



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 BVS 08.0050X issue No.:4

Status: **Current**

Date of Issue: **2016-02-15** Page 1 of 4

Certificate history:

~~Issue No. 4 (2016-2-15)~~

~~Issue No. 3 (2015-4-16)~~

~~Issue No. 2 (2013-4-9)~~

~~Issue No. 1 (2011-2-17)~~

~~Issue No. 0 (2008-11-3)~~

Applicant: **R.STAHL Schaltgeräte GmbH**
Am Bahnhof 30
74638 Waldenburg
Germany

Electrical Apparatus: **Transmitter Supply unit type 9160/**-**-**, Isolating Repeater Input type 9163/**-**-****
Optional accessory:

Type of Protection: **Equipment protection by intrinsic safety "i", Equipment protection by type of protection "n"**

Marking:

	Type
Ex nA nC [ia Ga] IIC T4 Gc	916/**-**-11
[Ex ia Da] IIIC	916/**-**-13
Ex nA [ia Ga] IIC T4 Gc	916/**-**-10
[Ex ia Da] IIIC	916/**-**-1*
[Ex ia Ma] I	916/**-**-1*
Ex nA nC IIC T4 Gc	916/**-**-61
	916/**-**-63
Ex nA IIC T4 Gc	916/**-**-60

Approved for issue on behalf of the IECEx
Certification Body:

H.-Ch. Simanski

Position:

Head of 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](http://www.iecex.com).

Certificate issued by:

DEKRA EXAM GmbH
Dinnendahlstrasse 9
44809 Bochum
Germany





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Manufacturer: **R.STAHL Schaltgeräte GmbH**
Am Bahnhof 30
74638 Waldenburg
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 electrical 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"
IEC 60079-15 : 2010 Edition: 4	Explosive atmospheres - Part 15: Equipment protection by type of protection "n"

*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/BVS/ExTR08.0056/03](#)

Quality Assessment Report:
[DE/BVS/QAR10.0002/07](#)



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Schedule

EQUIPMENT:

Equipment and systems covered by this certificate are as follows:

General product information:

The units type 916* are associated apparatus per IEC 60079-11 as well as non-incendive apparatus per IEC 60079-15. Additional variants exist as non-incendive apparatus without intrinsically safe circuits.

The intrinsically safe circuits are galvanically separated from each other, as from the non-IS signal circuits and from the auxiliary power supply circuit.

The Transmitter Supply Unit type 9160 device serves for power supply and signal evaluation of 2- and 3-wire transmitters. It may also be used for signal evaluation of active current sources. The Isolating Repeaters type 9163 are used for intrinsically safe operation of 4-wire transmitters or for connection of intrinsically safe mA sources.

With both devices, additionally the bidirectional transmission of a superimposed frequency-shift-keying signal as per HART protocol is possible.

Type Designation

See Annex

Electrical parameters

See Annex

CONDITIONS OF CERTIFICATION: YES as shown below:

For installation of the Transmitter Supply Unit type 9160/**-**-** resp. of the Isolating Repeater Input type 9163/**-**-** in areas, where EPL Gc equipment is required, the apparatus has to be mounted inside an enclosure which is in accordance with IEC 60079-15 and suitable for the ambient temperature range.

For the application of the Transmitter Supply Unit type 9160/**-**-** resp. of the Isolating Repeater Input type 9163/**-**-** in an ambient temperature of less than -20 °C suitable cable and cable entries for this condition shall be used.



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DETAILS OF CERTIFICATE CHANGES (for issues 1 and above):

The variants type 916*/**-*1 and type 916*/**-*3 can be equipped with a different type of relay.
The apparatus can be used in an ambient temperature range from -40 °C to +70 °C independent from the mounting position.

A new variant is possible:
type 9160/15-11-10



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Electrical parameters

1 Auxiliary Power Supply

(Terminal: 7 (L+), 9 (L-) and pac-Bus connector V007/ 1 (+), 2 (-))

Nominal Voltage:	$U_n = 24 \text{ V DC (18 up to 31.2 V DC)}$
Nominal Current:	$I_n = 115 \text{ mA (type 9160)}$
	$I_n = 65 \text{ mA (type 9163)}$
Maximum safety voltage:	$U_m \leq 253 \text{ V AC}$

2 Non-Intrinsically safe output circuits

Maximum safety voltage:	$U_m \leq 253 \text{ V AC}$
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2.1 Analog-Output (active)

(Output 1: Terminal 1 resp. 3 (+), 2 (-);

Output 2: Terminal 5 resp. 4(+), 6 (-) at types 916*/2... und 9160/19... only)

Nominal Current:	0/4 – 20 mA
Load resistance:	0 – 600 Ω resp. 350 Ω (at connection on Terminal 3 or 4)

2.2 Analog- Output (passive)

(Output 1: Terminal 1 (+), 2 (-);

Output 2: Terminal 5 (+), 6 (-) at types 916*/2... und 9160/19... only)

Nominal Current:	0/4 – 20 mA
Load resistance:	0 – 750 Ω resp. 500 Ω (at connection on Terminal 3 or 4)

2.3 Line fault monitoring circuit

Types 916*/**_**_*f with f = 1 or 3 only

(Loop 1: Terminal 8, 9 (-)); Loop 2: pac-Bus connector V007/ 3, 4)

Loop 1 references to the return of the auxiliary power supply.

Loop 2 is galvanically separated from Loop 1.

Nominal Voltage:	$U_n = 30 \text{ V AC/DC}$
Nominal Current:	$I_n = 100 \text{ mA}$

3 Intrinsically safe Input circuits

The intrinsically safe circuits may also be used in areas endangered by explosive dust atmospheres and be connected to apparatus certified accordingly.

For explosive dust atmospheres the maximum allowed values for inductance and capacitance as for Gas Group IIB apply.

3.1 Type 9160/**-1*-1* (level of protection “ia”)

3.1.1 Connection of 2- or 3-Wire-Transmitters, without type 9160/15-11-10

Terminals for 2-Wire Transmitters:

Channel 1: 12 (+), 10 (signal)

Channel 2: 13 (+), 14 (signal) at types 9160/2... and 9160/19... only)

Terminals for 3-Wire Transmitters:

Channel 1: 12 (+), 10 (Signal +), 11 (-)

Channel 2: 13 (+), 14 (Signal +), 15 (-) at types 9160/2... and 9160/19... only)

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$U_o = 27 \text{ V}$
 $I_o = 88 \text{ mA}$
 $P_o = 576 \text{ mW}$
 Linear characteristic
 C_i negligible
 L_i negligible

The values for the external capacitances C_o and inductances L_o are shown in the following table:

	IIC	IIB/IIIC	IIA	I
L_o [mH]	2.3	17	28	40
C_o [nF]	90	705	2330	3750

The following pairs of values apply when circuits with combined inductances and capacitances are connected:

	IIC				IIB / IIIC				IIA				I			
L_o [mH]	2.0	1.0	0.5	0.2	17	2.0	0.5	0.2	28	2.0	1.0	0.2	40	20	0.5	0.1
C_o [nF]	42	56	72	90	290	320	460	600	410	480	540	820	480	660	810	1200

The input is designed for the connection of intrinsically safe circuits not exceeding the following values:

$U_i = 30 \text{ V}$
 $I_i =$ determined by internal circuit
 $P_i = 100 \text{ mW}$

3.1.2 Connection of 2- or 3-Wire-Transmitters for type 9160/15-11-10

Terminals for 2-Wire Transmitters:

Channel 1: 12 (+), 10 (signal)

Terminals for 3-Wire Transmitters:

Channel 1: 12 (+), 10 (Signal +), 11 (-)

$U_o = 15.5 \text{ V}$
 $I_o = 98 \text{ mA}$
 $P_o = 356 \text{ mW}$
 Linear characteristic
 C_i negligible
 L_i negligible

The values for the external capacitances C_o and inductances L_o are shown in the following table:

	IIC	IIB/IIIC	IIA	I
L_o [mH]	4	18	28	38
C_o [μ F]	0.508	3.11	12.5	14.5

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The following pairs of values apply when circuits with combined inductances and capacitances are connected:

	IIC				IIB / IIIC			
L_o [mH]	4.0	2.0	0.5	0.02	18	2	0.5	0.02
C_o [μ F]	0.21	0.32	0.45	0.508	0.79	2.1	3	3.11

	IIA						I					
L_o [mH]	28	20	5	1	0.2	0.02	38	20	5	1	0.2	0.02
C_o [μ F]	1	1.3	2.2	3.6	4.7	5.2	1.2	1.8	2.9	4.6	6.4	6.8

The input is designed for the connection of intrinsically safe circuits not exceeding the following values:

$$\begin{aligned}
 U_i &= 30 \text{ V} \\
 I_i &= \text{determined by internal circuit} \\
 P_i &= 100 \text{ mW}
 \end{aligned}$$

3.1.3 Connection of 3-Wire-Transmitters - Power variant, types 9160/14-1*-1*

Terminals: Channel 1: 12 (+), 10 (Signal +), 11 (-)

$$\begin{aligned}
 U_o &= 27 \text{ V} \\
 I_o &= 112.5 \text{ mA} \\
 P_o &= 731 \text{ mW} \\
 \text{Linear characteristic} \\
 C_i &= \text{negligible} \\
 L_i &= \text{negligible}
 \end{aligned}$$

The values for the external capacitances C_o and inductances L_o are shown in the following table:

	IIC	IIB / IIIC	IIA	I
L_o [mH]	0.31	9.2	16	23
C_o [nF]	90	705	2330	3750

The following pairs of values apply when circuits with combined inductances and capacitances are connected:

	IIC		IIB / IIIC				IIA				I			
L_o [mH]	0.31	0.2	9.2	2.0	0.2	0.1	16	1.0	0.5	0.1	20	10	0.5	0.1
C_o [nF]	82	90	260	300	590	705	460	520	620	990	610	640	800	1200

The input is designed for the connection of intrinsically safe circuits not exceeding the following values:

$$\begin{aligned}
 U_i &= 30 \text{ V} \\
 I_i &= \text{determined by internal circuit} \\
 P_i &= 100 \text{ mW}
 \end{aligned}$$



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3.1.4 Connection of active current sources

Terminals: Channel 1: 10 (Signal +), 11 (-)
Channel 2: 14 (Signal +), 15 (-) at types 9160/2... and 9160/19... only

$U_o = 4.1 \text{ V}$
 $I_o \approx 0 \text{ mA}$
 $P_o \approx 0 \text{ mW}$
Linear characteristic
 C_i negligible
 L_i negligible

The signal input is designed for the connection of intrinsically safe circuits not exceeding the following values:

$U_i = 30 \text{ V}$
 $I_i = 100 \text{ mA}$
 $P_i =$ determined by internal circuit

3.2 Type 9163/**-**-1* (level of protection "ia")

3.2.1 Connection of active current sources (Types 9163/**-1*-1*)

Terminals: Channel 1: 10 (Signal +), 11 (-)
Channel 2: 14 (Signal +), 15 (-)

U_o , I_o and P_o as well as C_i and L_i are negligible.

The signal input is designed for the connection of intrinsically safe circuits not exceeding the following values:

$U_i = 30 \text{ V}$
 $I_i = 150 \text{ mA}$
 $P_i = 1 \text{ W}$

3.2.2 Connection of voltage sources (Types 9163/**-8*-1*)

Terminals: Channel 1: 10/12 (Signal +), 11 (-)
Channel 2: 13/14 (Signal +), 15 (-)

$U_o = 4.1 \text{ V}$
 $I_o \approx 0 \text{ mA}$
 $P_o \approx 0 \text{ mW}$
Linear characteristic
 C_i negligible
 L_i negligible

The signal input is designed for the connection of intrinsically safe circuits not exceeding the following values:

$U_i = 30 \text{ V}$
 $I_i =$ determined by internal circuit
 $P_i =$ determined by internal circuit



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4 Non-intrinsically safe input circuits

4.1 Type 9160/**-1*-6*

4.1.1 Connection of 2- or 3-Wire-Transmitters

Terminals for 2-wire transmitters

Channel 1: 12 (+) and 10 (signal)

Channel 2: 13 (+) and 14 (signal) (only types 9160/2*-**-6* and 9160/19**-6*)

Terminals for 3-wire transmitters

Channel 1: 12 (+), 10 (signal) and 11 (-)

Channel 2: 13 (+), 14 (signal) and 15 (-) (only types 9160/2*-**-6* and 9160/19**-6*)

Nominal voltage: $U_N = 16 \text{ V at } 20 \text{ mA}$

Nominal current: $I_N = 0 \text{ to } 20 \text{ mA}$

Short circuit current: $I_{KS} \leq 35 \text{ mA}$

4.1.2 Connection of active current sources

Terminals: Channel 1: 10 (signal) and 11 (-)

Channel 2: 14 (signal) and 15 (-) (only types 9160/2*-**-6* and 9160/19**-6*)

Nominal input voltage: $U_{in} \leq 30 \text{ V}$

Nominal current: $I_N = 0 \text{ to } 20 \text{ mA}$

Input current: $I_{in} \leq 50 \text{ mA}$

4.2 Type 9163/**-**-6*

4.2.1 Connection of active current sources

Terminals: Channel 1: 10 (signal) and 11 (-)

Channel 2: 14 (signal) and 15 (-)

Nominal input voltage: $U_{in} \leq 30 \text{ V}$

Nominal current: $I_N = 0 \text{ to } 20 \text{ mA}$

Input current: $I_{in} \leq 50 \text{ mA}$

4.2.2 Connection of voltage sources

Terminals: Channel 1: 10/12 (signal) and 11 (-)

Channel 2: 13/14 (signal) and 15 (-)

Nominal voltage: $U_N = 0 \text{ to } 10 \text{ V}$

Input voltage: $U_{in} \leq 30 \text{ V}$

4.3 Ambient temperature range T_a -40 °C up to +70 °C