TKWL-1800电动浮筒液位计

TKWL-1800 Electric Float Liquid Level Meter



一、概述

智能浮筒液位计依据力平衡原理，在早期浮筒液位计的基础上采用最新的传感结构，使传感器与杠杆机构合二为一，可直接测量浮筒在液体中所受的浮力，很好地解决了静压的影响。本仪表具有耐高温、耐高压的突出特点，为解决高温高压容器内的液位测量提供了良好的方法，并且该仪表具有精度高、可靠性好、调整方便、测量范围广、经久耐用、性能价格比高等优点。适合工艺流程中敞口或带压容器内的液位、界位、密度的连续测量，广泛应用于石油、化工、电力、食品、水利、冶金、热力、水泥和污水处理等行业。

该仪表符合二线制4~20mA传输协议，并有本安型、隔爆型、液晶指示型、电池型、Hart型以及多种安装形式，为用户提供了非常广阔的选择空间。另外高质量的电路及传感系统，保证了在各种应用场所的优良性能。

二、主要特点

1、三行液晶数字显示；

2、耐高温高压、抗振性能好、质量稳定、性能可靠；

3、采用系列化设计，多种安装方式，实用面广，可装于各种储灌和过程罐，各种常压罐和压力容器；

4、智能化结构设计，具有参数设定、标校及故障提示功能；

5、标准的二线制 4~20mA 输出，无需专用二次仪表，并可与计算机连接；

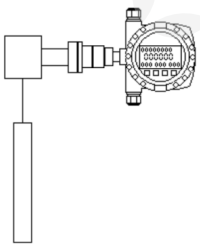
6、具有温度补偿和软件修正功能；

7、具有去零功能及中间点标校功能。

三、结构原理

智能浮筒液位计由浮筒、指示器、传感器三部分组成，如图所示：

（1）液晶指示器
（2）传感器
（3）浮筒



Overview

According to the principle of equilibrium, based on the earlier float liquid level meter, the intelligent floater liquid level meter adopts the latest sensor structure to make the sensor and the leverage become one, which can directly measure the buoyancy of the float in the liquid, thus well solving the influence of static pressure. This instrument has outstanding features of high temperature and high pressure resistance, which provides a good method to deal with the liquid level measurement inside high-temperature and high pressure vessels. Besides, this instrument is of high precision, good reliability, simple adjustment, wide range of measurement, durable service and high cost performance. It is applicable to the continuous measurement of the liquid level, boundary and density inside the open or pressure vessels in the technological process, so it is widely applied to industries like petroleum, chemical engineering, electricity, food, water conservancy, metallurgy, heating power, cement and sewage treatment. This instrument accords with the two-wire system 4~20mA transport protocol, and it has multiple installation methods like intrinsic safety type, flame-proof type, liquid crystal indication type, battery type and Hart type, thus offering users a wide range of selections. Besides, the high-quality circuit and sensor system guarantees its good performance in various applications.

Main Features

1. Three-line liquid crystal digital display.
2. High temperature and high pressure resistance, good resistance to shock, stable quality and reliable performance.
3. Serialized design, multiple installation methods and wide range of application; it can be installed to various storage tanks, processing tanks, various ordinary pressure tanks and pressure vessels.
4. Intelligent structure design, functions of parameter determination, calibration and malfunction prompt.
5. Standard two-wire 4~20mA output, no need of secondary meters, able to be connected to the computer.
6. Functions of temperature compensation and software revision.
7. Functions of zero-suppression and intermediate point calibration.

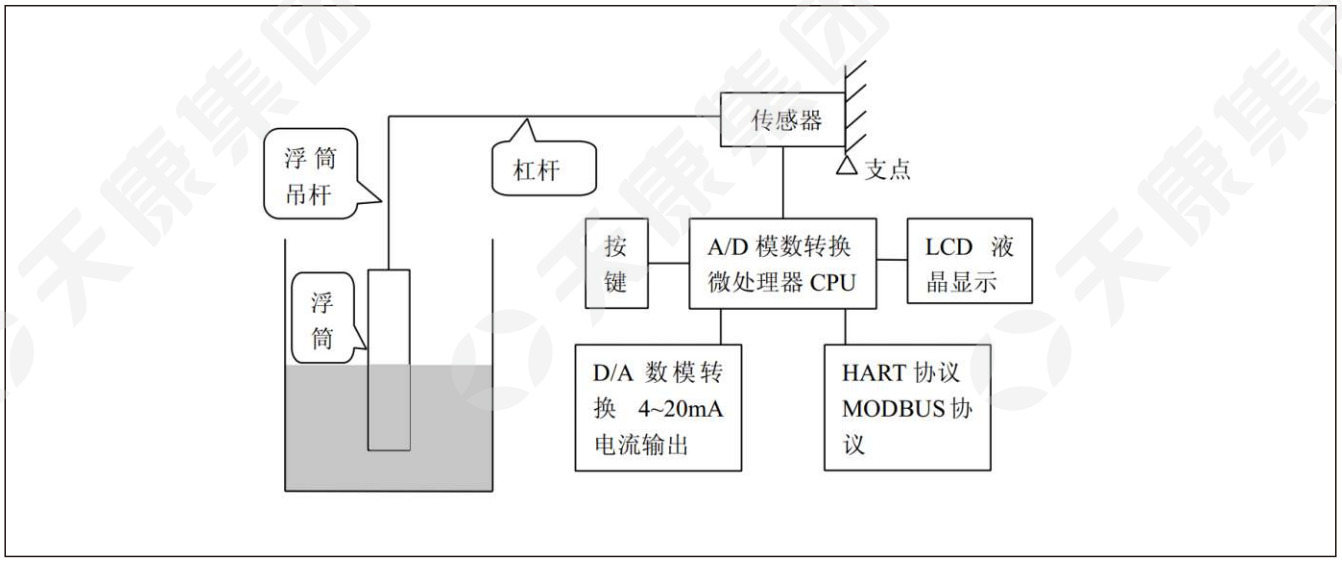
Structure Principle

The intelligent float liquid level meter is made up of a float, an indicator and a sensor, as shown in the figure:

(1) Liquid crystal indicator
(2) Sensor
(3) Float

浮筒受到液体向上浮力 F 后通过浮力杆将浮力 F 作用到传感器上，如图二所示： 传感器电压输出： 即： V ∝ F 因为浮筒浸没液体的高度与所受到的浮力成正比，因此，浮力的变化通过传感器电压输出就变换成对应的液体高度，并通过 A/D→CPU→D/A 转换成标准的 4~20mA 电流输出， 如图三所示：

Receiving the upward buoyancy F of the liquid, the float makes the buoyancy F work on the sensor through the buoyancy pole, as shown in figure 2: as to the sensor's voltage output, i.e. V ∝ F, because of the direction proportion between the float's height of immersing in the liquid and the buoyancy it receives, the change of the buoyancy is converted to corresponding liquid height through the sensor's voltage output, which is then changed into standard 4~20mA current output through A/D→CPU→D/A, as shown in figure 3.



四、技术参数

测量范围： 0.3~6m（特殊尺寸可订购）；

精度等级： 1.0、0.5（特殊型）；

输出信号： 4~20mA DC 二线制，可带 HART 协议；

供电电源：标准型： 24VDC 二线制 4~20mA（ 12VDC-32VDC）；

电池型： 3.6V@19AH 锂电池，可连续使用一年 ；

公称压力：最大 16MPa（特殊规格可订购）；

环境温度：-40℃~+85℃（液晶不会损坏），液晶正常工作 -30℃~+80℃；

介质温度：常温-40℃ ~100 ℃（无散热片） ，高温100℃ ~200 ℃（带散热片） ，超高温 200~450 （带散热片及夹套装置）；

介质密度：液位 p≥0.4g/cm³，界位p1-p2≥0.1g/cm³；

接液材质：测量室为碳钢或 1Cr18Ni9Ti，其余为 1Cr18Ni9Ti；

外壳材质：铸铝；

连接法兰：内浮筒 DN30 PN4.0法兰标准 DIN2501；

外浮筒侧法兰DN50 PN4.0主体法兰 DN50 PN4.0 法兰标准 DIN2501；

特殊型： 由用户选择；

电缆接口：隔爆型为 1/2NPT内螺纹，其它 M20*1.5内螺纹；

液晶显示：主屏液位显示数值范围： 0~50000(可带小数点)付屏百分比显示保留一位小数；

防爆标志：本安型 ia||CT5 隔爆型 d||BT6；

防护等级： Ip65；

负载特性： RImax=50*(电源电压-12)Ω=600Ω@24V。

Technical Parameters

Measurement range: 0.3~6m (special sizes can be customized)

Accuracy grade: 1.0 , 0.5（special type）

Output signal: 4~20mA DC two-wire system, which can be equipped with HART protocol

Power supply:standard: 24VDC two-wire system 4~20mA(12VDC-32VDC)

Battery type: 3.6V@19AH lithium battery, which can be continuously used for a year

Nominal pressure: 16MPa at the maximum (special grades can be customized)

Environmenrface: flame-proof type adopts 1/2NPT internal thread, others adopt M20*1.5 internal thread

Liquid crystal display: number range of liquid level dt temperature: —40℃~+85℃ (the liquid crystal can't be damaged), liquid crystal's normal operation —30℃~+80℃

Medium temperature: normal temperature —40℃ ~100℃(no cooling fin)

High temperature: 100℃ ~200 ℃ (with cooling fin)

Superhigh temperature 200~450 (with cooling fin and jacket device)

Medium density: liquid level p⩾0.4g/cm3

boundary p1-p2⩾0.1g/cm3

Connecting liquid material: the measuring room uses carbon steel or 1Cr18Ni9Ti. Others use 1Cr18Ni9Ti

Shell material: cast aluminium

Connecting flange: internal float DN30 PN4.0 Flange standard DIN2501

External float side flange DN50 PN4.0 Body flange DN50 PN4.0 Flange standard DIN2501

Special type: chosen by users

Cable inteisplay on the main screen: 0-50000 (with decimal point) the percentage display of the secondary screen reserves a decimal

Explosion-proof sign: intrinsic safety type iaⅡCT5 Flame-proof type dⅡBT6

Protection grade: Ip65

Load characteristics: RImax=50* (supply voltage-12)Ω=600Ω@24V

五、TKWL-1800订购信息　　Order Information of TKWL-1800r

TKWL-1800										
接液材质 **Connecting liquid material** 304 B 316 C 其他 Z Others （并注明）(noted)										
精度等级 **Accuracy grade** ±1%F.SXP XP ±0.5%F.S SP										
过程连接 **Process connection** 不锈钢法兰DN50 PN16 A Stainless steel flange DN50 Pn16 不锈钢法兰DN50 PN16 B Stainless steel flange DN50 Pn16 其他 C Others										
测量范围 **Measurement range** 0.3-6m（订货请注明） Measurement range										
介质温度 **Medium temperature** -40~100℃ A 100~200℃ B 200~450℃ C										
介质密度 **Medium density** 液位ρ≥0.4g/cm³ Liquid levelρ≥0.4g/cm³ 界位ρ1-ρ2≥0.1g/cm³ Boundary ρ1-ρ2≥0.1g/cm³ 订货时注明（界位注明两项密度） Please specify when ordering (density of the two items should be specified at the boundary)										
电气接口 **Electrical interface** M20×1.5 M 1/2NPT N										
现场显示 **Status display** 带 V With 不带 X Without										
防爆形式 **Anti-explosion type** 标准型(非防爆)电流信号输出（4~20mA）HRAT协议24VDC P Standard type (not explosion proof) Current signal output (4~20mA), HRAT protocol 24VDC 本安型（ExiaIICT6）电流信号输出（4~20mA）HRAT协议24VDC I Standard type (not explosion proof) Current signal output (4~20mA), HRAT protocol 24VDC 本安型+隔爆型（Exd iaIICT6）电流信号输出（4~20mA）HRAT协议24VDC D Standard type (not explosion proof) Current signal output (4~20mA), HRAT protocol 24VDC										
防护等级 **Protection grade** IP65 E IP67 F										