Operating Instructions
操作说明

阻抗频谱物位开关, 型号ILS

CN

Impedance spectrum level switch, model ILS

EN

阻抗频谱物位开关, 型号ILS

WIKA

Smart in sensing

Prior to starting any work, read the operating instructions! Keep for later use!

在开始任何工作之前，请仔细阅读操作说明!
请妥善保留以备后用!

目录

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一致性声明在线查询网址为www.wika.cn / www.wika.com.

1. 一般信息

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- 本操作说明中描述的阻抗频谱物位开关均采用先进的技术设计和制造。所有零部件在生产过程中都遵守严格的质量和环境标准。我们的管理体系通过 ISO9001 认证。
- 本操作说明包含有关操作仪表的重要信息。操作时应遵守所有安全说明和作业指导。
- 使用仪表时应遵守当地相关的事故预防安全规范和使用量程内的一般安全规范。
- 操作说明是产品的一部分，必须保存在仪表附近，技术人员可以随时获取的地方。将操作说明传达给仪表的下一位操作者或所有者。
- 使用产品前，技术人员应仔细阅读并理解本操作说明。
- 适用销售文件中包含的一般条款和条件。
- 遵守技术修改。
- 更多信息：
  - 网址： www.wika.cn / www.wika.com
  - 相关技术数据： ILS数据资料

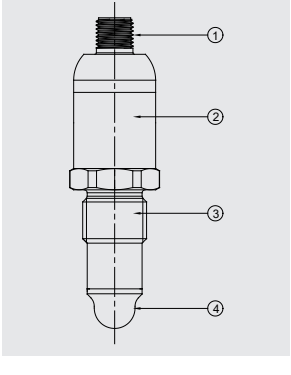
2. 设计和功能

CN

2.1 描述

阻抗频谱物位开关用于检测各种介质的极限物位。开关用途广泛，不受流动、扰动、气泡、泡沫、振动、固体含量或粘附的影响。

集成在传感器探头中的电极与周围环境共同形成一个电容，其电容值取决于介质的介电常数。电容器和传感器电路中的电感线圈共同组成一个谐振电路。根据测得的谐振频率和可调的开关动作范围，传感器触发开关信号。



1 航空插头 M12
2 外壳
3 安装螺纹
4 PEEK 探头

2.2 供货范围

按交货单核对供货范围。

3.安全

CN

3.1 符号

危险!
...用于警示即时的危险情形，若不避免，可能会导致严重的人身伤害或死亡。

警告!
...用于警示潜在的危险情形，若不避免，可能会导致严重的人身伤害或死亡。

小心!
...用于警示潜在的危险情形，若不避免，可能导致人员轻伤或设备、环境损坏。

信息
... 给出有用的提示、建议和信息以进行高效的无故障操作。

3.2 预期用途

阻抗频谱物位开关适用于物位监测。使用范围基于技术性能和材料限制。

- 应用范围限制：
  不适用粗糙介质（如石英砂）和很重的块状材料（如石头）
  用于腐蚀性介质（酸或碱）时，要和厂家确定兼容性
  传感器探头避免受到强烈的紫外辐射
- 遵守操作说明中规定的使用条件。

3. 安全

- 阻抗频谱物位开关不得受到强烈的机械应力（冲击、弯曲、振动）。该仪表的设计和制造仅适用于此处所述的预期用途，只能相应使用。
- 阻抗频谱物位开关的开关阈值可以通过蓝牙功能进行调整。
- 遵守相关的安全使用规定。
- 遵守操作说明中的技术规范。在技术规范之外对仪表进行不当使用或操作，需要立即停止并由授权的 WIKA 技术服务人员进行检查。

对使用不当而引起的任何索赔，制造商不承担责任。

危险!

在容器上作业时，有中毒或窒息的风险。只能使用合适的个人安全设备（例如呼吸保护装置、防护服等）进行作业。

3.3 不当使用

任何超过技术性能阈值或与材料不兼容的使用都被视为不当使用。

警告!

因使用不当造成伤害

产品使用不当可能导致危险情况和人员伤害。

未经授权不得改动仪表。

任何超出预期用途的应用或任何其他用途都被认为是不当使用。

请勿在安全或紧急关闭设备中使用本仪表。

3.4 操作员责任

该装置用于工业领域。因此，经营者负有职业安全方面的法定义务。

遵守本操作说明中的安全说明以及机组使用区域适用的安全、事故预防和环境保护规定。

为了在设备上安全工作，操作人员必须确保:

- 定期接受与职业安全、急救和环境保护相关的所有事项的培训，熟悉操作说明，尤其是其中包含的安全说明。
- 根据预期用途（检测是否不当使用）确保仪表适合应用场景。

3.5 人员资质

警告!

资质不足有受伤风险

不当使用可能导致严重的人生伤害和财产损失。

- 操作说明中所述的活动只能由具有以下资质的专业技术人员执行。

专业人员

操作员授权的专业人员能够执行所述工作，并自主检测潜在危险，这是由于他们接受过技术培训、拥有测量和控制技术知识以及他们的经验和了解国家特定法规、适用标准和导则。

3.6 个人安全设备

个人安全设备用于保护技术人员在工作时免受可能影响安全或健康的风险。在装置上和装置一起执行各种任务时，技术人员必须穿戴个人安全设备。

遵守工作区域张贴的有关个人安全设备的警告标识!

操作员必须提供所需的个人安全设备。

3.7 标签/安全标识

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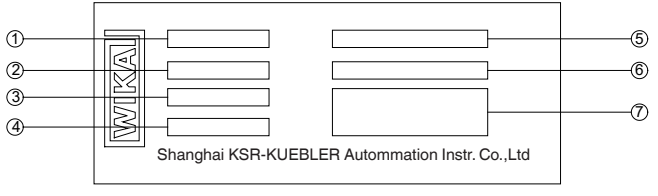
产品标签 (示例)



1 – 产品型号
2 – 操作压力
3 – 信号输出
4 – 供电电源
5 – 供电电源
6 – 产品名称
7 – 产品编号
8 – 接线指示

符号

在安装和调试仪表前，请确保已阅读操作说明!

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4.运输、包装和储存

4.1 运输

检查仪表是否在运输途中产生任何损坏。如有明显损坏，必须立即上报。

小心!

运输不当造成损坏

运输不当可能会对财产造成严重损坏。

- ► 注意包装上的符号。
- ► 小心处理包裹。

4.2 运输和储存

调试之前请勿拆除包装。

5.调试和运行

- ■ 遵守包装上提供的运输安全装置的拆卸说明。
- ■ 小心地从包装里取出阻抗频谱物位开关!
- ■ 拆包时，检查所有部件是否有外部损坏。

5.1 安装准备工作

功能检查

安装之前，可以按照 5.3 节的描述连接阻抗频谱物位开关，并且可以手动触碰叉体做功能检测。

警告!

确保功能检查不会启动任何计划外的进程。

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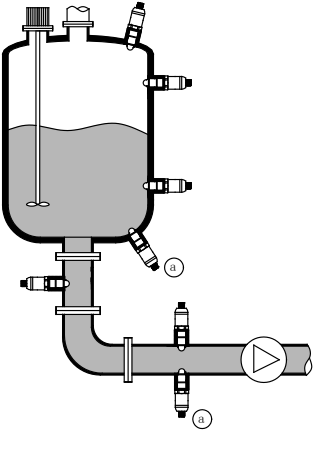
5.2 安装

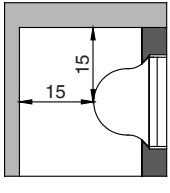
- 遵守管道安装作业规定的螺栓扭矩值。
- 在选择安装材料（密封件、螺栓、垫圈和螺母）时，应考虑工艺条件。必须针对介质及其蒸汽规定适用的密封件。此外，确保其具有相应的耐腐蚀性。
- 确保容器和阻抗频谱物位开关的密封面清洁，没有任何机械损坏。
- 传感器的 PEEK 探头是检测部件，在安装过程中要注意严禁外力碰撞和人为损伤。
- 安装示意

  1) 容器和管道中的安装位置如下图，作为点物位检测或干运转保护。

  2) 如果介质的粘性很强，安装位置 a 仅在一定程度上适用，可能会将介质残留检测为液位。



- 安装和拆卸设备前，确保系统未承受任何压力，且管道霍容器中无介质。
- 安装位置/环境
  最好安装于闭合的金属容器或管道中。
  传感器必须和金属管路连接装置保持电气接触。
  安装在塑料容器中时，需要采取适当的措施接地，避免电磁干扰导致性能受影响。
- 受限空间的安装
  如果安装在如管道/容器角落或搅拌器等位置，为避免出现故障和对传感器造成损害，必须让传感器探头的尖端与邻近的物体（如管道/容器壁）最少保持 15 mm 的距离，如下图所示。



- 安装步骤
  将包装箱内的平面密封圈穿过螺纹，装在传感器上并检查是否在正确的位置。
  给传感器螺纹涂抹少量适合该应用的润滑油膏。
  将传感器拧入相应的管路连接装置并拧紧，扭矩范围 20 ... 25 N.m
  安装后，检查容器/管道的入口阻力。

5.3 电气连接

- 电气连接只能由有资质的技术人员完成。
- 仪表的电气原理图上给出了连接细节和开关功能。
- 所提供的电源连接线的尺寸必须满足最大的仪表电流，并符合 IEC 227 或 IEC 245 的要求。
- 安装在产品上的电缆是为固定安装而设计的。

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危险!
必须在断电状态下进行电气连接。

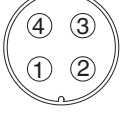
警告!
阻抗频谱物位开关的电气连接错误可能损坏电路模块。这可能导致工厂发生故障，从而导致人员受伤或设备损坏。

接线步骤

操作步骤按照如下执行:

1）取出 M12 航空插座（端部带有规定长度的线缆）；
2）将 M12 航空插座的定位凹点与音叉开关本体上的航空插头的定位凸点对准；
3）按压 M12 航空插座的端部，保证插座按照定位位置插入插头；
4）拧紧 M12 航空插座外部的锁紧螺母；
5）确保 M12 航空插座和插头的连接可靠。

接线原理图

航空插头M12		
	1	U+
	3	U-
	2	SW1 (NO)
	4	SW2 (NC)
芯线颜色 1 BN 棕色 2 WH 白色 3 BU 蓝色 4 BK 黑色		

5.4 调试

- 该阻抗频谱物位开关带有蓝牙功能，通过蓝牙功能可以完成如下设置：
  1）读取当前的开关阈值
  2）根据现场的实际需求，设置开关阈值
- 蓝牙连接设备
  可以通过手机/平板电脑等带有蓝牙功能的移动设备。
- 蓝牙软件
  手机 APP 或微信小程序。
  如果采用手机 APP，请联系厂家提供APP安装包。
  如果采用微信小程序，在微信小程序里面搜索“威卡蓝牙”。
- 蓝牙连接方式
  每台开关的铭牌上都有一个唯一的产品编号，蓝牙打开之后，搜索到这个产品编号，点开后输入密钥就可以进入操作界面。
  密钥需要联系厂家提供。
- 完整操作步骤
  1）安装手机 app 或者打开微信小程序。
  2）选择对应的蓝牙 ID（产品铭牌上的产品编号）。
  3）进入蓝牙界面，会有数据更新。
  4）读阈值指令：输入“Read#”，返回值为阈值。
  5）设置阈值指令：输入“@数值#”，例如“@750#”返回 success，则阈值设成功。

出厂前，开关阈值的默认设置为 600，信号输出的时间延时默认为 1.8 s。

注意
蓝牙连接时，要在距离设备 1.5 m 范围内操作，超出此范围，蓝牙信号弱，会出现信号中断问题。

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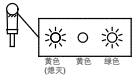
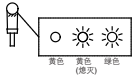
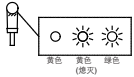
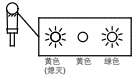
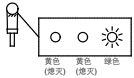
注意
开关状态与液位的对应关系。

	液位	开关状态	指示灯
高限位		1／2	
高限位		1 2	
低限位		1／4	
低限位		1 4	
报警			不适用
报错			

功能测试

上电后，绿灯亮和其中一个黄灯亮，说明阻抗频谱物位开关可以工作。

把阻抗频谱物位开关提起，并插入水中，当传感器的探头接触介质或被介质浸没后，电压信号可以在 24 V 和0 V 之间切换，指示灯的颜色切换，说明开关功能正常。

6. 故障

以下表格包含了最常见的故障原因和必要的措施。

故障	序号	原因	处理	
			方法	地方
上电 指示灯不亮	1	接线错误 电源线接反了	按照接线图正确接线	现场
	2	电路模块损坏	更换电路模块	返修
探头被介质覆盖，但是没有开关动作（包含电压信号改变和指示灯颜色切换）	1	电源电压低	检查供电电源	现场
	2	电路模块损坏	更换电路模块	返修
	3	阈值设置不对	按照 5.4 的阈值设置方法重新设置阈值	现场
探头被介质覆盖，开关动作频繁切换（包含电压信号改变和指示灯颜色切换）	1	液面波动过大	信号延时需要设置，现场无法调整	返修
	2	电路模块损坏	更换电路模块	返修

CN

小心!

人员受伤及财产、环境损害

如果无法通过所列措施消除故障，则必须立即使仪表停止运行。

- ► 确保不再存在任何压力，并防止意外投入运行。
- ► 联系制造商。
- ► 如果需要返修，请按照第 8.2 节“返修”中的说明进行操作。

7. 维护和清洁

7.1 维护

如果使用得当，阻抗频谱物位开关可以免维护。但是，必须在定期维护的时候对其进行目视检查，并在容器压力测试时将其包括其中。

危险!

在容器上作业会有中毒和窒息的危险。除非采取适当的个人防护措施（如呼吸防护设备、防护服等），否则不得进行任何工作。

只能由制造商进行维修。

注释!

只有使用原装配件和备件，才能保证音叉开关的完美功能。

7.维护和清洁

7.2 清洁

小心!

人员受伤及财产、环境损害

清洁不当可能导致人员伤害以及财产和环境损坏。拆卸后的仪表中残留的介质可能会对人员、环境和设备造成风险。

- ► 冲洗或清洁拆下的仪表。
- ► 必须采取足够的预防措施。

1. 清洁前，应将仪表同进程和电源正确断开。
2. 用湿抹布仔细清洁仪表。
3. 不得让电气连接接触湿气

小心!

财产损坏

清洁不当可能导致仪表损坏!

- ► 不要使用任何侵蚀性清洁剂。
- ► 不要使用任何尖锐或坚硬的物体进行清洁。

8. 拆卸、返修和处置

CN

警告!

参与介质造成的人员伤害、财产及环境损害

拆卸后的仪表中残留的介质可能会对人员、环境和设备造成风险。

► 清洗或清洁拆下的仪表，以保护人员和环境免受残留介质的影响。

8.1 拆卸

只有在系统减压并断开电源后，才能断开测量仪表!

8.2 返修

将拆下的阻抗频谱物位开关退回之前，应清洗或清洁，以保护人员和环境免受残余介质的影响。

有关返修的信息可以在外面当地网站的“服务”标题下找到。

8.3 处置

不当的处置会使环境处于危险之中。

按照指定国家的废物处理法规，以环保的方式处理仪表部件和包装材料。

9. 规格

9.1 产品型号

型号代码	描述	认证无	CE	Ex ia	Ex ib	3-A	EHEDG
ILS-S1	阻抗频谱物位开关 基本型	X					
ILS-S2	阻抗频谱物位开关 延长型	X					
ILS-S3	阻抗频谱物位开关 特殊型	X					

更多数据请参阅ILS数据资料

Contents

EN

Declarations of conformity can be found online at www.wika.com.

1. General information

EN

- The Impedance spectrum level switches described in the operating instructions have been designed and manufactured using state-of-the-art technology. All components are subject to stringent quality and environmental criteria during production. Our management systems are certified to ISO 9001.
- These operating instructions contain important information on handling the instrument. Working safely requires that all safety instructions and work instructions are observed.
- Observe the relevant local accident prevention regulations and general safety regulations for the instrument's range of use.
- The operating instructions are part of the product and must be kept in the immediate vicinity of the instrument and readily accessible to skilled personnel at any time. Pass the operating instructions onto the next user or owner of the instrument.
- Skilled personnel must have carefully read and understood the operating instructions prior to beginning any work.
- The general terms and conditions contained in the sales documentation shall apply.
- Subject to technical modifications.
- Further information:
  - Internet address: www.wika.com
  - Relevant data sheet: ILS datasheet

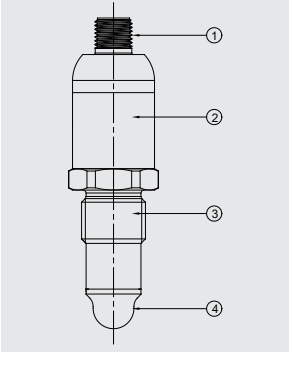
2. Design and function

EN

2.1 Functional description

Impedance limit switches are used to detect limit levels in various media. Switches are versatile and are not affected by flow, turbulence, bubbles, foam, vibration, solids content, or adhesion.

The electrodes integrated in the sensor probe together with the surrounding environment form a capacitance whose value depends on the dielectric constant of the medium. The capacitor and the inductance coils in the sensor circuit together form a resonant circuit. Based on the measured resonant frequency and the adjustable switching range, the sensor triggers a switching signal.



1 M12 connector
2 Housing
3 Mounting thread
4 PEEK probe
5 Tuning fork

2.2 Scope of delivery

Cross-check scope of delivery with delivery note.

3. Safety

3.1 Symbols

DANGER!
... indicates an immediately hazardous situation which might result in death or severe injuries if it is not avoided.

WARNING!
... indicates an potentially hazardous situation which might result in death or severe injuries if it is not avoided.

CAUTION!
... indicates an potentially hazardous situation which might result in light or minor injuries or property or environmental damages if it is not avoided.

Information
... highlights useful tips and recommendations and information for efficient and fault-free operation.

EN

3.2 Proper intended use

Impedance spectrum level switches are solely intended for monitoring the limit level of fluid and solid. The area of use is based on the technical performance limits and materials.

- The application should meet the following requirements:
  Not suitable for rough media (e.g. quartz sand) and heavy bulk materials (e.g. stones).
  When used in corrosive media (acids or alkalis), it is necessary to determine compatibility with the manufacturer.
  The sensor probe is protected from strong UV radiation.
- Compliance with the usage conditions specified in the operating instructions is required.

- Impedance spectrum level switch may not be subjected to strong mechanical stresses (im- pact, bending, vibrations). The unit is exclusively designed and constructed for the intended use described here and may only be used accordingly.
- The switching thresholds of the Impedance spectrum level switch can be adjusted by Bluetooth function.
- Compliance with the relevant safety regulations for the use is required.
- Compliance with the technical specifications in these operating instructions is required. Improper use or operation of the unit outside the technical specifications requires immediate shut-down and inspection by an authorized WIKA service technician.

Claims of any kind due to improper use are excluded.

DANGER!
When working on containers, there is a risk of poisoning or suffocation. Work may only be performed using suitable personal safety equipment (e.g. respiratory protection, protective clothing, etc.).

3.3 Improper use

Any use that exceeds the technical performance thresholds or that is incompatible with the materials is considered improper use.

WARNING!
Injury due to improper use
Improper use of the unit can result in hazardous situations and injuries.
Do not modify the unit without authorization

Any use beyond the proper intended use or any other use is considered improper use.

Do not use this unit in safety or emergency off equipment.

3.4 Responsibility of the operator

The unit is used in the industrial sector. The operator is therefore subject to statutory obligations with respect to occupational safety.

Compliance with the safety instructions in these operating instructions and the applicable safety, accident prevention and environmental protection regulations for the area of use of the unit is required.

In order to safely work on the unit, the operator must ensure:

- the operating personnel is regularly trained in all matters pertaining to occupational safety, first aid and environmental conservation and is familiar with the operating instructions and, in particular, the safety instructions contained therein.
- the unit is suitable for the application in accordance with the proper intended use (check for improper use).

3.5 Personnel qualification

WARNING!
Risk of injury due to insufficient qualifications
Improper use can result in significant personal injury and property damages.

- The activities described in these operating instructions may only be performed by specialist technicians with the following qualifications.

Specialist personnel
The specialist personnel authorized by the operator is capable of executing the described work and autonomously detect potential hazards due their technical training, knowledge of measuring and control technology and their experience and knowledge of country-specific regulations, applicable standards and guidelines.

3.6 Personal safety equipment

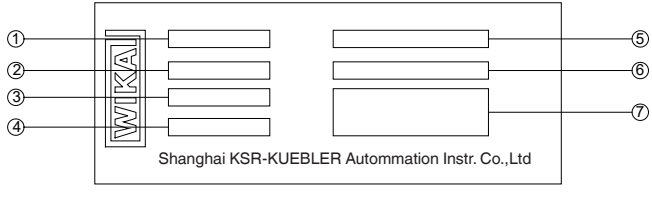
The personal safety equipment serves to protect the technicians against hazards that might impact the safety or health while working. When executing the various tasks on and with the unit, the technicians must wear personal safety equipment.

Comply with warning signs posted in the work area regarding personal safety equipment!

The required personal safety equipment must be provided by the operator.

3.7 Labelling, safety markings

Product label (examples)



1 - Product type
2 - Operating pressure
3 - Signal output
4 - Power supply
5 - Product name
6 - Serial number
7 - Wiring diagram

Symbols

Before mounting and commissioning the instrument, ensure ywou read the operating instructions!

EN

4. Transport, packaging and storage

4.1 Transport

Check the Impedance spectrum level switch for any damage that may have been caused by transport. Obvious damage must be reported immediately.

EN

CAUTION!
Damage due to improper transport
With improper transport, a high level of damage to property can occur.

- ► Observe the symbols on the packaging.
- ► Handle packages with care.

4.2 Transport and storage

Do not remove packaging until just before commissioning.

5. Commissioning, operation

- Observe all instructions provided on the packaging for removing the transportation safety devices.
- Remove the Impedance spectrum level switch carefully from the packaging!
- When unpacking, check all components for any external damage.

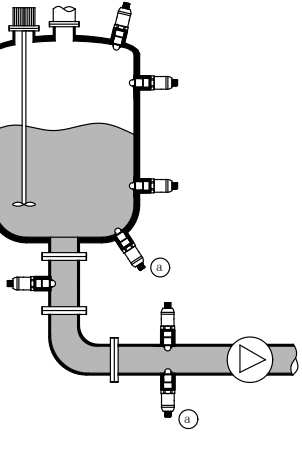
5.1 Mounting preparations

Functional check
Before mounting, the Impedance spectrum level switch can be connected as described in chapter 5.3 and the tuning fork can be manually touched for functional testing.

WARNING!
Ensure that the functional check does not start any unin- tended processes.

5.2 Mounting

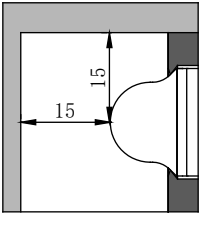
- Observe the torque values of screws specified in pipefitting work.
- In the selection of the mounting material (seals, bolts, washers and nuts), take the process conditions into account.
- Ensure that the sealing faces of the vessel and Impedance spectrum level switch are clean and do not show any mechanical damage.
- The PEEK probe of the sensor is a detection component, and it is necessary to pay attention to the strict prohibition of external force collision and man-made damage during the installation process.
- Mounting schematic
  Note: The direction mark of the tuning fork must be upward when installing.
  1) The installation position in the container and pipeline is shown below as a point level detection or dry running protection.
  2) If the viscosity of the medium is very strong, the installation position a is only applicable to a certain extent, and the residual medium may be detected as a liquid level.



5. Commissioning, operation

EN

- Before installing and disassembling the equipment, make sure that the system is not subjected to any pressure and that there is no media in the pipe container.
- Installation location/environment
  It is best installed in a closed metal container or pipe.
  The sensor must be in electrical contact with the metal pipe connection.
  When installed in plastic containers, appropriate grounding needs to be taken to avoid electromagnetic interference that may affect performance.
- Installation of confined spaces
  If installed in a location such as a pipe/vessel corner or agitator, the tip of the sensor probe must be kept at least 15 mm away from adjacent objects (e.g. pipe/vessel walls) to avoid malfunction and damage to the sensor, as shown in the figure below.



- Installation Steps
  Thread the flat seal inside the box through the threads, attach it to the sensor and check that it is in the correct position.
  Apply a small amount of lube paste suitable for the application to the sensor threads.
  Screw the sensor into the corresponding pipe connection and tighten it with a torque range of 20...25 N.m.
  After installation, check the inlet resistance of the vessel/pipe.

5.3 Electrical connection

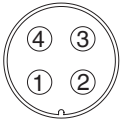
- The electrical connection must only be made by qualified skilled personnel.
- Connection details and switching functions are given on the connection diagram on the instrument and the connection terminals are appropriately marked.
- The mains connection lines to be provided must be dimensioned for maximum instrument current supply and comply with IEC 227 or IEC 245.
- The cables installed on the product are designed for fixed installation.

DANGER!
The electrical connection must be made in a de-energised state.

WARNING!
Electrical connection errors of the Impedance spectrum level switches can destroy the reed contacts. This can lead to a malfunction in the plant and thus lead to injury to personnel or damage to equipment.
Explosion-proof instrument, only when there is no detonating atmosphere, it is allowed to open the lid of the junction box.

Wiring steps
1) Take out the M12 aviation socket (cable with specified length at the end);
2) Align the positioning bent of the M12 aviation socket with the positioning bump of the aviation plug on the tuning fork switch body;
3) Press the end of the M12 aviation socket to ensure that the socket inserts the plug according to the positioning position;
4) Tighten the locking nut outside the M12 aviation socket;
5) Make sure the connection of M12 aviation socket and plug is reliable.

Connections diagrams

M12 Connector		
	1	U+
	3	U-
	2	SW1 (NO)
	4	SW2 (NC)

Color of the cable
1 BN Brown
2 WH White
3 BU Blue
4 BK Black

5.4 Commissioning

- The impedance spectrum level switch has a Bluetooth function, through which the following settings can be completed:
  1) Read the current switching threshold.
  2) Set the switching threshold according to the actual needs of the site.
- Bluetooth connected devices
  Mobile devices with Bluetooth capabilities such as mobile phones/ tablets.
- Bluetooth software
  Mobile app or WeChat applet.
  If the mobile APP, please contact the manufacturer to provide APP installation files.
  If you use the WeChat Mini Program, search for “WIKA Bluetooth IoT” in the WeChat Mini Program.
- Bluetooth connection
  Each switch has a unique product number on the nameplate, after the Bluetooth is turned on, search for this product number, click on it and to enter the operation interface after entering the correct password. You need to contact the manufacturer to provide the password.
- Complete steps
  1) Install the mobile app or open the WeChat Mini Program.
  2) Select the corresponding Bluetooth ID (product number on the product nameplate).
  3) Enter the Bluetooth interface, there will be a data update.
  4) Read Threshold Command: Enter “Read#” , and the return value is the threshold.
  5) Set the threshold command: Enter “@value#” , for example, “@750#” returns success, then the threshold is set successfully.

Before leaving the factory, the default setting of the switching threshold is 600, and the time delay of the signal output is 1.8s by default.

Note
When making a Bluetooth connection, it is necessary to operate within 1.5m from the product, beyond this range, the Bluetooth signal is weak.

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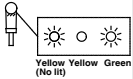
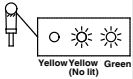
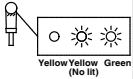
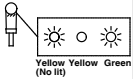
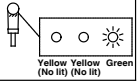
Note
The following table shows the switch state related to the indicator light and level.

	Level	Switch state	Indicator light
Max. Level			
Max. Level			
Min. Level			
Min. Level			
Alarm			Not Applicable
Error			

Function test
After powering on, the green light is on and one of the yellow lights is on, indicating that the switch can work well.
When the probe of the sensor contacts the medium or is immersed in the medium, the voltage signal can be switched between 24V and 0V, and the color of the indicator light is switched, indicating that the switch function is normal.

6. Faults

The following table contains the most frequent causes of faults and the necessary countermeasures.

EN

Faults	No.	Causes	Solutions	
			Method	Place
Power on The indicator light is off	1	Wiring error The power supply cable is connected in reverse	Wiring correctly according to the wiring diagram	On site
	2	Circuit module damage	Replace circuit module damage	Return
The sensor probe is covered totally by medium, but no on-off action (include voltage signal change and the color of indicator light change)	1	Power supply is too low	Check the power supply	On site
	2	Circuit module damage	Replace circuit module damage	Return
	3	The threshold is set incorrectly	Re-set the threshold according to the threshold setting method in 5.4	On site
The sensor probe is covered totally by medium, but on-off action continually (include voltage signal change and the color of indicator light change)	1	Excessive fluctuation of liquid level	The signal delay needs to be set and cannot be adjusted on site	Return
	2	Circuit module damage	Replace circuit module damage	Return

CAUTION!
Physical injuries and damage to property and the environment
If faults cannot be eliminated by means of the listed measures, the instrument must be taken out of operation immediately.

- ► Ensure that there is no longer any pressure present and protect against being put into operation accidentally.
- ► Contact the manufacturer.
- ► If a return is needed, please follow the instructions given in chapter 8.2 “Return”.

7. Maintenance and cleaning

7.1 Maintenance

When used properly, the Impedance spectrum level switches work maintenance-free. They must be subjected to visual inspection within the context of regular maintenance, however, and included in the vessel pressure test.

DANGER!
Work on vessels involves the danger of intoxication and suffocation. No work is allowed to be carried out unless by taking suitable personal protective measures (e.g. respiratory protection apparatus, protective outfit etc.).

Repairs must only be carried out by the manufacturer.

Perfect functioning of the Impedance spectrum level switches can only be guar- anteed when original accessories and spare parts are used.

7.2 Cleaning

CAUTION!
Physical injuries and damage to property and the environment
Improper cleaning may lead to physical injuries and dam- age to property and the environment. Residual media in the dismounted instrument can result in a risk to persons, the environment and equipment.
- ► Rinse or clean the removed instrument.
- ► Sufficient precautionary measures must be taken.

1. Prior to cleaning the unit, properly disconnect it from the process and the power supply.
2. Carefully clean the unit with a damp cloth.
3. Do not let electrical connections come into contact with moisture!

CAUTION!
Damage to property
Improper cleaning may lead to damage to the instrument!
- ► Do not use any aggressive cleaning agents.
- ► Do not use any pointed and hard objects for cleaning.

8. Dismounting, return and disposal

EN

WARNING!
Physical injuries and damage to property and the environment through residual media
Residual media in the dismounted instrument can result in a risk to persons, the environment and equipment.
- ► Wash or clean the dismounted instrument, in order to protect persons and the environment from exposure to residual media.

8.1 Dismounting

Only disconnect the measuring instrument once the system has been de- pressurised and the power disconnected!

8.2 Return

Wash or clean the dismounted Impedance spectrum level switch before returning it, in order to protect personnel and the environment from exposure to residual media.

Information on returns can be found under the heading “Service” on our local website.

8.3 Disposal

Incorrect disposal can put the environment at risk.
Dispose of instrument components and packaging materials in an environmentally compatible way and in accordance with the country specific waste disposal regulations.

9. Specifications

9.1 Product model

Model code	Desciption	Certificate None	CE	Ex ia	Ex ib	3-A	EHEDG
ILS-S1	Impedance limit switch Standard model	X					
ILS-S2	Impedance limit switch Extension model	X					
ILS-S3	Impedance limit switch Special model	X					

For further specifications see data sheet ILS datasheet

WIKA subsidiaries worldwide can be found online at www.wika.com.

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