ZERTIFIKAT | CERTIFICATE | CERTIFICAT | CERTIFICADO | СЕРТИФИКАТ | شهادة | 证书 | 인증서

TÜV AUSTRIA

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

WE HEREBY CERTIFY THAT

Product description	**SOLDO™ 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**
Issue date	**14.12.2022**

TÜV AUSTRIA ITALIA - Blu Solutions s.r.l.
14.12.2022, Monte Roberto (AN)

Ing. Crescenzo Di Fratta

TÜV AUSTRIA ITALIA - Blu Solutions s.r.l.
Sede operativa: Via dell'Industria, 14 – 25030 Erbusco - Brescia, Italy
Phone +39 030 9821049 Fax +39 030 9822253 info.bs@tuvaustriaitalia.com
Sede legale: Via del Commercio, 6/A - 60030 Monte Roberto - Ancona, Italy
Cap. Soc. i.v. EUR 10.000,00; R.I. Ancona – C.F. – P. IVA 02217380423
Cod. Id. CEE IT02217380423 REA AN n. 170070
A socio unico, soggetta a controllo e coordinamento di:
TÜV AUSTRIA HOLDING AG, Deutschstrasse 10, 1230, Vienna, Austria
www.tuvaustriaitalia.com www.tuv.at

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

Product	Soldo™ micro switch box series SS, SF, SB, HW, SX, SW, SY, SH, SI, CS, CA, XA, SK, SQ, SP
Type	A
HFT	0
Safety functions	1. Give an output signal to indicate that the actuator has moved from the "normal position" 2. Give an output signal to indicate that the actuator has reached the "safe position"
Mode of operation	Low Demand Mode

Random failure rates				
Configuration	**Safety function**	**λ_D [1/h]**	**λ_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

Systematic capability	**3** (Route 1s applied)			
Architectural constraints	**Route 1_H:**	Applied	**Route 2_H:**	Applied

	The product can be used in:
	• single switch configuration:
	  o up to SIL 2 without external diagnostic tests
	  o up to SIL 3 considering external diagnostic tests (only for safety function 1)
	• redundant switch configuration: up to SIL 3			

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

TÜV AUSTRIA ITALIA - Blu Solutions s.r.l.
14.12.2022, Monte Roberto (AN)

Ing. Crescenzo Di Fratta

TÜV AUSTRIA ITALIA - Blu Solutions s.r.l.
Sede operativa: Via dell'Industria, 14 – 25030 Erbusco - Brescia, Italy
Phone +39 030 9821049 Fax +39 030 9822253 info.bs@tuvaustriaitalia.com
Sede legale: Via del Commercio, 6/A - 60030 Monte Roberto - Ancona, Italy
Cap. Soc. i.v. EUR 10.000,00; R.I. Ancona – C.F. – P. IVA 02217380423
Cod. Id. CEE IT02217380423 REA AN n. 170070
A socio unico, soggetta a controllo e coordinamento di:
TÜV AUSTRIA HOLDING AG, Deutschstrasse 10, 1230, Vienna, Austria
www.tuvaustriaitalia.com www.tuv.at

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

Product	Soldo™ micro switch box series SS, SF, HW, SX, SW, SY, SI with position transmitter
Type	B
HFT	0
Safety functions	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 ±2 % of tolerance
Mode of operation	Low Demand Mode

Random failure rates					
Configuration	**Safety function**	**λ_{DU} [1/h]**	**λ_{DD} [1/h]**	**λ_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

Systematic capability	**3** (Route 1_S applied)			
Architectural constraints	**Route 1_H:**	Applied	**Route 2_H:**	--
	The product can be used in: • single channel configuration (1oo1): up to SIL 2 • double channel configuration (1oo2): up to SIL 3			

Remarks:

- The above λ values are those for single channel configuration; the PFH / PFD_{AVG} values for 1oo2 configuration have to be calculated considering the β 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

TÜV AUSTRIA ITALIA - Blu Solutions s.r.l.
14.12.2022, Monte Roberto (AN)

Ing. Crescenzo Di Fratta

TÜV AUSTRIA ITALIA - Blu Solutions s.r.l.
Sede operativa: Via dell'Industria, 14 – 25030 Erbusco - Brescia, Italy
Phone +39 030 9821049 Fax +39 030 9822253 info.bs@tuvaustriaitalia.com
Sede legale: Via del Commercio, 6/A - 60030 Monte Roberto - Ancona, Italy
Cap. Soc. i.v. EUR 10.000,00; R.I. Ancona – C.F. – P. IVA 02217380423
Cod. Id. CEE IT02217380423 REA AN n. 170070
A socio unico, soggetta a controllo e coordinamento di:
TÜV AUSTRIA HOLDING AG, Deutschstrasse 10, 1230, Vienna, Austria
www.tuvaustriaitalia.com www.tuv.at