Translation

1 # EU-Type Examination Certificate Supplement 1

2 **Equipment intended for use in potentially explosive atmospheres Directive 2014/34/EU**

3 EU-Type Examination Certificate Number: **BVS 16 ATEX E 117 X**

4 Product: **Positioner type TROVIS / TROVIS SAFE 3793- **0 HART®**

5 Manufacturer: **SAMSON AG**

6 Address: **Weismüllerstraße 3, 60314 Frankfurt am Main, Germany**

7 This supplementary certificate extends EC-Type Examination Certificate No. BVS 16 ATEX E 117 to apply to products designed and constructed in accordance with the specification set out in the appendix of the said certificate but having any acceptable variations specified in the appendix to this certificate and the documents referred to therein.

8 DEKRA Testing and Certification GmbH, Notified Body number 0158, in accordance with Article 17 of Directive 2014/34/EU of the European Parliament and of the Council, dated 26 February 2014, certifies that this product has been found to comply with the Essential Health and Safety Requirements relating to the design and construction of products intended for use in potentially explosive atmospheres given in Annex II to the Directive.
The examination and test results are recorded in the confidential Report No. BVS PP 16.2199 EU.

9 The Essential Health and Safety Requirements are assured in consideration of:

EN IEC 60079-0:2018	**General requirements**
EN 60079-11:2012	**Intrinsic Safety "i"**
EN 60079-15:2010	**Equipment protection by type of protection "n"**
EN 60079-31:2014	**Protection by Enclosure "t"**

10 If the sign "X" is placed after the certificate number, it indicates that the product is subject to the Special Conditions for Use specified in the appendix to this certificate.

11 This EU-Type Examination Certificate relates only to the design and construction of the specified product. Further requirements of the Directive apply to the manufacturing process and supply of this product. These are not covered by this certificate.

12 The marking of the product shall include the following:

II 2G Ex ia IIC T4/T6 Gb **II 2D Ex ia IIIC T85°C Db**	for type 3793 - 110
II 3G Ex nA IIC T4/T6 Gc **II 2D Ex tb IIIC T85°C Db**	for type 3793 - 810
II 2D Ex tb IIIC T85°C Db	for type 3793 - 510

DEKRA Testing and Certification GmbH
Bochum, 2021-07-05

Signed: Jörg-Timm Kilisch

Managing Director

DEKRA Testing and Certification GmbH, Handwerkstr. 15, 70565 Stuttgart, Germany
Certification body: Dinnendahlstr. 9, 44809 Bochum, Germany
Phone +49.234.3696-400, Fax +49.234.3696-401, e-mail DTC-Certification-body@dekra.com

13 **Appendix**

14 **EU-Type Examination Certificate**

BVS 16 ATEX E 117
Supplement 1

15 **Product description**

15.1 **Subject and type**

Positioner TROVIS / TROVIS SAFE 3793 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**	**0**	Ex ia IIC T4/T6 Gb / Ex ia IIIC T85°C Db
5	**1**	**0**	Ex tb IIIC T85°C Db
8	**1**	**0**	Ex nA IIC T4/T6 Gc / Ex tb IIIC T85°C Db

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®

n

Special applications (not safety relevant)

o

Additional approvals (not safety relevant)

p

Ambient temperature (not safety relevant)

q

DEKRA Testing and Certification GmbH, Handwerkstr. 15, 70565 Stuttgart, Germany
Certification body: Dinnendahlstr. 9, 44809 Bochum, Germany
Phone +49.234.3696-400, Fax +49.234.3696-401, e-mail DTC-Certification-body@dekra.com

15.2 **Description**

Reason for the supplement:

- The Positioner TROVIS / TROVIS SAFE 3793 HART® 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

Description of Product:

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 - 110... has type of protection "ia" and it may be used for Category 2G and 2D (Zone 1 and Zone 21).
Type 3793 - 510... has type of protection "tb" and it may be used for Category 2D in Zone 21.
Type 3793 - 810... has type of protection "nA" and 'tb' and it may be used for Category 3G and 2D in Zone 2 and Zone 21.

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.

The Options Modules Code P and Code F include a Pepperl+Fuchs inductive limit switch type SJ2-SN (Certificate: PTB 00 ATEX 2049X; standard EN 60079-0:2012-A11:2013, EN 60079-11:2012).

For types 3793 - 110... (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 tb" (Option module 2, jk=50 and 51) the external travel sensor I is not permitted.

DEKRA Testing and Certification GmbH, Handwerkstr. 15, 70565 Stuttgart, Germany
Certification body: Dinnendahlstr. 9, 44809 Bochum, Germany
Phone +49.234.3696-400, Fax +49.234.3696-401, e-mail DTC-Certification-body@dekra.com

15.3 Parameters

15.3.1 Electrical Parameters

15.3.1.1 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 - 110...			
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	

15.3.1.2 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 - 110...			
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	

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

Nominal input voltage	U_N	8.2	V
Nominal input power	P_N	17	mW
For types 3793 - 110...			
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	

15.3.1.4 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 - 110...			
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	

15.3.1.5 Binary input (Contact) Terminals +85 / -86

Nominal input voltage	U_N	24	V
For types 3793 - 110...			
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

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15.3.1.6 Position Transmitter Terminal +31 / -32

Nominal input voltage	U_N	24	V
Nominal input power	P_N	518	mW
For types 3793 - 110...			
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	

15.3.1.7 Servo drive (AMR) Terminal 21 / 22 / 23 / 24

For types 3793 - 110...			
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

15.3.1.8 Forced Venting Terminal +81 / -82

Nominal input voltage	U_N	24	V
Nominal input power	P_N	173	mW
For types 3793 - 110...			
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	

15.3.1.9 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 - 110...		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	71.1	nF
Maximum internal inductance	L_i	100	µH	100	µH

15.3.1.10 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 - 110...			
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

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15.3.1.11 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 - 110...			
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	

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

For types 3793 - 110...			
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

15.3.1.13 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 - 110...			
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	

15.3.2 Thermal Parameters

15.3.2.1 For types 3793 - 110... Group II application (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

15.3.2.2 For types 3793 - 110... Group III application (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

15.3.2.3 For types 3793 - 810...

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

15.3.2.4 For types 3793 - 510... and types 3793 – 810... (type of protection tb)

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

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Phone +49.234.3696-400, Fax +49.234.3696-401, e-mail DTC-Certification-body@dekra.com

16 **Report Number**

BVS PP 16.2199 EU, as of 2021-07-05

17 **Special Conditions for Use**

For TROVIS / TROVIS SAFE 3793-110...:
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 certified temperature range and have a degree of protection of at least IP54.

18 **Essential Health and Safety Requirements**

The Essential Health and Safety Requirements are covered by the standards listed under item 9.

19 Drawings and Documents

Drawings and documents are listed in the confidential report.

We confirm the correctness of the translation from the German original.
In the case of arbitration only the German wording shall be valid and binding.

DEKRA Testing and Certification GmbH
Bochum, 2021-07-05
BVS-Fro/Mu A20190512

Managing Director

DEKRA Testing and Certification GmbH, Handwerkstr. 15, 70565 Stuttgart, Germany
Certification body: Dinnendahlstr. 9, 44809 Bochum, Germany
Phone +49.234.3696-400, Fax +49.234.3696-401, e-mail DTC-Certification-body@dekra.com