SHAANXI SHENGKE ELECTRONIC TECHNOLOGY CO., LTD.

COMPANY PROFILE

Shaanxi Shengke Electronic Technology Co. Ltd is a high technology enterprise, located in Xian hi-tech industries development zone. Our Company relies on the scientific resources of Xi'an University.

We are jointly devoted to the development of liquid level sensor products for the petroleum, chemical, pharmaceutical, metallurgical and other industries. The company concentrates on exploration of the theory, and research, of Sonar technology, as it applies to real applications in industrial automation and control. Our external liquid level switch and external liquid level transmitter, have reached a level of performance that will meet the expectations of International industry. We have, for the first time, had a breakthrough in overcoming the technical problems in development of a practical two wire externally mounted Sonar liquid level sensor.

As the supplier, we take customer feedback as our primary driver, and provide high quality service to maximise customer satisfaction and value . This is our sincere goal, to be delivered in a professional and efficient way and to achieve recognition as a high technology enterprise in China's automation control field.

External Liquid Level Sensor

Product overview

Our external liquid level sensors use an advanced signal processing technology to avoid the influence of tank wall thickness and assure the non-contact measurement of level, between the liquid inside and the tank wall.

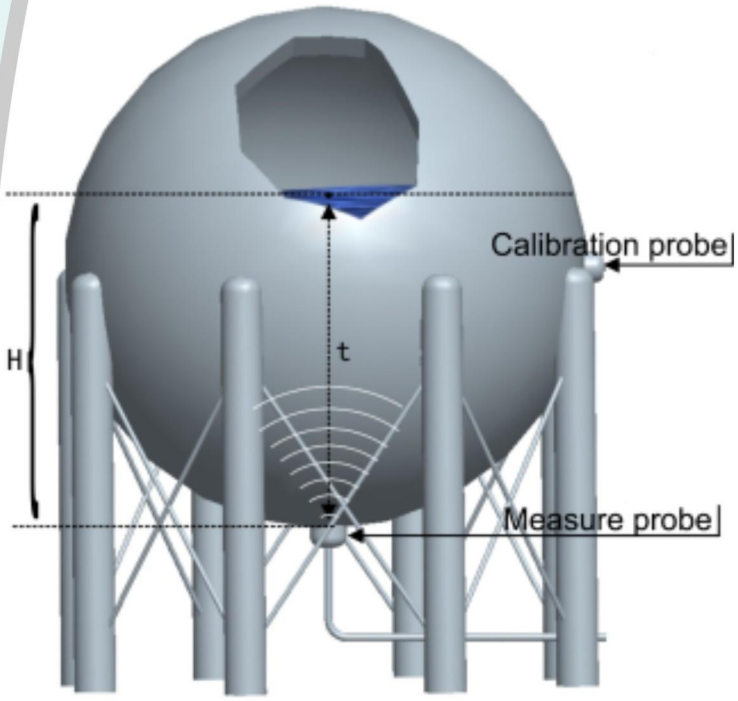
The probe can be easily installed on the bottom of tank without any drilling, saving time and expensive installation. The installation set-up and debugging can be done on live processes, without affecting production.

SK external liquid level sensors can be used for flammable, explosive and poisonous liquid (strong acid and strong base) and for levels in any kinds of pure liquid. There is no special requirement for the tank wall material and liquid type.

Work Principle

The external liquid sensor uses the principle of sonar ranging, by transmitting and receiving the sonar signal from the special probe fixed outer wall of the tank. Using proprietary high speed sonar wave processing technology as the base, then SK's proprietary method to calculate the level value, the output signal can be generated for control ,monitoring or analysis purpose. The sensor can send the data to the control centre in the form of conventional 4-20 mA analog signal and with digital communications including HART, RS485, Wi-Fi, Infrared, Modbus, Bluetooth and Ethernet.

As shown in the picture, the sonar wave signal sent from the measuring probe gets reflected when it meet the liquid surfacel. The measuring probe detects the echo signal and analyses this signal by a proprietary algorithm to calculate the time (t) taken by sonar wave to return. The system will calculate the liquid level data according to following formula:



$$H=\frac{v\times t\times \alpha}{2}$$

H=liquid level height

v=the speed of the sonar wave propagation in liquid

t=the time from the sonar wave return

α=correction coefficient

Calibration Sensor Probe Function：

When measuring liquid level, the sound speed is different, at different temperatures and pressures. The calibration probe will measure the speed of sound in the liquid during measurement, assuring increased accuracy in all conditions.

Principle：

The calibration probe is installed in a diameter location, with fixed target distance. By measuring the sound reflection time, the instrument calculates the actual sound speed.

Advantage

- External level measurement solution with exceptional safety
- Easy and low cost installation
- Low maintenance
- Various communication options
- Diagnostics and error detection
- Local display
- Explosion-proof design with ingress protection from dust & water

Application fields

External sensors for liquid level measurement are suitable for almost any liquid type such as oil, petrochemical, chemical, poisons, acids, strong base and other liquids. The external sensor can measure the liquid level without any physical contact with the liquid and altering, or drilling the tank.

Its explosion-proof design makes it suitable for hazardous applications*. This solution can be used in petroleum, mining, power, chemical, water & waste treatment plant, agriculture, environmental monitoring, food & beverages industries.

This system is suitable for following liquids:

*[Please check local Certification requirements]

butadiene	diesel	chloroform	hydrogen sulfide
ethyl alcoholethylene	Trichloroethylene	Light naphtha	methylbenzene
butene	n-butane	gasoline	lye
diethyl ether	hydrogen fluoride	aviation kerosene	hydrochloric acid
tetrafluoroethylene	vitriol	oxirane	unsym-Dimethylhydrazine
hydrogen chloride	trichlorosilane	N methyl aniline	propane
carbon dioxide	nickel carbonyl	hydrofluoric acid	kerosene
etrafluoroethane	transformer oil	isobutylene	chloroethylene
ethylene	methyl-tert-butyl ether	bromine	liquefied petroleum gas
perfluoropropylene	methylamine	Freon	dimethyl ether
raffinate oil	xylene	propylene	acetaldehyde
Chloromethane	acetone	n-butane	milk
methanol	water	butane	phosphorus trichloride
ethanediol	brine	nitric acid	o-xylene

Work Condition

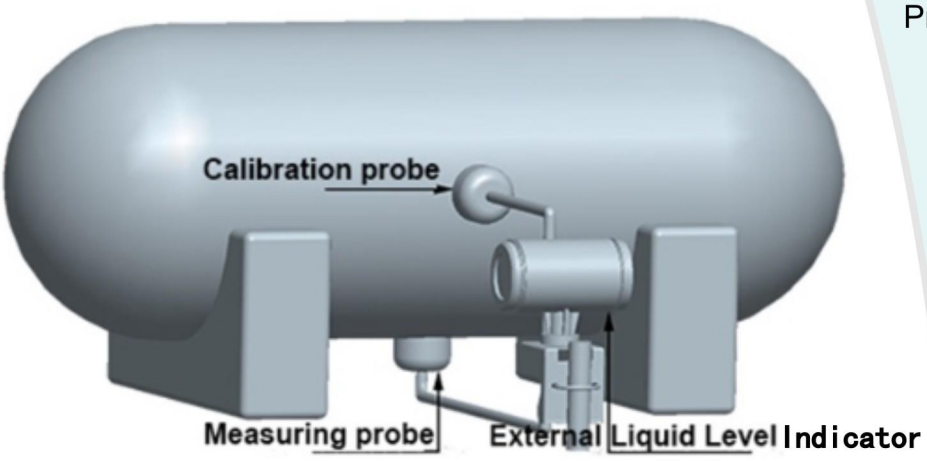
Factors	Requirement
Container	Spherical, vertical, horizontal. The position of probe should be right under the container For probe installing: 200mm(L)*200mm(W)*300mm(H). No solid matters between measuring probe installation position and the highest liquid level. The wall thickness at the bottom of container (probe position) ≤100mm. (unless customized probe) The wall at the bottom of the container should be no soft lining or gas interlayer. The wall at the bottom of the container should be dense isotropic materials, such as carbon steel, 16MnR, 304, 316, FRP, hard rubber.
Liquid	Dynamic viscosity of liquid medium＜30mPa·s. (unless customized probe) Liquid without much sediment, crystal, auto polymer, suspended solid, some bubbles. Single ingredient liquid or several ingredients of compatible liquids. If not the probe will require special configuration.
Liquid Temperature	Temperature of the tank bottom where probe installation position. The normal temperature probe (−50℃~100℃). The high temperature probe (60℃~330℃). Others should be customized probe.
Ambient Temperature	Sensor assembly selection depends on the temperature of the sensor work position. Normal temperature (−20℃~70℃). Low temperature (−40℃~70℃).
Ambient Humidity	0%~100%
Explosive-Proof Grade	Exd II CT6
Protection Grade	IP67

Specification

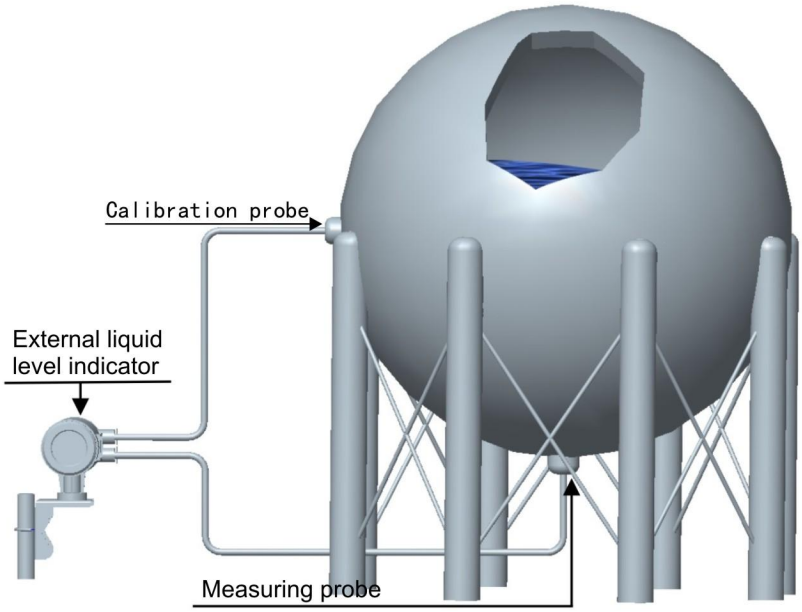
External level Sensor	Two-wire type	Four-wire type
Measuring range	(0.2～3)m、(0.3～5)m、(0.4～10)m、(0.5～15)m、(0.6～20)m、(0.7～30)m、(0.8～50)m	
Display resolution	1mm	
Repeatability in short time	1mm	
Measuring error	±1‰FS	
Zero offset adjustment	±100 m	
Signal output	(4~20)mA, HART, MAX 500Ω	(4~20) mA, HART,MAX 1000Ω
Power	<80mw	10w
Communication	RS-485,IR,HART	RS-485,IR,HART,Modbus,Wi-Fi, Bluetooth,Etherne
Relay alarm output		AC 250V 5A DC 30V 5A
Environment temperature for display/transmitter	-20℃~+70℃,-40℃~+70℃	
Environment temperature of main sensor assembly	-50℃~+100℃,60℃~330℃	
Ambient humidity	(15%～100%) RH	
Explosion-proof sign	Exd Ⅱ CT6	
Enclosure protection grade	IP67	
Liquid level indication	128*64 liquid crystal display	
Dead zone	It will show “Dead” when liquid level in dead zone, the output will be 4mA in signal	
Power supply	DC 24V	DC 24V、AC 220V
Electrical interface	M20×1.5	
The cable length from probe to main sensor assembly	5m、10m、15m、20m、25m、30m	
Weight of main sensor assembly	2.9KG	
Size of main sensor assembly	217mm(length)×160mm(width)×185mm(height)	
The diameter of the base hole in main sensor assembly	Φ6	

Installation

Probe position guidelines

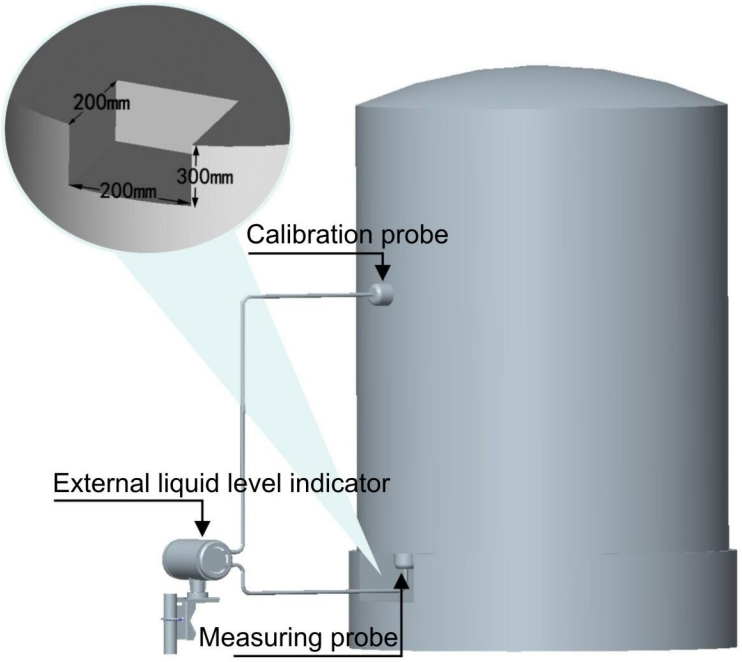


The measuring probe position should be perpendicular to the liquid level surface. There should be no obstructions above the probe.



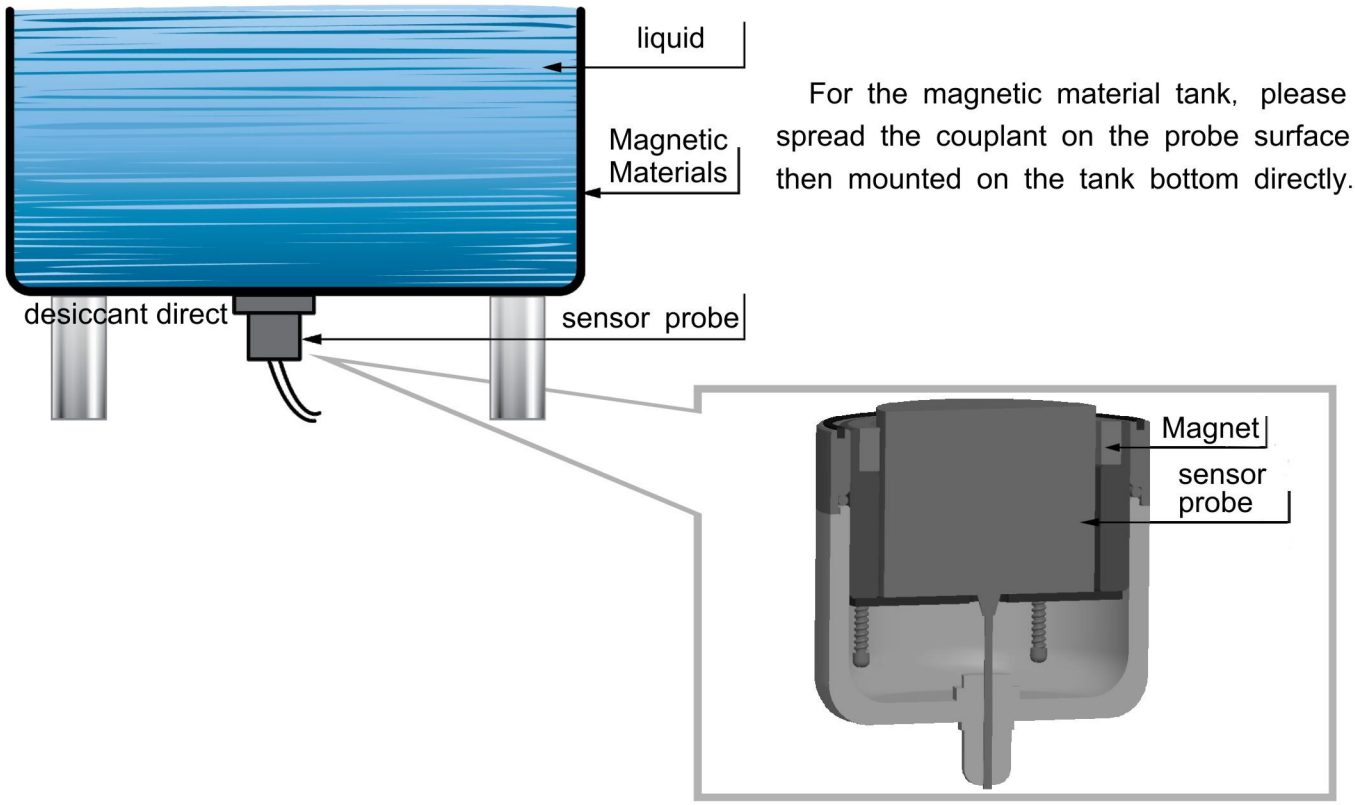
The measuring probe installation position must be remote from the input and exit pipes in the tank in order to avoid turbulent flow created by entrance or exit of liquid affecting the measurement.

The measuring probe installation position should be higher than the liquid outlet hole, in order to avoid dirt deposited at the tank bottom in the long term, affecting on the measurement. Otherwise periodic cleaning will be required.

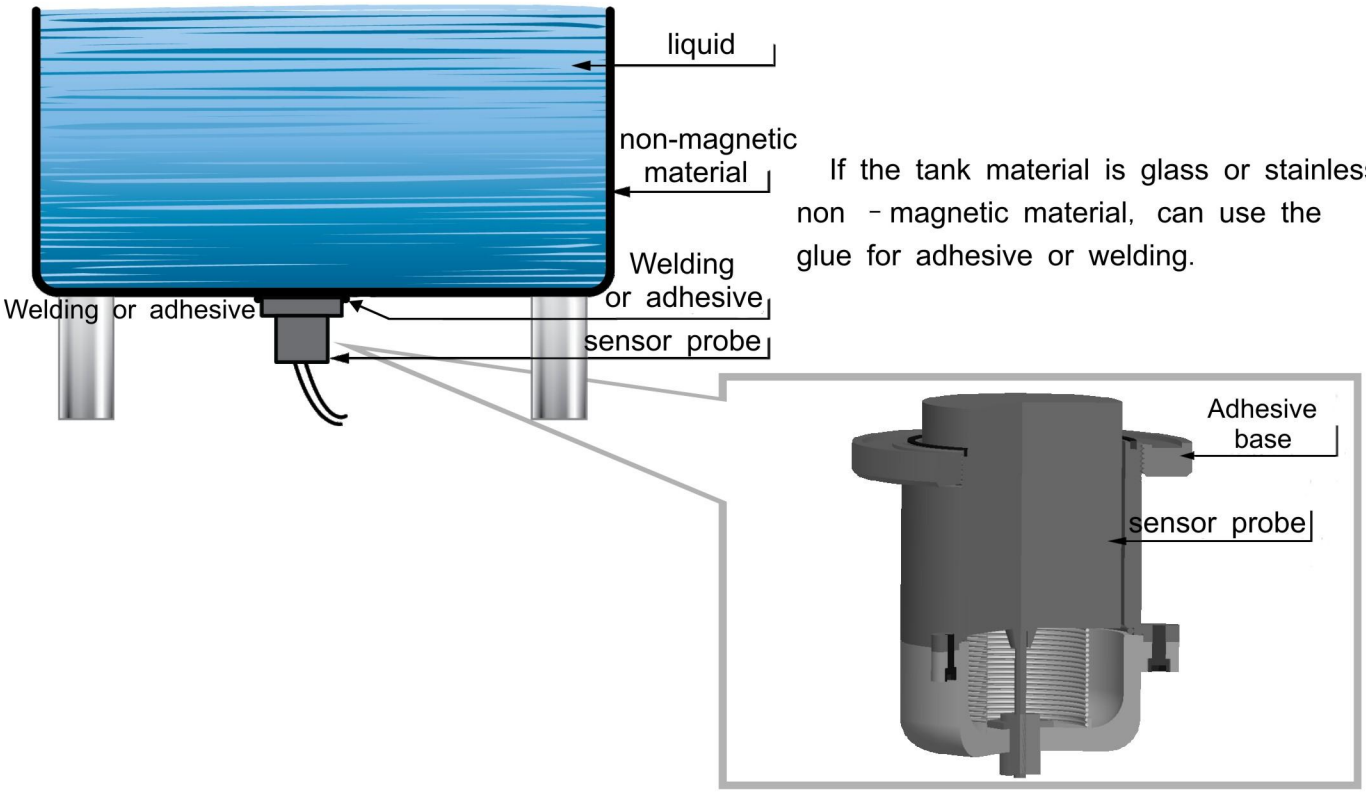


The main sensor installation area on the tank wall should more than Ø 100mm. The inclination should be less than 3° from horizontal.

Attachment of main sensing probe assembly

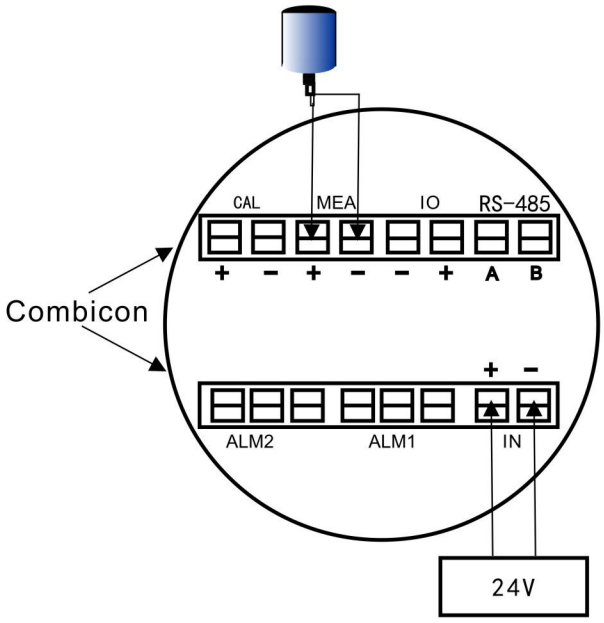


For the magnetic material tank, please spread the couplant on the probe surface then mounted on the tank bottom directly.



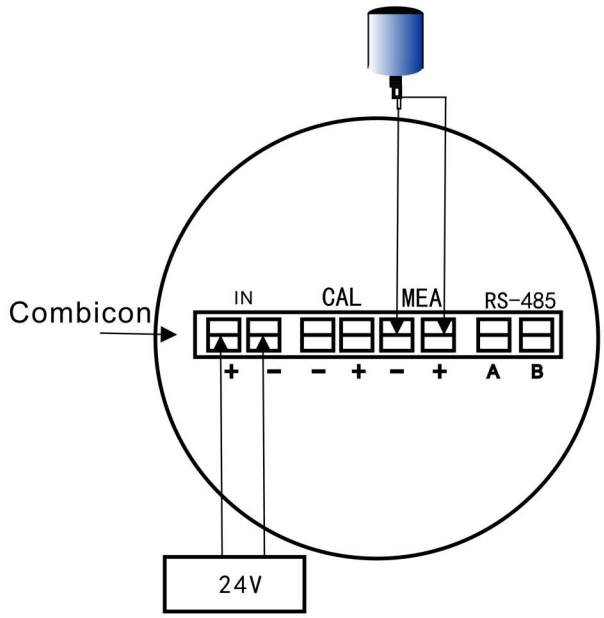
If the tank material is glass or stainless, non - magnetic material, can use the glue for adhesive or welding.

Electrical Connection



four wire type

mark		connection	define
CAL	+	Calibration probe	Signal positive
	−		Signal negative
MEA	+	Measuring probe	Signal positive
	−		Signal negative
IO	−	4-20mA(HART)	Current output negative
	+		Current output positive
RS-485	A	RS-485	485 +
	B		485 −
ALM2	NO	Relay alarm output 2	NO Point
	NC		NC Point
ALM1	NO	Relay alarm output 1	NO Point
	NC		NC Point
24V	+	DC24V electricity	positive
	−		negative



two wire type

mark	connection
DC24V	24V direct electricity 4~20mA HART
CAL	calibration probe
MEA	measuring probe
RS-485	RS-485 Communication

Model Selection

SK-WY	
Wire Connection type	L: two-wire S:four-wire
Tank type	Q:spherical tank W:horizontal tank L:Vertical tank
Measuring range	3 , 5 , 10 , 15 , 20 , 30&50 meters
J(N)	Relay output alarm module and output number
H	HART
M	Modbus RTU[RS485]
W	Wi Fi
R	Infrared
E	Ethernet

For example:

SK-WY-LQ20HMWE means liquid level sensor with two wire type for Spherical tank, max measure range is 20M, with HART, Modbus, Wi fi, Ethernet.

中华人民共和国
制造计量器具许可证

陕制 01000373 号

陕西声科电子科技有限公司：

根据《中华人民共和国计量法》的规定，对你单位制造下列计量器具的生产条件、产品质量和计量法制管理考核合格，特发此证。

序号	计量器具名称	型号（规格）	测量范围	准确度等级
1	外贴式液位计	SK-WY 系列	3m,10m,20m,30m,50m	0.1 级

（以下空白）

注册地址：西安市高新区太白南路高山流水和城5幢2单元16层21604室
生产地址：西安市高新区太白南路高山流水和城5幢2单元16层21604室

发证单位（盖章）：
发证日期：2013 年 12 月 18 日
有效日期：2016 年 12 月 17 日

备注：有效期届满前 3 个月应向原发证机关提出复查换证申请。

质量管理体系认证证书

证书编号：00114Q23682R0S/6100

兹证明
陕西声科电子科技有限公司

注册/运营地址：中国陕西省西安市高新区太白南路高山流水和城5幢2单元16层21604室

建立的质量管理体系符合标准：
ISO9001:2008
GB/T 19001-2008
通过认证范围如下：
外贴式液位开关、外贴式液位计的设计开发和生产

首次发证日期：2014年5月12日　本次发证日期：2014年5月12日　有效期至：2017年5月11日

Signed by: Wang Kejiao

中国质量认证中心
中国·北京·南四环西路188号9区 100070
http://www.cqc.com.cn

Q 0167136　2009年版

SHAANXI SHENGKE ELECTRONIC TECHNOLOGY CO., LTD.

CNEX 国家防爆

防爆电气设备
防爆合格证

编 号： CNEx14.0198X

送检单位	陕西声科电子科技有限公司 西安市高新区太白南路高山流水和城 5 幢 2 单元 16 层 21604 室
样品名称	外贴式液位计
型号规格	SK-WY　24VDC
防爆标志	ExdIICT6 Gb
产品标准	Q/SK001-2013
总装图号	WY-00.00

经对上述产品图样及技术文件的审查和样品检验，确认符合下列标准：
GB3836.1—2010《爆炸性环境 第1部分：设备 通用要求》
GB3836.2—2010《爆炸性环境 第2部分：由隔爆外壳“d”保护的设备》

记 事
1、外壳防护等级 IP67.
2、安装使用时，用户应按照使用说明书规定对防爆电缆密封接头进行填料密封。
3、安装使用时，禁止拆掉堵头配接其他防爆部件。

本证有效期　2014 年 1 月 22 日至 2019 年 1 月 21 日

颁 发 日 期　2014 年 1 月 22 日

中心主任

国家防爆电气产品质量监督检验中心
地址：中国河南省南阳市仲景北路20号　邮政编码：473006
电话：0377-63258564　传真：0377-63208175　Http://www.china-ex.com

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CNEX 国家防爆

防爆电气设备
防爆合格证

编 号： CNEx14.0200X

送检单位	陕西声科电子科技有限公司 西安市高新区太白南路高山流水和城 5 幢 2 单元 16 层 21604 室
样品名称	外贴式液位探头
型号规格	SK-WT　＜100 mA
防爆标志	ExmbIIT6 Gb
产品标准	Q/SK003-2013
总装图号	WT-00.00

经对上述产品图样及技术文件的审查和样品检验，确认符合下列标准：
GB3836.1—2010《爆炸性环境 第1部分：设备 通用要求》
GB3836.9—2006《爆炸性气体环境用电气设备 第9部分：浇封型“m”》

记 事
1、预留电缆长度应大于 1 米，电缆自由端应接入与环境相适应的防爆设备里。
2、代表型号 SK-WT01、SK-WT02，工作电流＜100 mA，防爆标志 ExmbIIT6 Gb。
3、潜在静电电荷危险，见使用说明书。

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CNEX 国家防爆

防爆电气设备
防爆合格证

编 号： CNEx14.0199

送检单位	陕西声科电子科技有限公司 西安市高新区太白南路高山流水和城 5 幢 2 单元 16 层 21604 室
样品名称	外贴式液位开关
型号规格	SK-WK　24VDC
防爆标志	ExdIICT6 Gb
产品标准	Q/SK002-2013
总装图号	WK-00.00

经对上述产品图样及技术文件的审查和样品检验，确认符合下列标准：
GB3836.1—2010《爆炸性环境 第1部分：设备 通用要求》
GB3836.2—2010《爆炸性环境 第2部分：由隔爆外壳“d”保护的设备》

记 事
1、外壳防护等级 IP67.
2、安装使用时，用户应按照使用说明书规定对防爆电缆密封接头进行填料密封。

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颁 发 日 期　2014 年 1 月 22 日

中心主任

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