



电容式接近传感器

管道液位型 (TP系列)

使用说明书

感谢您选择星川产品，使用产品前，请您认真阅读此说明书。
为了您的方便，请妥善保管好此说明书，以便随时查阅。

安全上须知

以下内容为了确保安全使用之必要项目，请务必遵守。

- 请勿在可燃性、挥发性、爆炸气体的环境中使用。请勿对本产品进行任何分解、修理、改造等。
- 有关电源电压：
请勿超越规定电压使用。若使用额定电压以上之电压或对只能使用直流电源的产品施加交流电则都可能会造成产品爆裂、烧毁的后果。
- 有关负载端短路：
请勿使用负载短路。请勿将负载端直接接电源。否则会有产品爆裂、烧毁的后果。
- 有关配线：
请勿发生诸如搞错电源极性、误接线等错误。否则会有造成产品爆裂、烧毁的后果。
- 有关无负载时的配线：
如在不接负载的情况下接通电源，则会有内部元件破裂、烧毁的危险，故请在接入负载后配线、通电。

使用上须知

- 请勿在以下场所使用：
室外诸如直射阳光、雨、雪、水滴等直接接触的场所。
化学药品特别是在溶剂、酸性蒸气环境。
有腐蚀性气体场合。
- 当靠近移动电话、收发报机等使用时，接近开关有时会发生误动作，务必请十分注意。
- 当与高压线、动力线混合在同一配线管、配线槽时，会由于感应引起误动作或损坏，请分开或单独配线。
- 有关清洁工作：
溶剂类清洁剂会造成产品表面熔化，请勿使用。
- 固定：
请将固定螺丝钉的紧固力矩设定在不超过0.95N·m。
- 周围金属的影响：
当周围有金属时，会受其影响产生复归不良等，即使不产生复归不良，也会因周围金属、温度变化等导致检测距离变化。

技术规格

规格		TP-13□	TP-26□
适合管道	外径	6-13mm	12-26mm
	壁厚	1mm以下	1.5mm以下
电源电压		DC 10-30V	
输出方式		NPN N.O.; NPN N.C.; PNP N.O.; PNP N.C. 允许通过最大电流200mA	
外壳材质		PBT树脂	

输出方式

DC3线	NPN NO	NPN NC	PNP NO	PNP NC
引线式				

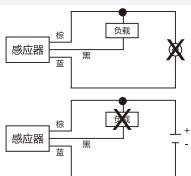
配电注意事项

电源电压

请勿超过电压范围以上使用，输入超过电压范围或者直流电源型输入交流电源恐会发生破裂或烧毁。

负载短路

请勿将负载短路恐会发生破裂或烧毁。
负载短路保持功能是指电源正极性下，在额定电压内使用的功能。

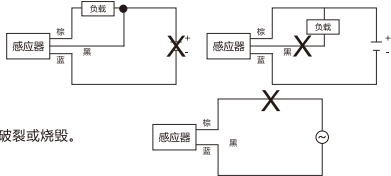


误配线

电源的极性等请勿配错线，恐会发生破裂或烧毁。

没有负载连接时

无负载电源直接通入内部，恐会发生破裂或烧毁。
所以请加入负载再配线。



介电常数表

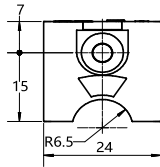
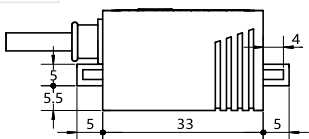
常用材料介电常数表

材 料	介电常数
空气	1
特氟龙	2
木材	2~7
石蜡	2.2
汽油	2.2
松节油	2.2
变压器油	2.2
纸	2.3
有机玻璃	3.6
环氧树脂粘合剂	3.6
电木	3.6
石英玻璃	3.7
硬橡胶	4
油纸	4
纸板压制的碎屑	4
陶瓷	4.4

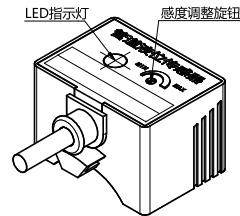
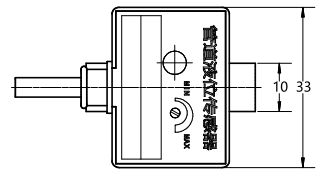
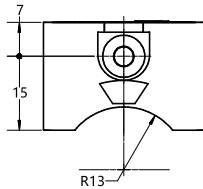
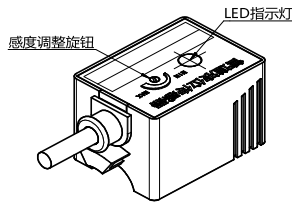
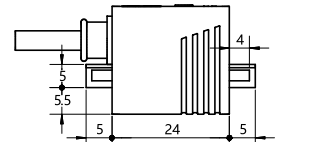
材 料	介电常数
聚乙烯	2.3
聚丙烯	2.3
电绝缘皮化合物	2.5
软橡胶	2.5
硅	2.8
聚氯乙烯	2.9
聚苯乙烯	3
赛璐络	3
硬纸	4.5
石英砂	4.5
玻璃	5
聚酰胺	5
云母	6
大理石	8
酒精	25.8
水	80

产品尺寸

TP-13□□



TP-26系列



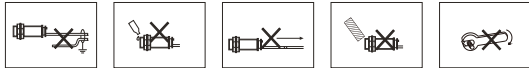
定期维护检查

接近开关在正确的使用下，可以保持永久的寿命及稳定性，故在使用期间、平日的定期检查、维护是非常必要的，确保机器的正常运作。定期检查项目如下：

- 检出物体时，开关是否在距离内，是否有松动现象，是否有倾斜不正，检出物是否有变更。
- 配线或等衍接线，是否接触正常，或者无断线顾虑。
- 感应面是否有金属粉末堆积。
- 使用温度，及周围环境是否正常。
- 安装空间，是否有异常，如震动，电气漏电.....

其它：

- 当通电后，开关须要100ms的前置时间，为达到开关稳定输出，故于这段时间内，请勿操作开关。避免适用于室外（如有遮蔽物除外）。
- 避免有机溶剂直接接触。
- 防止检测面受物体撞击，因为感应面部分非常脆弱。
- 当装置或运动中开关电源不可过度拉扯、挪动。



注意事项

- 请确认在电源关闭状态下进行接线。
- 请确认电源电压在额定范围内变化。
- 如果电源由商用开关调节器提供，请确保电源机架接地端子（F.G）接地。
- 请务必将该设备接地端子（F.G）接地。
- 电源通电后短时间（0.5s）内，请勿使用。
- 请勿与高压线或电源线一起或同在一电线管内运行线路，这可能会由于感应而引起失灵。
- 避免灰尘污垢和水蒸气。
- 请勿将传感器与水、油、油脂或有机溶液，如稀释剂直接接触。

产品承诺书

星川的产品经过严格的出厂检验。如出现故障，请与星川公司联系，并提供故障详细情况，以便为您尽快解决。

保修期

- 产品保修期为一年，从产品发送到购买方指定地点之日算起。

保修范围

- （1）如果在上述保质期内出现星川造成的故障，星川将免费修复/更换产品。但是以下情况不属于保修范围：
 - 未按照操作说明书、用户说明书或购方与星川公司专门达成的技术要求中规定的条件、环境下的不正确的操作或不正确使用造成的故障。
 - 故障不是由于产品缺陷，而是购买方设备或购买方软件设计造成的。
 - 由非星川公司技术人员进行的修改或修理而造成的故障。
 - 按照操作说明书或用户说明书正确维修或更换易损件等规定可以完全避免的故障。
 - 在产品从星川公司发货后，因无法预料的科学技术水平变化等因素而成造成的故障。
 - 由于火灾、地震和洪水等自然灾害，或异常电压等外部因素造成的故障星川公司不负责保修。
- 保修范围只限于第（1）条规定的情况，星川对其设备造成的购买方间接损失（设备损坏、机会丧失、利润损失等）或者其它损失不承担任何责任。

产品适用性

星川公司的产品是针对一般行业的通用产品而设计生产的，因此星川公司产品不得用于下列应用且不适合其使用。但是，如果购买方以对自己负责的态度提前就产品的使用向星川公司进行了咨询并了解产品的技术规范、等级和性能，并采取必要的安全措施，则产品可以使用。在这种情况下，产品的保修范围和上述相同。

- 潜在化学污染或者受到电气的妨害的用途或者在产品目录、使用说明书等中没有记载的条件及环境下使用。
- 原子力控制设备、焚烧设备、铁道、航空、车辆设备、安全装置及行政机关及根据个别业界的规定制造的设备。
- 可能危及生命、财产的机械、系统、装置。
- 煤气、水道、电气的供给系统24小时连续运转系统等需要高信赖的设备。



www.hoshikawa.com



Capacitance-type sensor

Pipeline-Liquid level type

Instruction Manual

Thank you for choosing products of Hoshikawa. Please read this instruction manual carefully before using products. In addition, keep this Instruction Manual so that you may read it at anytime when necessary.

Safety instruction

Following content is necessary programs which can make sure that users use this product safely, so users should obey these rules.

- Please do not use this product in a place where is full of flammable, volatile, explosive gas. Please do not disassembly, repair, and transform this product.
- About supply voltage:
Please do not use it with a supply voltage which is higher than the standard voltage. if the supply voltage is higher than the standard voltage or using alternating voltage instead of direct voltage, the product may burst or burn and some serious results may occur.
- About load short circuit:
Please do not use load short circuit. Please do not connect load end with direct voltage, or the product may burst or burn and some serious results may occur.
- About wire:
Please do not make mistakes in electrode and wire, or the product may burn or burst.
- About wire without load:
Without any load, internal elements may burst or burn when the product is connected with power supply. Please connect the product with load when use it.

Notice for use

- Please do not use the product in following environment:
In outdoor places where are connected with sunlight, rain, snow, water directly.
Chemical medicines, especially solutions, acid vapor.
Environment with corrosive gas.
- Please pay attention to such a situation where the product may make mistakes when the product is near telephone or receiver-transmitter.
- When high-tension cable and power line are one the same wiring pipes or wiring duct, the product may make mistakes or damage because of interaction. Please separate them in different wires.
- About cleaning work:
Please do not use solvent type cleaners, because they may melt the surface of the product.
- Immobilization: Please set the fixed moment of screws less than 0.95N·m.
- About the influence of surrounding metal:
The product can not return to its original situation when it is near metal. Even it can return to its original situation, the detect distance may change because surrounding Meta, changing temperature and so on.

Technical specification

Specification	TP-13□	TP-26□
Suitable External diameter	6-13mm	12-26mm
channel Wall thickness	Under 1mm	Under 1.5mm
Supply voltage	DC 10-30V	
Output mode	NPN N.O.; NPN N.C.; PNP N.O.; PNP N.C. The largest voltage is 200mA	
Material of shell	PBT resin	

Output mode

DC3 wire	NPN NO	NPN NC	PNP NO	PNP NC
Lead type				

Announcement of power distribution

Voltage of power supply

The product may burn or burst, when the using voltage is higher than standard voltage or input direct voltage instead of alternating voltage.

Load short-circuit

Hold function of load short-circuit means that a function is used in nominal voltage when the power supply is on right polarity.



Wrong wire

The product may burn or burst when the product is connected with wrong polarity.

The product works without load

The product may burn or burst when the product is connected without load. So please add load at first, and then wire the product.

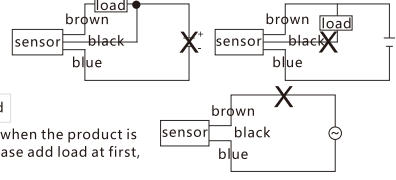


Table of dielectric constant

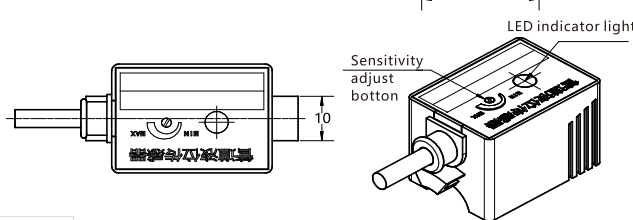
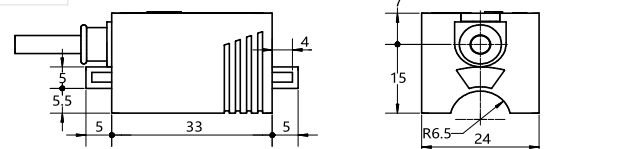
Dielectric constant of conventional materials

Materials	Dielectric constant
Air	1
Teflon	2
Wood	2-7
Paraffin	2.2
Gasoline	2.2
Turpentine	2.2
Transformer oil	2.2
Paper	2.3
Organic glass	3.6
Epoxy adhesives	3.6
Bakelite	3.6
Quart glass	3.7
Hard rubber	4
Oiled paper	4
paperboard	4
Ceramics	4.4

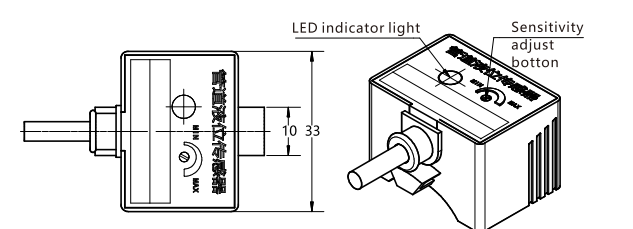
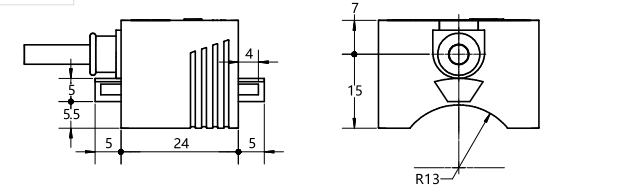
Materials	Dielectric constant
Polyethylene	2.3
Polypropylene	2.3
Chemical compound of rubber cable	2.5
Soft rubber	2.5
Silicon	2.8
PVC	2.9
Polystyrene	3
Celluloid	3
Stiff paper	4.5
Silica sand	4.5
Glass	5
Polyamide	5
Mica	6
Marble	8
Alcohol	25.8
Water	80

Size of product

TP-13□



TP-26系列



Maintenance routine

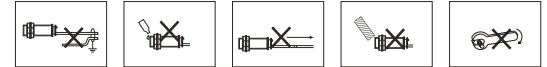
Proximity switch can be used forever, if users use it with right methods. So during the period of using proximity switch, it is necessary for users to check and maintenance it which can keep the machine working correctly. Routine programs are as following:

- When checking things, weather the switch is on the distance or not, the switch starts or not, the switch inclines or not, the detected things change or not.
- Wire distribution or connected-wire is normal, they would not break easily.
- There is not metal filling before interaction.
- The temperature and environment are normal.
- The installation space is correct, such as shake, electrical leakage and so on.

Others:

Before the product is power on, the switch need a lead time which is about 100ms. In order to use the switch safely, the switch can not be used during this period. The product can not used in outdoor space (except there is one shelter).

- Avoid the product connect with organic solution.
- The interaction part can not be hit, because it is tender.
- The switching power supply can not be pulled or moved when setting or moving the product.



Notice

- Users should wire under the situation of power off.
- Users should make sure that the power supply moves in the standard scale.
- If the power is provided by commercial switching regulator, please make sure that the terminal (F.G) of power frame is connected with ground.
- Please connect the terminal of the machine (F.G) with the ground.
- The machine can not be used for 0.5 second after it is power on.
- The product may not work because interaction, when high-tension cable or power line is on the same wiring tube.
- Avoid dust pollution and water vapor.
- The sensor can not be connected with water, oil, grease or organic solution directly.

Product commitment

Products of Hoshikawa are checked by factories strictly. So if products break down, please communicate with Hoshikawa company and offer details. The company will solve the problems quickly.

Guarantee period

- The guarantee period of the product is one year. The period is counted when the product is sent to appointed place.

Guarantee scope

(1) During the period above, Hoshikawa company can repair or change products without any payment. But in the following situations the company would not repair or change products freely.

But in the following situations the company would not repair or change products freely.

- Users didn't obey the rules of operation specification, users' manual or technical requirement which is made by users and Hoshikawa Company and these actions cause problems.
- Because of problems of purchasers' equipment or software design of purchasers, the product breaks down.
- The problems made by technical persons who are not from Hoshikawa Company.
- The problems can be avoided if users obey operation specification or users' manual.
- Unexpected changes of technical level or other factors after Hoshikawa Company delivers their products.
- Because of fire, earthquake or other natural disaster, or abnormal voltage.
- The guarantee scope is regulated by (1), Hoshikawa company would not pay for direct lose (equipment damage, loss of chance, loss of profit and so on).

Applicability of products

According to common industrial situations, Hoshikawa Company designs the product, so these products can not be used in following situations. However the product can be used, if purchasers consult with Hoshikawa Company about the technical scope, level and performance of the produce in advance and carry out related actions. In such a situation, the scope of guarantee is as same as the scope above.

- Potential chemical pollution or electrical influence which have not been recorded in the operation specification.
- Equipment controlled by atomic power, firing equipment, railway, aviation, vehicles, security equipment and other equipment which are made by administration according to specific requirement of industries.
- Machines, system and equipment which may damage lives, property.
- The systems of gas, water channel and power supply which should operate 24 hours precisely.



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