

# LWYC系列磁致伸缩液位计

## 用户手册

安徽料位传感技术有限公司

# 磁致伸缩液位传感器

## MAGNETOSTRICTIVE LEVEL PROBE

### 概述 Introduction

磁致伸缩液位传感器是我公司自行研制、生产的具有完全自主知识产权的产品，性能指标，可靠性等方面已达到或接近国际先进水平；部分性能已领先于国际先进水平。业务遍及全国二十余个省份，并受用户好评。该产品获得国家电气产品质量监督检验测试中心及石油和化学工业电气产品防爆质量监督检验中心颁发的防爆合格证书。

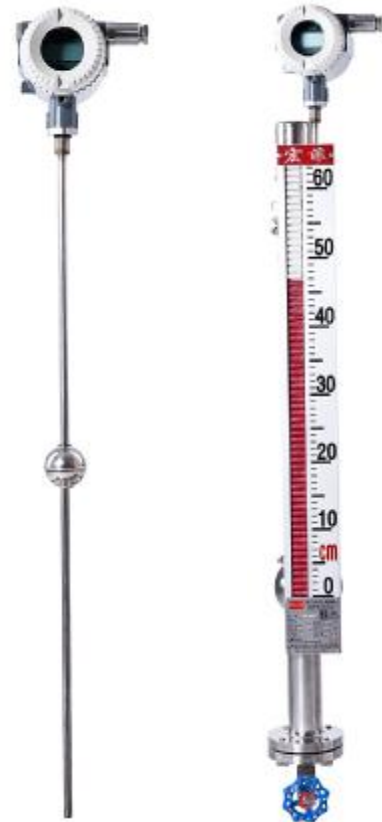
磁致伸缩液位传感器（以下简称传感器，含普通型和隔爆型）用于液体液位、界面连续测量。除此以外，磁致伸缩液位传感器的应用领域还十分广泛，包括：石油、化工原料储存、工业流程、生化医药、食品饮料、罐区管理和加油站地下库存等各种液罐的液位工业计量和控制，大坝水位，水库水位监测与污水处理等。

磁致伸缩液位传感器严格按照GB3836.1-2002《爆炸性环境用防爆电气设备通用要求》，GB3836.2-2000《爆炸性气体环境用电气设备；第二部分：隔爆型"d"》的要求制造，并取得国家防爆电气产品质检中心颁发的防爆合格证。

Magnetostrictive liquid level transmitter is developed by our company with a completely independent intellectual property rights. Performance & reliability of the product can approach international advanced level; part of the performance has been ahead of international advanced level. Business is all over the country more than twenty provinces. Explosion-proof certification is issued by The National Electric Products Quality Inspection and Testing Center and The Petroleum & Chemical Industry explosion-proof Center.

Magnetostrictive liquid level transmitter (hereinafter referred to as transmitter, including the general type and explosion-proof) is used for the liquid level & interface continuous measurement. In addition, the transmitter is for wide range of application areas, including petroleum, chemical raw materials storage, industrial processes, biochemical medicine, food and beverage, gas station underground tank management etc.

The transmitter is produced strictly according with the "explosive atmospheres requirements for explosion proof electrical equipment", GB3836.2-2000 "explosive gas atmospheres electrical equipment; Part II: explosive-proof d". The explosive-proof certification is issued by National Explosion Protected Electrical Products quality inspection center.



## 技术参数 TECHNICAL PARAMETER

量程范围: 50~22000mm

Measuring range: 50mm~22000mm

供电电源: 24V±2.4V. DC

Supply power: 24V±2.4V.DC

可测量液面和界位

To measure not only liquid level but also two kinds of liquid contact surface

输出形式: 4~20mA、0~5V、0~10V、±5V、±10V

Output: 4~20mA、0~5V、0~10V、±5V、±10V

工作温度: 电子仓: -40~+85℃ 测杆: -40~200℃

Working temperature: electric warehouse: -40~+85℃ measuring rod: -40~110℃

输出温漂: 50ppm/℃

Output temperature drift: 50ppm/℃

产品功耗: <60mA

Power loss: <60mA

工作压力: 浮球: 3.2MPa

Working pressure: float: 3.2MPa

输出纹波: <20mv

Output ripple: <20mv

线性误差: 优于0.05%FS, 量程小于300mm的传感器误差小于150μm

Linear error: precede 0.05%FS, error less than 150μm as the measuring range less than 300mm

重复性误差: 优于0.002%FS

Repetitiveness error: precede 0.002%FS

带负载能力 loading capability

4~20mA输出: 带负载能力不低于500Ω

4~20mA output: loading capability not less than 500Ω

0~5V、0~10V输出: 最大输出阻抗小于20Ω

0~5V、0~10V output: maximum output impedance less than 20Ω

防爆等级Explosiye proof classification: 隔爆型Explosion proof type: ExdIICT4~T6

本质安全型Intrinsically safe type: ExialICT4~T6

## 工作原理 PRINCIPLE

磁致伸缩液位传感器的结构部分由不锈钢管(测杆)、磁致伸缩线(波导丝)、可移动浮子(内有永外磁钢)等部分组成。

传感器工作时,传感器的电路部分将在波导丝上激励出脉冲电流,该电流沿波导丝传播时会在波导丝的周围产生脉冲电流磁场。在传感器测杆外配有一浮子,此浮子内部有一组永久磁钢。当脉冲电流磁场与浮子产生的磁环磁场相遇时,浮子周围的磁场发生改变从而使得由磁致伸缩材料做成的波导丝在浮子所在的位置产生一个扭转波脉冲;这个脉冲以固定的速度沿波导丝传回并由检测机构检出。通过测量脉冲电流与扭转波的时间差可以精确地确定浮子所在的位置,即液面的位置。

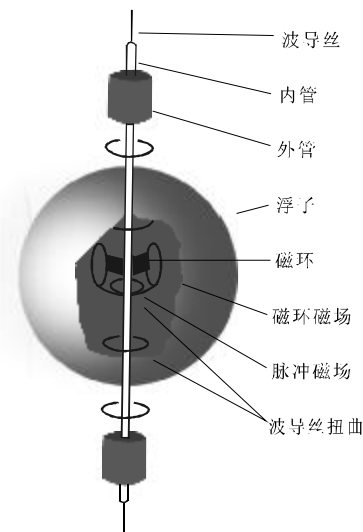
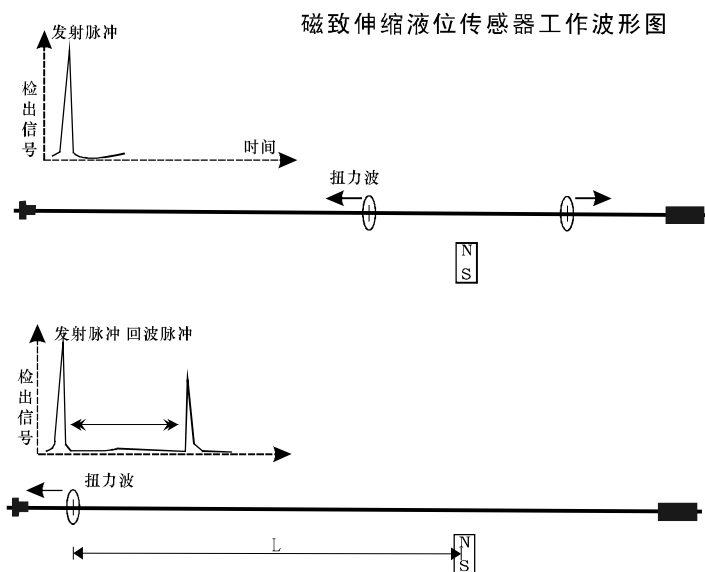
Magnetostrictive liquid level transmitter is composed of stainless steel tube (measuring rod), magnetostrictive line (waveguide wire), movable float (with permanent magnet) and other components, see Figure 1.

When the transmitter is working, the circuit will send out pulse current on waveguide wire. The current will produce a pulse current magnetic field while the current is along the wire. There is a float with magnetic around the measuring rod. When the pulse current magnetic field meet with another magnetic field produced by the float, the field around the float is changed, the waveguide wire will produce a torsional wave pulse, this pulse will be back to measuring centre with one fixed speed along the waveguide wire. By measuring the pulse current and time to reverse the wave can accurately determine the location of float, that is the location of liquid level.

 型号规格表 MODEL & SPEC

LWYC200	磁致伸缩液位（界位、位移）变送器 Magnetostrictive Liquid Level Transmitter		系列号 series				
	D	单球（测液位或界位）single float(measure liquid level or contact surface)	1、磁性浮球数 float number				
	S	双球（测液位或界位）double float(measure liquid or liquid contact surface)					
	P	硬管 hard tube	2、测杆类型 measuring tube				
	F	软管 soft tube					
	1	00Cr17Ni14Mo2(316L)	3、测杆材质 measuring tube material				
	2	1Cr18Ni9Ti(321)					
	3	0Cr18Ni9(304)					
	4	聚四氟乙烯（PTFE）					
	5	其他 other					
	1	二线制4-20mA two-wire 4-20mA	4、输出信号 output signal				
	2	二线制4-20mA+HART协议 two-wire 4-20mA + HART					
	3	RS-485、CAN等					
	4	脉冲、PWM pulse、PWM					
	5	其他 other					
	A	G3/4" 外螺纹	5、过程连接 process connection				
	B	DN50 PN1.6					
	C	DN80 PN1.6					
	D	DN100 PN1.6					
	E	其他 other					
	P	普通型 general type	6、防爆类型 explosion type				
	D	隔爆型 Exd II CT4-T6 explosive-proof					
	B	本质安全型 Exia II CT4-T6 intrinsically safe type					
	<input type="checkbox"/>	安装高度 mm install height	7、安装高度 install height				
	<input type="checkbox"/>	测量范围 mm measuring range	8、测量范围 measuring range				
LWYC200-	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>

★ 1、与磁性液位计配套使用时 1、5、7项不选  
2、其他特殊要求可在订货时注明！




**磁致伸缩液位传感器结构示意图**

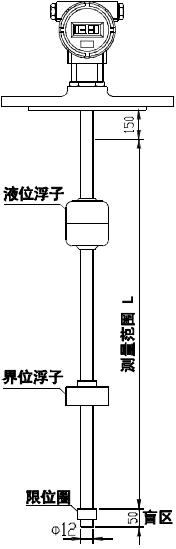
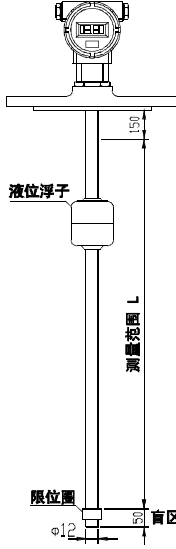
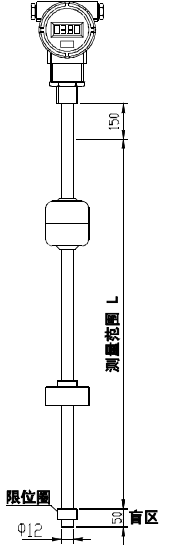
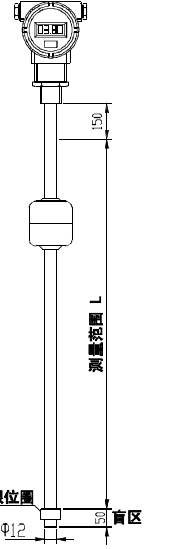
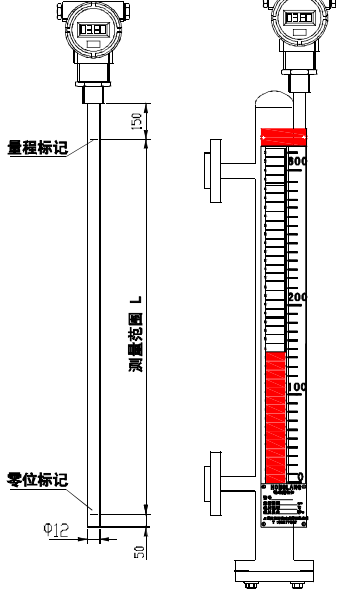
## 安装注意事项INSTALLATION PRECAUTION


在定货或安装前，用户应先了解安装现场情况，并认真阅读使用说明书，使安装现场的环境温度符合液位传感器的安装允许范围，购买者或用户应对产品的应用、防腐及功能选择负责，所订购产品应符合使用环境要求。

Before pre-order or install, the user should first know the installation site, and read the instructions carefully, to ensure the ambient temperature of installation site is in lining with the the transmitter. Purchaser or user response to the application of products, anti-corrosion and function selection ,the ordered products shall be consistent with the environmental requirements.

1. 浮球方向：安装的时候将浮球的标记为 0 N 的一端朝上  
Float direction: the end of the ball marked "ON" is up
2. 测杆不能弯曲，液位传感器的电子部件端或最末端不允许受大的冲击或振动  
Measuring rod should not be bent, the electronic components or the ending of the transmitter should not allow large impact or vibration.
3. 液位传感器不可直接用于有化学反应或其它对液位传感器有损害的易燃、易爆、腐蚀、蒸气和液体等场合，必要时需有防护措施给予保护  
The transmitter can not be directly used for the site which has chemical reaction or other harm to the liquid level sensor, like flammable, explosive, corrosive, steam and liquid and so on. If necessary, protective measure have to be given to the circuit.
4. 液位传感器的电子部件防溅但不可浸没，切不可让液体浸至六方形基座上方。安装完毕，应对电子仓进行保护处理  
The electric components are splash-proof, but not submerged, must not allow the liquid to dip the top of the six square base. After installed, deal with the protection of electronic warehouse.
5. 液位传感器的屏蔽电缆连线必须避开大功率电源、射频信号源和其它有噪声的传输线等  
The shielded cables of the transmitter must avoid the transmission line of high-power, RF signal source and other noise

 外形尺寸图OUTSIZE

法兰连接		螺纹连接		与磁性液位计配套安装
				
测界位	测液位	测界位	测液位	测界位或液位
法兰标准 HG20592-97 DN50 PN1.6 PN2.5 PN4.0 DN80 PN1.6 PN2.5 PN4.0 DN100 PN1.6 PN2.5 PN4.0		G1/2" G3/4" G1" G1/4" G2"		

 接线方式WIRING

液位传感器的引线方式为屏蔽电缆, 共有两根引出线. 接线说明如下:

- 红色线: 电源正(+24VDC);
- 蓝色线: 电源负(0VDC);

注意: 用户在接线之前, 请检查供电电源是否满足  
8~24VDC 要求, 如果电源不满足要求,  
请更换供电电源以保证传感器能够正常工作.

