due to various factors (such as human and environmental factors), but when such conditions appear, the unexpected loss brought by accidents will be greatly reduced if there is a comprehensive protection system; at the beginning of the design, our electrical system has had comprehensive consideration, with all kinds of protection measures added into the control system; in addition to the commonly used thermal relays, we also have such optional devices provided as follows.

电动机保护断路器
Motor Protection Circuit Breaker

该断路器在普通断路器的基础上增加了过载保护等功能，使其具备短路保护、过载保护、缺相保护、线路通断等功能，既能节省空间，又方便操作。

This circuit breaker has such functions as short circuit protection, overload protection (added on the basis of the general circuit breaker), open phase protection and circuit on-off protection, and other functions, able to save space and facilitate operation.

电动机保护器 / Motor Protector

该保护器具有过载和缺相保护功能。在电机启动或运行过程中，检测电机电流，若发生故障，可第一时间做出反应，对电机进行保护。保护范围可选可调，适用于多种电机。

This protector specially targets motor phase loss and overload, able to protect motors by detecting the running current. In case of phase loss or overload during motor startup or running, this protector can immediately respond to protect the motor. At the same time, the range of protection can be optional and adjustable to adapt to a variety of motors.

程序保护 / Programmed Protection

程序保护即利用程序对设备进行保护，既可以通过电流等信号对各个设备进行过载保护，也可以通过内部的连锁关系对工艺流程进行保护，保证工艺流程的安全可靠，对一些特殊设备，甚至可以通过温度、位移、压力等信号进行保护。

The programmed protection (namely protection of the equipment via a set program) can achieve equipment overload protection by means of such signals as current and also protect the process flow through the internal linkage relationship to ensure the process safety and reliability, and even protect some special equipment by such signals as temperature, displacement and pressure.

03 高精尖的控制单元
High-grade. Precision And Advanced Control Unit

工业计算机 / Industrial Computer

工业计算机是DCS（分布式控制系统）的核心单元，在DCS中，客户直接面对的就是该设备，该设备能够直观的显示出现场的运行情况，并让客户不迈出中控室就能控制现场所有设备，这样既能保证操作人员的人身安全，又能极大的节省成本。

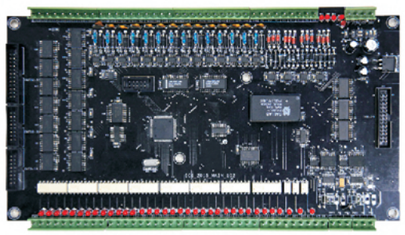
The industrial computer acts as the core unit of a DCS (Distributed Control System), in a DCS, the customers will directly face such equipment, which can intuitively display the on-site operation conditions and have its customers competent for controlling all on-site equipment only in the central control room, so that it could assure the operator's safety, and save cost greatly.

PLC

PLC(可编程逻辑控制器)是工业领域使用最广的智能控制单元，具有体积小，编程快速等优点。该控制单元以模块化形式融入到控制柜当中，能够方便的实现多种复杂的控制。

PLC(Programmable Logic Controller) as an intelligent control unit most widely used in the industrial field features such advantages as small size and rapid programming. This control unit integrated into the control cabinet in a modular form can easily achieve a variety of complex control.

ECS



ECS(专家控制系统)是公司自主研发，针对破磨设备的使用环境及流程设计出的控制系统，可适应多种恶劣环境；通过PID控制或者模糊控制可实现一键专家调试，简化了调试过程，提高了设备的使用效率。

ECS (Expert Control System), which developed by our company, is designed according to the working condition and process of crushers and grinding mills.It can adapt to various severe environment; moreover, it can also achieve one-key expert debugging by means of PID or fuzzy control, which has simplified the debugging process and thus improved the equipment use efficiency.

ECU

ECU(电子控制单元，也称为行车电脑)主要应用到公司移动式破碎站，适应野外工作环境，保证产品可靠运行。

ECU(Electronic Control Unit，also called Trip Computer)mainly applied to our company's mobile crushing stations can adapt to the field work environment and thus guarantee the product reliable operation.

04 多样的柜体 A Variety Of Cabinets

空调柜/Air-conditioning Cabinet

空调柜适用于多种恶劣环境，由于该类型电控柜自身已经装有冷暖空调，因此不用担心内部过热问题，也不用担心因为温度过低造成的器件性能问题，可直接使用于温度过高或过低的特殊地区。

The air-conditioning cabinets can be suitable for a variety of severe environment and such electrical control cabinets themselves are equipped with air-conditioning devices, so there is no need worrying about the internal overheating as well as device performance reduction due to extremely low temperature, and thus they can be directly used in such special areas subject to too high or too low temperature.

移动操作台/Mobile Control Console

该控制台可以在有效范围内随意移动，可以根据需求制作成带滚轮的移动台或者是更加便捷的操作盒，同时也可以制作成有线操作或无线连接等工作模式，更加方便操作。

This control console can move freely within its effective range, able to be made into a mobile station with rollers or more convenient operation box according to the actual demands, and also provided with wired or wireless work modes for more convenient operation.

Our Products
我们的产品

操作台/Control Console

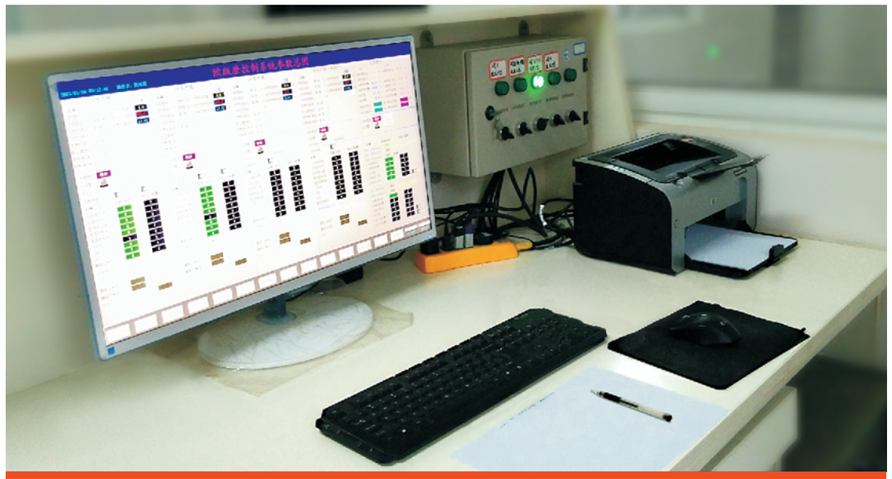
该操作台特殊的外形方便于操作人员在观察现场的同时对设备进行操作，同时其外观小巧，可以作为单独的操作平台。

The special appearance of this control console can facilitate operators' scene observation and equipment operation and at the same time, its small and exquisite appearance can be used as a separate operating platform.

连体柜/One-piece Cabinet

对于一些大型设备，设备功率大，控制系统复杂，这就需要连体柜将所有的控制与连锁关系集中起来进行控制，这样提高了安全性，同时也方便于检修。

Some large equipment characterized by high power and complex system control requires that a one-piece cabinet should be used to integrate all control and chain relationships to improve the security and simultaneously facilitate effective maintenance.



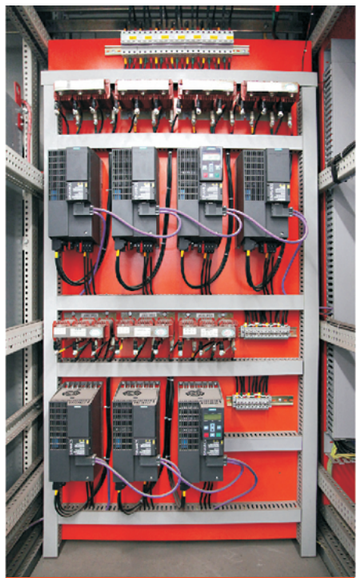
中控系统操作室 | Central Control System Operation Room

PLC智能控制柜 | PLC Intelligent Control Cabinet

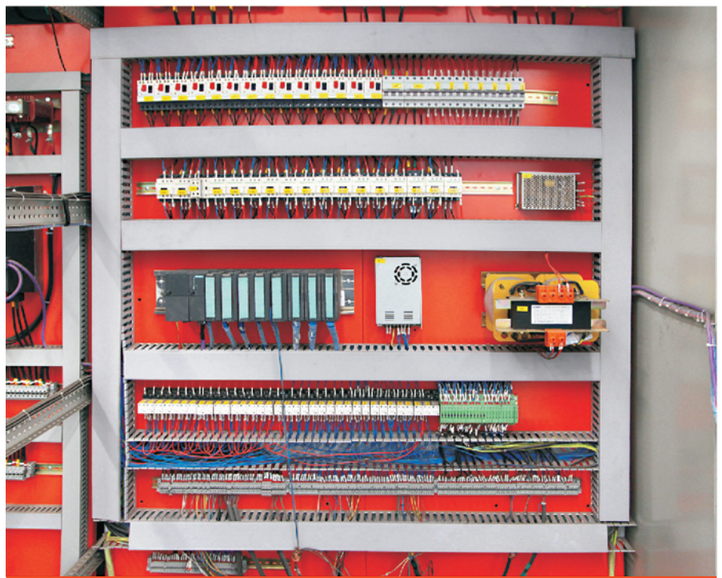
01 常规控制产品 Conventional Control Products

针对一些控制原理简单地设备，我们设计出了常规控制电气产品。常规控制针对电动机的启停、电机过载保护、电源缺相保护等进行设计，能满足这些设备的工作要求，同时又能保护这些设备的电机的运行安全。

For some equipment subject to a simple control principle, we have designed conventional electrical control products. Such conventional control products are designed targeting the start-stop, overload protection and power phase loss of motors, able to satisfy the working requirements of the equipment and simultaneously protect the operation safety of the equipment motors.

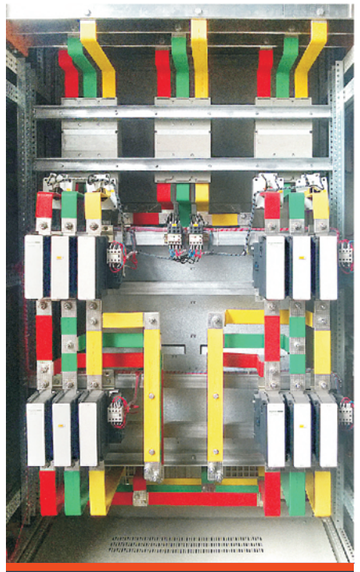


多变频器控制 | Control Of Multi-converter



控制器件 | Controlling Device

产品特点 / Product Features



磨机主机启动 | Mill Engine Startup

合理美观的器件布局。在设计电控柜过程中，设计人员会根据器件的功能及尺寸进行预放置，方案修改完善之后再进行制作，这样便能充分的考虑防干扰及空间利用率，使电控柜更加合理、安全。

Reasonable and beautiful device layout - In the process of designing the electric control cabinet, the designer will try laying it out in advance according to the device functions and size and then formally make it after the scheme has modified and improved in order to fully consider the interference prevention and space utilization, so that the electric control cabinet could be kept safer and more reasonable.

多种启动方式，合理选择。根据电动机功率以及电机负载情况灵活选用最合适的启动方式，减小了电机启动时对电网的冲击，同时也减轻了电机自身的损耗。常见的启动方式有变频启动（可调速）、软启动器启动、自耦降压启动、水阻启动、频敏变阻启动等。

软启动器 | Soft Starter

A variety of startup modes for reasonable choice - The most appropriate startup mode can be flexibly selected according to the motor power and load conditions, which has reduced the impact of the motor startup on the power grid and also lessened the loss of the motor itself. The common startup modes include variable frequency startup (with the speed adjustable), soft starter startup, self-coupling voltage step-down startup, water resistance startup and frequency-sensitive variable resistance startup, etc.

主要产品启动方式 / Main Product Startup Modes

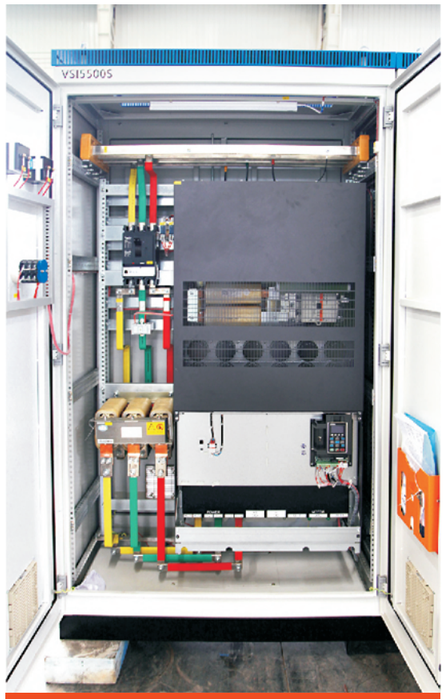
各系列破碎筛分产品启动方式（若有特殊要求可单独设计）

Modes for startup of various series crushing screening products (a separate design can be available for special requirements)

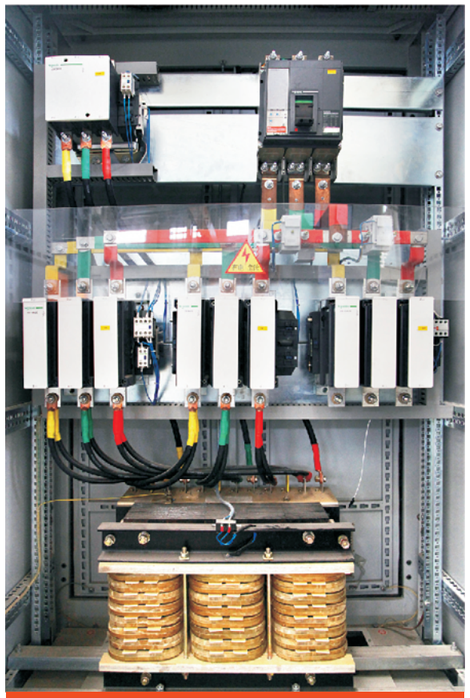
产品名称 Product Name	产品型号 Product Model	电机功率(kW) Motor Power (kw)	启动方式 Startup Mode
颚破 Jaw Crusher	PE250*400	15	直接启动 Direct Startup
	PE250*750	22	
	PE400*600	30	星三角启动 Star-delta Starting
	PE500*750	55	
	PE600*900	55/75	
	PE750*1060	90/110	自耦降压启动 Autotransformer Starting
	PE900*1200	132	频敏变阻启动★ Frequency-sensitive Variable Resistance Startup*
	PE1000*1200	132	
	PE1200*1500	200	
欧版颚破 European Style Jaw Crusher	PEW400*600	37	星三角启动 Star-delta Starting
	PEW200*1300	30	
	PEW250*1000	30	
	PEW250*1200	37	
	PEW760	110	自耦降压启动 Autotransformer Starting
	PEW860	132	
	PEW1100	185	
YZS圆振动筛 YZS Circular Vibrating Screen	全系列 Complete Series		直接启动（另可选变频控制） Direct Startup (with Frequency Conversion Control Optional)
振动给料机 Vibrating Feeder	全系列 Complete Series		
多缸圆锥破（HPT） Multi-cylinder Cone Crusher (HPT)	全系列 Complete Series		自耦降压启动 Autotransformer Starting
单缸圆锥破（HST） Single-cylinder Cone Crusher (HST)	全系列 Complete Series		
反击破 Impact Crusher	全系列 Complete Series		
欧版反击破 European Style Impact Crusher	全系列 Complete Series		
高能颚破 High-energy Jaw Crusher	全系列 Complete Series		
VSI制砂机 VSI Sand Maker	全系列 Complete Series		
VSI5X制砂机 VSI5X Sand Maker	全系列 Complete Series		

* **技术数据如果有变动，恕不另行通知**
Any change to the technical data shall be subject to no prior notice.

* **电机为绕线电机，启动方式采用频敏变阻启动**
The motors are wire wrapping ones, adopting the mode of frequency-sensitive variable resistance startup.



变频器启动 | Converter Startup


自耦降压启动 | Autotransformer Starting

圆锥破控制柜 | Electric Control Cabinet Of Cone Crusher


圆锥破控制柜 | Electric Control Cabinet Of Cone Crusher

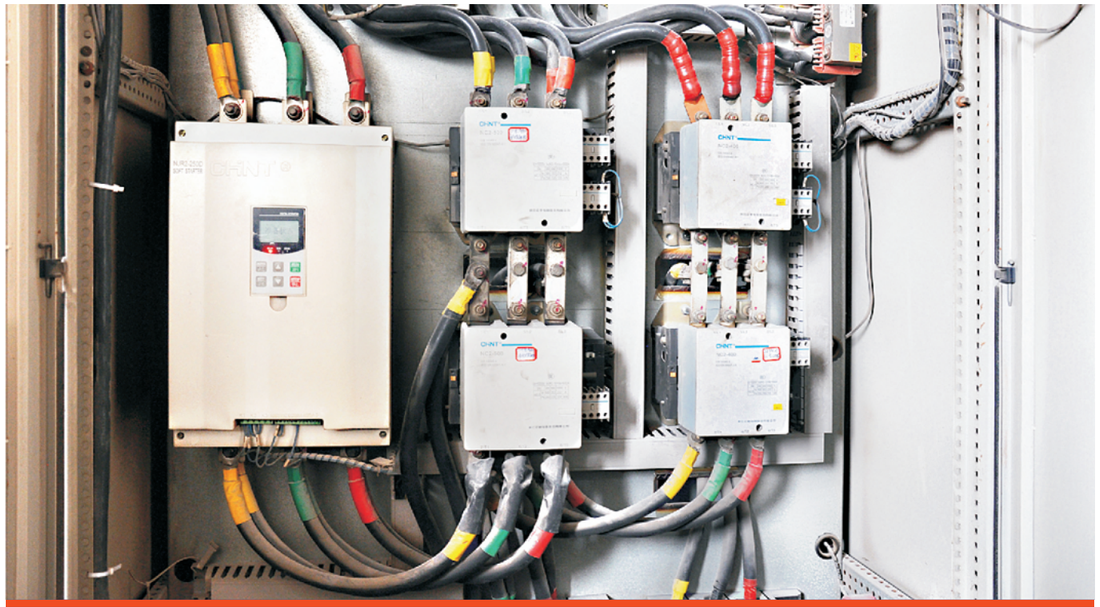
各系列磨机启动方式（若有特殊要求可单独设计）

Modes for startup of various series mills (a separate design can be available for special requirements)

产品名称 Product Name	产品型号 Product Model		电机功率(kW) Motor Power (kw)	启动方式 Startup Mode
MTW	100	主机 Main Engine	37	星三角启动 Star-delta Starting
		风机 Fan	37	
		选粉机 Powder Classifier	5.5	转速控制器 Speed Controller
	130	主机 Main Engine	75	星三角启动 Star-delta Starting
		风机 Fan	75	
		选粉机 Powder Classifier	7.5	转速控制器 Speed Controller
	160	主机 Main Engine	132	自耦降压启动 Autotransformer Starting
		风机 Fan	132	
		选粉机 Powder Classifier	18.5	转速控制器 Speed Controller
	110	主机 Main Engine	55	星三角启动 Star-delta Starting
		风机 Fan	55	
		选粉机 Powder Classifier	7.5	变频控制 Frequency Conversion Control
	138	主机 Main Engine	90	软启动器启动（一拖二） Soft Starter Startup (one In Two)
		风机 Fan	110	
		选粉机 Powder Classifier	22	变频控制 Frequency Conversion Control
	175	主机 Main Engine	160	软启动器启动（一拖二） Soft Starter Startup (one In Two)
		风机 Fan	200	
		选粉机 Powder Classifier	37	变频控制 Frequency Conversion Control
	215	主机 Main Engine	280	软启动器启动（一拖二） Soft Starter Startup (one In Two)
		风机 Fan	315	
		选粉机 Powder Classifier	90	变频控制 Frequency Conversion Control
立式磨粉机 Vertical Mill	全系列 Complete Series			软启动器启动（高压或低压） Soft Starter Startup (high Or Low Voltage)
SCM	全系列 Complete Series			星三角、软起、变频器可选 Star-delta Starting Or Soft Starter Startup Or Frequency Conversion Control

*** 技术数据如果有变动，恕不另行通知**

Any change to the technical data shall be subject to no prior notice.



软启动器启动（一拖二） | Soft Starter Startup (One In Two)

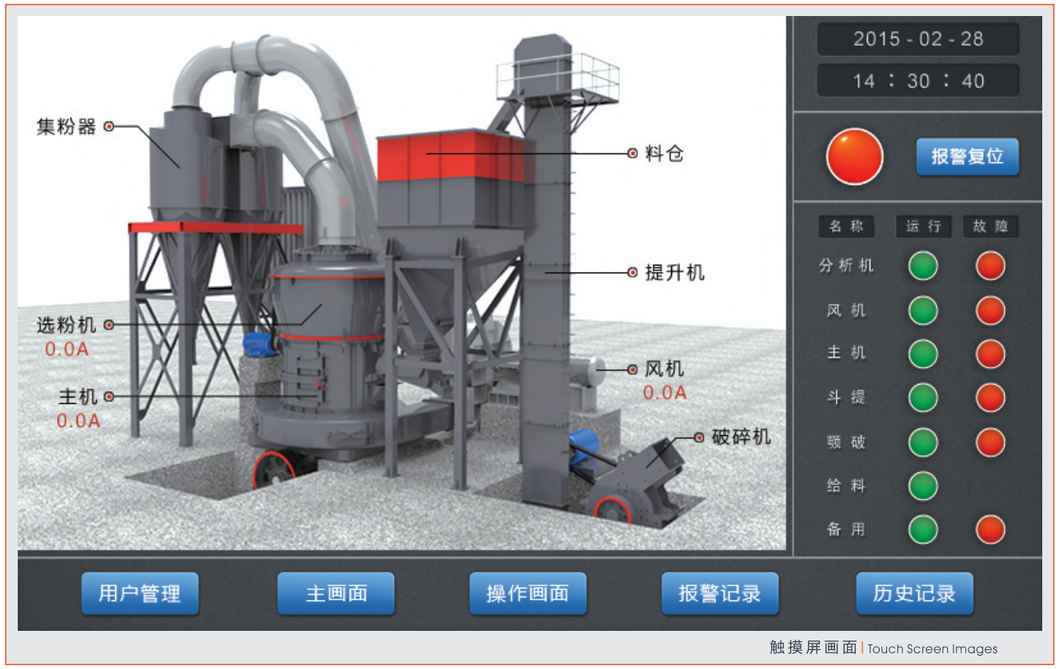
磨机控制柜 | Electric Control Cabinet Of Gringding Mills

02 智能控制产品 Intelligent Control Products

智能控制产品是我公司着力打造的控制产品，除了具备常规控制的所有功能之外，还添加了智能单元和触摸屏，提升了控制产品的智能性和可视化性，提高了人机交互的感受，简化了操作流程。

The intelligent control products are specially developed by our company, featuring all such features for conventional control and additional intelligence units and touch screens, which have promoted the intelligent controllability and visualization of the control products, improved the feeling of human-computer interaction and simplified the operation process.

产品特点 / Product Features



触摸屏画面 | Touch Screen Images

加入触摸屏，人机交互性加强
A Touch Screen Is Provided, Featuring Stronger Man-machine Interaction

触摸屏能显示设备的状态，操作人员能及时的从画面中观察到电机电流、温度及各报警信息，并能够查询历史记录，从历史记录中分析设备的运行状况。

The touch screen can show the equipment status, the operator can timely observe the motor current, temperature and alarm information from the screen images, query the history memory and analyze the equipment operation conditions from the history memory.

报 警 记 录 | Alarm Records

历 史 记 录 | History Memory

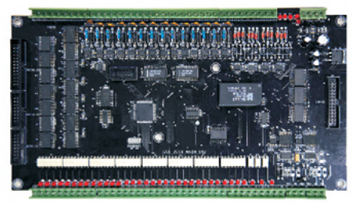
使用智能单元，控制更加精细
The intelligent unit makes the control more accurate

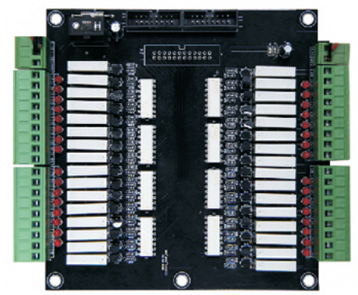
智能控制单元可以将保护、控制、调节等功能融合起来，使设备的生产可以根据工艺流程自动进行，同时可以实现远程控制。

Intelligent control unit combines protection, control and adjustment functions, which makes manufacture automatically proceeded, and makes remote control realized.

智能控制单元按照控制核心的不同分为**PLC控制单元**和**ECS控制单元**。

The intelligent control units can be divided into PLC and ECS control units in accordance with the control cores.

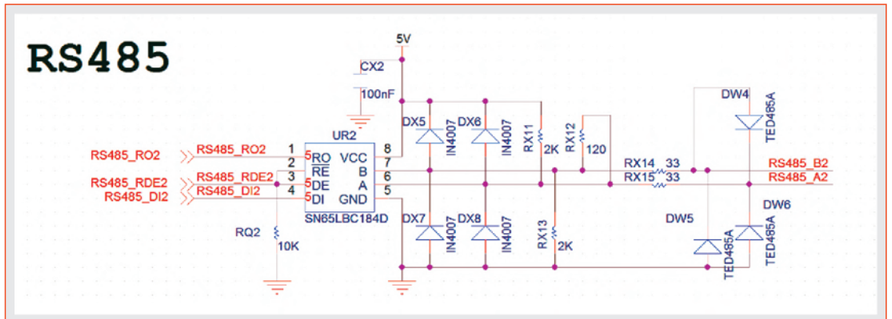




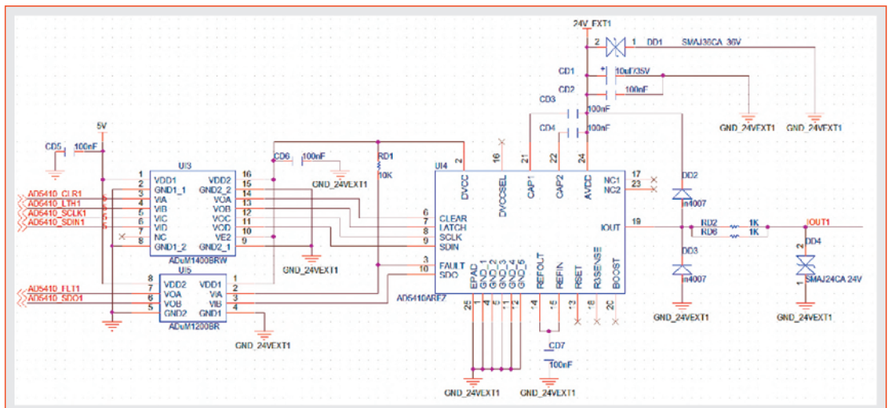
ECS控制单元 / ECS

ECS是公司自主开发设计的智能控制单元，具有如下特点：
1、程序中融入工艺流程和工程师调试思路，可实现一键专家调试和智能运行；
2、使用军工级电子元件，保证该系统高速运行、适应性强、安全可靠；
3、有针对的加入滤波电路，排除环境的干扰；
4、采用专门的给料控制器，提高给料稳定性；
5、拥有器件保护和程序保护，出现故障，自动按顺序停机；
6、预留升级维护接口，方便后期升级为中控系统，添加物联网功能；
7、采用PID控制或者模糊控制，提高控制的精度与及时性。

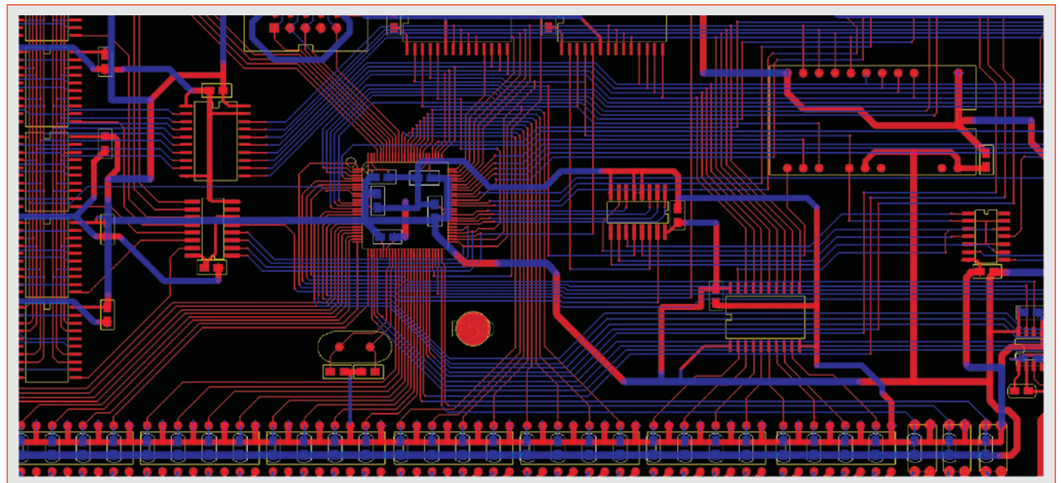
ECS is an intelligent control unit independently developed and designed by our company, able to achieve such features as follows:
1.The process flow and engineer's debugging thinking is integrated into the program, which can realize one-key expert debugging and intelligent operation;
2.The military-level electronic components are used to ensure high-speed operation, strong adaptability, as well as sufficient safety and reliability of the system;
3. A filter circuit is specially added to eliminate the environmental disturbance;
4. A special feeding controller is adopted to improve the feeding stability;
5.The device and program protection is provided to achieve automatic stop in sequence in case of malfunction;
6. An upgrade maintenance interface is reserved, so that it could be upgraded as a central control system, with the function of the Internet of things added.
7.The PID or fuzzy control is adopted to improve the control accuracy and timeliness.

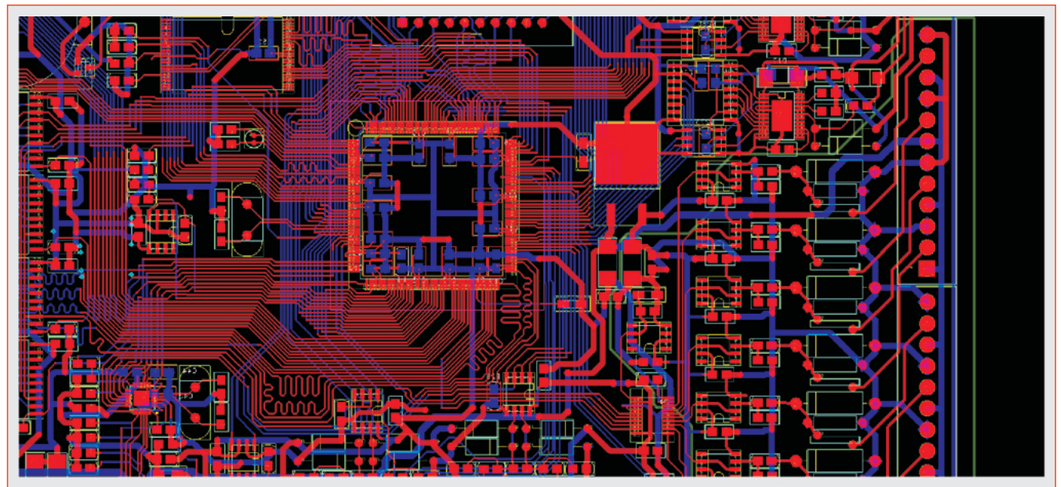


RS485通讯端口 | RS485 Communication Port



模拟量输出 | Analog Output


MCU


信号处理 | Signal Processing Circuit

该控制单元在信号采集与控制方面，均为自主设计，加入了多种抗干扰和滤波电路，同时采用军工级器件，保证该控制单元能够在多种复杂环境中使用，并保证了使用的可靠性与安全性。多路输入输出可以使系统的扩展升级更加方便。

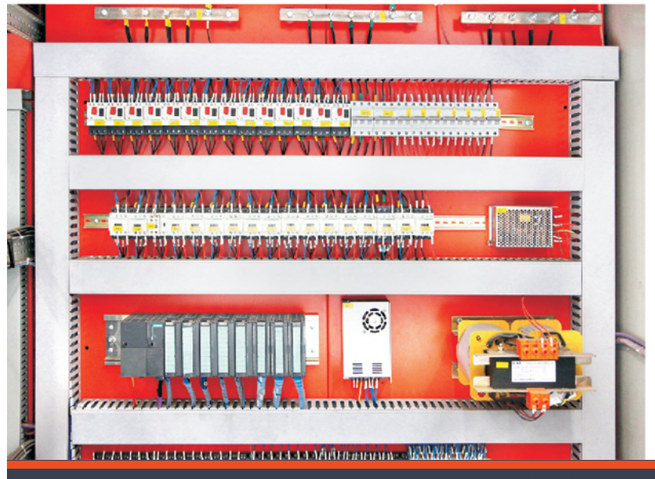
In terms of signal acquisition and control, this control unit is independently designed and provided with a variety of anti-interference and filter circuits, adopting the military-level devices at the same time to ensure that the control unit could be used in a variety of complex conditions and ensure the use reliability and safety. Its sufficient input and output interfaces can greatly facilitate the system extension and upgrade.

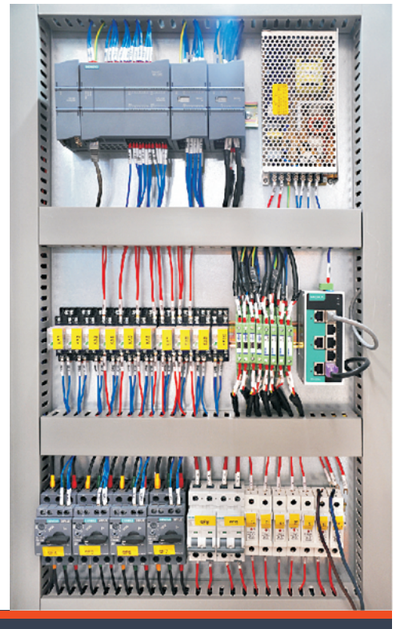
ECS控制单元主要参数 Main Parameters Of The Ecs Control Unit	
数字量输入（DI） Digital Input (DI)	光电隔离 Photoelectric Isolation
数字量输出（DO） Digital Output (DO)	光电隔离+继电器隔离 Photoelectric Isolation + Relay Isolation
模拟量输入（AI） Analog Input (AI)	12位高速AD转换 12-bit High-speed AD Conversion
模拟量输出（AO） Analog Output (AO)	变压器隔离的12位高速DA转换 12-bit High-speed DA Conversion Isolated By A Transformer
RS485通讯口 RS485 Communication Port	4接口，防雷击保护 4-interface, Protection Against Lightning Strike
工作温度 Working Temperature	-40℃-85℃

采用PLC控制单元的控制柜 / Control Cabinet With A PLC control unit adopted

PLC是工业领域使用最广泛的智能控制单元。
1、可靠性高，抗干扰能力强；
2、专用程序，严格遵循工艺流程；
3、模块化设计，方便维护及升级；
4、编程简单，设计周期短。

PLC is an intelligent control unit most widely used in the industrial field.
1.Higher reliability and stronger anti-interference ability;
2.Specific program, in strict accordance with the process flow;
3.The modular design can facilitate maintenance and upgrade;
4.Simpler programming and shorter design cycle





采用PLC控制单元的控制柜 | Control Cabinet With A PLC Control Unit Adopted

工作原理 / Working Principle

触摸屏与智能单元通过专用通讯线路连接，将操作指令传递给智能单元，智能单元控制相应的执行器件（继电器、接触器等）动作，从而控制电机的动作；运行时，电流、温度等信号传递给智能单元，处理后传递给触摸屏显示。

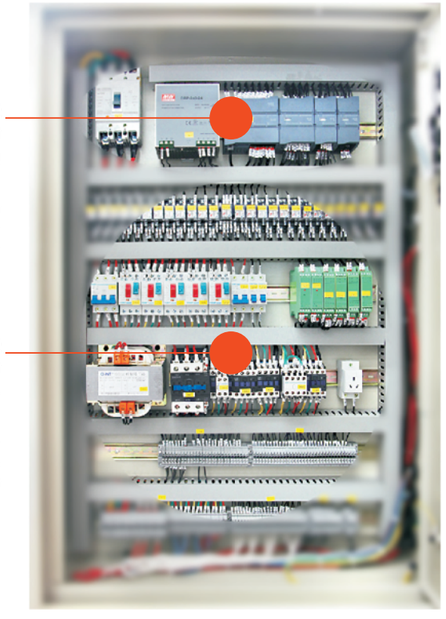
The touch screen is connected to the intelligent unit through a dedicated communication line and the operational orders can be transmitted to the intelligent unit, which will then control the corresponding actuators (such as relays and contactors) to act and consequently control the motor movement; during working, the current, temperature and other signals can be transmitted to the intelligent unit and then to the touch screen for display after processed.

产品结构 / Product Structure

智能控制产品由以下几个部分组成：操作单元、控制单元、执行单元。

The intelligent control product consists of such parts as: operating unit, control unit, execution unit.

操作单元
Operating Unit
主要指触摸屏和按钮部分，设备正常运行后，主要的操作和监视都在触摸屏上完成。
It mainly refers to the touch screen and buttons, and after the equipment has been in normal operation, the main operating and monitoring functions are to be completed on the touch screen.



控制单元
Control Unit
ECS或者PLC，主要负责处理现场传回的信号并发出动作命令。
ECS or PLC, mainly responsible for handling the signal fed back from the scene and give action commands.

执行单元
Execution Unit
控制柜内的强电元器件，接受控制单元的命令并执行动作。
The strong-current components in the control cabinet can receive commands from the control unit and perform the actions.

03 中控系统 Central Control System

中控系统是公司针对大型生产线或者有集中控制要求的客户开发的专用控制产品。中控系统实现了生产线的自动化、智能化和集中化，可满足客户的多种控制要求，实现设备的分散管理，集中控制。

The central control system is a special control product developed by our company for large production lines or such customers requiring centralized control. The central control system has realized automation, intelligentization and centralization of the production line, able to meet customers' various control requirements and achieve equipment decentralized management and centralized control.

产品特点 / Product Features

1、设备集中控制，远程操控，远程参数设置；
2、数据记录，历史查询，数据打印，开机时间记录，运行时间自动存储；
3、系统灵活，操作便捷，功能强大，资源共享，安全性能高；
4、强大的通讯功能，系统扩展功能，远程物联网控制，用户可随时随地查看设备状态；
5、设备运行自动化程度高，模糊控制，大大节省人工和材料的成本；
6、可实现监控可视化、生产线自动化、实现单独启停、一键启停、单控和联锁切换、自动判定运行故障、故障状况下自动停止相关设备；
7、后期可根据生产工艺的优化,快速的完成生产线升级改造。

1. Equipment centralized control, remote control, remote parameter settings.
2. Data records, history query, data printing, boot time records and automatic storage of running time.
3. Flexible system, convenient operation, powerful functions, sharable resources and high safety performance.
4. Strong communication function, function of system extension and remote IOT control - Users can view the device status anytime and anywhere.
5. A higher degree of automation and fuzzy control of the equipment operation can greatly reduce the labor and material costs.
6. It can realize monitoring visualization, production line automation, separate start-stop, one-key start-stop, switching of single control and interlocking, automatic judgment of the operation troubles and automatic shutdown of the related equipment in case of malfunctions.
7. Later, the production line can be quickly upgraded according to the optimization of the production technology.

工作原理 / Working Principle

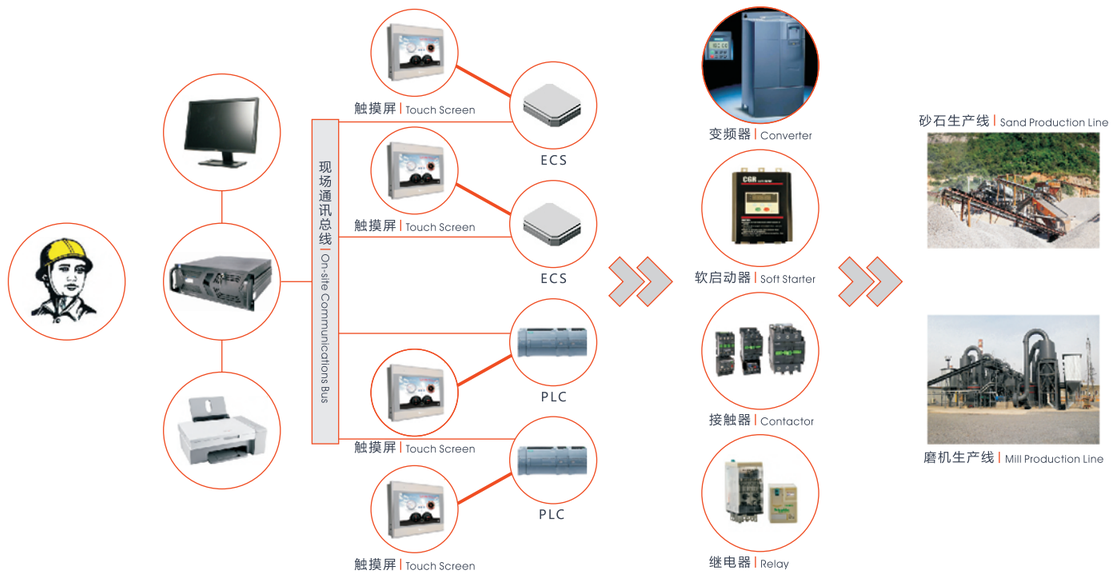
中控系统以工业计算机作为整个系统的核心单元，通过多种通讯技术来读取PLC（可编程控制器）或ECS(智能控制系统)，采集现场设备的状态，根据现场设备的状态，由计算机发出指令来控制现场的设备，由此实现设备的远程操控、设备信息的记录分析、打印机打印出设备的运行报告等功能。

The central control system uses an industrial computer as the core unit of the whole system, reading the PLC (Programmable Logic Controller) or ECS (Intelligent Control System) through a variety of communication technology, acquiring the status of the on-site devices and controlling the on-site equipment by means of the instructions from the computer according to its status, thus to realize such functions as the equipment remote control, records and analysis of the equipment information and printing of the report on equipment running on a printer.

产品结构 / Product Structure

中控系统主要由三大部分构成，分别为上位机、智能单元和执行单元。上位机部分是主要的操作单元，包括计算机、显示器、打印机和键盘鼠标；智能单元可以有两种选择：PLC和ECS,该单元是设备的信息搜集（结合传感器）和控制端；执行单元为主要的动作端，该部分的动作与否决定了设备是否运行。这三大部分共同工作，用于控制各类生产现场。

The central control system mainly consists of such three parts as a host computer, an intelligent unit and an execution unit. The host computer as a major operating unit includes a computer, a monitor, a printer, a keyboard and a mouse; the intelligent unit can have two options: PLC and ECS and this unit acts as the equipment information collection (based on sensors) and control terminal; the execution unit serves as the main action terminal, which acts or not will decide whether the equipment works or not. Such three major parts can work together to control all kinds of production sites.

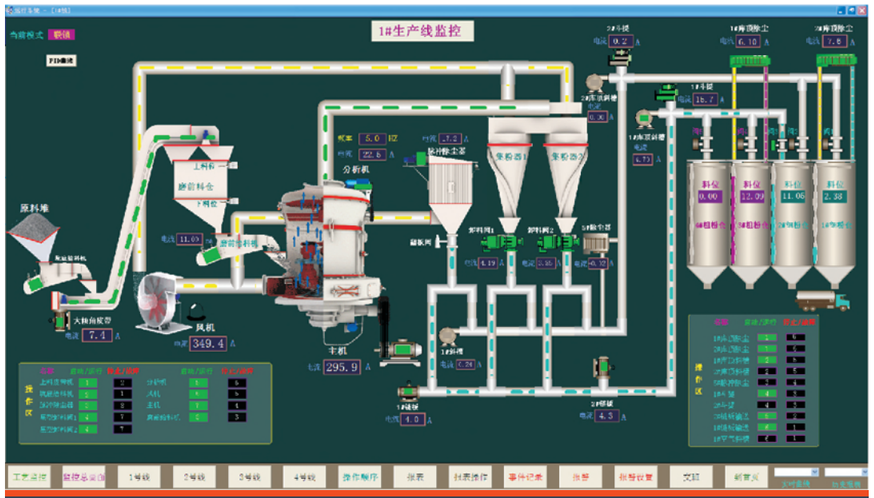


Case Of
A Central Control System
中控系统案例

该中控系统控制多条磨粉机生产线及其公共设备。工业计算机放置在控制室，将设备的操作与现场的设备隔离开，保障安全的同时也方便操作人员进行操作，智能控制柜采用ECS控制单元。

This central control system can control several mill production lines and their public facilities. The industrial computer placed in the control room can isolate the equipment operation from the on-site equipment, able to guarantee sufficient security and facilitate operators' work, and moreover, the intelligent control cabinet adopts an ECS control unit.

国内某中控系统项目 | Certain Domestic Central Control System Project



▲ 生产线主画面。显示各个设备的运行状况及电流信息。

This picture shows the main production line, as well as the operation conditions and current information of each device.

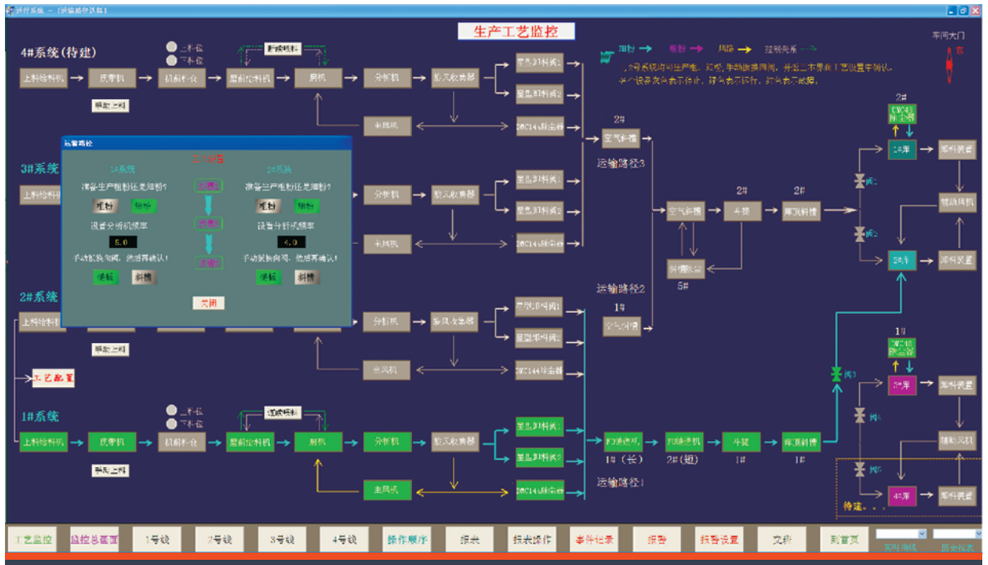
▲ 参数总图界面。生产线中的各个参数的查看及设置在该界面进行。

This picture shows the interface of the parameter general drawing. On this interface, various parameters in a production line can be easily viewed and set.

砂石线某中控系统项目 | Certain Central Control System Project For A Sand Production Line

该项目是典型的的砂石生产线中控项目。将所有设备的操作均集成在工业计算机上，并对主要设备设立单独的界面，方便重点监控，更有利于生产线的稳定运行。

This project involves in a central control project of a typical sand production line. The operations of all equipment are integrated in the industrial computer, with a separate interface set up for the main equipment to facilitate key monitoring and be more conducive to the stable operation of the production line.

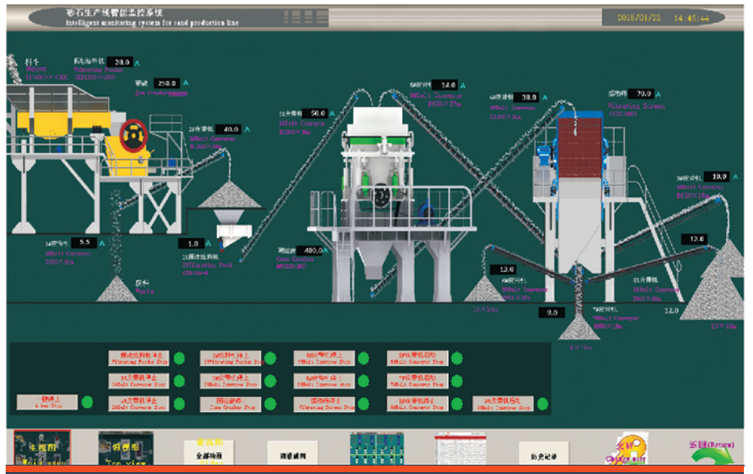


▲ **工艺监控界面。设置所需的工艺配置并显示当前阶段的工艺配置。**

This picture shows the process monitoring interface. The required process configurations can be set, with the current process configurations displayed.

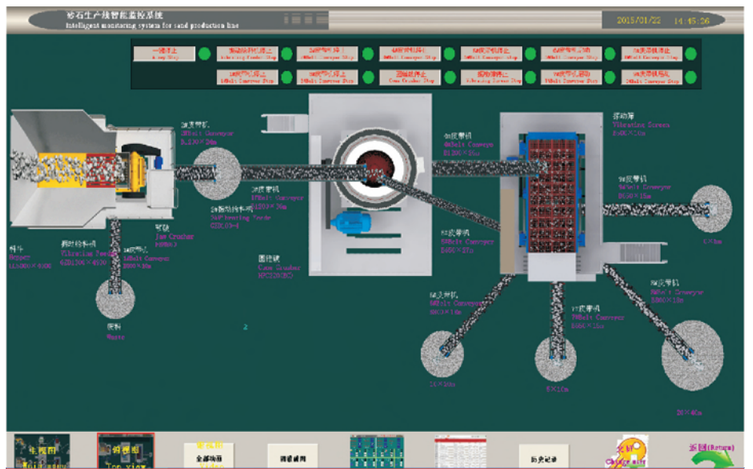
▲ **报表界面。该界面可将生产线的主要参数按时间顺序生成表格，连接打印机后可打印出来，方便查看。**

This picture shows a report interface. The main parameters of a production line can be included in a form on this interface in a chronological order and the form can printed out if a printer is connected to facilitate viewing.



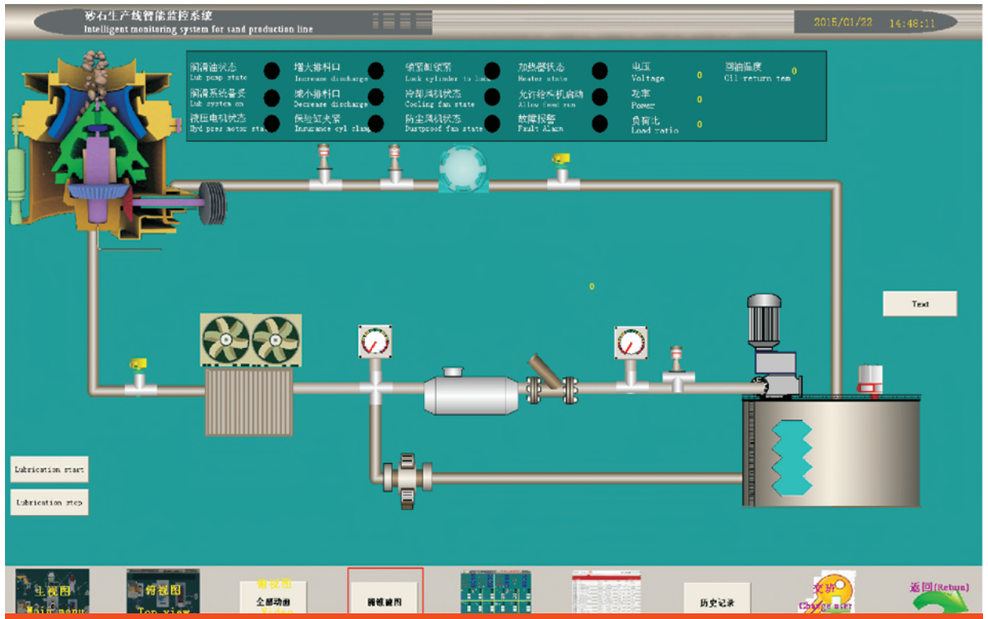
▲ **设备主视图界面。显示所有设备的工作状态并显示工作电流。**

Equipment front view interface – It displays the working conditions and working current of all equipment.



▲ **设备腐蚀图界面。将主视图中不能直观显示的设备显示出来，方便监控整个生产流程。**

Equipment corrosion diagram interface – It can display such equipment impossible to be visually displayed in the front view to facilitate monitoring of the whole production process.



▲ 圆锥破运行界面。显示圆锥破整体的工作状态，包括主机，油站及液压站。

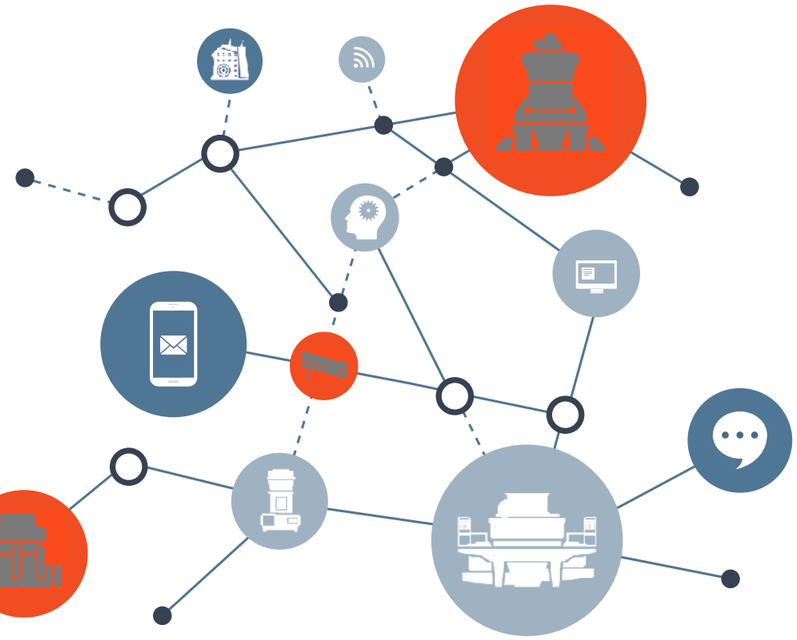
Cone crusher operation interface – It can display the overall working status of the cone crusher, including the main engine, oil station and hydraulic station.

▲ 设备操作界面。所有设备的启停操作均在该界面进行，并显示设备的运行状态。

Equipment operation interface - All equipment start-stop operations are completed on this interface and the running state of the equipment can also be displayed.

Our Internet Of Things (IOT) And Internet Of Vehicles (IOV)

我们的物联网与车联网

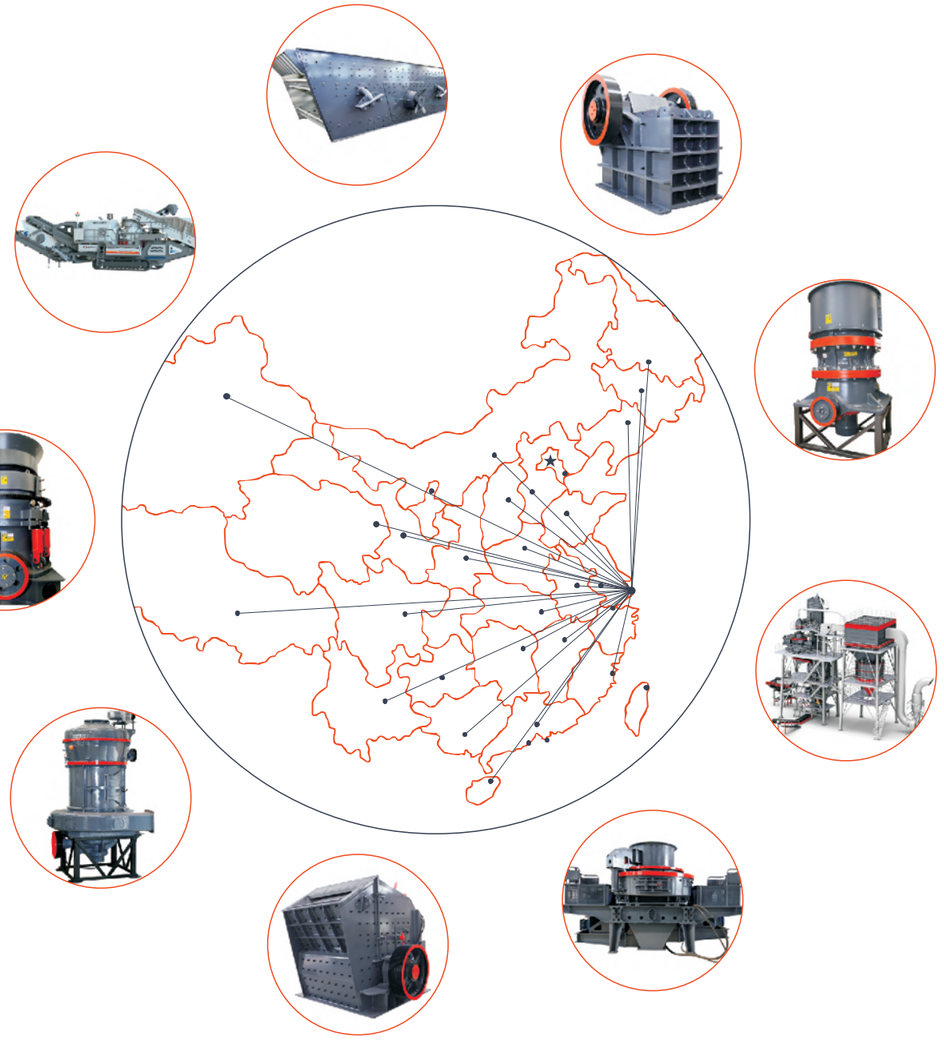


物联网可以让所有设备融入到网络当中，无论你身在何地，只要你有一台能上网的设备，你就能随时查看设备的运行情况，并能查阅历史记录；如果你的设备是移动站，你甚至能随时对该设备进行定位。

如果您购买了我们的设备，我们将给您提供即时预警服务，当您的设备出现故障时，我们将及时通知相关人员停机检修，如果需要我们可以提供远程服务，指导维修。

The IOT can make all equipment integrated into the network, no matter where you are, you can check the equipment operation conditions and the history records at any time as long as you have a device that can be connected to the Internet; if your device is a mobile plant, you can even locate it at any time.

If you buy our equipment, we will provide you with instant warning services, when your equipment has failed, we will promptly notify the relevant personnel to shut down for troubleshooting, and if necessary, we can provide remote services to instruct your maintenance operations.

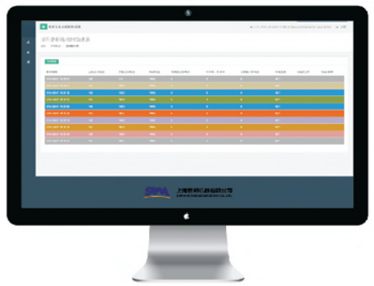


各地现场 | Various Local Sites

数据管理中心 | Data Management Center

Network

微信公众平台 | Wechat Public Platform



网页查询 | Web Query

移动端APP | Mobile APP