(1) EC TYPE-EXAMINATION CERTIFICATE

(2) Equipment and Protective Systems intended for use in Potentially Explosive Atmosphere - **Directive 94/9/EC**

(3) EC Type-Examination Certificate Number

TÜV 14 ATEX 7603 X

(4) **Equipment:** ViscoScope Sensor type S-1***-** or S-3***-** and type VA-100*-** or VA-300*-**

(5) **Manufacturer:** Marimex Industries GmbH & Co.KG
(6) **Address:** Bergiusstrasse 6
46244 Bottrop, Germany

(7) This equipment and any acceptable variation thereto are specified in the schedule to this certificate and the documents therein referred to.

(8) The TÜV Rheinland Zertifizierungsstelle for ex-protected products of TÜV Rheinland Industrie Service GmbH, Notified Body No. 0035 in accordance with Article 9 of the Council Directive 94/9/EC of 23 March 1994, certifies this equipment has been found to comply with the Essential Health and Safety Requirements relating to the design and construction of equipment and protective systems intended
for use in potentially explosive atmosphere, given in Annex II to the Directive.

The examination and test results are recorded in the confidential report 557 / Ex 603.00/14

(9) Compliance with the Essential Health and Safety Requirements, with the exception of those listed in the schedule of this certificate, has been assessed by reference to:

EN 60079-0: 2012 **EN 60079-11:2012** **EN 60079-26:2007**

except the requirements, which are listed under item (18).

(10) If the sign "X" is placed after the certificate number, it indicates that the equipment is subject to special conditions for safe use specified in the schedule to this certificate.

(11) This EC-Type-Examination Certificate relates only to the design and specification for construction of the equipment or protective system. It does not cover the process for actual manufacture or supply of the equipment or protective system, for which further requirements of the directive are applicable.

(12) The marking of the equipment shall include the following:

II 1/2G Ex ia IIC T6...T3 Ga/Gb

TÜV Rheinland ExNB for explosion protected equipment

Cologne, 2015-01-13

Dipl.-Ing. Klauspeter Graffi

This EC-Type-Examination Certificate without signature and stamp shall not be valid.
This EC-Type-Examination Certificate may be circulated only without alteration. Extracts or alterations are subject to approval by the TÜV Rheinland Notified Body of TÜV Rheinland Industrie Service GmbH, Am Grauen Stein 51105 Köln
Tel. +49 (0) 221 806-0 Fax. + 49 (0) 221 806 114

1st Supplement

to

EU - Type Examination Certificate

TÜV 14 ATEX 7603 X

Device: ViscoScope Sensor type S-1***-** or type S-3***-** und type VA-100*-** or type VA-300*-**

Manufacturer: Marimex Industries GmbH & Co.KG
Address: Bergiusstrasse 6
46244 Bottrop
Germany

Description of supplements and modifications:

Scope of this supplement is the compliance with the standard EN 60079-26:2015 as well as correction of the technical data.

(15) **The following modifications are valid for this 1st Supplement**

Standard basis:

EN 60079-0:2012;
EN 60079-11:2012;
EN 60079-26:2015

Code for type of protection

II 1/2 G Ex ia IIC T6...T3 Ga/Gb

15.1 Subject and Type

Unchanged

15.2 Description

The ViscoScope sensor type S-1***-** or type S-3***-**and type VA-100*-** or type VA-300*-** in connection with a respective evaluation unit is used to dynamically determine the viscosity of fluids in processes. The evaluation unit, consisting of an associated transmission cable, safety barrier, and transmitter, is not part of this assessment.

The sensor is installed in the separation wall of e.g. vessels, tanks or pipes. For the process connection different types of flanges or threads are available. The external electrical connection is done either via terminal situated in the top part of the sensor enclosure or via a connector situated at the cover of the sensor enclosure.

The sensor of type S-1***-** and type VA-100*-** contains in total 2 coils; 1 driver and 1 receiver coil. The sensor of type S-3***-** and type VA-300*-** contains 2 split pair coils connected in series; 2 driver and 2 receiver coils.

15.3 Technical Data

15.3.1 Electrical data

15.3.1.1 Driver coil (Terminals 4 + 5)

Maximum input voltage	U_i	DC	10	V
Maximum input current	I_i		40	mA
Maximum input power	P_i		100	mW
Effective internal capacitance	C_i	negligible		
Max. internal inductance, each coil	L_i		16±10%	mH
Resistance, each coil			41±10%	Ω
Inductance-/ resistance ratio	L_o/R_o		0,477	mH/Ω

15.3.1.2 Receiver coil (Terminals 1 + 2)

Maximum input voltage	U_i	DC	10	V
Maximum input current	I_i		40	mA
Maximum input power	P_i		100	mW
Effective internal capacitance	C_i	negligible		
Max. internal inductance, each coil	L_i		16±10%	mH
Resistance, each coil			41±10%	Ω
Inductance-/ resistance ratio	L_o/R_o		0,477	mH/Ω

15.3.1.3 Process-Pt100 (Terminals 6, 7 + 8)

Maximum input voltage	U_i	DC	3,5	V
Maximum input current	I_i		310	mA
Maximum input power	P_i		275	mW
Effective internal capacitance	C_i	negligible		
Effective internal inductance	L_i	negligible		

15.3.1.4 Coil-Pt100 (Terminals 9, 10 + 11)

Maximum input voltage	U_i	DC 3,5	V
Maximum input current	I_i	310	mA
Maximum input power	P_i	275	mW
Effective internal capacitance	C_i	negligible	
Effective internal inductance	L_i	negligible	

15.3.2 Thermal data

Temperature class	Ambient temperature range	Maximum process temperature
T3	-40 °C ≤ T_a ≤ +185 °C	+350 °C
T4	-40 °C ≤ T_a ≤ +120 °C	+135 °C
T5	-40 °C ≤ T_a ≤ +85 °C	+100 °C
T6	-40 °C ≤ T_a ≤ +70 °C	+85 °C

(16) **Test Report No.** 557 / Ex 7603.01 / 14

The applicability and assembly of mechanical and electrical parts and components of the ViscoScope sensor were assessed and approved by TÜV Rheinland Industrie Service GmbH with respect to the requirements of explosion protection.

(17) **Special conditions for safe use**

The original certificate has to be observed.

(18) **Basic Safety and Health Requirements**

Covered by afore mentioned standards.

TÜV Rheinland ExNB for explosion protected equipment

Cologne, 2016-05-11

Dipl.-Ing. Klauspeter Graffi

(1) EU-TYPE EXAMINATION CERTIFICATE

(2) Equipment and Protective Systems intended for use in Potentially Explosive Atmosphere - **Directive 2014/34/EU**

(3) EU-Type Examination Certificate Number

TÜV 14 ATEX 7603 X Issue: 02

(4) Equipment: **ViscoScope Sensor type S-1***-** or S-3***-** and type VA-100*-** or Typ VA-300*-****

(5) Manufacturer: **E.L.B. Füllstandsgeräte Bundschuh GmbH & Co.KG**

(6) Address: **An der Hartbrücke 6,**
64625 Bensheim
Germany

(7) This product and any acceptable variation thereto are specified in the schedule to this certificate and the documents therein referred to.

(8) The TÜV Rheinland Zertifizierungsstelle für Explosionsschutz of TÜV Rheinland Industrie Service GmbH, Notified Body No. 0035 in accordance with Article 21 of the Council Directive 2014/34/EU of 26th February 2014, certifies this product which has been found to comply with the Essential Health and Safety Requirements relating to the design and construction of equipment and protective systems intended for use in potentially explosive atmosphere, given in Annex II to the Directive.

The examination and test results are recorded in the confidential report 557 / Ex 7603.02 / 14

(9) Compliance with the Essential Health and Safety Requirements, with the exception of those listed in the schedule of this certificate, has been assessed by reference to:

EN IEC 60079-0:2018 **EN 60079-11:2012** **EN 60079-26:2015**

(10) If the sign "X" is placed after the certificate number, it indicates that the equipment is subject to special conditions for safe use specified in the schedule to this certificate.

(11) This EU-Type Examination Certificate relates only to the design and specification for construction of the equipment or protective system. It does not cover the process for actual manufacture or supply of the equipment or protective system, for which further requirements of the directive are applicable.

(12) The marking of the equipment shall include the following:

II 1/2G Ex ia IIC T6...T3 Ga/Gb

TÜV Rheinland Zertifizierungsstelle für Explosionsschutz Cologne, 2021-03-08

Dipl.-Ing. Klauspeter Gräfl

This EU-Type Examination Certificate without signature and stamp shall not be valid.
This EU-Type Examination Certificate may be circulated only without alteration. Extracts or alterations are subject to approval by the TÜV Rheinland Industrie Service GmbH TÜV Rheinland Group Am Grauen Stein 51105 Köln
Tel. +49 (0) 221 806-0 Fax. + 49 (0) 221 806 114

(13) Annex

(14) # EU Type Examination Certificate

TÜV 14 ATEX 7603 X Issue: 02

(15) Description of equipment

15.1 Equipment and type:

Issue 00

ViscoScope Sensor type S-1***-** or S-3***-**

Asterisk	Description	Values
1, 2	Sensor design	10, 11, 20, 21, 50, 51, 60, 61, 1F
3	Viscosity range	C, B, H, L, M, S, X
4, 5	Process temperature range	BT, LT, ST, HT

ViscoScope Sensor type VA-100*-** or VA-300*-**

Asterisk	Description	Values
1	Viscosity range	C, B, H, L, M, S, X
2, 3	Process temperature range	BT, LT, ST, HT

ISSUE 01

Unchanged to 557 / Ex 7603.00 / 14

ISSUE 02

Unchanged to 557 / Ex 7603.00 / 14/00

15.2 Description / Details of Change

General product information

ISSUE 01

The ViscoScope Sensor type S-1***-** or S-3***-** and type VA-100*-** or VA-300*-** in connection with a respective evaluation unit is used to dynamically determine the viscosity of fluids in processes.

The evaluation unit, consisting of an associated transmission cable, safety barrier, and transmitter. The transmission cable, safety barrier, and transmitter are notot part of this assessment.

The sensor is installed in the separation wall of e.g. vessels, tanks or pipes. For the process connection different types of flanges or threads are available. The external electrical connection is done either via terminal situated in the top part of the sensor enclosure or via a connector situated at the cover of the sensor enclosure.

The sensor of type S-1***-** and type VA-100*-** contains in total 2 coils; 1 driver and 1 receiver coil. The sensor of type S-3***-** and type VA-300*-** contains 2 split pair coils connected in series; 2 driver and 2 receiver coils.

ISSUE 02

Unchanged to 557 / Ex 7603.00 / 14/00

Description of change

ISSUE 01

Scope of this supplement is the compliance with the standard IEC 60079-26:2014 as well as correction of the technical data.

ISSUE 02

Scope of this supplement is the compliance with the standard IEC 60079-0:2017 as well as the applicant changed:

From	to
Marimex Industries GmbH & Co.KG	E.L.B. Füllstandsgeräte Bundschuh GmbH & Co.KG
Bergiusstrasse 6	An der Hartbrücke 6
46244 Bottrop, Germany	64625 Bensheim Germany

Technical Data

1.1 Electrical parameter

1.1.1 Driver coil (Terminals 4 + 5)

Maximum input voltage	U_i	DC	10 V	
Maximum input current	I_i		40 mA	
Maximum input power	P_i		100 mW	
Effective internal capacitance	C_i		negligible	
Max. internal inductance, each coil	L_i		16±10%	mH
Resistance, each coil			41±10%	Ω
Inductance-/ resistance ratio	L_o/R_o		0.477 mH/Ω	

1.1.2 Receiver coil (Terminals 1 + 2)

Maximum input voltage	U_i	DC	10 V	
Maximum input current	I_i		40 mA	
Maximum input power	P_i		100 mW	
Effective internal capacitance	C_i		negligible	
Max. internal inductance, each coil	L_i		16±10%	mH
Resistance, each coil			41±10%	Ω
Inductance-/ resistance ratio	L_o/R_o		0.477 mH/Ω	

1.1.3 Process-Pt100 (Terminals 6, 7 + 8)

Maximum input voltage	U_i	DC	3.5 V	
Maximum input current	I_i		310 mA	
Maximum input power	P_i		275 mW	
Effective internal capacitance	C_i		negligible	
Effective internal inductance	L_i		negligible	

1.1.4 Coil-Pt100 (Terminals 9, 10 + 11)

Maximum input voltage	U_i	DC	3,5 V	
Maximum input current	I_i		310 mA	
Maximum input power	P_i		275 mW	
Effective internal capacitance	C_i		negligible	
Effective internal inductance	L_i		negligible	

1.2 Thermal parameter

Temperature class	Ambient temperature range	Maximum process temperature
T3	-40 °C ≤ T_a ≤ +185 °C	+350 °C
T4	-40 °C ≤ T_a ≤ +120 °C	+135 °C
T5	-40 °C ≤ T_a ≤ +85 °C	+100 °C
T6	-40 °C ≤ T_a ≤ +70 °C	+85 °C

(16) Test-Report No. 557 / Ex 7603.02 / 14

(17) Special Conditions for safe use

1. The thermal parameter of the sensor are as follows:

Temperature class	Ambient temperature range	Max process temperature
T3	-40 °C ≤ T_a ≤ +185 °C	+350 °C
T4	-40 °C ≤ T_a ≤ +120 °C	+135 °C
T5	-40 °C ≤ T_a ≤ +85 °C	+100 °C
T6	-40 °C ≤ T_a ≤ +70 °C	+85 °C

2. For application with ambient temperature ranges above +80 °C particularly suitable connection cable has to be used for external connection of the sensor.
3. For application with ambient temperature ranges way above +80 °C a ventilation system for cooling to temperatures below +100 °C has to be applied to the connector head of the sensor. The ventilation system is not part of this assessment and has to be separately certified.
4. The sensor has to be integrated into the local equipotential bonding.

(18) Basic Safety and Health Requirements

Covered by afore mentioned standard

TÜV Rheinland Zertifizierungsstelle für Explosionsschutz Cologne, 2021-03-08

ATEX Notified body 0035 Rheinland Industrie Service GmbH

Dipl.-Ing. Klausperter Graff

(1) EU-TYPE EXAMINATION CERTIFICATE

(2) Equipment and Protective Systems intended for use in Potentially Explosive Atmosphere - **Directive 2014/34/EU**

(3) EU-Type Examination Certificate Number

TÜV 14 ATEX 7603 X Issue: 03

(4) Equipment: **ViscoScope Sensor type S-1***-** or S-3***-** and type VA-100*-** or Typ VA-300*-****

(5) Manufacturer: **Fluid.iO® Sensor + Control GmbH & Co. KG**

(6) Address: **An der Hartbrücke 6,**
64625 Bensheim
Germany

(7) This product and any acceptable variation thereto are specified in the schedule to this certificate and the documents therein referred to.

(8) The TÜV Rheinland Zertifizierungsstelle für Explosionsschutz of TÜV Rheinland Industrie Service GmbH, Notified Body No. 0035 in accordance with Article 21 of the Council Directive 2014/34/EU of 26th February 2014, certifies this product which has been found to comply with the Essential Health and Safety Requirements relating to the design and construction of equipment and protective systems intended for use in potentially explosive atmosphere, given in Annex II to the Directive.

The examination and test results are recorded in the confidential report 557 / Ex 7603.03 / 14

(9) Compliance with the Essential Health and Safety Requirements, with the exception of those listed in the schedule of this certificate, has been assessed by reference to:

EN IEC 60079-0:2018 **EN 60079-11:2012** **EN 60079-26:2015**

(10) If the sign "X" is placed after the certificate number, it indicates that the equipment is subject to special conditions for safe use specified in the schedule to this certificate.

(11) This EU-Type Examination Certificate relates only to the design and specification for construction of the equipment or protective system. It does not cover the process for actual manufacture or supply of the equipment or protective system, for which further requirements of the directive are applicable.

(12) The marking of the equipment shall include the following:

II 1/2G Ex ia IIC T6...T3 Ga/Gb

TÜV Rheinland Zertifizierungsstelle für Explosionsschutz Cologne, 2023-07-06

Dipl.-Ing. Christian Mehrhoff

Notified body 0035 TÜV Rheinland Industrie Service GmbH

This EU-Type Examination Certificate without signature and stamp shall not be valid.
This EU-Type Examination Certificate may be circulated only without alteration. Extracts or alterations are subject to approval by the TÜV Rheinland Industrie Service GmbH TÜV Rheinland Group Am Grauen Stein 51105 Köln
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(13) Annex

(14) # EU Type Examination Certificate

TÜV 14 ATEX 7603 X Issue: 03

(15) Description of equipment

15.1 Equipment and type:

Issue 00

ViscoScope Sensor type S-1***-** or S-3***-**

Asterisk	Description	Values
1, 2	Sensor design	10, 11, 20, 21, 50, 51, 60, 61, 1F
3	Viscosity range	C, B, H, L, M, S, X
4, 5	Process temperature range	BT, LT, ST, HT

ViscoScope Sensor type VA-100*-** or VA-300*-**

Asterisk	Description	Values
1	Viscosity range	C, B, H, L, M, S, X
2, 3	Process temperature range	BT, LT, ST, HT

ISSUE 01

Unchanged to 557 / Ex 7603.00 / 14

ISSUE 02

Unchanged to 557 / Ex 7603.00 / 14

ISSUE 03

Unchanged to 557 / Ex 7603.00 / 14

15.2 Description / Details of Change

General product information

ISSUE 01

The ViscoScope Sensor type S-1***-** or S-3***-** and type VA-100*-** or VA-300*-** in connection with a respective evaluation unit is used to dynamically determine the viscosity of fluids in processes.

The evaluation unit, consisting of an associated transmission cable, safety barrier, and transmitter. The transmission cable, safety barrier, and transmitter are notot part of this assessment.

The sensor is installed in the separation wall of e.g. vessels, tanks or pipes. For the process connection different types of flanges or threads are available. The external electrical connection is done either via terminal situated in the top part of the sensor enclosure or via a connector situated at the cover of the sensor enclosure.

The sensor of type S-1***-** and type VA-100*-** contains in total 2 coils; 1 driver and 1 receiver coil. The sensor of type S-3***-** and type VA-300*-** contains 2 split pair coils connected in series; 2 driver and 2 receiver coils.

ISSUE 02

Unchanged to 557 / Ex 7603.00 / 14

ISSUE 03

Unchanged to 557 / Ex 7603.00 / 14

Description of change

ISSUE 01

Scope of this supplement is the compliance with the standard IEC 60079-26:2014 as well as correction of the technical data.

ISSUE 02

Scope of this supplement is the compliance with the standard IEC 60079-0:2017 as well as the applicant changed:

From	to
Marimex Industries GmbH & Co.KG	E.L.B. Füllstandsgeräte Bundschuh GmbH & Co.KG
Bergiusstrasse 6	An der Hartbrücke 6
46244 Bottrop, Germany	64625 Bensheim Germany

ISSUE 03

The name of the Manufacturer changed to:

Fluid.iO® Sensor + Control GmbH & Co. KG
An der Hartbrücke 6
64625 Bensheim
Germany

Technical Data

Unchanged to 557 / Ex 7603.02 / 14

(16) Test-Report No. 557 / Ex 7603.03 / 14

(17) Special Conditions for safe use

Unchanged to 557 / Ex 7603.02 / 14

(18) Basic Safety and Health Requirements

Covered by afore mentioned standard

TÜV Rheinland Zertifizierungsstelle für Explosionsschutz Cologne, 2023-07-06

Dipl.-Ing. Christian Mehrhoff

ATEX Notified body • TÜV Rheinland Industrie Service • 0035