

命名方式															
SS-SS	XX	X	X	X	-	X	X	X	X	X	X	X	X	XX	
系列	开关类型	开关数量	端子	涂层		电缆接口	指示器	认证	标志	IP	温度范围	材质	线圈容量	气连接	特殊配置

请先阅读本手册

为了避免严重或致命的人员伤亡, 或重大财产损失, 请务必阅读本手册内所有的安全说明, 并始终保留本手册。如果您需要额外的帮助, 请联系 Rotork Instruments Italy。

请保存本手册。

警告!
警告, 可能会导致严重的人员伤亡, 或重大财产损失的危险。
危险电压。维修设备前, 请断开所有电源。

Ex 安全说明, 适用于危险区域内安装:

Soldo® 限位开关盒型号 SF – SS 是阀门位置指示设备 (用于指示阀门全开或全关位置)。根据第 ATEX 2014/34/EU 号指令并参考标准 IEC 60079–0, EN 60079–31 和, GB/T 3836.1 – 2021, GB/T 3836.31 – 2021, GB 12476.5 – 2013 进行设计和制造。
“ATEX”是法语“ATmosphere Explosive”其规定了适用于在潜在爆炸性环境中使用的设备技术要求。该指令旨在消除欧共体成员国之间的技术障碍。
在安装和维护SF SS门限位开关盒时, 必须遵守有关在存在气体, 粉尘和薄雾的潜在爆炸性环境中使用电气设备的相关标准。
使用前请先阅读并始终保留本说明手册。
所覆盖型号: Soldo® SF/SS 系列阀门限位开关盒。

以下说明适用于带有 和 IECEx 证书编号: IECEx EUT 17.0033X 的设备。

Soldo® SF/SS 系列阀门限位开关盒可在具有易燃粉尘和薄雾的IIIC 类且防护模式为 Ex tb 的危险区域内使用。

保护方式	设备特性	电气参数	最大环境温度	最高表面温度	设备电源
防粉尘	– 简易装置 – 认证开关 – 位置变送器 – 变送器+ 认证开关 – 变送器+简易装置 – 开关+线路监控	最大耗散 功率 2,47 W	–50°C≤T _{amb} ≤+80°C –60°C≤T _{amb} ≤+105°C	T95°C T120°C	U _{max} =250Vac I _{max} =1A PdiS _{max} =2,47W

- 表 1
- 应由接受过适当培训的人员按照适用规范进行安装。
 - 用户不得擅自维修该设备。
 - 如果设备可能接触到腐蚀性物质, 则用户应采取适当预防措施, 防止其受到不利影响, 从而确保不会影响所提供的保护。腐蚀性物质 – 例如酸性气体或液体可能会腐蚀开关盒外壳。
 - 在环境温度低于 –10°C 或高于 70°C 的情况下, 应使用适用于最低和最高环境温度的电缆。使用工作温度比环境温度高 11°C 的电缆。
 - 必须用湿布清洁阀门限位开关盒, 以防止静电积聚。用户应保证定期清洁粉尘可能积聚的位置。
 - 用户应确保维护不会影响设备的安全特性。
 - 应确保开关盒远离可能影响其使用温度的热源和冷源。

NEPSI 产品使用注意事项:

- “O”形圈和衬垫材质决定了产品使用环境温度范围, 具体为: EPDM (–50°C+80°C), 硅橡胶 (–60°C+105°C)。
- 对于带有防爆标志 Ex tb IIIC T95...T120°C Db..., 的产品, 电气安全参数为: 250Vac 1A 2,47W。
- 产品安装、使用和维护严格遵守 “在可燃性粉尘环境存在时不得开盖”的原则。
- 产品防爆标志为Ex tb IIIC T95...T120°C Db..., 时, 其电缆引入口 (螺纹规格为NPT1/2”, NPT3/4”, M25x1.5或M20x1.5) 须配用经防爆检验认可的, 符合GB/T3836.1–2021 和GB/T3836.31–2021标准、防爆等级Ex tb IIIC Db的电缆引入装置或封堵件, 安装后外壳防护等级不得低于GB/T4208–2017规定的IP66。冗余的电缆引入口应采用封堵件进行堵封, 其它防爆标志产品, 其电缆引入口(螺纹规格为 NPT1/2”, NPT3/4”, M25x1.5或M20x1.5) 须配用适用的电缆引入装置或封堵件, 安装后外壳防护等级不得低于GB/T4208–2017规定的IP66。冗余的电缆引入口应采用封堵件进行堵封。
- 产品的安装, 使用和维护应同时遵守产品说明书, GB/T3836.13–2021“爆炸性环境 第13部分: 设备的修理, 检修, 修复和改造”, GB/ T3836.15–2017“爆炸性环境 第15部分: 电气装置的设计, 选型和安装”, GB/T3836.16–2017“爆炸性环境 第16部分: 电气装置的检查和维护, GB/T3836.18–2017“爆炸性环境 第18部分: 本质安全电气系统”, GB15577–2018“粉尘防爆安全规程”及GB 50257–2014“电气装置安装工程爆炸和火灾危险环境 电气装置施工及验收规范”的有关规定。

我们于此声明 Soldo® 限位开关盒 SF – SS 系列,

Ex tb IIIC T95°C...T120°C Db

(根据接近式开关选项) 符合ATEX 2014/34/UE 指令有关“用于潜在爆炸性环境的设备或保护系统”的规定, 并符合国家实施法规, 并已采用适当的统一标准:

IEC 60079–0:2017 GB/T 3836.1 – 2021
EN 60079–31:2014 GB/T 3836.31 – 2021
2014/30/EU电磁兼容性指令
2014/35/UE低压指令
EN 60529:1991/A2:2013
EN 60730–1:2011
EN 61326–1:2013

IECEX – 形式检验证书 IECEX EUT 17.0033X
生产质量评估报告:
GB/ITS/QAR09.0004

Soldo® 限位开关盒SF–SS 系列也可可提供以下认证:
CCOE
EAC
ECAS

⚠ 注意!
请勿超过限位开关的行程限位。超过限制可能会损坏限位开关, 执行器和阀门。
开关盒标配所提供的堵头仅适用于运输使用。IP6X的防护等级取决于电缆格兰和接线方式。若需达到Ex “e”, Ex d 或 Ex “tb” 和 IP66的保护等级, 则需要使用电缆格兰或堵头。
限位开关盒适用于角行程阀门(90°旋转)。最大轴向角速度为250 rpm。
将限位开关盒投入使用前, 请确保开关及指示器调整完毕。

1 安装

- 通过四个M6X8 螺栓 (2) 将合适的安装支架 (1) 安装到开关盒 (4) 上。
- 将执行器输出轴与轴 (5) 对准并啮合。
- 通过所提供的螺栓 (3) 将支架与执行器固定。

2 关调整及3D指示器设定

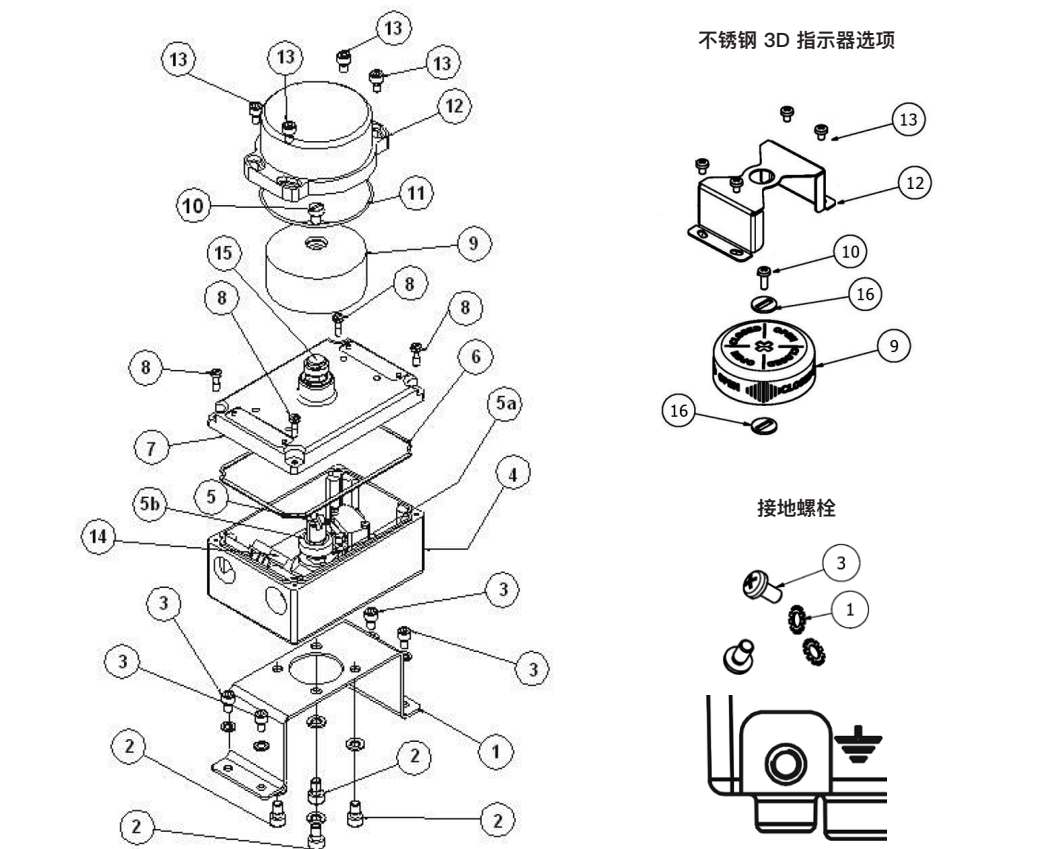
- 松开端盖 (8) 螺栓并拆下端盖 (7)。
- 按照 下面的“凸轮调整”进行。
- 带有3–4个开关的开关盒, 将执行器设定至需要信号的位置, 并根据 “凸轮调整”设定开关3和4的凸轮。
- 装回端盖 (7)。警告: 检查密封圈 (6) 在凹槽内安装到位。使用1,3Nm力矩紧固螺栓 (8)。

3 电气连接

- 参照 2.1 拆卸端盖 (7)。
- 卸下电缆接口上的堵头并更换合适的电缆格兰或堵头。维护: 在指定的维护周期内, 建议定期检查紧固件并进行紧固。
- 根据限位开关盒上的接线图连接端子 (14)。电缆应采用 AWG 20 或更高规格。
- 用0,45 – 0,6Nm力矩紧固端子螺栓。
- 参照 2.4 装回端盖 (7)。
- 必须使用接地螺栓将设备接地。我们提供了两个螺栓 (3) 和抗震垫片 (1)。有两个接地连接, 一个在壳体内一个在壳体外。外部连接建议使用截面积 4 mm² 的电缆或其他更高规格

4 产品储存

- 开关盒应远离紫外线及大气臭氧, 环境温度 0°C – 40°C。



凸轮调整 / 凸轮类型				
A	B	C	D	E
1. 顺时针旋转执行器传动齿轮。	1. 顺时针旋转执行器传动齿轮。	1. 顺时针旋转执行器传动齿轮。	1. 顺时针旋转执行器传动齿轮。	1. 将凸轮从齿轮套筒中脱离至 45° 位置。
2. 将凸轮脱离齿轮套筒。	2. 将凸轮脱离齿轮套筒。	2. 松开 (使用 19 扳手) 顶轴螺母。	2. 松开 (使用 19 扳手) 顶轴螺母。	2. 啮合齿轮套筒并顺时针旋转执行器传动齿轮。
3. 继续旋转直到开关被激活, 然后将凸轮放回齿轮套筒。	3. 继续旋转直到开关被激活, 然后将凸轮放回齿轮套筒。通过调节凸轮与感应传感器之间的距离调整灵敏度。	3. 将凸轮旋转至传感器前。	3. 将凸轮旋转至传感器前。	3. 将凸轮脱离齿轮套筒并旋转凸轮至传感器前。
4. 逆时针旋转执行器传动齿轮。	4. 逆时针旋转执行器传动齿轮。	4. 逆时针旋转执行器传动齿轮。	4. 逆时针旋转执行器传动齿轮。	5. 逆时针旋转执行器传动齿轮。
5. 将凸轮脱离齿轮套筒。	5. 将凸轮脱离齿轮套筒。	5. 将凸轮旋转至传感器前。	5. 将凸轮旋转至传感器前。	6. 将凸轮脱离齿轮套筒并旋转凸轮至传感器前, 然后将凸轮与挡圈重新啮合。
6. 按图示旋转直到开关被激活, 然后将凸轮放回齿轮套筒。	6. 继续旋转直到开关被激活, 然后将凸轮放回齿轮套筒。通过调节凸轮与感应传感器之间的距离调整灵敏度。	6. 紧固 (使用 19 扳手) 顶轴螺母。	6. 紧固 (使用 19 扳手) 顶轴螺母。	7. ⚠ 注意: 请确保凸轮与传感器没有接触, 否则可能造成损坏。

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Installation & Operating Manual – 2049049

Rev. 1-0

SF-SS

NOMENCLATURE

SF-SS	xx	x	x	x	-	x	x	x	x	x	x	x	x	x	xx
Series	Type of Switches	Quantity of switches	Terminals	Painting		Cable entry	Indicator	Approval	Marking	IP	Temp. range	Material and sov	Coil rating	Pneumatic connection	Special execution

READ THIS INSTRUCTION FIRST

To avoid serious or fatal personal injury or major property damage, read and follow all safety instructions in this manual. If you require additional instructions, please contact Rotork Instruments Italy.

SAVE THIS INSTRUCTION.

WARNING! Warns of hazard that MAY cause serious personal injury, death or major property damage. HAZARDOUS VOLTAGE. Disconnect all power before servicing equipment.

Ex Safety instructions for hazardous area installation:

Soldo® limit switch boxes models SF - SS are valve position indication devices (used to indicate the valve fully open or fully closed position). Projected and built according to directive ATEX 2014/34/EU with reference to standard EN 60079-0, EN 60079-31, GB/T 3836.1 – 2021, GB/T 3836.31 – 2021.

"ATEX" is derived from the french "ATmosphere Explosive", which specifies the technical requirements for equipment used in potentially explosive environments. The directive aims to remove technical obstacles between the member states of the European Community.

When installing and maintaining SF - SS valve limit switch boxes, you must comply with the relevant standards for the use of electrical equipment in potentially explosive environments where gases, dust, and mist are present. Please read and keep this instruction manual before use.

Model numbers covered: limit switch box series Soldo® SF - SS.

The following instructions apply to equipment with and IECEx certificate number: IECEx EUT 17.0033X.

The Soldo® limit switch box series SF/SS may be used in a hazardous areas with flammable dust and mist, group IIIC and Ex tb protection mode.

Type of protection	Equipment characteristics	Electrical parameters	Maximum ambient temperature	Maximum surface temperature	Equipment power supply
Dust-tight	- Simple apparatus - Certified switches - Position transmitter - Transmitter+certified switches - Transmitter+simple apparatus - Switches+line monitoring	Max dissipated power 2,47 W	-50°C≤Tamb≤+80°C -60°C≤Tamb≤+105°C	T95°C T120°C	Umax=250Vac Imax=1A Pdismax=2,47W

Table 1

- Suitably trained personnel shall carry out installation according with applicable code of practice.
- The user should not repair this equipment.
- If the equipment is likely to come in to contact with aggressive substances, it is responsibility of the user to take suitable precautions that prevent it from being adversely affected, thus ensuring that the type of protection is not compromised. Aggressive substances: example Acids, liquids, gases which can affect metals.
- For ambient temperature below -10°C and above 70°C use field wiring suitable for both minimum and maximum ambient temperature. Use field wiring with operating temperature 11°C higher than ambient temperature.
- Cleaning the limit switch box must be done with a moist cloth to prevent build up of electrostatic charges. The user should guarantee periodic cleaning of the places where dust can accumulate.
- The user should guarantee the keeping of the safety characteristic of the device after maintenance.
- Keep the boxes away from heating and cooling sources that could affect its service temperature.

Note on the use of NEPSI products:

- The material of O-ring and gasket determines the ambient temperature range of the product, specifically: EPDM (-50°C+80°C), silicone rubber (-60°C+105°C).
- For products with the explosionproof mark Ex tb IIIC T95...T120°C Db, the electrical safety parameters are: 250Vac 1A 2.47W.
- The product installation, use and maintenance strictly abide by the principle of "do not open the cover when flammable dust environment exists".
- When the explosionproof mark of the product is Ex tb IIIC T95...T120°C Db, the cable entry port (thread specification: NPT1/2", NPT3/4", M25x1.5 or M20x1.5) must be equipped with explosionproof inspection approved cable entry devices or plugs that meet the standards of GB/T3836.1-2021 and GB/T3836.31-2021 and have an explosionproof level of Ex tb IIIC Db. After installation, the enclosure protection level shall not be lower than the IP66 specified in GB/T4208-2017. Redundant cable inlets should be blocked with plugging; other explosionproof marked products, their cable inlets (thread specifications are NPT1/2", NPT3/4", M25x1.5 or M20x1.5) must be used. After installation, the protection level of the enclosure shall not be lower than IP66 specified in GB/T4208-2017. Redundant cable entries should be blocked with plugs.
- The installation, use and maintenance of the product should also comply with the product manual, GB/T3836.13-2021 "Explosive environment Part 13: Repair, overhaul, repair and modification of equipment", GB/T3836.15-2017 "Explosive environment No. 15 Part: Design, selection and installation of electrical devices", GB/T3836.16-2017 "Explosive environment Part 16: Inspection and maintenance of electrical devices, GB/T3836.18-2017" Explosive environment Part 18: Intrinsic safety Relevant provisions of "Electrical System", GB15577-2018 "Dust Explosion Safety Regulations" and GB 50257-2014 "Electrical Device Installation Engineering Explosion and Fire Hazardous Environment Electrical Device Construction and Acceptance Code".

Herewith we declare that the Soldo® limit switch boxes models SF - SS,

Ex tb IIIC T95°C...T120°C Db

(according to proximity switches options) are in conformity with the provision of the ATEX Directive 2014/34/UE "Equipment or Protective Systems intended for use in potentially explosive atmospheres" and with national implementing legislation and that appropriate harmonized standards have been applied:

IEC 60079-0:2017 GB/T 3836.1 – 2021
EN 60079-31:2014 GB/T 3836.31 – 2021
2014/30/EU Electromagnetic compatibility
2014/35/UE Low voltage
EN 60529:1991/A2:2013
EN 60730-1:2011
EN 61326-1:2013

IECEx – Type examination certificate IECEx EUT 17.0033X

Production Quality assessment report:
GB/ITS/QAR09.0004

Soldo® limit switch boxes SF-SS series are also available, on request, with the following certifications:

CCOE
EAC
ECAS

CAUTION:

Do not exceed the limit switch performance limitation. Exceeding the limitation may cause damage to the limit switch, actuator and valve. The conduit plug supplied with the switch boxes are for transit purposes only. IP6X protection depends on cable gland and cabling methods used. Use cable gland and conduit plug with protection level Ex "e", Ex d or Ex "tb" and IP66 at least. Limit switchbox for quarter-turn valve device (90° rotation). Maximum shaft angular velocity 250 rpm. Follow switch adjustment & indicator setting before servicing the limit switch box.

- INSTALLATION**
 - Attach proper mounting bracket (1) to the box (4) housing using four M6x8 bolts (2).
 - Align shaft (5) to actuator shaft and engage it.
 - Attach bracket to actuator using hardware provided (3).
- SWITCH ADJUSTMENT & 3D INDICATOR SETTING**
 - Loosen the screws (8) and remove box cover (7).
 - Follow instructions in "Cams setting".
 - Box with 3-4 switches, set the actuator in the required signal position and set cams according to instructions in "Cams setting".
 - Replace box cover (7). **WARNING:** check seal (6) is properly fitted in slot. Tighten screws (8) using a torque of 1,3Nm.
- ELECTRICAL WIRING**
 - Remove cover (7) according to point 2.1.
 - Remove protection plugs from cable entries and substitute them with cable glands or plugs suitable for the type of protection required. Maintenance: at the specified maintenance intervals it is recommended to check the compression fittings and tighten as necessary.
 - Connect terminal strip (14) according to the wiring diagram on the label on the limit switch box. Use cable with section AWG 20 or superior.
 - Tighten terminal strip's screws using values of torque between 0,45+0,6Nm.
 - Reassemble cover (7) according to point 2.4.
 - The device must be grounded using the grounding kit. Two screws (3) and anti-vibration washers (1) are provided. There are two earth connections, one inside and one outside the box. For the external connection, it is recommended to use a cable with a cross-section of 4 mm² or higher.
- PRODUCT'S STORAGE**
 - Keep the boxes away from UV rays and atmospheric agents, in an environment with temperature between 0°C and 40°C.

Optional 3D stainless steel indicator

Grounding kit

Cams setting / Cams type				
A	B	C	D	E
1. Turn actuator pinion clockwise.	1. Turn actuator pinion clockwise.	1. Turn actuator pinion clockwise.	1. Turn actuator pinion clockwise.	1. Disengage cams from splined retainer to position 45 °.
2. Disengage cam from splined retainer.	2. Disengage cam from splined retainer.	2. Loosen (using a 19 wrench) top nut.	2. Loosen (using a 19 wrench) top nut.	2. Engage into splined retainer and turn actuator pinion clockwise.
3. Turn, until switch is activated, then engage into splined retainer.	3. Turn, until switch is activated, then engage into splined retainer. Adjust the sensitivity by regulating the distance between the cam and the inductive sensor.	3. Rotate cam and fit in front of sensor.	3. Rotate cam and fit in front of sensor.	3. Disengage cams from splined retainer. 4. Rotate cam and fit in front of sensor then engage into splined retainer.
4. Turn actuator pinion counterclockwise.	4. Turn actuator pinion counterclockwise.	4. Turn actuator pinion counterclockwise.	4. Turn actuator pinion counterclockwise.	5. Turn actuator pinion counterclockwise.
5. Disengage cam from splined retainer.	5. Disengage cam from splined retainer.	5. Rotate cam and fit in front of sensor.	5. Rotate cam and fit in front of sensor.	6. Disengage cam from splined retainer and rotate cam and fit in front of sensor then engage into splined retainer then engage.
6. Turn, in the way shown, until switch is activated, then engage into retainer.	6. Turn, in the way shown, until switch is activated, then engage into retainer. Adjust the sensitivity by regulating the distance between the cam and the inductive sensor.	6. Fasten (using a 19 wrench) top shaft nut.	6. Fasten (using a 19 wrench) top shaft nut.	7. CAUTION: Make sure that the cams do not come in contact with the sensor possible breakage.

2