

**Certificate no. TAI-FS-C-22-0054**

WE HEREBY CERTIFY THAT

**Product description** SOLDOTM MICRO SWITCH BOX

**Models** Series SS, SF, SB, HW, SX, SW, SY, SH, SI, CS, CA, XA, SK, SQ, SP

**Manufacturer** ROTORK INSTRUMENTS ITALY S.r.l.  
Via Portico 17  
I-24050 Orio al Serio (BG)

IS IN COMPLIANCE WITH THE REQUIREMENTS OF THE STANDARDS

**IEC 61508 Parts 1–7:2010**

AS RESULT OF THE ASSESSMENT ACCORDING TO THE PROVISION SET OUT IN THE ABOVE-MENTIONED STANDARDS

**Summary Report no.** TAI-FS-R-22-0015 Rev. 01  
TAI-FS-R-22-0109

**Expiry date** 30.06.2025

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Page 1 of 3

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## Annex 1 to certificate no. TAI-FS-C-22-0054


<b>Product</b>	Soldo™ micro switch box series SS, SF, SB, HW, SX, SW, SY, SH, SI, CS, CA, XA, SK, SQ, SP
<b>Type</b>	A
<b>HFT</b>	0
<b>Safety functions</b>	<ol style="list-style-type: none"> <li>1. Give an output signal to indicate that the actuator has moved from the "normal position"</li> <li>2. Give an output signal to indicate that the actuator has reached the "safe position"</li> </ol>
<b>Mode of operation</b>	Low Demand Mode

Random failure rates				
Configuration	Safety function	$\lambda_D$ [1/h]	$\lambda_S$ [1/h]	SFF [%]
With Pepperl+Fuchs NAMUR sensors, standard NAMUR amplifier With Werner Turck NAMUR sensors	1 / 2	9,6E-09	1,6E-08	> 60 > 99 including PST
With Pepperl+Fuchs NAMUR sensors, standard NAMUR amplifier, redundant configuration With Werner Turck NAMUR sensors, redundant configuration	1 / 2	<1,0E-09	<1,0E-08	> 90 > 99 including PST
With Pepperl+Fuchs NAMUR sensors, fail-safe interface	1 / 2	7,0E-11	2,5E-08	> 99
With Pepperl+Fuchs sensor model NBB2-V3-E2	1 / 2	1,28E-08	1,93E-08	> 60 > 99 including PST
With Soldo™ REED and Nova V3 sensors, or micromechanical switches	1 / 2	9,6E-09	1,6E-08	> 60 > 99% including PST
With Soldo™ REED and Nova V3 sensors, or micromechanical switches, redundant configuration	1 / 2	<1,0E-09	<1,0E-08	> 90 > 99 including PST

<b>Systematic capability</b>	3 (Route 1s applied)			
<b>Architectural constraints</b>	<b>Route 1H:</b>	Applied	<b>Route 2H:</b>	Applied
	The product can be used in: <ul style="list-style-type: none"> <li>• single switch configuration:                             <ul style="list-style-type: none"> <li>○ up to SIL 2 without external diagnostic tests</li> <li>○ up to SIL 3 considering external diagnostic tests (only for safety function 1)</li> </ul> </li> <li>• redundant switch configuration: up to SIL 3</li> </ul>			

**Remarks:**

- Micro switch boxes series SS, SF, SB, HW, SX, SW, SY, SH, SI, CS, CA, XA include the "Line-Monitoring" option
- Specific cycling and stall testing performed and assessed at -50 °C for P+F SJ-3.5-SN
- For further details, including environmental conditions, limitations of use, lifetime, failure rates traceability, mean repair times, common cause factors and systematic capability constraints, make reference to Safety Manual IOM00069\_ENG



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## Annex 2 to certificate no. TAI-FS-C-22-0054

<b>Product</b>	Soldo™ micro switch box series SS, SF, HW, SX, SW, SY, SI with position transmitter
<b>Type</b>	B
<b>HFT</b>	0
<b>Safety functions</b>	1. Correct measuring of the position of the actuator on which the device is mounted (normally angular position), and generation of 4-20 mA output signal proportional to the position, within $\pm 2$ % of tolerance
<b>Mode of operation</b>	Low Demand Mode

Random failure rates					
Configuration	Safety function	$\lambda_{DU}$ [1/h]	$\lambda_{DD}$ [1/h]	$\lambda_S$ [1/h]	SFF [%]
Soldo™ micro switch boxes with position transmitters Siemens TH320/420 / PR electronics 5437D	1	2,95E-08	4,66E-07	0,00E+00	94,04

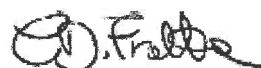
<b>Systematic capability</b>	3 (Route 1s applied)			
<b>Architectural constraints</b>	<b>Route 1H:</b>	Applied	<b>Route 2H:</b>	--
	The product can be used in: <ul style="list-style-type: none"> <li>• single channel configuration (1oo1): up to SIL 2</li> <li>• double channel configuration (1oo2): up to SIL 3</li> </ul>			

**Remarks:**

- The above  $\lambda$  values are those for single channel configuration; the PFH /  $PFD_{AVG}$  values for 1oo2 configuration have to be calculated considering the  $\beta$  factors
- For further details, including environmental conditions, limitations of use, lifetime, failure rates traceability, mean repair times, common cause factors and systematic capability constraints, make reference to Safety Manual IOM00069\_ENG

*END OF CERTIFICATE*

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