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安装与操作手册 2049046

Rev. 1-0 | **SF-SS**

命名方式

SS-SF	xx	x	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 (其他语言请访问 www.soldo.net)

为了避免严重或致命的人员伤亡，或重大财产损失，请务必阅读手册内所有的安全说明。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，或重大财产损失的的危险。危险电压。维修设备前，请断开所有电源。

有关危险区域安装的安全说明:

Soldo 限位开关盒型号 SF SS 是阀位位置指示设备（用于指示阀门全开或全关位置）。

以及相关标准GB/T 3836.1 — 2021, GB/T 3836.4 — 2021和, GB/T 3836.1 — 2021, GB/T 3836.4 — 2021进行设计和制造。“ATEX”源自法语“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阀门限位开关盒时，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。
使用前请首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 证书编号：和IECEx 证书编号：IECEx EUT 17.0033X
SOLDO™ SF/SS 系列阀门限位开关盒可在具有易燃气体、蒸汽、粉尘及薄雾的IIC和IIIC类保护方式为 Ex ia/Ex ib 且温度等级为 T4,T5,T6 的危险区域内使用。

T 等级	*危险场所的环境温度范围	存在危险粉尘的危险场所最高表面温度
认证开关		
T6	$-50^{\circ}C \le T_{amb} \le +80^{\circ}C$	T85˚C
T5	$-60^{\circ}C \le T_{amb} \le +95^{\circ}C$	T100˚C
T4	$-60^{\circ}C \le T_{amb} \le +105^{\circ}C$	T120˚C
简易装置		
T4	$-50^{\circ}C \le T_{amb} \le +80^{\circ}C$	T95˚C
	$-60^{\circ}C \le T_{amb} \le +105^{\circ}C$	T120˚C
阀位变送器或变送器 + 认证开关		
T4	$-40^{\circ}C \le T_{amb} \le +85^{\circ}C$	T120˚C
简易装置/认证开关+ 终端监测		
T4	$-60^{\circ}C \le T_{amb} \le +80^{\circ}C$	T95˚C
	$-60^{\circ}C \le T_{amb} \le +105^{\circ}C$	T120˚C

*⚠ **注意:**
以上数值对应环境温度范围，当设备已经包含认证过的组件（例如感应开关和/或变送器）时，设备环境温度将限制在其证书中所提及的最小范围内。
环境温度的降低与已获得认证组件的证书内容相对应:
对于认证的开关，已根据以下数据和相关设备类型降低设备标签中所报告的最高环境温度:

Switches	Type 1	Type 2	Type 3	Type 4
2 至 4个开关	–1˚C	–4˚C	–7˚C	–10˚C

当变送器与两个认证的开关一同安装时，根据变送器所连接相关设备的类型，已将设备标签中的开关最高环境温度降低至如下值:

适用于温度等级的最高允许环境温度*	变送器相关设备		开关相关设备			
	Type A P_i=0,84W	Type B P_i=1,3W	Type 1	Type 2	Type 3	Type 4
2 开关+ 变送器 (type A)			6˚C*	6˚C*	6˚C*	6˚C*
2 开关+ 变送器 (type B)			8˚C*	8˚C*	8˚C*	8˚C*

下表所示为电路本安保护类型的最大值:

Type 1	Type 2	Type 3	Type 4**	Type 5*	Type 5***
U_i = 16 V	P_i = 34 mW	U_i = 16 V	U_i = 16 V	U_i = 30 V	U_i = 30 V
I_i = 25 mA	I_i = 25 mA	I_i = 52 mA	I_i = 76 mA	I_i = 100 mA	I_i = 100 mA
P_i = 34 mW	P_i = 64 mW	P_i = 169 mW	P_i = 242 mW	P_i = 750 mW	P_i = 650 mW

*对应干接点简易装置（机械开关和簧片）**仅适用气体 ***适用于终端监测的简易装置
内部电容和电感的所示数值已充分考虑了 10 m 的电源线。

对于开关盒中其他类型的开关或其他设备，参见下表列出的安装组件认证。
PepperI&Fuchs 传感器认证请访问：https://www.pepperl-fuchs.com/great_britain/en/index.htm
IFM 传感器认证请访问：https://www.ifm.com/gb/en/
变送器认证请访问：https://www.siemens.com/
PR Electronics 变送器认证请访问：https://www.prelectronics.com/it/prodotti/temperature/

下表列出相关组件及其 ATEX 或 IECEx 认证证书:

Ex i 认证组件			
开关系列	**制造商**	**ATEX 认证**	**IECEx 认证**
NC… 和NJ…圆柱形感应接近传感器	P&F	PTB 00 ATEX 2048X	ECEx PTB 11.0037X
NJ 和SJ 型 SN系列接近传感器	P&F	PTB 00 ATEX 2049X	IECEx PTB 11.0092X
SJ… 和 SC…槽型接近传感器	P&F	PTB 99 ATEX 2219X	IECEx PTB 11.0091X
FJ…, NB….方形感应接近开关	P&F	PTB 00 ATEX 2032X	IECEx PTB 11.0021X
NJ…, and NC…感应接近开关	P&F	PTB 00 ATEX 2032X	IECEx PTB 11.0021X
NCN.–....–.N4..., PL.–F25. –.N4..., NC..–F31.–N5..阀位传感器	P&F	TUV 99 ATEX 1479X	IECEx TUN 04.0014X
感应式开关N*50*A	IFM Electronics GmbH	PTB 01 ATEX 2191	IECEx BVS 06.0003
SPDT/DPDT 镀金电磁式开关	如适用	简易装置	简易装置
SPDT/DPDT 镀金接近式开关 NOVA V3	Soldo	简易装置	简易装置
簧片开关 SPDT/DPDT	Soldo/如适用	简易装置	简易装置
变送器 TH300	Siemens	PTB 05 ATEX 2040X	IECEx PTB 10.0067X
变送器 TH400	Siemens	KEMA 06 ATEX 0264	IECEx BVS 14.0041X
变送器 5337D/5335D	PR Electronics	KEMA 03 ATEX 1537	KEM 10.0083X

1. 对比限位开关盒上所示的温度额定值和安装及操作手册中所列出的温度额定值。
2. 应由接受过适当培训的人员按照适用规范进行安装。
3. 用户不得擅自维修该设备。
4. 如果设备可能接触到腐蚀性物质，则用户应采取适当的预防措施，防止设备收到不利影响，从而确保不会影响其所提供的保护。腐蚀性物质 例如酸性液体或气体可能会腐蚀开关盒外壳。
5. **必须采用以下预防措施:** SF 系列为铝制外壳，因此在 EPL Ga 和Da中使用时，必须防止发生撞击和摩擦，以避免发生火灾危险。
6. 在环境温度低于 –10˚C 或高于 70˚C 的情况下，应使用适用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˚ 的电缆。
7. 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。
8. 用户应确保维护不会影响设备的安全特性。
9. III每个安全栅都应连接至 III 类过电压电路。
10. 对于每个 SPDT 限位开关，每个安全栅只能连接一个电路。因此，各个限位开关应常开或常闭连接，以避免将两个安全栅连接到同一个公共端上。
11. 应确保开关盒原理可能影响其使用温度的热源和冷源。

NEPSI 产品使用注意事项:

12. “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～+80)℃, 硅橡胶（–60～+105)℃。
13. 关联设备应优先选用隔离式安全栅，如选齐纳式安全栅，应符合GB/T3836.15–2017标准关于本安电路接地的要求。
14. 产品与关联设备的连接电缆应为带绝缘护套的屏蔽电缆，其屏蔽层应接地。
15. 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。
16. 产品的安装、使用和维护应同时遵守产品说明书、GB3836.13–2013“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GB50257–2014。

我们于此声明 SOLDO™ 限位开关盒 SS–SF 系列,

Ex ia IIC T6...T4 Ga, Ex ia IIIC T85˚C…T120˚C Db
Ex ib IIC T6..T4 Ga, Ex ib IIIC T85˚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 60079–0：2011 GB/T 3836.1 — 2021
IEC 60079–11: 2011 GB/T 3836.4 — 2021
2014/30/UE 电磁兼容性指令
2014/35/UE 低压指令
EN 60529:1991/A
EN 61326–1: 2013

IECEx — 形式检验证书 IECEx EUT 17.0033X

生产质量保证证书:
ITS08ATEXQ5820

生产质量评估报告:
GB/ITS/QAR09.0004

Soldo SF–SS 系列限位开关盒还可根据要求提供一下认证:
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
1.1 通过四个 M6 × 8 螺栓 (2) 将合适的安装支架 (1) 安装到开关盒 (4) 上。
1.2 将执行器输出轴与轴 (5) 对准并啮合。
1.3 通过所提供的螺栓 (3) 将支架与执行器固定。

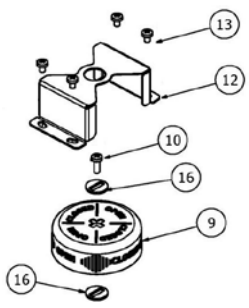
2 开关调整及 3D 指示器设定
2.1 松开端盖 (8) 螺栓并拆下端盖 (7)。
2.2 按照 下面的“凸轮调整”进行。
2.3 带有3–4个开关的开关盒，将执行器设定至需要信号的位置，并根据 “凸轮调整”设定开关3和4的凸轮。
2.4 装回端盖 (7)。警告：检查密封圈 (6) 在凹槽内安装到位。使用 1,3 Nm 力矩紧固螺栓 (8) 。

3 电气连接
3.1 参照2.1拆卸端盖 (7) 。
3.2 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。
3.3 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。
3.4 用0,45 – 0,6Nm力矩紧固端子螺栓。
3.5 参照2.4 装回端盖 (7)。
3.6 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 mm^2 的电缆或其他更高规格。

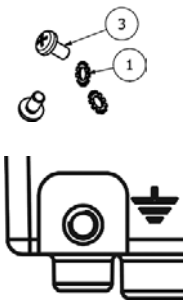
4 产品储存
4.1 开关盒应远离紫外线及大气臭氧，环境温度 0˚C ~40˚C。

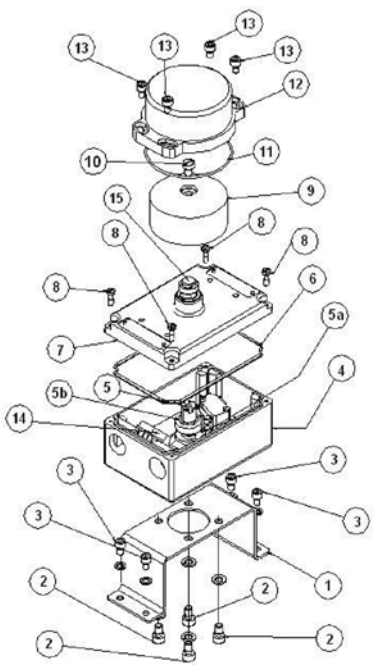
5 SIL
5.1 关于安全手册请访问 www.rotork.com/en/documents 并选择产品 – Soldo 开关盒。

不锈钢 3D 指示器选项

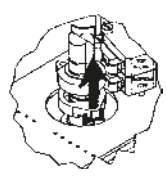
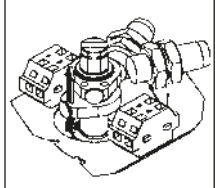
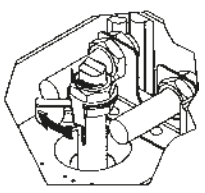
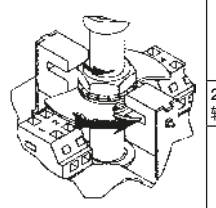
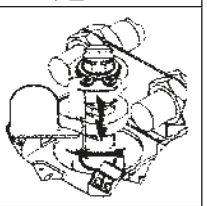
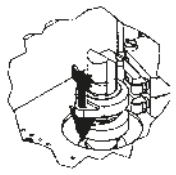
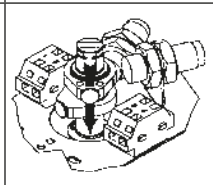
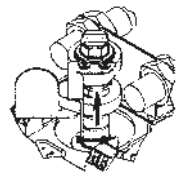
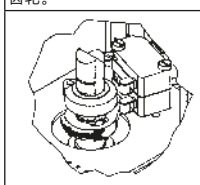
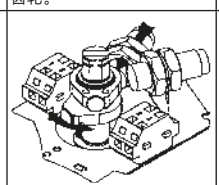
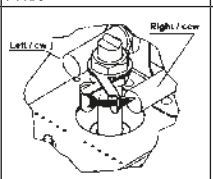
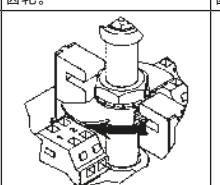
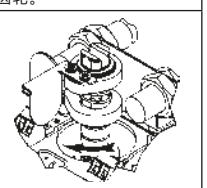
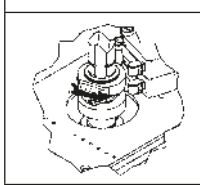
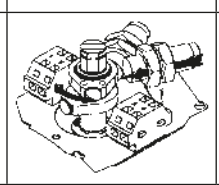
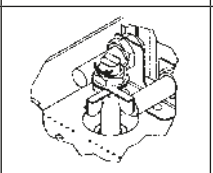
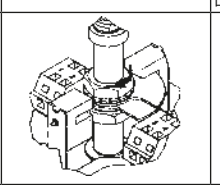


接地螺栓





Cams setting / Cams type

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. 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。	2. 松开 (使用 19 扳手) 顶轴螺母。 3. 将凸轮旋转至传感器前。	2. 松开 (使用 19 扳手) 顶轴螺母。 3. 将凸轮旋转至传感器前。	3. 将凸轮脱离齿轮套筒。 4. 并旋转凸轮至传感器前，然后将凸轮与挡圈重新啮合。
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) 上轴螺母。	6. 紧固 (使用 19 扳手) 上轴螺母。	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 – 2049046

Rev. 1-0 | **SF-SS**

NOMENCLATURE

SS-SF	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 (for other languages visit www.soldo.net)

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.

Safety instruction to hazardous area installation:

Soldo limit switch box model SF SS is a valve position indication device (used to indicate the valve fully open or fully closed position).

According to Directive ATEX 2014/34/UE and with reference to standards IEC 60079-0: 2011, IEC 60079-11: 2011 GB 3836.1-2021, GB 3836.4–2021 were designed and manufactured. “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 covered by CCC certificate and IECEx certificate number: IECEx EUT 17.0033X
The SOLDO™ limit switch box series SF/SS may be used in a hazardous area with flammable gases, vapours, dust and mist, group IIC, IIIC protection mode Ex ia/Ex ib with the following temperature classes T4,T5,T6.

T Class	*Ambient temperature range for hazardous location	Max surface temperature for hazardous location due to presence of hazardous dust
Certified switches		
T6	-50°C ≤ T_{amb} ≤ +80°C	T85°C
T5	-60°C ≤ T_{amb} ≤ +95°C	T100°C
T4	-60°C ≤ T_{amb} ≤ +105°C	T120°C
Simple apparatus		
T4	-50°C ≤ T_{amb} ≤ +80°C	T95°C
	-60°C ≤ T_{amb} ≤ +105°C	T120°C
Position transmitter or transmitter + certified switches		
T4	-40°C ≤ T_{amb} ≤ +85°C	T120°C
Simple apparatus/certified switches + end of line monitoring		
T4	-60°C ≤ T_{amb} ≤ +80°C	T95°C
	-60°C ≤ T_{amb} ≤ +105°C	T120°C

*⚠ **ATTENTION:**
The above reported values correspond to the ambient temperature extension; when the equipment contains already certified devices (such as inductive switches and/or transmitter) the equipment ambient temperature is constrained to the range of the device having the narrowest range as reported in its certificate.
T_{amb} reductions applied to the already certified devices in respect to their certificates:
for certified switches, the maximum ambient temperature reported in the equipment label has been reduced according to the following values and the type of associated apparatus:

Switches	Type 1	Type 2	Type 3	Type 4
From 2 to 4 switches	-1°C	-4°C	-7°C	-10°C

When a transmitter is installed with two certified switches, according to the type of associated apparatus connected to the transmitter, the maximum ambient temperature of switch, reported in the equipment label has been reduced according to the following values and the type of associated apparatus:

*Maximum permissible ambient temperature in °C for application in temperature class	Transmitter associated apparatus		Switches associated apparatus			
	Type A P_i=0,84W	Type B P_i=1,3W	Type 1	Type 2	Type 3	Type 4
2 switches + transmitter (type A)			6°C*	6°C*	6°C*	6°C*
2 switches + transmitter (type B)			8°C*	8°C*	8°C*	8°C*

The maximum value for type of protection intrinsically safe for circuits are shown in the following table:

Type 1	Type 2	Type 3	Type 4**	Type 5*	Type 5***
U_i = 16 V	P_i = 34 mW	U_i = 16 V	U_i = 16 V	U_i = 30 V	U_i = 30 V
I_i = 25 mA	I_i = 25 mA	I_i = 52 mA	I_i = 76 mA	I_i = 100 mA	I_i = 100 mA
P_i = 34 mW	P_i = 64 mW	P_i = 169 mW	P_i = 242 mW	P_i = 750 mW	P_i = 650 mW

*For dry contact simple apparatus (mechanical switch & reed) **For gas only ***For simple apparatus with end of line monitoring
The indicated values of internal capacitances and inductances do consider a supply cord of 10 m length.

For other types of switches or other devices inside boxes, refer to type certificate of components installed listed as follows:
The certificates for Pepperl&Fuchs sensors are available on: https://www.pepperl-fuchs.com/great_britain/en/index.htm
The certificates for IFM sensors are available on: https://www.ifm.com/gb/en/
The certificates for Siemens transmitters are available on: https://www.siemens.com/
The certificates for PR Electronics transmitters are available on: https://www.prelectronics.com/it/prodotti/temperature/

The list of components with their Certificate ATEX or IECEx covered by this certificate are listed in the following table:

Certification Components Ex i			
Switch series	**Manufacturer**	**ATEX Certificate**	**IECEx Certificate**
Cylindrical inductive proximity sensors of types NC… and NJ…	P&F	PTB 00 ATEX 2048X	ECEx PTB 11.0037X
SN-type proximity sensors series NJ and SJ	P&F	PTB 00 ATEX 2049X	IECEx PTB 11.0092X
Slot-type proximity sensors Types SJ… and SC…	P&F	PTB 99 ATEX 2219X	IECEx PTB 11.0091X
Cuboidal inductive proximity sensors Types FJ…, NB….	P&F	PTB 00 ATEX 2032X	IECEx PTB 11.0021X
Cuboidal inductive proximity sensors Types NJ…, and NC…	P&F	PTB 00 ATEX 2032X	IECEx PTB 11.0021X
Valve Position sensor type NCN.-….-.N4..., PL.-F25.-.N4..., NC..-F31.-N5..	P&F	TUV 99 ATEX 1479X	IECEx TUN 04.0014X
Inductive proximity switch type N*50*A	IFM Electronics GmbH	PTB 01 ATEX 2191	IECEx BVS 06.0003
Micromechanical switch SPDT/DPDT Gold plated and sealed	As applicable	Simple apparatus	Simple apparatus
Proximity SPDT/DPDT Gold plated type NOVA V3	Soldo	Simple apparatus	Simple apparatus
Reed switch SPDT/DPDT	Soldo/As applicable	Simple apparatus	Simple apparatus
Transmitter TH300	Siemens	PTB 05 ATEX 2040X	IECEx PTB 10.0067X
Transmitter TH400	Siemens	KEMA 06 ATEX 0264	IECEx BVS 14.0041X
Transmitter 5337D/5335D	PR Electronics	KEMA 03 ATEX 1537	KEM 10.0083X

1. Cross the temperature rating shown with the limit switch box rating shown in limit switch box installation & operating manual.
2. Suitably trained personnel shall carry out installation in accordance with applicable code of practice.
3. The user should not repair this equipment.
4. If the equipment is likely to come into contact with aggressive substances, it is the 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 such as Acidic liquids or gases that may attack the switch box housing.
5. **The following precaution must be observed:** the SF series is manufactured from aluminium, therefore for application in EPL Ga and Da, the device must be protected by impacts and frictions to avoid an ignition hazardous.
6. For ambient temperatures below -10°C and above 70°C use field wiring suitable for both minimum and maximum ambient temperatures. Use field wiring with an operating temperature 11°C higher than the ambient temperature.
7. 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 store.
8. The user should guarantee the keeping of the safety characteristic of the device after maintenance.
9. Every barrier shall be connected to a circuit classified as overvoltage category III.
10. For every SPDT limit switch, a safety barrier shall be connected only to a circuit. So every limit switch shall be connected either normally closed or normally open, to avoid that two safety barriers are connected to the same common pole.
11. Keep the switch box away from heating and cooling sources that could affect its service temperature.

Note on the use of NEPSI products:

12. The material of “O” ring and gasket determines the ambient temperature range of the product, specifically: EPDM (−50 ~ +80)°C, silicone rubber (−60 ~ +105)°C.
13. Associated equipment should preferentially use isolated safety barriers. If a Zener safety barrier is used, it should meet the requirements of GB/T3836.15-2017 for grounding of intrinsically safe circuits.
14. The connecting cable between the product and the associated equipment should be a shielded cable with an insulating sheath, and the shielding layer should be grounded.
15. The product installation, use and maintenance strictly comply with the principle of “do not open the cover when flammable dust environment exists”.
16. The installation, use and maintenance of the product should also comply with the product manual, GB3836.13-2013 “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”.

Herewith we declare that the SOLDO™ limit switch box SS-SF series,

Ex ia IIC T6...T4 Ga, Ex ia IIIC T85°C…T120°C Db
Ex ib IIC T6..T4 Ga, Ex ib IIIC T85°C…T120°C Db

(according to proximity switches options) are in conformity with national implementing legislation and that appropriate harmonised standards have been applied:
IEC 60079-0: 2011 GB/T 3836.1 – 2021
IEC 60079-11: 2011 GB/T 3836.4 – 2021
Directive 2014/30/UE Electromagnetic compatibility
Directive 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 plugs with a protection level of at least Ex “e”, Ex d or Ex “tb” and IP66.
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.

1 INSTALLATION
1.1 Attach a suitable mounting bracket (1) to the box (4) housing using four M 6 × 8 bolts (2).
1.2 Align shaft (5) to actuator output shaft and engage it.
1.3 Secure the bracket to the actuator using the provided bolts (3).

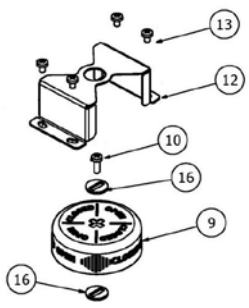
2 SWITCH ADJUSTMENT & 3D INDICATOR SETTING
2.1 Loosen the screws (8) and remove box cover (7).
2.2 Follow “Cams setting” instructions below.
2.3 For switch housings with 3-4 switches, set the actuator to the required signal position and set the cams following “Cams setting” instructions below.
2.4 Replace box cover (7). WARNING: check that the seal (6) is seated in the groove. Tighten the screws (8) using a torque of 1,3 Nm.

3 ELECTRICAL WIRING
3.1 Remove cover (7) following point 2.1 instructions.
3.2 Remove protection plugs from cable entries and replace with suitable cable glands or plugs. Maintenance: at the specified maintenance intervals it is recommended to check the compression fittings and tighten as necessary.
3.3 Connect terminal strip (14) according to the wiring diagram on the limit switch box. Cables should be AWG 20 or larger.
3.4 Tighten the terminal screws with a torque of 0,45÷0,6 Nm.
3.5 Reassemble cover (7) following point 2.4 instructions.
3.6 The device must be grounded using 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 external connections, it is recommended to use a cable with a cross-section of 4 mm² or higher.

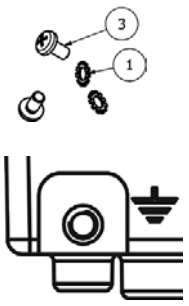
4 PRODUCT’S STORAGE
4.1 Keep switch boxes away from UV rays and atmospheric agents, with an ambient temperature of 0°C to 40°C.

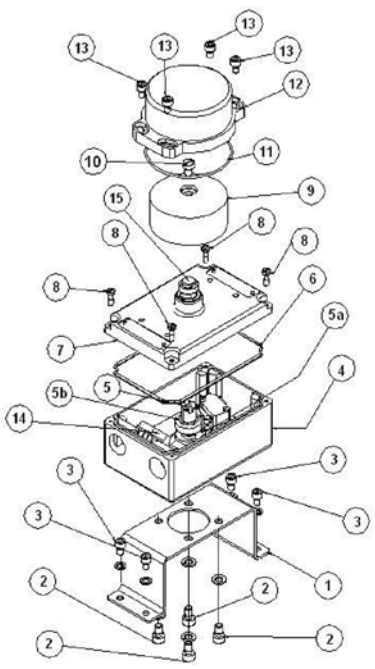
5 SIL
5.1 For the safety manual please refer to www.rotork.com/en/documents and select Product – Soldo Switch Box.

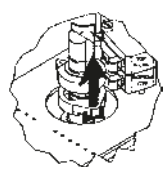
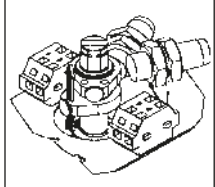
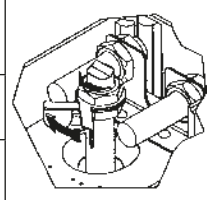
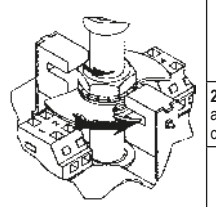
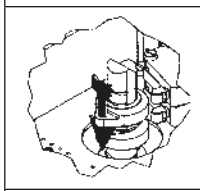
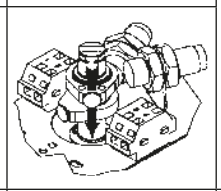
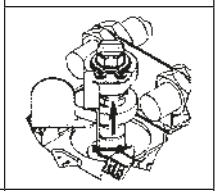
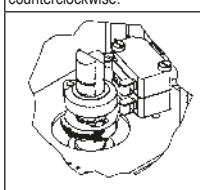
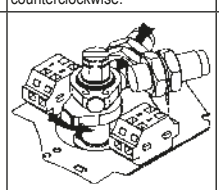
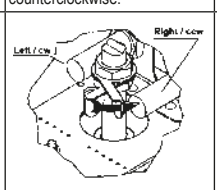
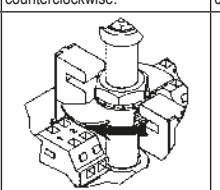
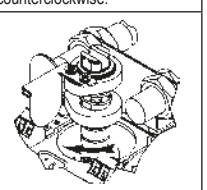
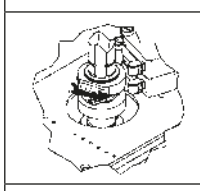
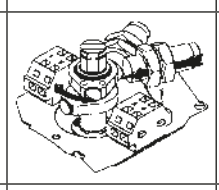
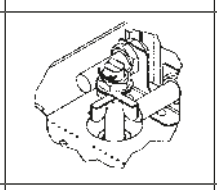
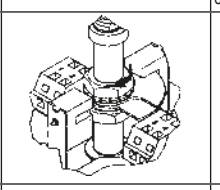
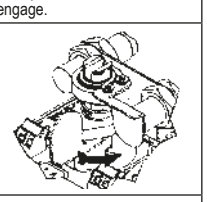
Optional 3D stainless steel indicator



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.** 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.	**2.** Loosen (using a 19 wrench) top nut. **3.** Rotate cam and fit in front of sensor.	**2.** Loosen (using a 19 wrench) top nut. **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.