

烟气脱硫自动化控制系统解决方案 Flue Gas Desulfurization Automation Control System Solution

系统解决方案介绍

本系统提供的钢铁厂、火电厂烟气脱硫自动化控制系统解决方案与配套厂家提供的烟气脱硫工艺（湿法、干法、半干法）相结合可组成完整的脱硫软硬件系统，可满足钢铁企业烧结机烟气脱硫和火电厂锅炉烟气脱硫工艺的自动化控制要求。该控制系统配置灵活、功能完备、上位机画面可定制，能与配套厂家提供的烟气脱硫工艺（湿法、干法、半干法）形成整套脱硫系统。同时该系统加入了本公司自主研发的优化算法，能最大程度的起到节能降耗、减少设备维护费用、降低运行成本的作用。

系统方案组成

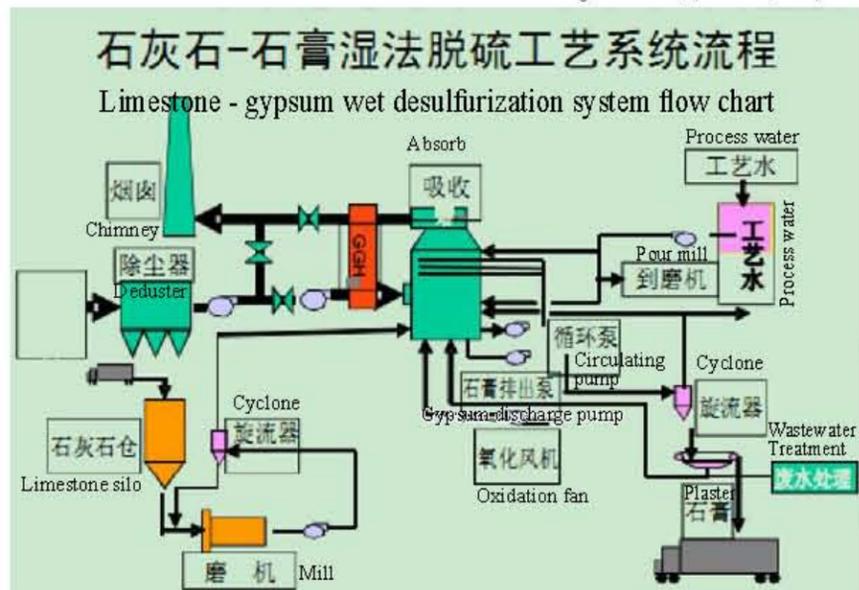
1. 根据脱硫工艺流程的特点，本公司提供的脱硫自动化控制系统一般包括烟气输送及调温系统、吸收塔系统、吸收剂制备供应系统、二氧化硫吸收和氧化系统、副产品处理系统以及废水处理系统，具体工程的脱硫系统因条件不同，其组成也略有差异。
2. 本系统提供的脱硫工艺配套自动化控制系统的硬件一般包含高低压控制柜、PLC 控制柜、工控机、脱硫工艺相关仪表及执行机构。系统上位机软件包含用户登录模块、吸收塔的压力、温度、液位、PH 值、进口烟气和出口烟气的 SO₂、NO_x、O₂ 含量及附属设备的数据显示模块、远程控制模块、智能算法控制模块、查询和打印模块等。

Introduction of System Solution

Steel plant, thermal power plant FGD automation control system solution provided by the system and flue gas desulfurization process (wet, dry, semi-dry) provided by the supporting manufacturer can be combined to form a complete desulfurization hardware and software system, which can meet automation control requirements of sintering machine flue gas desulphurization of steel enterprises and boiler flue gas desulfurization process of thermal power plants. With flexible configuration, complete functions and customized PC screen, the control system and flue gas desulfurization process (wet, dry, semi-dry) provided by the supporting manufacturer can form the complete desulfurization system. Meanwhile, introducing the optimization algorithm developed by our company, the system can save energy consumption, reduce equipment maintenance costs, reduce the operating costs to the greatest degree.

System Composition

1. According to the characteristics of the desulfurization process, the desulfurization automation control system provided by the Company generally include flue gas delivery system and thermostat system, absorber system, absorbent preparation supply system, sulfur dioxide absorption and oxidation system, byproduct processing systems and wastewater treatment system. For concrete projects, the desulfurization system is slightly different in composition due to different conditions.
2. Hardware of desulfurization process automation and control system provided by the system generally comprises high and low voltage control cabinet, PLC control cabinet, IPC, desulfurization process-related instruments and actuators. The system PC software contains the user login module, pressure, temperature, level, PH value, inlet and outlet smoke fumes SO₂, NO_x, O₂ content of absorber and data display module, remote control module, intelligent algorithm control module, query and print module and so on of ancillary equipment.



系统功能

1. 整个脱硫自控控制系统采用了管理级、控制级和过程级三层网络结构，其中包括数据采集和处理、模拟量控制、顺序控制以及保护连锁、报警等功能。
2. 过程级控制主要采用 PLC 和执行机构（电动调节阀、变频器）控制生产过程，另外采用智能仪表采集现场压力、温度、流量等各项数据。系统正常运行时，采用闭环控制，系统根据设定值和实测值的差值实现自动控制，使被控量自动稳定于设定值；当自动控制系统发生异常时，可由现场操作人员直接对调节阀、变频器等执行机构进行操作，即通过手动控制以确保整个系统的安全、稳定、有效运行。
3. 监控级运行可实现实时数据采集和控制软件（监控组态软件）完成烟气脱硫系统监控与管理。监控范围包括：现场控制设备的启停操作及运行状态；脱硫控制系统的动态参数；脱硫除尘后烟气中烟尘、SO₂ 排放浓度。整个系统功能范围内的全部报警项目可在显示器上显示并可在打印机上打印。
4. 烟气脱硫技术主要利用各种碱性吸收剂吸收烟气中的 SO₂，将其转化为较稳定且易机械分离的硫化物，从而达到脱硫目的。北京科慧德公司根据客户要求提供多样化脱硫工艺控制系统，其中石灰石-石膏法脱硫是比较经济实用并且具有良好市场前景的一种脱硫方式，不仅工艺成熟，脱硫效率高而且稳定，具有系统简单、脱硫成本低，运行可靠，所产生的最终固态产物易于处理等优点。
5. 本脱硫自控控制系统可实现液位自动控制、pH 值的智能调节、排灰浆精准控制等功能，有效提升脱硫效率，同时使 SO₂ 的排放要求达到国家环保标准。每个仪器仪表在上位机软件中都设有历史曲线趋势方便直观对比，各设备在历史报表里都会有历史记录，提供查询和打印功能。

System Features

1. The whole desulfurization automation control system is featured by management level, control level and process-level three-tier network architecture, including data collection and processing, analog control, sequence control, as well as protection chain, alarm function, etc.
2. Process-level control mainly control the production process using PLC and actuators (electric control valve, inverter), and additionally collect site pressure, temperature, flow and other data with smart meter. During normal operation of the system, closed-loop control is used, the system achieved automatic control based on the difference between the set value and the measured value to allow the controlled amount to be automatically stabilized at the set value; where the automatic control system abnormality occurs, the site operators can directly operate the control valve, inverter and other actuators, that is, to ensure the safety, stability and effective operation of the entire system by manual control.
3. Monitor level operating can achieve monitoring and management of the flue gas desulfurization system using the real-time data acquisition and control software (monitoring configuration software). Monitoring scope includes: start and stop operation and operating status of on-site control equipment; dynamic parameters of the desulfurization control system; soot, SO₂ emission concentration in the flue gas after desulfurization and dedusting. All alarm items in the scope of the entire system can be displayed on the display and can be printed on the printer.
4. Flue gas desulphurization technology mainly absorbs SO₂ in flue gas by a variety of utilizing alkaline absorbent and converts it into a more stable and easy to mechanically separated sulfur compounds, so as to achieve the purpose of desulfurization. Beijing Creid Automation Technology Co., Ltd. provides diversified desulfurization process control systems according to customer requirements. Among these desulfurization process control systems, limestone-gypsum desulfurization is more economical and practical and is a desulfurization way having a good market prospect, featuring in mature technology, high desulfurization efficiency and stability, simple system, Low cost of desulfurization, reliable operation and ultimately produced solid product easy to handle, etc.
5. The desulfurization automatic control system can achieve automatic control of liquid level, intelligent adjusting of pH value, precise control of mortar platoon and other functions, which can effectively enhance the desulfurization efficiency, and allow emission of SO₂ to meet the national environmental standards. Each instrument has a convenient and intuitive contrast of historical trend curve in the PC software. Each device will have previous records in historical reports, providing query and print function.