

屏蔽泵轴承监视器及屏蔽套修复方法

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关键词 屏蔽泵 轴承监视器 屏蔽套修复

1 前言

在石油化工生产中, 有大量的易燃、易爆和有毒的介质, 而在输送介质时严禁发生泄漏, 以防发生危险, 普通的离心泵采用的是机械密封, 有许多因素会导致机械密封失效而使介质泄漏, 由于机械密封失效无法监测, 所以泄漏是随机的, 极易酿成事故隐患。另外, 频繁的更换机械密封, 会使维修成本大大提高。屏蔽泵因为没有轴向密封, 因而也就没有泄漏点, 所以能够保证介质不泄漏。

2 屏蔽泵密封原理

我厂线性低密度聚乙烯装置 (LLDPE) 是由日本引进的设备, 以粗丁烯-1 精制厂房的一台屏蔽泵为例说明其原理 (见图 1)。

品相同。改造和增设的零部件绝大部分厂家可自行加工, 改造费用低, 可供需进行空压机无油润滑改造的多种行业采用。

b. 填充聚四氟乙烯导向环、活塞环的耐磨性和使用寿命主要取决于材质性能。复合型填充聚合物及相应的热压成型工艺, 能达到增加环的表面硬度、提高抗压强度、减小耐压变形而又不增大摩擦系数的目的, 使导向环、活塞环的耐磨性提高, 使用寿命延长, 在自润滑材质上得到了保证。

c. 带卸荷槽、卸荷孔的开口导向环, 可消除背压、均匀摩擦, 这种结构可进一步延长导向环的使用寿命, 减少易损件费用和非生产检修时间, 是值得推广的合理结构。

d. 生产实践表明, 该空压机有油润滑改造为无油润滑后, 取得了如下效果:

(1) 改造后使压缩风中不含油污, 消除了油污对环境的污染;

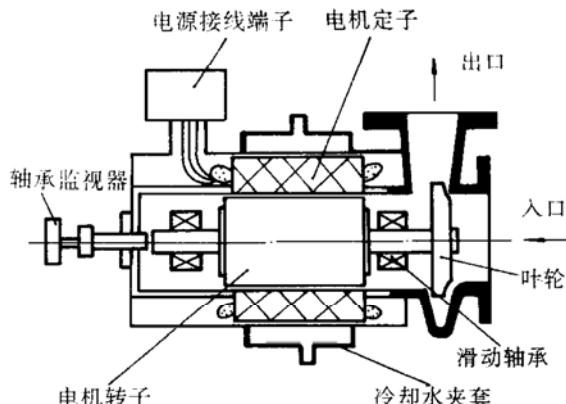


图 1 屏蔽泵示意图

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(2) 取消了脱油装置, 同时也不存在脱油、压缩机加油等操作环节, 大大减轻了工人的劳动强度;

(3) 节约一次性投资 11 万多元 (不包括新机的运输费和安装费等);

(4) 改造后平均每年节约润滑油约 4 吨 (约 2 万余元);

(5) 改造后的活塞环材料采用新配方, 增设的导向环为独特配方与新结构, 延长了易损件使用寿命 6 倍以上, 降低了易损件消耗费用, 延长了压缩机使用周期。

参 考 文 献

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屏蔽泵工况参数:

电机功率: 15kW;

电压: 380V;

转数: 3000r/min;

流量: 0.54m³/min;

扬程: 60m。

电机的定子完全封闭在隔离套内, 隔离套是密封焊接的, 能保证工作介质不浸入到定子绕组中去。由于电机转子和泵的叶轮同在一个容积腔内, 所以也就没有了轴向密封。轴承选用了无油润滑的滑动轴承, 并且可以根据不同的介质采用不同的轴承材料。冷却水夹套可以将热量带走, 以保证电机正常运转。由于泵和电机结合为一个整体, 所以结构紧凑、振动小、无噪音, 不需加润滑油。

3 轴承监视器

轴承监视器能够准确检测轴承的磨损, 及时地向操作人员发出警告, 以免发生转子“扫膛”及叶轮损坏等事故。

监视器(见图2)内充满加压的惰性气体, 这样表盘指针就相应地指向一个数值。监视器的端部有一个圆形的小触头, 插入转子轴端的凹槽内, 触头与转子轴端凹处之间的间隙确定为轴承的最大允许磨损量。随着轴承的渐渐磨损, 静止的触头与转动的轴端凹槽间隙将逐渐变小, 当达到轴承磨损允许最大值时, 触头和凹处因为相接触而很快将触头磨裂, 导致监视器内惰性气体泄压, 从而使表盘上的数值(指针)发生变化, 将压力信号用相应仪器传感到控制操作中心, 及时切断电源, 也可和电机电

源设定联锁自动停下电机。此监视器同样可以推广应用到其它轴承上。我厂线性装置共有26台屏蔽泵, 自1986年投产以来已有10年, 因为有了轴承监视器, 我们便能及时地对轴承部位的故障进行处理。

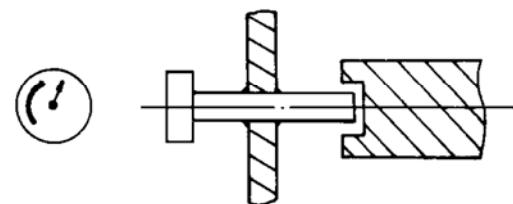


图2 监视器示意图

4 屏蔽套泄漏的处理

由于使用的时间较长, 冷却水入口处的定子屏蔽外壳长期受到水流冲击, 致使定子的外壳被冲破, 冷却水进入定子绕组内。1995年6~11月各有一台泵因为冲刷而损坏造成停止使用。我们对其进行修复, 方法如下:

将冷却水夹套拆下, 即可看到被冲蚀的漏洞。将定子烘干24小时, 直到达到要求的干燥度。测绕阻的绝缘情况, 如果有短路则需全部解体重新缠绕定子。修补漏洞我们采用的是用电焊补焊, 电焊机电流要尽量调低, 将冲蚀处用毛刷除去表面锈迹, 为了避免过热, 损坏绕阻线圈, 施焊要间歇进行, 同时用一台吹风机帮助散热, 一点点地将洞焊满, 冷却下来后, 将焊处磨平, 回装即可使用。

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携式, DF-5000为车载式, DF-5000对常用钢材制成的管道一次测量距离可达2000m。

5 展望

国内管道检测工作的开展尚属初始阶段, 在很多大型的石化企业甚至基本上还处于空白状态。这与我国石化工业迅猛发展的现状是很不相称的, 对当前企业的生产和长期经济效益都是极为不利的。改变这一状况已是迫在眉睫的任务。该是引起我们

企业领导和主管部门重视的时机。当前, 从整个行业的高度, 可选择几家大型、急需的企业, 迅速组织力量在摸清自己家底, 各种管道现有情况的基础上, 对国际上已有的先进检测设备及应用情况作一全面调查(上述介绍的仪器国内均由鼎高公司代理), 制订出管道维护与检修的统一规划, 进而形成企业标准和行业标准并与国际ISO标准接轨。若如将管道检修工作委托外国公司和技术人员来承担, 则是将我们的命脉交于外人之手, 决非长远之策。

Li xucan. Yangzi petrochemical cor. aromatic hydrocarbon plant, P. C 210048

Abstract Some new views and methods to solve the problems that exist generally in the burners used nowadays are proposed by introducing the improvement in the performance of SOG type burner, and some thoughts about the development of combustion technology research are considered.

Keywords Burner, Improvement, Development

THE REASON ANALYSIS AND PROTECTION OF MOTOR TRIP FOR 12M³ POLYMERIC DRUM

Ding Yunhua. Wuhan petrochemical plant, P. C 430082

Abstract The main faults of equipment existed in operation of 12m³ polymeric drum is the problem of motor trip. By means of analysis of shaft power. It is found out that the basic reason is not with a matching motor. Under the guidance of shaft power formula, the optimum way for resolving problem is obtained.

Keywords Polymeric drum, Power of agitating shaft, Relationship, feasibility analysis

THE APPLICATION OF CONVERTED FREQUENCY SPEED GOVERNOR ON FCCU

Wei Qiang, Zhang Changqing. Linyuan refinery, P. C 163813

Abstract The application of converted frequency speed governor on FCCU, the basis of adopting converted frequency speed governor, type selection and control loop, tuning circumstance and effect of save energy are mentioned. The suggestion of using converted frequency speed governor is proposed.

Keywords Centrifugal pump, Air cooler, Frequency converted speed governor, Selection, Save energy

FZB TYPE FREE FLOATING BALL STYLE AUTOMATIC DRAIN VALVE

Zhao Xinmin. Nanjing machinery factory of fluid engineering, P. C 211305

Wu Xi. Beijing university of chemical engineering, P. C 100029

Abstract The working principle, construction feature, selection and technical performance of FZB type free floating ball style automatic drain valve are recommended.

Keywords Free floating ball style automatic drain valve, Construction, Performance

THE CACULATION AND DISCUSSION OF FIT SIZE FOR KEYLESS GEAR JOINT

Wang Jinze, Zhang Guomin. Daqing petrochemical general plant, plastic plant, P. C 163714

Han Daoquan, Zong Yujie. Daqing petroleum institute, Anda, P. C 151400

Abstract The selective calculation of keyless joint fit between synchronous gear and rotor shaft of roots blower for LDPE unit are recommended. The application and matters needing attention of keyless joint are discussed.

Keywords keyless joint, Fit, Calculation

904L STEEL AND ITS APPLICATION IN PTA UNIT

Zhang Jie. Luoyang general petrochemical plant, P. C 471012

Abstract General properties, corrosion-proof performance etc. of high nickel stainless steel 904L are discussed mainly.

The applied situations of 904L in PTA unit are recommended.

Keywords 904L steel, Performance, Application

THE REASON ANALYSIS OF FRACTURE FOR REBOILER IN FCC SYSTEM

Yu Ji, Chen Gang, Lu Runzhi, Bi Zhimin, Lanzhou general petrochemical plant, P. C 730060

Abstract The fracture reasons of reboiler made by 16MnR steel in FCC unit and gas distillation unit are analyzed.

The protections of sulphide stress corrosion cracking are proposed.

Keywords 16MnR steel, Shell of reboiler, Sulphide, Stress corrosion cracking

RESEARCH OF NEW MATERIAL AND STRUCTURE OF TECHNICAL IMPROVEMENT ON OILLESS L TYPE AIR COMPRESSOR

Wu Jiasheng, Fu Yuhua, Liu Gang, Wuhan chemical institute, P. C 430073

Lu Shengqi, Li Yufeng, Gao Chao, Qin Menyuan, refinery of Henan petroleum prospecting bureau, Nanyang, P. C 473132

Abstract The oil lubrication of L type air compressor is rebuild to oilless compressor of comming generation. The piston ring of new material complex filler PTPE, and guide ring with unloading structure are adopted. So that, not only its operating performances are the same as domestic identical compressor, but the service life of guide ring and piston ring are increased by several times.

Keywords Air compressor, Oilless lubrication, Guide ring of complex filler PTPE, Piston ring

BEARING MONITOR OF SHIELDING PUMP AND REPAIR METHOD OF SHIELDING CASING

Ma Xilin. Daqing general petrochemical plant plastic works, P. C 163714

Keywords Shielding pump, Bearing monitor, Repair of shielding casing

NON-DESTRUCTIVE TESTING AND EVALUATION TECHNIQUE FOR PIPELINE

Chen Jimao. China national non-destructive testing association, Beijing, P. C 100024

Abstract In order to suit the urgent needs of inspectives and maintenance of a large number of pipe for petrochemical system, the new technique, new equipment, its application and developing behavior of international relevant non-destructive testing, operation monitor and leakage examination of on-line pipe are recommended.

Keywords On-line pipe inspection, Pipe operating monitor, Leakage examiner, Pipeline pig