



沪制02240183



# UYB-2000 射频电容液位传感器

## UYB-2000 RF (RADIO FREQUENCY) CAPACITIVE LEVEL TRANSMITTER

### 概述 INTRODUCTION

UYB-2000 射频电容液位变送器, 采用射频电容法测量原理, 适用于电力、冶金、化工、水利、食品、污水处理、锅炉汽包等液位的连续测量。仪表具有以下特点:

UYB-2000 RF capacitive level transmitter operates on principle of RF capacitance measurement, being suitable for electric power, metallurgy, chemical, water conservancy, foodstuff, sewerage treatment and boiler drum. The instrument has following advantages:

多种信号输出形式, 方便不同系统配置;

Multiple signal output modes adapt to different systems;

聚四氟乙烯探极, 耐酸、碱等强腐蚀性液体(除氢氟酸及金属钠以外)及高温;

The sensing probe is made of Teflon to withstand acid and alkali etc. strong corrosive liquids (except for hydrofluoric acid and metal natrium) and high temperature;

测量部分, 只有一条四氟软线或四氟棒探极作为传感器, 可靠性高;

Only a Teflon flexible wire or Teflon probe serves as sensor in measuring unit, so reliability is high;

能用于高温、高压场合且测量值不受被测液体的温度、比重及容器的形状、压力的影响; Can applied to high temperature and high pressure occasion, and measuring value is not effected by temperature and specific gravity of measured liquids as well as shape and pressure of vessels;

二线制LED现场显示, 无须电源, 彻底解决了LCD在黑暗环境中无法显示的问题; 2-wire LED local display, needn't power supply, drastically settled the question that LCD cannot display in dark environment;

完善的过流、过压、电源极性保护。

Perfect over current, over voltage and reverse power polarity protection.

### 主要技术参数

#### MAIN TECHNICAL PARAMETER

测量范围 measuring range: 0.2~20m

精确度 accuracy: 0.5级

探极耐温 temperature of probe: -40~250℃

工作压力 operating pressure: -1MPa~2.5 MPa

被测介质 measured medium: 导电率不低于 $10^{-3}$ s/m的

非结晶导电液体 non-crystalline conductive liquids which conductivity is not less than  $10^{-3}$ s/m.

电源电压 power supply: 24VDC (允许范围15~35V)

输出信号 output: 4~20mADC二线制 two-wire

测量调节范围及零点迁移 measure and adjustment range and zero elevation:  $\geq \pm 30\%FS$

The instrument is based on principle of capacitance. The probe and conductive liquid form a capacitor. The metal core of probe serves as one plate of capacitor while conductive liquid serves as the other plate. And Teflon with high reliability is between them. When liquid level changes, the area that probe is surrounded by liquid correspondingly changes, so the relative area between two plates changes, which cause a change in capacitance. The relation between liquid level and capacitance according to concentric cylinder capacitor as below:

### 结构原理

#### STRUCTURE PRINCIPLE

电容法液位测量原理为探极线与导电液体构成一电容器, 其中探极线的金属内芯为电容的一极, 导电液体为电容的另一极, 中间为高稳定性的聚四氟乙烯。随着液位的变化, 液体包围探极线的面积随之改变, 使构成电容器两极的相对面积改变, 导致电容的变化, 根据同心筒状电容的公式可写出液体高度与电容的关系:

$$C=C_0+\frac{2\pi\epsilon}{\text{Log } D/d}h \quad \text{式中 } In \text{ formula:}$$

$C_0$ : 分布电容 distributed capacitance

$\epsilon$ : 聚四氟乙烯介电常数 dielectric constant of Teflon

$D$ : 探极外径 outer diameter of probe

$d$ : 探极内径 inner diameter of probe

$h$ : 液体浸没探极的高度 height of probe immersed by liquid

因 $C_0$ 、 $\epsilon$ 和 $D/d$ 为固定常数, 所以 $C=kh$ , 即电容只与液体浸没探极的高度成正比。Because  $C_0$ ,  $\epsilon$  and  $D/d$  are all constant, so given  $C=kh$ , the capacitance is only proportional to the liquid level.

