

光纤技术

## 用于石油罐的光纤传感液位测量系统

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**摘要** 许多石油化工企业的油品储存罐仍使用着靠人工读数的浮子式液位测量装置, 其工作效率低、误差大, 而且无法实现自动化控制和管理。针对这种情况, 采用先进的光纤传感技术在人工浮子液位计的基础上研制了一种新型的液位测量系统。该系统利用力平衡原理测量液位, 利用光纤传感器探测和传输信号, 采用自制的光码盘实现光信号的调节。该系统的现场测试结果表明, 系统在测量范围为0~1000mm时, 测量误差 $\leq \pm 6$ mm、相对误差 $< 2\%$ 。现场应用表明, 该系统的各项性能指标符合生产要求, 并且运行稳定, 性能可靠。

**关键词** [光纤传感技术](#) [液位测量](#) [石油储存罐](#)

分类号

### A fiber optic sensing liquid level measuring system for oil storage tanks

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**Abstract** The floater type measurement devices with their readings recorded manually are still used in many petro-chemical enterprises. With regard to their low efficiency, great error and their improbability in implementing automation management and remote control, a new liquid level measuring system with the advanced fiber optic sensing technology based on the traditional floater level meter is developed. It measures the liquid level of an oil tank by using the principle of force balance, captures and transmits optical signals by means of the fiber optic sensors, implements optical signal modulation with the self-made light code disc. Moreover, It was tested in a chemical plant. The testing results indicate that the measurement error is  $\leq \pm 6$  mm, relative error is  $< 2\%$  when its measuring range is 0~1 000 mm. It is proved that every specification of the system meets the demands of its users and its performance is reliable.

**Key words** [fiber optic sensing technology](#) [liquid level measurement](#) [oil storage tank](#)

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