IECEx Certificate of Conformity

INTERNATIONAL ELECTROTECHNICAL COMMISSION
IEC Certification System for Explosive Atmospheres

for rules and details of the IECEx Scheme visit www.iecex.com

Certificate No.: **IECEx BVS 16.0084X**

Certificate history:
Issue 0 (2016-12-07)

Status: **Current**

Issue No: 1

Date of Issue: 2021-07-29

Applicant: **SAMSON AG**
Weismüllerstraße 3
60314 Frankfurt am Main
Germany

Equipment: **Positioner type TROVIS / TROVIS SAFE 3793 - **1… HART®**

Optional accessory:

Type of Protection: **Equipment protection by intrinsic safety "i", Equipment protection by type of protection "n", Equipment dust ignition protection by enclosure "t"**

Marking:

Ex ia IIC T4/T6 Gb / Ex ia IIIC T85°C Db

Ex tb IIIC T85°C Db

Ex nA IIC T4/T6 Gc / Ex tb IIIC T85°C Db

Ex nA IIC T4/T6 Gc

Approved for issue on behalf of the IECEx Certification Body: **Jörg Koch**

Position: **Head of Certification Body**

Signature:
(for printed version)

Date:
(for printed version)

1. This certificate and schedule may only be reproduced in full.
2. This certificate is not transferable and remains the property of the issuing body.
3. The Status and authenticity of this certificate may be verified by visiting www.iecex.com or use of this QR Code.

Certificate issued by:

DEKRA Testing and Certification GmbH
Certification Body
Dinnendahlstrasse 9
44809 Bochum
Germany

DEKRA
On the safe side.

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Certificate No.: **IECEx BVS 16.0084X**

Date of issue: 2021-07-29 Issue No: 1

Manufacturer: **SAMSON AG**
Weismüllerstraße 3
60314 Frankfurt am Main
Germany

Manufacturing locations:

This certificate is issued as verification that a sample(s), representative of production, was assessed and tested and found to comply with the IEC Standard list below and that the manufacturer's quality system, relating to the Ex products covered by this certificate, was assessed and found to comply with the IECEx Quality system requirements.This certificate is granted subject to the conditions as set out in IECEx Scheme Rules, IECEx 02 and Operational Documents as amended

STANDARDS :
The equipment and any acceptable variations to it specified in the schedule of this certificate and the identified documents, was found to comply with the following standards

IEC 60079-0:2017 Explosive atmospheres - Part 0: Equipment - General requirements
Edition:7.0

IEC 60079-11:2011 Explosive atmospheres - Part 11: Equipment protection by intrinsic safety "i"
Edition:6.0

IEC 60079-15:2010 Explosive atmospheres - Part 15: Equipment protection by type of protection "n"
Edition:4

IEC 60079-31:2013 Explosive atmospheres - Part 31: Equipment dust ignition protection by enclosure "t"
Edition:2

This Certificate **does not** indicate compliance with safety and performance requirements other than those expressly included in the Standards listed above.

TEST & ASSESSMENT REPORTS:
A sample(s) of the equipment listed has successfully met the examination and test requirements as recorded in:

Test Report:

DE/BVS/ExTR16.0084/01

Quality Assessment Report:

DE/TUN/QAR06.0011/11

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EQUIPMENT:
Equipment and systems covered by this Certificate are as follows:

Type code:

See Annex

Ratings:

See Annex

SPECIFIC CONDITIONS OF USE: YES as shown below:
For TROVIS / TROVIS SAFE 3793-111:
For applications in Dust Group IIIC, the cable glands, blanking plugs and connectors supplied must be replaced with certified ones. The cable glands, blanking plugs and connectors must be suitable for the certified temperature range and have a degree of protection of at least IP54.

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Equipment (continued):

The TROVIS/TROVIS SAFE 3793 HART® Positioner is a single or double acting positioner for attachment to pneumatic control valves.

The positioner ensures a predetermined assignment of the valve position (controlled variable x) to the input signal (reference variable w). It compares the input signal received from a control system to the travel or rotational angle of the control valve and issues a corresponding output signal pressure
(output variable y) for the pneumatic actuator.

The apparatus consists of an enclosure with degree of protection IP66 and contains several fixed mounted PCBs. In addition to the power supply terminals +11 / -12 the device contains two slots for different options modules. The options modules provide additional connection terminals for external circuits. The serial interface (5 pin socket) for performing a firmware update may only be used by the manufacturer.

Depending on the type of the apparatus there are different types of protection:

Type 3793 - 111… has type of protection ‘ia’ and it may be used for EPL Gb and Db
(Zone 1 and Zone 21).

Type 3793 - 511… has type of protection ‘tb’ and it may be used for EPL Db (Zone 21).

Type 3793 - 811… has type of protection ‘nA’ and ‘tb’ and it may be used for EPL Gc and Db
(Zone 2 and Zone 21).

Type 3793 - 851… has type of protection ‘nA’ and it may be used for EPL Gc (Zone 2).

The options modules are exchangeable.
The type of protection of the apparatus shall be marked on the type label of the options modules. It is not allowed to use an options module with type of protection ‘ia’, if it has ever been supplied with a non-intrinsically safe circuit.

Options module Code P and Code F includes a Pepperl+Fuchs inductive limit switch type SJ2-SN which is separately certified (Certificate IECEx PTB 11.0092X).

For types 3793 - 111… (type of protection ‘ia’), when using the options module Code P:

Two different sets of input parameters are permissible (supply variant type 2 and type 3). If the options module is supplied with parameters type 3, the ambient temperature is limited. Refer to thermal ratings.

For explosion protection “Ex nA” the external travel sensor I is not permitted.

For explosion protection “Ex tb” (Option module 2, jk=50 and 51) the external travel sensor I is not permitted.

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DETAILS OF CERTIFICATE CHANGES (for issues 1 and above)

- The Positioner TROVIS / TROVIS SAFE 3793 is extended by additional option modules with Codes A, E, F, G, U, Y
- The circuitry of the Modem PCB is slightly modified
- The circuitry of the Multifunction PCB is slightly modified
- The circuitry of the Pneumatic Block PCB is slightly modified
- Introduction of a new Pressure sensor PCB
- Introduction of an external position sensor
- Introduction of a further material of the shaft
- Extension of the type code
- Updating of the applied standards
- Correction of Applicant's and Manufacturer's name

Annex:

BVS_16_0084X_Samson_Annex1.pdf

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Annex

Type code:
Positioner TROVIS / TROVIS SAFE 3793 - **1… HART®
3 7 9 3 – b c d e f g h I j k l m n o p q

b	c	d	e	f	g	h	i	j	k	l	m	n	o	p	q
x	**x**	**x**	**x**	**x**	**x**	**x**	**x**	**x**	**x**	**x**	**x**	**x**	**x**	**x**	**x**

Explosion protection

1	**1**	**1**	Ex ia IIC T4/T6 Gb / Ex ia IIIC T85°C Db
5	**1**	**1**	Ex tb IIIC T85°C Db
8	**1**	**1**	Ex nA IIC T4/T6 Gc / Ex tb IIIC T85°C Db
8	**5**	**1**	Ex nA IIC T4/T6 Gc

b c d

Function (not safety relevant)

e

Pneumatics (not safety relevant)

f g

Option module 1

0	**0**	Without
1	**0**	with Software Limit Switches, Binary Input and Output (Code N)
4	**0**	with Position Transmitter Binary Input and Output (Code T)
4	**5**	Servo drive (AMR) (Code G)
6	**5**	with Binary input (contact), binary input (24 V DC) and binary output (NAMUR) (Code U)
8	**0**	with Forced Venting, Binary Input and Output (Code V)
9	**0**	with Analog input (4 to 20 mA) and binary output (NAMUR) (Code A)

h i

Option module 2

0	**0**	Without
1	**0**	with Software Limit Switches, Binary Input and Output (Code N)
2	**1**	with Forced Venting and Inductive limit contacts (Code F)
4	**0**	with Position Transmitter, Binary Input and Output (Code T)
5	**0**	External travel sensor I (with sensor and 10 m connecting cable) (Code E)
5	**1**	External travel sensor I (without sensor and connecting cable) (Code E)
8	**0**	with Forced Venting, Binary Input and Output (Code V)
1	**5**	with Inductive Limit Switches (NC) and Binary Output (Code P)
1	**6**	with Inductive Limit Switches (NO) and Binary Output (Code P)
3	**0**	with Mechanical Limit Switches (NO/NC)
6	**0**	External travel sensor II (4 to 20 mA) and binary output (NAMUR) (Code Y)
6	**5**	Binary input (contact), binary input (24 V DC) and binary output (NAMUR) (Code U)
9	**0**	Analog input (4 to 20 mA) and binary output (NAMUR) (Code A)

j k

Pressure sensor

0	Without
1	with Pressure Sensors for p_zul, Y1 and Y2
2	Standard (Supply 9, Output 138, Output 238)

l

Electrical connections

0	4 blanking plugs
1	1 cable gland, 3 blanking plugs

m

Housing material

0	Standard aluminum die cast
1	Stainless steel
2	Stainless steel, Shaft made of Hastelloy®

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Annex

n | **Special applications** (not safety relevant)
o | **Additional approvals** (not safety relevant)
p | **Ambient temperature** (not safety relevant)
q

Ratings:

1. Electrical data:

1.1 Signal Circuit Terminal +11 / -12

Nominal input voltage	U_N	9.8 V
Nominal input current	I_N	4 … 20 mA
Nominal input power	P_N	212 mW
For types 3793 - 111…		
Maximum input voltage	U_i	28 V
Maximum input current	I_i	115 mA
Maximum input power	P_i	1 W
Maximum internal capacitance	C_i	16.3 nF
Maximum internal inductance	L_i	negligible

1.2 Software Limit Switches (NAMUR) Terminals +45 / -46 and +55 / -56

Nominal input voltage	U_N	8.2 V
Nominal input power	P_N	17 mW
For types 3793 - 111…		
Maximum input voltage	U_i	16 V
Maximum input current	I_i	52 mA
Maximum input power	P_i	169 mW
Maximum internal capacitance	C_i	12.2 nF
Maximum internal inductance	L_i	negligible

1.3 Binary Output (NAMUR) Terminal +83 / -84

Nominal input voltage	U_N	8.2 V
Nominal input power	P_N	17 mW
For types 3793 - 111…		
Maximum input voltage	U_i	16 V
Maximum input current	I_i	52 mA
Maximum input power	P_i	169 mW
Maximum internal capacitance	C_i	12.2 nF
Maximum internal inductance	L_i	negligible

1.4 Binary Input (24 V DC) Terminal +87 / -88

Nominal input voltage	U_N	24 V
Nominal input power	P_N	120 mW
For types 3793 - 111…		
Maximum input voltage	U_i	28 V
Maximum input current	I_i	115 mA
Maximum input power	P_i	1 W
Maximum internal capacitance	C_i	11.1 nF
Maximum internal inductance	L_i	negligible

1.5 Binary Input (Contact) Terminal +85 / -86

Nominal input voltage	U_N	24	V
For types 3793 - 111…			
Maximum output voltage	U_o	9.6	V
Maximum output current	I_o	5	mA
Maximum output power	P_o	5.8	mW
Maximum internal capacitance	C_o	3.3	nF
Maximum internal inductance	L_o	50	mH

1.6 Position Transmitter Terminal +31 / -32

Nominal input voltage	U_N	24	V
Nominal input power	P_N	518	mW
For types 3793 - 111…			
Maximum input voltage	U_i	28	V
Maximum input current	I_i	115	mA
Maximum input power	P_i	1	W
Maximum internal capacitance	C_i	11.1	nF
Maximum internal inductance	L_i	negligible	

1.7 Servo drive (AMR) Terminals 21 / 22 / 23 / 24

For types 3793 - 111…			
Maximum output voltage	U_o	4.8	V
Maximum output current	I_o	65	mA
Maximum output power	P_o	74	mW
Maximum internal capacitance	C_o	100	µF
Maximum internal inductance	L_o	8	mH

1.8 Forced Venting Terminal +81 / -82

Nominal input voltage	U_N	24	V
Nominal input power	P_N	173	mW
For types 3793 - 111…			
Maximum input voltage	U_i	28	V
Maximum input current	I_i	115	mA
Maximum input power	P_i	1	W
Maximum internal capacitance	C_i	11.1	nF
Maximum internal inductance	L_i	negligible	

1.9 Inductive Limit Switches Terminals +41 / -42 and +51 / -52

Nominal input voltage	U_N			8.2	V
Nominal input power	P_N			17	mW
For types 3793 - 111…					
Supply variant		Type 2		Type 3	
Maximum input voltage	U_i	16	V	16	V
Maximum input current	I_i	25	mA	52	mA
Maximum input power	P_i	64	mW	169	mW
Maximum internal capacitance	C_i			71.1	nF
Maximum internal inductance	L_i			100	µH

1.10 Mechanical Limit Switches Terminals 47 / 48 / 49 and 57 / 58 / 59

Nominal input voltage	U_N	28	V
Nominal input power	P_N	10	mW
For types 3793 - 111…			
Maximum input voltage	U_i	28	V
Maximum input current	I_i	115	mA
Maximum input power	P_i	500	mW
Maximum internal capacitance	C_i	22.2	nF
Maximum internal inductance	L_i	150	µH

1.11 Analog Input Terminal +17 / -18

Nominal input voltage	U_N	3.5	V
Nominal input current	I_N	4 … 20	mA
Nominal input power	P_N	76	mW
For types 3793 - 111…			
Maximum input voltage	U_i	28	V
Maximum input current	I_i	115	mA
Maximum input power	P_i	1	W
Maximum internal capacitance	C_i	11.1	nF
Maximum internal inductance	L_i	negligible	

1.12 External position sensor I Terminals 21 / 22 / 23 / 24

For types 3793 - 111…			
Maximum output voltage	U_o	4.8	V
Maximum output current	I_o	65	mA
Maximum output power	P_o	74	mW
Maximum internal capacitance	C_o	100	µF
Maximum internal inductance	L_o	8	mH

1.13 External position sensor II Terminal +15 / -16

Nominal input voltage	U_N	3.5	V
Nominal input current	I_N	4 … 20	mA
Nominal input power	P_N	76	mW
For types 3793 - 111…			
Maximum input voltage	U_i	28	V
Maximum input current	I_i	115	mA
Maximum input power	P_i	1	W
Maximum internal capacitance	C_i	11.1	nF
Maximum internal inductance	L_i	negligible	

2. Thermal Parameters:

2.1 Types 3793 - 111… Group II applications (type of protection ia)

Temperature Class	T4	-40 °C ≤ T_{amb} ≤ +80 °C
Temperature Class	T6	-40 °C ≤ T_{amb} ≤ +55 °C
Operation with Inductive Limit Switches supply variant type 3		
Temperature Class	T4	-40 °C ≤ T_{amb} ≤ +70 °C
Temperature Class	T6	-40 °C ≤ T_{amb} ≤ +45 °C
Operation with External position sensor I		
Temperature Class	T4	-30 °C ≤ T_{amb} ≤ +80 °C
Temperature Class	T6	-30 °C ≤ T_{amb} ≤ +55 °C

2.2 Types 3793 - 111… Group III applications (type of protection ia)

Maximum surface temperature	T 85 °C	-40 °C ≤ T_{amb} ≤ +55 °C
Operation with External position sensor I		
Maximum surface temperature	T 85 °C	-30 °C ≤ T_{amb} ≤ +55 °C

2.3 Types 3793 - 811… and types 3793 - 851… (type of protection nA)

Temperature Class	T4	-40 °C ≤ T_{amb} ≤ +80 °C
Temperature Class	T6	-40 °C ≤ T_{amb} ≤ +55 °C

2.4 Types 3793 - 511… and types 3793 - 811… (type of protection tb)

Maximum surface temperature	T 85 °C	-40 °C ≤ T_{amb} ≤ +70 °C