IECEx Certificate of Conformity

INTERNATIONAL ELECTROTECHNICAL COMMISSION
IEC Certification Scheme for Explosive Atmospheres

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

Certificate No.: IECEx TUN 18.0003X

Issue No: 0

Certificate history:
Issue No. 0 (2018-05-09)

Status: **Current**

Date of Issue: **2018-05-09**

Applicant: **Festo AG &Co.KG**
Ruiter Straße 82
73734 Esslingen-Berkheim
Germany

Equipment: **Valve Position Sensors**

Optional accessory: *SRBG-C1-N-20N-ZC-M12-EX5 and SRBG-C1-N-20N-ZC-C2-C2-EX5*

Type of Protection: **Intrinsic Safety "ia"**

Marking:

For SRBG-C1-N-20N-ZC-M12-EX5

Ex ia IIC T6…T1 Ga resp. Ex ia IIIC T135°C Da

For SRBG-C1-N-20N-ZC-C2-C2-EX5

Ex ia IIC T6…T1 Ga

Approved for issue on behalf of the IECEx Certification Body: Christian Roder

Position: Head of IECEx Certification Body

Signature:
(for printed version)

Date:

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 the Official IECEx Website.

Certificate issued by:

TÜV NORD CERT GmbH
Hanover Office
Am TÜV 1, 30519 Hannover
Germany

5451392 | DRW | - | 210910

IECEx Certificate of Conformity

Certificate No:	IECEx TUN 18.0003X	Issue No: 0
Date of Issue:	**2018-05-09**	Page 2 of 4
Manufacturer:	**Festo AG &Co.KG** Ruiter Straße 82 73734 Esslingen-Berkheim **Germany**	

Additional Manufacturing location(s):

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 apparatus 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 : 2011 Edition:6.0	Explosive atmospheres - Part 0: General requirements
IEC 60079-11 : 2011 Edition:6.0	Explosive atmospheres - Part 11: Equipment protection by intrinsic safety "i"

*This Certificate **does not** indicate compliance with electrical 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/TUN/ExTR18.0009/00

Quality Assessment Report:

NL/DEK/QAR12.0012/06

5451392 | DRW | - | 210910

IECEx Certificate of Conformity

Certificate No: IECEx TUN 18.0003X Issue No: 0

Date of Issue: 2018-05-09 Page 3 of 4

Schedule

EQUIPMENT:

Equipment and systems covered by this certificate are as follows:

The Valve Position Sensors SRBG-C1-N-20N-ZC-M12-EX5 and SRBG-C1-N-20N-ZC-C2-C2-EX5 are used for transforming changes in distance in electrical signals. Depending of the type, the device includes two inductive sensors and up to one valve connection. The valve connection for valve control is looped through the device only, but with indicating LED for displaying valve control status.
The SRBG-C1-N-20N-ZC-M12-EX5 and SRBG-C1-N-20N-ZC-C2-C2-EX5 types are installed in plastic enclosures which are filled with casting compound, except terminal compartment of the SRBG-C1-N-20N-ZC-C2-C2-EX5 type.

For all other technical data see attachment.

SPECIFIC CONDITIONS OF USE: YES as shown below:

1. For relationship between type of the connected circuit, maximum permissible ambient temperature and temperature class (for group II application) as well as the effective internal reactances for the individual types of the Valve Position Sensors, refer to the attachment to IECEx TUN 18.0003 X and in the operating instructions manual.

2. For Group III, the Valve Position Sensors SRBG-C1-N-20N-ZC-M12-EX5: The sensor circuits have to be considered galvanically connected to each other, in safety technical point of view. Verification of intrinsic safety must include the possibility of the interconnection of these intrinsically safe circuits. The functional galvanically separation remains unaffected.

3. Appropriate measures need to be taken to protect the Valve Position Sensors against mechanical damage due to impact if they are used within an ambient temperature range between – 60 °C and – 20 °C. An ambient temperature below – 60°C is not permissible.

4. The connection facilities of the Valve Position Sensors shall be installed as such that a minimum degree of protection of IP20 according IEC 60529 is complied with.

5. Inadmissible electrostatic charge of parts of the metal housing has to be avoided for the Valve Position Sensors SRBG-C1-N-20N-ZC-M12-EX5 and SRBG-C1-N-20N-ZC-C2-C2-EX5. Dangerous electrostatic charge of parts of the metal housing can be avoided by grounding these parts whereas very small parts of the metal housing (e.g. screws) do not need to be grounded.

6. When the following types of Valve Position Sensors are applied corresponding to the explosion group, apparatus group and zones tabulated below, inadmissible electrostatic charge of the plastic housing has to be prevented. The equipment shall be labelled with an appropriate warning note:

Type	For use in Group II EPL Ga	For use in Group II EPL Gb	For use in Group III EPL Da
SRBG-C1-N-20N-ZC-M12-EX5	IIC	-	IIIA/IIIB/IIIC
SRBG-C1-N-20N-ZC-C2-C2-EX5	IIB/IIC	IIC	-

5451392 | DRW | - | 210910

IECEx Certificate of Conformity

7. For the application of the following Valve Position Sensors in hazardous areas appropriate measures need to be taken to protect the free resin surface against mechanical damage if the free resin surface is accessible after installation:
   - SRBG-C1-N-20N-ZC-M12-EX5

8. The Valve Position Sensor SRBG-C1-N-20N-ZC-C2-C2-EX5 is being delivered without cable gland. Protection of cables and cable glands from tensile load and torsional stress is necessary, alternatively certified cable glands may be used.

9. Valve Position Sensors with valve circuits, the maximum values of the connected intrinsically safe valve have to be taken into account.

Annex:

Attachment to CoC IECEx TUN 18.0003X issue 0.pdf

5451392 | DRW | - | 210910

TÜV NORD CERT GmbH
Hanover Office
Am TÜV 1
30519 Hannover
Germany

General product information:

Description of product

The Valve Position Sensors SRBG-C1-N-20N-ZC-M12-EX5 and SRBG-C1-N-20N-ZC-C2-C2-EX5 are used for transforming changes in distance in electrical signals. Depending of the type, the device includes two inductive sensors and up to one valve connection. The valve connection for valve control is looped through the device only, but with indicating LED for displaying valve control status.
The SRBG-C1-N-20N-ZC-M12-EX5 and SRBG-C1-N-20N-ZC-C2-C2-EX5 types are ínstalled in plastic enclosures which are filled with casting compound, except terminal compartment of the SRBG-C1-N-20N-ZC-C2-C2-EX5 type.

The inductive sensors and the valve connection are electrically separated from each other, except:

- Only for group III application: devices incorporating a terminal or plug connectors.

Type code

SRBG

SRBG	–	C1	–	N	–	20N	–	ZC	–	C2	–	C2	–	EX5

Type	
SRBG	Sensor box

Design	
C1	Dual sensor

Sensor principle	
N	Proximity sensor, inductive

Nominal operating voltage	
1	24 V DC
20N	8.2 V DC, NAMUR

Electrical output	
P	PNP
ZC	2-wire N/C contact
ZU	2-wire N/O contact
AS	AS-Interface

Electrical connection	
C2	Screw terminal
M12	M12 plug connector, A-coded

Electrical connection, valve	
–	Without
C2	Screw terminal
M12	M12 plug connector, A-coded

EU certification	
–	None
EX5	II1G

5451392 | DRW | - | 210910

TÜV NORD CERT GmbH
Hanover Office
Am TÜV 1
30519 Hannover
Germany

Parameters:

Electrical and thermal parameters:

For the Valve Position Sensors for group II G:

SRBG-C1-N-20N-ZC-M12-EX5 and SRBG-C1-N-20N-ZC-C2-C2-EX5 the following data is valid:

Sensor circuit(s)
(connections, see operating instructions of the manufacturer)

in type of protection Intrinsic Safety Ex ia IIC
only for the connection to intrinsically safe circuits

Maximum values:

	Type 1	**Type 2**	**Type 3**
U_i	15 V	15 V	15 V
I_i	25 mA	25 mA	52 mA
P_i	34 mW	64 mW	169 mW

Valve circuit
(connections, see operating instructions of the manufacturer)

in type of protection Intrinsic Safety Ex ia IIC
only for the connection to intrinsically safe circuits

Maximum values:

U_i	32 V
I_i	240 mA

The maximum permissible ambient temperature depends on the temperature class and has to be taken from the following table.

Gruppe II (EPL Ga and Gb)	**Type 1**			**Type 2**			**Type 3**		
	maximum permissible ambient temperature in °C for application in temperature class								
Sensor types	T6	T5	T4-T1	T6	T5	T4-T1	T6	T5	T4-T1
SRBG-C1-N-20N-ZC-M12-EX5	75	90	100	75	90	100	65	80	90
SRBG-C1-N-20N-ZC-C2-C2-EX5	70	85	100	70	85	100	65	80	90

5451392 | DRW | - | 210910

TÜV NORD CERT GmbH
Hanover Office
Am TÜV 1
30519 Hannover
Germany

The minimum ambient temperature is -60 °C.
The effective internal inductance and capacitance have to be taken from the following table:

Sensor circuit´s:

	C_i / nF	L_i / µH
SRBG-C1-N-20N-ZC-M12-EX5	< 100	< 100
SRBG-C1-N-20N-ZC-C2-C2-EX5	< 100	< 100

Valve circuit´s:

C_i / nF	L_i / µH
< 10	< 20

The above stated values of C_i and L_i already consider the connection cable of a length of 10 m.
For cable length of more than 10 m, the internal inductance and capacitance of the additional cable length have to be considered.

For the Valve Position Sensors for group III :

SRBG-C1-N-20N-ZC-M12-EX5 the following data is valid:

Sensor circuit(s)

(connections, see operating instructions of the manufacturer)

in type of protection Intrinsic Safety Ex ia IIIC
only for the connection to intrinsically safe circuits

Maximum values:

	Type 1	**Type 2**	**Type 3**
U_i	15 V	15 V	15 V
I_i	25 mA	25 mA	52 mA
P_i	34 mW	64 mW	169 mW

The maximum permissible ambient temperature has to be taken from the following table.

Group III (EPL Da)	**Type 1**	**Type 2**	**Type 3**
Sensor types	maximum permissible ambient temperature in °C		
SRBG-C1-N-20N-ZC-M12-EX5	100	100	90

The minimum ambient temperature is -60 °C.

5451392 | DRW | - | 210910

TÜV NORD CERT GmbH
Hanover Office
Am TÜV 1
30519 Hannover
Germany

The effective internal inductance and capacitance have to be taken from the following table:

Sensor circuit´s:

	C_i / nF	L_i / µH
SRBG-C1-N-20N-ZC-M12-EX5	< 100	< 100

The above stated values of C_i and L_i already consider the connection cable of a length of 10 m.
For cable length of more than 10 m, the internal inductance and capacitance of the additional cable length have to be considered.

For group III applications:

The sensor circuits have to be considered galvanically connected to each other, in safety technical point of view. Verification of intrinsic safety must include the possibility of the interconnection of these intrinsically safe circuits. The functional galvanically separation remains unaffected.

"Specific Conditions of Use" ~~/ "Schedule of Limitations"~~:

1. For relationship between type of the connected circuit, maximum permissible ambient temperature and temperature class (for group II application) as well as the effective internal reactances for the individual types of the Valve Position Sensors, refer to the attachment to IECEx TUN 18.0003 X and in the operating instructions manual.
2. For Group III, the Valve Position Sensors SRBG-C1-N-20N-ZC-M12-EX5:
   The sensor circuits have to be considered galvanically connected to each other, in safety technical point of view. Verification of intrinsic safety must include the possibility of the interconnection of these intrinsically safe circuits. The functional galvanically separation remains unaffected.
3. Appropriate measures need to be taken to protect the Valve Position Sensors against mechanical damage due to impact if they are used within an ambient temperature range between – 60 °C and – 20 °C. An ambient temperature below – 60°C is not permissible.
4. The connection facilities of the Valve Position Sensors shall be installed as such that a minimum degree of protection of IP20 according IEC 60529 is complied with.
5. Inadmissible electrostatic charge of parts of the metal housing has to be avoided for the Valve Position Sensors SRBG-C1-N-20N-ZC-M12-EX5 and SRBG-C1-N-20N-ZC-C2-C2-EX5. Dangerous electrostatic charge of parts of the metal housing can be avoided by grounding these parts whereas very small parts of the metal housing (e.g. screws) do not need to be grounded.
6. When the following types of Valve Position Sensors are applied corresponding to the explosion group, apparatus group and zones tabulated below, inadmissible electrostatic charge of the plastic housing has to be prevented. The equipment shall be labelled with an appropriate warning note:

5451392 | DRW | - | 210910

TÜV NORD CERT GmbH
Hanover Office
Am TÜV 1
30519 Hannover
Germany

Type	For use in Group II EPL Ga	For use in Group II EPL Gb	For use in Group III EPL Da
SRBG-C1-N-20N-ZC-M12-EX5	IIC	-	IIIA/IIIB/IIIC
SRBG-C1-N-20N-ZC-C2-C2-EX5	IIB/IIC	IIC	-

Valve Position Sensors which are marked with a gas group resp. IIIA/IIIB/IIIC in column "Group …" need to be protected against dangerous electrostatic charges.

7. For the application of the following Valve Position Sensors in hazardous areas appropriate measures need to be taken to protect the free resin surface against mechanical damage if the free resin surface is accessible after installation:

   - SRBG-C1-N-20N-ZC-M12-EX5

8. The Valve Position Sensor SRBG-C1-N-20N-ZC-C2-C2-EX5 is being delivered without cable gland. Protection of cables and cable glands from tensile load and torsional stress is necessary, alternatively certified cable glands may be used.

9. Valve Position Sensors with valve circuits, the maximum values of the connected intrinsically safe valve have to be taken into account.

5451392 | DRW | - | 210910