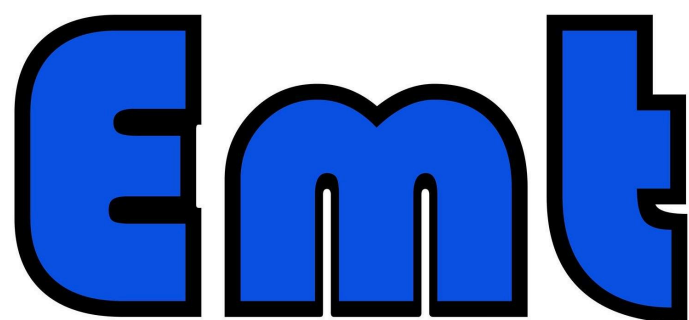




PRODUCTS OVERVIEW
产品总览



Experts At Monitoring Management And Control Integration Of Equipment Corrosion

设备腐蚀监、管、控一体化专家

Optimal Choice For Equipment Corrosion Monitoring

设备腐蚀监测的最佳选择

OUTLINE OF CORROSION MONITORING PRODUCTS

腐蚀监测产品总览

- ▶ 腐蚀管理平台
Corrosion management platform
- ▶ 集成式腐蚀在线监测系统
Integrated online corrosion monitoring system
- ▶ 自补偿精密电感腐蚀在线监测系统
Online self-compensation inductance corrosion monitoring system
- ▶ 电化学腐蚀在线监测系统
Online electrochemical corrosion monitoring system
- ▶ 电阻腐蚀在线监测系统
Online electrical resistance corrosion monitoring system
- ▶ pH电极自动清洗保养系统
Automatic cleaning and maintaining system for pH electrode
- ▶ pH值腐蚀在线监测系统
Online pH value corrosion monitoring system
- ▶ pH值注剂自动控制系统
Automatic pH injection control system
- ▶ 挂片腐蚀监测系统
Coupon corrosion monitoring system
- ▶ 腐蚀监测仪器仪表
Corrosion monitoring instruments

**Corrosion
Management Platform**
腐蚀管理平台

E m t

Corrosion Management Platform

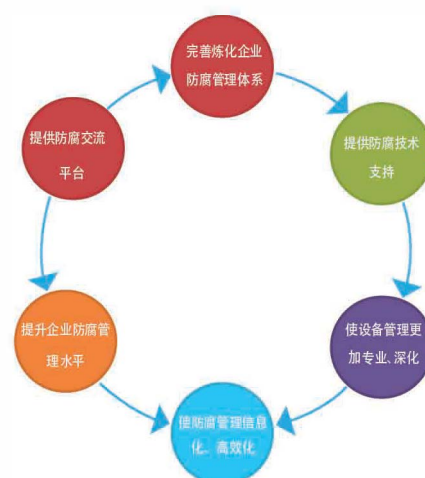
腐蚀管理平台

Corrosion Management Platform

腐蚀管理平台

腐蚀管理平台是针对目前炼化企业防腐管理现状，结合多年腐蚀监测及防腐综合管理工作经验，并广泛开展设备腐蚀调研工作，集合了炼油工艺及设备、腐蚀与防护、软件开发、安全管理等知识，以及多位防腐专家的工作意见，打造出的一款信息全面，实用性较强的防腐综合管理系统。

Corrosion management platform is an integrated anti-corrosion management system which includes comprehensive information and be practical. According to the rich experience of corrosion monitoring and testing and integrated anti-corrosion management, the system combines rich knowledge including the refinery technology and plants, corrosion and protection, software development and safety management after the widely plants investigation.



6 Subsystems

28 Function Modules

6大子系统，28个功能模块

- 1.全面覆盖炼化企业腐蚀与防护工作模块，使业务管理更加顺畅；
- 2.融合多种腐蚀评估与预测模型，更准确的预测腐蚀状况的发展；
- 3.强大的腐蚀数据库支撑，使信息获取更加简便、快捷；
- 4.提供广阔的信息交流平台，有助于提高企业防腐专业技术水平；

- 1.Cover all of refinery corrosion and protection module, make the management smoothly.
- 2.Combine several corrosion evaluation and prediction modules to predict corrosion condition changes exactly.
- 3.Powerful corrosion database makes the information acquisition convenient and rapid.
- 4.Divide widely information change platform to improve the enterprise's corrosion technology level.



Subsystem Function Introduction

部分子系统功能介绍

► Online Corrosion Monitoring System

在线腐蚀监测管理系统

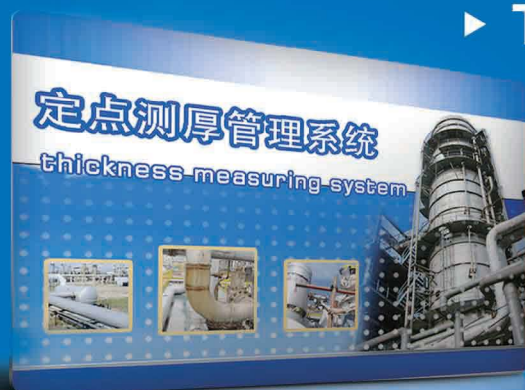
腐蚀在线监测管理系统是对在线监测数据进行显示和分析的专用管理系统，能够实现与硬件设备（数据采集器）稳定的时时通讯，接收检测准确数据，作为腐蚀在线监测分析的基础数据。根据探针针对管道及装置设备的在线腐蚀监测，能够实时提供相应装置(管道)的腐蚀分析曲线及相关的动态监测数据，从而达到对管道及设备的腐蚀监测。

On-line Corrosion Monitoring Management System, as the dedicated management system for display and analysis of on-line monitoring data, can achieve stable real-time communication with hardware (data collectors), receive and inspect accurate data as basic data for on-line monitoring and analysis. Based on the corrosion on-line monitoring by means of probes in pipelines and devices, it can constantly provide the corrosion analytic curve of relevant devices (pipelines) as well as the relevant dynamic monitoring data so as to accomplish corrosion monitoring of pipelines and devices.



► Thickness Measuring System

定点测厚管理系统



定点测厚管理系统主要是通过客户定期对设备及管道壁厚进行测量，并将相应的测量数据通过录入界面进行保存，作为提供基础的分析数据，由分析软件生成曲线分析，报警提示等直观界面，达到定时(定期)掌握设备及管道腐蚀情况。

The thickness measurement management system of fixed points is the system under which the regular measurement of devices and thickness of pipelines is conducted by customers, and the ensuing measurement data is preserved via the input interface

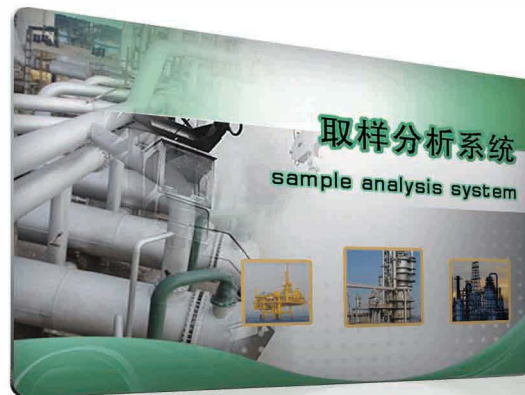
to provide basic analytic data for the analytic software to generate analytic curves and intuitive interfaces such as alarm presentation, which helps acquire the information on corrosion of devices and pipelines in time-fixed (at regular intervals).

► Sample Analysis System

取样分析系统

取样分析管理子系统主要是将特定设备所需分析各项项目(化学项目)含有的化学成份比例, 录入到取样分析数据库中,通过用户选择相应设备的指定分析项目, 能够生成对应的曲线分析图表,提供查询功能, 同时各项设备装置信息及对应的取样化学项目能够进行增、删、改等操作。

Sample analysis is an important part of the equipment corrosion management. The corrosion information of devices can be indirectly obtained through analysis and inspection of a medium. The sample analysis management system generally inputs chemical composition proportions needed by special devices for analysis of a variety of items (chemical items) into the database of sample analysis. Diagrams of curve analysis and the function of inquiry can be generated by the customers' selection of specific analysis items by corresponding devices. Meanwhile the corresponding items of chemical sampling along with the information of all of the related devices can be added, deleted, or changed.



The Integrated Online Corrosion Monitoring System

集成式腐蚀在线监测系统

腐蚀监测技术就是利用专业的腐蚀监测仪器工具和科学的分析方法，通过确定材料在工艺介质环境中的腐蚀速度，及时为工程技术人员反馈设备腐蚀信息，从而采取有效措施减缓腐蚀，避免腐蚀事故的发生。腐蚀在线监测技术初期主要为电阻监测手段，随着技术的不断进步，先后出现了电化学测量手段，电感测量手段等。根据不同的监测目的和现场环境要求，可选择不同的监测方法，我公司ZKG901集成式腐蚀在线监测系统即融合了电感腐蚀监测、电化学腐蚀监测、pH值监测，以及电阻腐蚀监测等多种监测手段，用以满足用户日益增长的防腐需求。

The integrated online corrosion monitoring system is a comprehensive corrosion monitoring system integrating the inductance corrosion monitoring, electrical resistance corrosion monitoring, electrochemical corrosion monitoring, pH value monitoring and other methods.

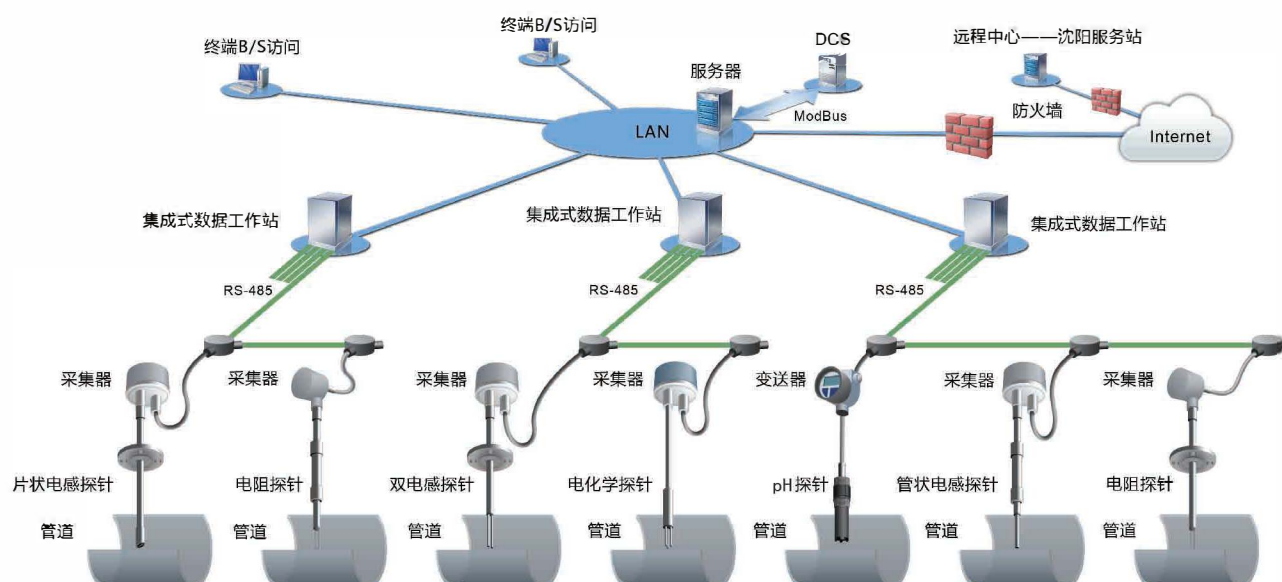
技术优势

- 多种长寿命探针设计（0.25mm, 0.5mm, 0.75mm等），一般可满足工业现场4年大修周期的需求；
- 采用双重自补偿技术，在理论自补偿的基础上，通过增设实时温度测量手段，使腐蚀速率的测量数据更加准确；
- 采用独特探针和电路设计，有效消除现场电磁干扰，提高系统数据测量精度及准确性；
- 采用新型的数据工作站，实现现场数据采集、存储，及网络传输功能，简化系统结构，减少安装成本；
- 实施断网保护，提高数据安全性，具备长达30天的断网存储功能；
- 全新的云计算数据处理技术，大幅度提高数据处理速度。

System Features

- A variety of time proof probe design (0.25mm, 0.5mm, 0.75mm, etc.), generally meeting the needs of four-year overhaul cycle in the industrial field;
- On the basis of the theory of self-compensation and through the addition of real-time temperature measurements, adoption of double self-compensation technique makes measurement data of corrosion rate more accurate;
- Adoption of unique probe and circuit design effectively eliminates the field electromagnetic interference and thus improves the measurement precision and accuracy of system data;
- Adoption of new data workstations to achieve field data collection, storage, and network transport functions simplifies the system structure and reduces the installation costs;
- Implementation of network breaking protection improves data security, with network breaking storage capabilities up to 30 days;
- Brand new cloud computing data processing technology significantly improves the speed of data processing and other resources.

► System Structure 系统构成



► Data Management and Analysis 数据管理与分析

集成式腐蚀在线监测系统的数据管理与分析均通过终端B/S软件来实现。腐蚀监测数据管理系统可以进行任何数目的电感监测、电化学监测、pH值监测，以及电阻监测数据的管理、显示和分析。数据管理系统具有如下特点：

- 腐蚀监测数据的全方位管理，适用于多数监测方法数据的管理和分析；
- 系统功能全面，腐蚀趋势显现直观，数据对比简便灵活；
- 具有分布性特点，可以随时随地进行查询、浏览等业务处理；
- 维护简单方便。

By the B/S software, corrosion monitoring data management system can manage, display and analyze the inductance monitoring, electrochemical monitoring and pH monitoring data:

- Be suitable for the data management and analysis of many monitoring methods;
- Comprehensive function, intuitive corrosion trends, convenient data comparison;
- The data can be queried and browsed any time;
- Maintain simply and conveniently.

The image shows an industrial facility, likely a refinery or chemical plant, with various pipes, valves, and storage tanks in the background. In the foreground, a specific piece of equipment is highlighted: a vertical stainless steel pipe assembly. At the top of this assembly is a cylindrical sensor unit with a label that includes the word 'Индукция' (Induction) and other technical specifications. A green braided hose is connected to the side of the pipe. To the right, a yellow safety railing is visible. The bottom of the image features a blue gradient overlay containing the product name in English and Chinese.

**Inductance Online
Corrosion Monitoring System**
自补偿精密电感腐蚀监测系统

ZK9800 Inductance Online Corrosion Monitoring System

ZK9800自补偿精密电感腐蚀监测系统

电感腐蚀监测产品是目前应用最广泛的在线监测系统产品，电感探针的测量原理是电磁感应原理，是以测量金属腐蚀损失为基础，通过测量腐蚀试片腐蚀减薄引起的交流信号改变来计算腐蚀损耗速度。

Based on measuring corrosion loss of metal, the self-compensatory precision on-line inductance corrosion monitoring system can calculate corrosion loss rate by measuring changes of AC signals caused by the thickness reduction of corrosion sample. The system features high sensitivity, quick response, strong anti-disturbing capacity and extensive application. It is extensively and successfully applied nationwide at present. By applying the same theory, measuring sample may be made in tubular, sheet and various shapes to adapt to various application view angles.

Technical Characters

技术特点

- 适合任意的介质环境，包括高酸高硫等环境
- 分辨率高
- 响应速度快
- 测量精度高
- 抗干扰能力强
- 对轻微腐蚀系统或几乎无腐蚀系统也能进行快速的检测



- Indirect corrosion measurement: pipeline corrosion rate caused by medium can be indirectly reflected by element corrosion rate, which is calculated according to the accumulation of thickness reduction by corrosion over a period of time;
- Irrelevant to the corrosion system: it can measure liquid phase corrosion and gas phase corrosion, and can be applied to the electrolyte corrosion system and nonelectrolyte corrosion system;
- It is a comparatively universally used online corrosion monitoring method with strong anti-disturbing capacity by applying AC signals as measuring signals;
- It integrates tubular detector and probe body in term of welding with high temperature setting glue filled inside and stronger resistances to pitting corrosion, water rushing and pressure than wire resistance probe.



Key Components

系统核心构件

► Data Collector of Self-compensatory Precision Inductance Probe

自补偿精密电感数据采集器

- 数据采集，数据变送，自带7天的断网存储功能；
- 自带测温功能，监测腐蚀同时可测量介质温度；
- 具备RS485和4-20mA两种数据传输方式。
- Data collection and data transmission , with network breaking storage capabilities up to 7 days;
- Monitoring corrosion, in the meanwhile, measuring temperature;
- With RS485 and 4-20mA data transmission methods.

Technical Parameters

技术参数

- 数据采集间隔: ≥ 1 min (可自行设定)
- 工作电压: 12~36VDC
- 仪器功耗: 0.5W
- 环境温度: $-25^{\circ}\text{C} \sim +55^{\circ}\text{C}$
- 防爆类型: 本安、隔爆
- 防护等级: IP65
- Interval of date acquisition: ≥ 1 min (customizable)
- Working voltage : 12~36VDC
- Power consumption of the instrument : 0.5W
- Ambient temperature : $-25^{\circ}\text{C} \sim +55^{\circ}\text{C}$
- Explosion-proof type : Intrinsic safe、Flameproof
- Protection class : IP65



产品型号 Model:
ZK9800/9810/9820

Products Series Search

产品系列检索

产品系列 series	温度测量 Temperature measurement		适配探针类型 Suitable probe type		数据传输方式 Data transmission method	
	是 yes	否 no	单头 single	双头 double	RS485	4-20mA
ZK9800		●	●		●	
ZK9810	●		●		●	●
ZK9820	●			●	●	●

► Corrosion Rate Recorder

腐蚀速率记录仪

- 适宜安装在危险或不需要实时监测的部位
- 强大的数据存储量
- 电池寿命长
- Be suitable for installing the dangerous position or the position which doesn't need the online monitoring
- Powerful data storage capacity
- Long battery life

Technical Parameters

技术参数

- 工作温度：-25℃~70℃
- 防爆类型：本安、隔爆
- 防护等级：IP65
- 电池寿命：可充电使用，一次充电可使用3个月（采样间隔1小时）；6个月（采样间隔3小时）
- 工作电压：3.6V 38Ah 锂电池
- Working temperature: -25℃~70℃
- Explosion-proof type: intrinsic safe、Flameproof
- Protection class: IP65
- Battery life: Battery can be charged. Used for 3 months every charging time(1h interval), 6 months (3h intervals)
- Working voltage: 3.6V 38Ah Lithium batteries



产品型号Model: ZK9801



► Self-compensatory Precision Inductance Probe

自补偿精密电感探针

自补偿精密电感探针是腐蚀在线监测系统重要的传感单元，可适用于不同的温度、压力等条件。根据探针设计的显著特征，可分为单头管状、双头管状，以及片状探针等。

As a sensing unit of inductance corrosion monitoring system, inductance probes provide you with various probes applicable to various temperatures, pressure, assembling and disassembling requirements according to various on-site environments.

General Parameters

通用参数

- 适用温度：≤240℃（低温型）；≤430℃（高温型）
- 适用压力：≤2MPa（低压型）；≤30MPa（高压型）
- 试片厚度：0.25mm~0.75mm
- 试片形状：管状、片状
- 安全寿命：≤4年
- 有效使用寿命：试片厚度/年腐蚀率=有效使用寿命
- 安装方式：可带压拆装、不可带压拆装
- Applicable temperature: ≤240℃ (low temperature) ≤430℃ (high temperature)
- Applicable pressure: ≤2MPa (low pressure) ; ≤30MPa (high pressure)
- Thickness of measuring sample: 0.25mm~0.75mm
- Shape of sample: Tubular/sheet
- Safe life of probe: ≤4years
- Useful life of probe: Sample thickness/annual corrosion rate = useful life
- Installing methods: dismantling under pressure/ non- dismantling under pressure



- **Inductance Probe with Dual Heads**

双头管状电感探针

双探头自补偿精密电感探针，即一支电感探针采用双探头试片设计，在监测管线腐蚀的同时，也为工业现场的工艺评价及材质筛选提供了有力工具。

Self-compensatory precision inductance probe with dual head was developed to monitor the pipeline corrosion. In the meanwhile, it also divided the tool for field technology evaluation and material choice.

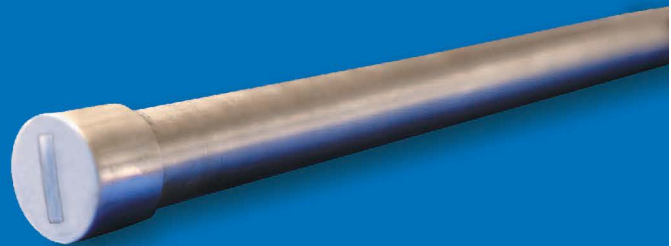


Sheet Inductance Probe

片状电感探针

片状电感探针的特点是占用垂直空间小，可用于小管径管线；被测腐蚀元件通过抗压密封材料与探针杆绝缘，有效抑制干扰信号的引入，从而使测量结果有更好的稳定性。被测腐蚀元件平行于管线安装，使得片状电感探针更准确模拟管线的腐蚀状况。

Sheet inductance probe: the occupancy of vertical space is small. It is suitable for small diameter pipeline. The measuring element is parallel to the pipe, The probe is installed which is parallel with the pipeline, so it can simulate the corrosion conditions exactly.



•

Tubular Inductance Probe

管状电感探针

管状电感探针的特点是具有最为广泛的适用性。根据不同的工艺条件，安装条件，进行探针拆装方式、材质、长度等选择。

Tubular inductance probe: widely used. According to the different technology conditions, choose the different material, length and dismounting methods.



Products Series Search

产品系列检索

ZK9200系列 series	特性关键词/keywords										
	温度 temperature		伸缩性 Stretching		试片形状 shape		带压拆装性 retrievable		探头数 head numbers		测温 Temperature measurement
	低 low	高 high	可 yes	否 no	管 tubular	片 sheet	可 yes	否 no	单 one	双 two	可 yes
ZK9251HT		●		●	●			●		●	●
ZK9200	●		●		●		●		●		●
ZK9200HT		●	●		●		●		●		●
ZK9210	●		●			●		●	●		●
ZK9201	●		●		●			●	●		●
ZK9201HT		●		●	●			●	●		●
ZK9202-(空冷)	●		●		●				●		●

PS: 如果选用测温型探针，需在系列号后备注（t），以示区别。 Please remark the letter t,if you choose the probe with measuring temperature.

A photograph of an industrial facility, likely a refinery or chemical plant. The image shows a complex network of large, silver-colored metal pipes and a central vertical cylindrical vessel with a spiral staircase. The sky is blue with some white clouds. A blue gradient overlay covers the bottom half of the image, where the text is located.

Electrochemical Online Corrosion Monitoring System

电化学腐蚀在线监测系统

ZK8800 Electrochemical Online Corrosion Monitoring System

ZK8800电化学腐蚀在线监测系统

电化学监测方法是通过线性极化与弱极化相结合的手段来测量腐蚀电流密度的。

技术特点:

- 直接测量介质的腐蚀速率，不需要腐蚀的积累；
- 用于电解质腐蚀体系；
- 采用线性极化与弱极化相结合的手段进行腐蚀速率测量，测量更准确；
- 多数应用于循环水体系或用于实验室快速评价缓蚀剂。

Electrochemical monitoring method is a method of measuring corrosion current density by combining linear polarization and weak polarization.

System Features:

- Measuring the corrosion rate of medium directly with no need for further corrosion accumulation ;
- Applicable to electrolyte corrosion system ;
- Mostly apply to circulate water system or express laboratory evaluation corrosion inhibitors ;
- Many disturbances, such as organic medium mixed in the water which distributes the surface of the measurement element unevenly and leads to inaccurate measurement.



Key Components

系统核心构件

► Electrochemical Corrosion Rate Collector 电化学腐蚀速率采集器

电化学腐蚀速率采集器是腐蚀监测系统的数据采集存储单元，其采用先进的极化阻力和弱极化技术原理设计开发而成，能够准确测量被测试片在腐蚀介质中的腐蚀电流密度，从而计算出年腐蚀率。

Electrochemical corrosion rate collector is a data acquisition and storage unit of corrosion monitoring system, and is designed and developed according to the advanced technical theories of polarization resistance and weak polarization. It can accurately measure the corrosion current density of the test sample in corrosion medium, and consequently calculate annual corrosion rate.



产品型号MODEL: ZK8800

Technical Parameters

技术参数:

- 模拟电阻 R_p 测量范围及精度： $20\Omega\sim 2M\Omega$
- 腐蚀速度测量范围A： $1\times 10^{-4}\sim 2.5\text{mm/a}$
(电极材质为20#，面积为 4cm^2 时)
- 仪器工作环境温度： $-25^\circ\text{C}\sim +55^\circ\text{C}$
- 探头测温范围： $0\sim 100^\circ\text{C}$
- 测温误差范围： $\pm 0.5^\circ\text{C}$
- 工作电压： $12\sim 36\text{VDC}$
- 仪器功耗： 0.6W
- 安装方式：与探针一体化连接
- 完成一次测量需要时间：3分钟
- 防爆类型：本安、隔爆
- 数据传输方式：RS485/4-20mA
- Measurement range and precision of analog resistance： $20\Omega\sim 2M\Omega$
- Measurement range of corrosion rate： $1\times 10^{-4}\sim 2.5\text{mm/a}$
(with electrodes 20# and 4cm^2 in area)
- Instruments working environment temperature： $-25^\circ\text{C}\sim +55^\circ\text{C}$
- Probe temperature measurement range： $0\sim 100^\circ\text{C}$
- Error range of temperature measurement： $\pm 0.5^\circ\text{C}$
- Working voltage: $12\sim 36\text{VDC}$
- Power consumption of the instrument: 0.6W
- Assembling method：Integrated with probe
- Single measurement time：3 minutes
- Explosion-proof Type: Intrinsic safe, Flameproof
- Data transmission method: RS485/4-20mA

► Electrochemical Probe

电化学探针

电化学探针是电化学腐蚀监测系统的传感单元，根据不同的工业现场环境，为您提供适合不同温度、压力、拆装条件的探针。电化学探针按照拆装形式分，分为可伸缩与不可伸缩类型；按照适用的温度和压力情况分，可分为高温（高压）电化学探针和低温（低压）电化学探针。

Electrochemical probe is a sensor unit of electrochemical corrosion monitoring system. We can provide you with proper probes applicable to various temperature, pressure and assembly-disassembly conditions according to various industrial environments. Electrochemical probes are classified into retractable and non-retractable types according to assembly-disassembly forms, and classified into high-temperature (pressure) and low-temperature (pressure) types according to applicable temperature and pressure.

Technical Parameters

技术参数:

- 适用温度: $\leq 100^{\circ}\text{C}$;
 - 适用压力: $\leq 2.0\text{MPa}$ (试片承压满足要求,以法兰密封结构能承受压力为准);
 - 腐蚀速度测量范围: $1 \times 10^{-4} \sim 2.5\text{mm/a}$;
 - 试片面积: 4 cm^2 ;
 - 探针安全寿命: ≤ 4 年 ;
 - 探针使用寿命: 当介质腐蚀率为 0.1mm/a (年) 时, ≤ 2 年 ;
 - 探针长度: 可选 ;
 - 安装方式: 可带压安装/不可带压拆装/螺纹安装。
-
- Applicable temperature: $\leq 100^{\circ}\text{C}$;
 - Applicable pressure: $\leq 2.0\text{MPa}$ (refer to pressure capacity of flange sealing structure provided that the pressure capacity of the sample meets the requirements) ;
 - Measurement range of corrosion rate: $1 \times 10^{-4} \sim 2.5\text{mm/a}$;
 - Thickness of samples: 4 cm^2 ;
 - Probe life: ≤ 4 years ;
 - Useful life of probe: It is not more than 2 years when medium corrosion rate is 0.1mm/a (year) ;
 - Probe length: Optional ;
 - Assembling method: Available for assembling with pressure/not Available for assembling with pressure .



Automatic Cleaning and Maintaining System for pH Electrode

pH电极自动清洗保养系统

在实际应用中，由于介质中的硫化氢等的作用，使pH电极受到污染，从而影响其使用寿命及测量准确性，进而影响了注剂自动控制系统的应用。具有pH电极自动伸缩清洗功能的塔顶注剂自动控制系统的成功开发，有效解决了此难题。pH电极自动伸缩清洗装置是通过程序控制，实时将pH电极与被测介质在线带压、无泄漏脱离并进行自动清洗和保养，使pH电极只在需要测量时与被测介质接触，测量完成后自动切换到清洗腔进行自动清洗和保养，尽可能减少电极受污染的时间，使电极大部分时间处于保养状态，最大限度延长电极的使用寿命，减少人工维护量。

Due to the influence of H₂S, pH electrode is easy to be polluted. The pollution influences the pH life and its measuring decision and also influences the application of control system. The development of pH electrode cleaned automatically solves the problem. Through the program control, the device makes the pH electrode and medium separate non-leak to clean and maintain the pH electrode automatically. This function makes the pH electrode contact with the medium only when it needs to measure. After finishing the measurement, the pH electrode converts to the cleaning cavity to clean and maintain automatically to decrease the polluted time. For these reasons, it can prolong the electrode life and decrease the human maintenance.



pH电极自动清洗保养系统

pH电极自动清洗保养系统

► System Principle

系统原理

pH电极自动伸缩清洗装置由电极伸缩承载器、清洗腔、接口及密封圈等附件构成。由pH电极承载器带动电极，在清洗腔和被测介质管路间无缝切换，形成的维护状态和测量状态两个工作位置，再配上动力及控制装置就可以使电极按需要在两个状态间切换，使电极得到在线维护。

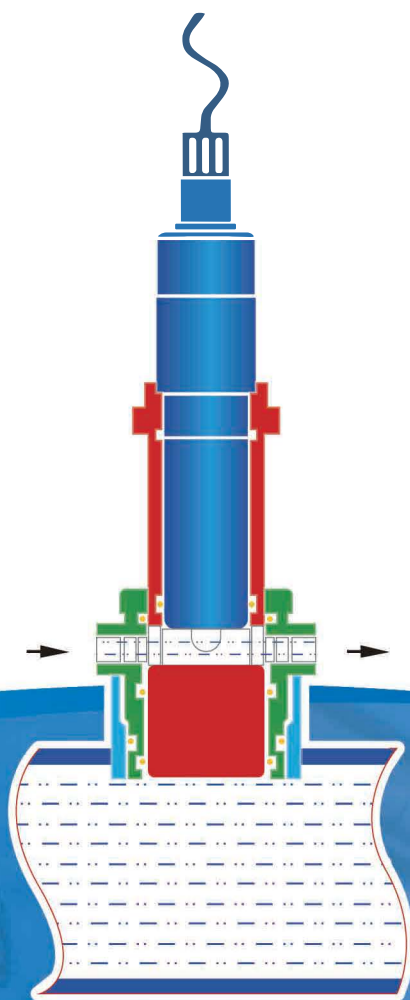
The device of pH stretching and cleaned automatically includes electrode access fitting, cleaning cavity, interface and O-ring, ect. The access fitting drives the electrode to convert between the cavity and the measured medium to on-line maintain the electrode.

Technical Parameters

技术参数:

- 仪表空气：0.5MPa，通过Φ6的铜管或不锈钢管敷设到产品控制箱
- 压缩空气接口：控制箱自带外圆Φ6的压接接口
- 电器接口：控制箱端：G3/4外管螺纹
- 清洗用水接口：DN15PN2.5 RD HG20615
- 排水口：DN15PN2.5 RD HG20615
- 工作电源：DC18V~DC36V
- 通讯方式：RS485
- 环境温度：-25℃~+70℃
- 清洗控制方式：手动控制、软手动控制、程序控制
- 外型尺寸：738 x 883 x 286 mm

- Instrument air : 0.5MPa, To the control box throuth Φ6 stainless steel pipe or copper pipe
- Condensed air interface : Controller with Cylindrical Φ6 interface
- Electric Interface : Controller : G3/4 thread
- Cleaning water interface : DN15PN2.5 RD HG20615
- Outfall : DN15PN2.5 RD HG20615
- Power supply : DC18V~DC36V
- Communicaiton method : RS485
- Ambient temperature : -25℃~+70℃
- Cleaning control method : manual control, Soft manual control, Program control
- Size : 738 x 883 x 286 mm



A photograph of a large industrial facility, likely a refinery or chemical plant, featuring tall distillation columns and a complex network of pipes and walkways. Several white cylindrical sensors are mounted on the walkways, with red Chinese characters and labels like 'E2-1H' and 'E1-07' visible. A blue diagonal banner is overlaid on the bottom right of the image.

Online Electrical Resistance Corrosion Monitoring System

电阻腐蚀在线监测系统

ZK7800 Online Electrical Resistance Corrosion Monitoring System

ZK7800电阻腐蚀在线监测系统

电阻监测是一种间接监测装置腐蚀的有效方法。通过测量电阻值的变化量来计算出试件的腐蚀减薄量和腐蚀速率。当测量元件的材质、受介质的冲刷状态等客观条件与所测量设备的状态基本相同时，就可用测量元件腐蚀速率近似地代表设备的腐蚀率。

Electrical resistance monitoring is an effective method of indirect monitoring on device corrosion. Measuring element is placed in the pipeline like a length of electrical resistance wire. As the cross-sectional area of measuring element is reduced by the corrosion of its medium, resulting in increased electrical resistance, the thickness reduction and corrosion rate of the test sample can be calculated by measuring the variation of electrical resistance value. When the objective conditions, such as measuring element material, corrosion by its medium, etc., are basically identical with those of the measured equipment, the corrosion rate of the measuring element can represent approximately that of the equipment.



Technical Characters

技术特点

- 间接测量腐蚀，通过一段时间内的腐蚀减薄积累来计算腐蚀率；
- 与介质体系无关，可测定液相或气相的腐蚀，可应用于电解质腐蚀体系和非电解质腐蚀体系；
- 抗干扰能力较强，但丝状测量元件在介质流速较大或粘稠介质中需加容易被介质冲弯或者扭曲变形，导致出现测量故障；
- a. Indirect corrosion measurement: the pipeline corrosion rate caused by medium can be indirectly reflected by element corrosion rate, which is calculated according to the accumulation of thickness reduction by corrosion over a period of time;
- b. Irrelevant to the medium system: it can measure and determine liquid phase corrosion and gas phase corrosion, and can be applied to the electrolyte corrosion system and nonelectrolyte corrosion system;
- c. It is a relatively traditional method of corrosion on-line monitoring. As its theory is simple and easy to understand, it has strong capability of resisting interference. Filiform measuring element, however, is needed to be provided with protection measures such as flow velocity safety cover when it is in a medium with greater flow velocity or in the viscous medium, otherwise the electrical resistance wire can be easily curved or deformed by medium wash, resulting in measurement failure;

Key Components

系统核心构件

► Electrical Resistance Corrosion Rate Collector

电阻腐蚀速率采集器



Technical Parameters

技术参数

- 环境温度: $-25^{\circ}\text{C} \sim +70^{\circ}\text{C}$
- 防爆类型: 本安、隔爆
- 安装方式: 通过适配器与探针一体化连接
- 数据传输方式: RS485/4-20mA

- Ambient temperature : $-25^{\circ}\text{C} \sim +70^{\circ}\text{C}$
- Explosion-proof Type : Intrinsic safe, Flameproof
- Assembling method : Integrated with probe by adapter
- Data transmission method : RS485/4-20mA



► Resistance Probe

腐蚀探针

电阻探针是电阻腐蚀监测系统的传感单元，根据不同的工业现场环境，为您提供适合不同温度、压力、拆装条件的探针。电阻探针最高耐温430℃，最高耐压20MPa。为避免因介质温度变化引起的测量误差，在探针内部置入温度补偿元件，并与测量元件串连在电路中，温度的影响可完全消除。在测量时利用腐蚀前和腐蚀后被测量元件与温度补偿元件电阻比值来推算腐蚀减薄量，也可以把腐蚀前和腐蚀后的电阻比值看成是第一次测量和第二次测量的电阻比值。对于不同形状的金属试片，其腐蚀减薄量的计算公式也不同，丝状测量元件比片状测量元件在相同寿命条件下灵敏度得到提高，因此电阻探针多采用丝状测量元件。



The electrical resistance probe is the sensing unit of the electrical resistance corrosion monitoring system. You can be provided with probes suitable for various temperature, pressure and disassembly conditions according to different industrial on-site environments. The highest resistant temperature of the electrical resistance probe is 430℃ and the lowest resistant pressure of it is 20 MPa. In order to avoid measurement error caused by temperature changes in the medium, the temperature compensated element should be placed into the probe body and be connected with measuring element in the series circuit, which can eliminate the temperature influence completely. During the measurement, corrosion thickness reduction can be calculated with the aid of the ratio of measuring element electrical resistance to the temperature compensated element electrical resistance before and after corrosion. The calculating formula of corrosion thickness reduction varies with the shape of metal sample. Provided with the same use life, filiform measuring element has higher sensitivity than sheet measuring element. Therefore most electrical resistance probes adopt filiform measuring element.

Parameters

技术参数

- 适用温度：≤240℃（低温型）；≤430℃（高温型）
- 适用压力：≤2MPa（低压型）；≤30MPa（高压型）
- 试片形状：丝状
- 安装方式：可带压拆装、不可带压拆装
- Applicable temperature: ≤240℃（low temperature）；≤430℃（high temperature）
- Applicable pressure: ≤2MPa（low pressure）；≤30MPa（high pressure）
- Shape of sample: Tubular/sheet
- Installing methods: dismantling under pressure/ non- dismantling under pressure



ZK6800 Online pH Value Corrosion Monitoring System

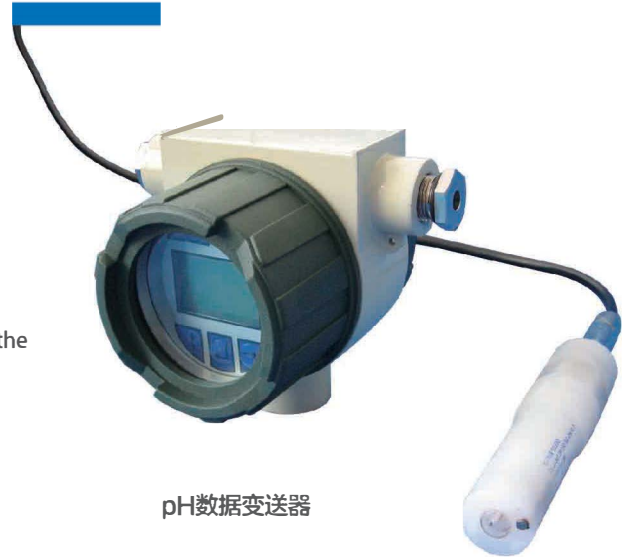
ZK6800 pH值腐蚀在线监测系统

pH值腐蚀在线监测系统是利用电位测量的方法，可实现实时pH测量和数据显示。pH值是很多行业的工业生产中重要的控制指标，因此及时获得准确的pH值显得尤为重要。pH在线监测系统系统与常规化验分析的方法相比较具有数据获取更为及时和准确的特点。

The principle of pH corrosion monitoring system is the electric potential. It can measure and display data real timely. Comparison with the chemical examination, pH monitoring system is exacter and rapider than it.

Key Components

系统核心构件



► pH数据变送器

腐蚀监测仪器是腐蚀监测系统的数据采集存储单元，pH值数据采集变送器的作用是将pH探头测量的数据进行存储和传输，最终在终端设备进行数值的显示和分析。

Corrosion monitoring instrument is a data collection and storage unit of corrosion monitoring system. The role of pH data collection transmitter is to store and transmit data collected by pH probe, and then make a final display and analysis in terminal device.

Technical Parameters

技术参数

- pH值测量范围：0~14
- 仪器适用环境温度：0℃~55℃
- 仪器相对湿度：10~80%
- 仪器运输/储藏温度：-40℃~80℃
- 工作电压：18~36VDC
- 仪器功耗：0.6W
- 防爆类型：本安、隔爆
- 数据传输方式：RS485/4-20mA
- 适用pH值电极：ZK6200/ZK6201/ZK6205
- Measurement range of pH value: 0~14
- Ambient temperature of instrument application environment: 0℃~55℃
- Instrument relative humidity: 10~80%
- Instrument transportation/storage temperature: -40℃~80℃
- Working voltage: 18~36VDC
- Power consumption of the instrument: 0.6W
- Explosion-proof Type: Intrinsic safe, Flameproof
- Data transmission method: RS485/4-20mA
- Applicable pH electrode: ZK6200/ZK6201/ZK6205

Applicable pH Electrode

与pH电极的适用情况

pH 数据变送器 pH data transmitter	适用pH 电极 Applicable pH electrode
ZK6800	ZK6200/ZK6201/ZK6205
ZK6810	ZK6200/ZK6201/ZK6205/ZK6215/ZK6220
ZK6820	ZK6200/ZK6201/ZK6205
ZK6830	ZK6220

► pH电极

pH值腐蚀在线监测系统中，pH电极是重要的传感单元，对于不同的工艺介质环境，要选择合适的pH电极进行监测。

Appropriate pH electrode should be selected according to different medium environments, as pH electrode is an important sensing unit in the pH corrosion on-line monitoring system.

General Parameters

通用参数

- 测量范围：1~14 pH
- 温度：0~55℃
- 当温度 ≤ 65℃ 时耐压 0.7MPa
当温度 ≤ 130℃ 时耐压 2MPa
- 最大流速：3m/s
- 灵敏度：<0.005 pH
- Measurement range: 1~14 pH
- Temperature: 0~55℃
- Pressure resistance is 0.7 Mpa when temperature is not more than 65℃
Pressure resistance is 2MPa, when temperature is not more than 130℃
- Maximum flow rate: 3m/s
- Sensitivity: <0.005 pH



Automatic pH Injection Control System

pH值注剂自动控制系统

塔顶pH值的控制是炼油过程中重要的工艺步骤，pH注剂自动控制系统是通过建立适用的控制模型，自动的调整炼油装置蒸馏塔顶注氨量，使塔顶挥发线的pH值被控制在预期的范围内，使生产工艺更稳定，实现有效控制腐蚀的目的。系统采用模糊PID控制数学模型，适应大滞后控制过程，有效克服大滞后对控制精度、响应时间的不利影响。

The overhead pH value control is an important procedure in the process of oil refining. The automatic control system of oil refining equipment overhead ammonia injection and pH value is a system under which a proper control model for the production process of oil refining equipment is established, distillation tower overhead ammonia injection can be automatically adjusted, the pH value of overhead gas line can be controlled within the expected range, and the equipment corrosion state can be real-time monitored by inductance probe corrosion monitoring technique, so as to improve the mathematical model which controls the overhead ammonia injection, make the production process more stable and realize effective corrosion control.

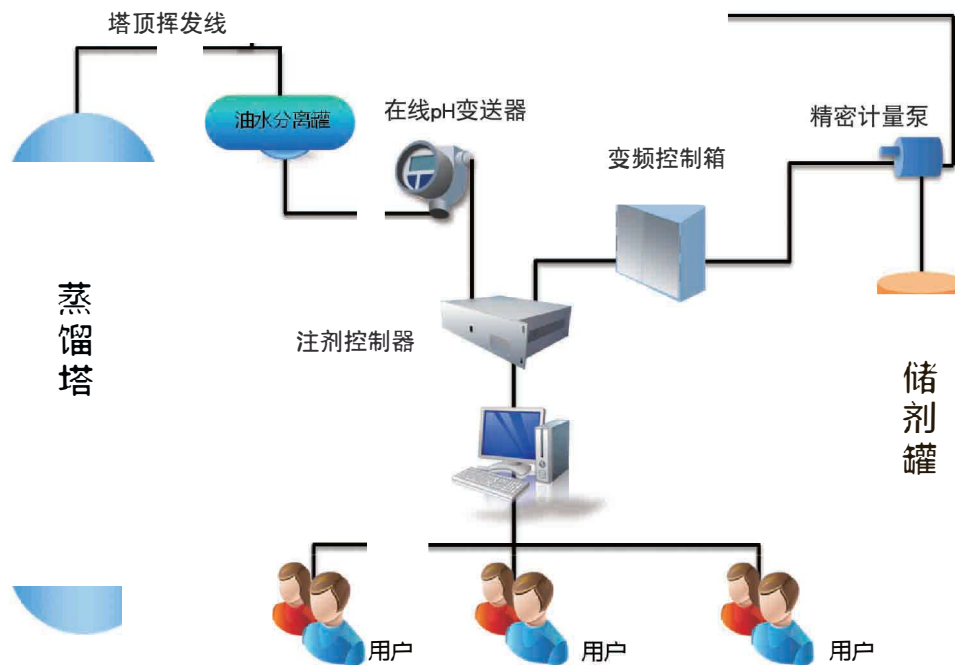
Technical Characters:

技术特点:

- 控制精度高
- 模糊PID算法对被控系统的适应性强，鲁棒性好
- 超调小
- High control precision
- Strong adaptability, good robustness
- Small overshoot



pH值注剂自动控制系统



系统示意图

pH Injection Controller

► pH注剂自动控制器

Technical Parameters

技术参数

- 分辨率:12位A/D转换器
- 控制精度:≤0.3pH
- 环境温度:0℃~50℃
- 相对湿度:≤85%
- 工作电压:220VAC
- Resolution : 12-bit A/D converter
- Control accuracy : ≤0.3pH
- Ambient temperature : 0℃~50℃
- Relative humidity : ≤85%
- Working voltage : 220VAC

► Converter/变频器

Technical Parameters

技术参数

采用西门子、ABB等通用主流变频器，具有4-20mA模拟量控制输入端子，具备执行频率反馈。
 Adopt universal frequency converter, such as siemens, ABB. 4-20 mA analog signal control output post. Be able to display online frequency.

A low-angle, upward-looking photograph of a complex industrial structure, likely a refinery or chemical plant. The image is dominated by a dense network of large, vertical and horizontal pipes, many of which are wrapped in silver insulation. Scaffolding and walkways with yellow railings are visible, crisscrossing the structure. The sky in the background is a pale, overcast grey. A semi-transparent blue banner with a wavy bottom edge covers the lower portion of the image, serving as a background for the text.

**Coupon
Corrosion Monitoring System**
挂片腐蚀监测系统

Coupon Corrosion Monitoring System

挂片腐蚀监测系统

挂片监测是传统经典的离线监测手段，具有经济投入小的优点，其监测原理主要是通过挂片使用前后的质量变化来计算均匀腐蚀速率的，同时，通过观察分析使用后挂片表面的宏观和微观形貌，也可获得一定的局部腐蚀信息。利用挂片方法评价腐蚀时，具有周期长，且必须把挂片从介质中取出才能评价腐蚀，以上缺点也制约了挂片监测方法的广泛应用。

Coupon monitoring is a traditional and classical off-line monitoring method, which needs little economic input. The monitoring principle is calculating uniform corrosion rate by coupon's quality change before and after use; meanwhile, partial corrosion rate can be derived through observation and analysis of the macro and micro topography of coupon surface before and after use. When using the coupon method to evaluate corrosion, coupon must be taken out from the medium before evaluation and the cycle is very long, which restricts its widespread application.

- **Probe Coupon Holder**

探针挂片器 (ZK4210/ZK4210HT)

探针挂片器是一类安装在腐蚀监测探针前端的挂片架，挂片与探针处于同样的监测环境，可进行腐蚀数据的对比分析。

Probe coupon holder is a kind of coupon frame installed in the front of corrosion monitor probe. As the coupon and the probe are in the same monitoring environment, the comparative analysis of corrosion data can be conducted.



- **Retractable Coupon Holder**

挂片探针 (ZK4220/ZK4220HT)

可伸缩式挂片探针分为高温和低温两种，分别与低温填料函和高温填料函配套使用，可实现带压拆卸。

Retractable coupon holders are classified into two categories: high-temperature and low-temperature, which match with low-temperature packing box and high-temperature packing box for use



Non- Retractable High-temperature Flange Coupon Holder

不可伸缩高温法兰挂片器(ZK4221)

此类挂片器用于高温危险环境，不可带压拆装，通过法兰片固定安装。
This kind of coupon holder is used in the high-temperature and dangerous environment. It can achieve the fixed installation by flange films and can not be assembled and disassembled with pressure.



- **Fully-enclosed Assembly
and Disassembly Coupon Holder**

全密闭拆装式挂片器(ZK4230)

全密闭拆装式挂片器由两个主要部分构成：承载器即挂片器本体，插体，保护盖为可选件，在大多数应用中建议使用。
Fully-enclosed assembly and disassembly coupon holder consists of two main parts: load receptor i.e. coupon holder itself, and plug body. Protective cover is optional and is recommended to be used in most applications.



- **Shelf of Corrosion
Coupon Group**

腐蚀试片组安放架

(ZK4240/ZK4240HT/ZK4241/ZK4241HT)

腐蚀试片组安放架是安放在各种塔器内的挂片安装支架
Shelf of corrosion sample group is a coupon installation stand installed in a variety of towers.



► Output Device

接出装置

- **Stuffing Box**

密封填料函

实现挂片可带压拆装

The coupon can be dismounting under pressure.



- **Access Fitting**

承载器

Technical Data

技术参数

安装方式：焊接或法兰连接

标准密封材料：氟化橡胶/特氟隆（操作温度范围：-26-204℃）

Installation method: soldering or flange connection

Standard sealing material: Viton/Teflon(operating temperature range : -26℃-204℃)



- **Plug**

旋塞

承载器旋塞是各种设备（挂片器，探针，药品注入螺母等）的“载体”，是承载器中可以回收的部分。有两种型式的旋塞：ZK750(空心旋塞)、ZK751（实心旋塞）实心旋塞-这种芯体上有一个盲孔。用于安装不需要与外部连接的设备，例如挂片器。通常将其与装在有旁通的承载器接头上的仪器配套使用，如注入器或取样器系统，或沙子探针。空心旋塞-这种芯体具有通孔，用于安装需要与外部连接的设备，例如腐蚀监测探针和氢监测探针。

The plug cock of the load receptor is the “carrier” of various equipments (coupon holder, probe, chemicals feeding nut, etc.) and belongs to the recyclable part of the load receptor. They are classified into two types: ZK750 (hollow plug cock) and ZK751 (solid plug cock). Solid cock-it has a blind hole on the core. It is used to install the equipments that need no external connection such as coupon holder. It is generally used in combination with instruments installed on the joint of load receptor with a bypass such as injector or sampler system or sand probe. Hollow plug cock-this kind of core has a pylome. It is used for instruments which require external connection for installation, such as corrosion monitoring probe and hydrogen monitoring probe.