



# 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](http://www.iecex.com)

Certificate No.:	<b>IECEX PTB 17.0042X</b>	Page 1 of 5	<u>Certificate history:</u>
Status:	<b>Current</b>	Issue No: 4	Issue 3 (2021-09-02)
Date of Issue:	2022-08-17		Issue 2 (2019-06-25)
Applicant:	<b>R. STAHL Schaltgeräte GmbH</b> Am Bahnhof 30, 74638 Waldenburg, Germany Germany		Issue 1 (2018-06-18)
Equipment:	<b>Power Module, type 9445/3*-12</b>		Issue 0 (2017-11-21)
Optional accessory:			
Type of Protection:	<b>Increased Safety, Intrinsic Safety, Encapsulation</b>		
Marking:	<b>Ex ec [ja Ga] [ib Gb] IIC T4 Gc or Ex eb mb [ja Ga] [ib Gb] IIC T4 Gb</b>		

Approved for issue on behalf of the IECEx  
Certification Body:

**Dr.-Ing. Martin Thedens**

Position:

**Head of Department "Explosion Protection in Sensor Technology  
and Instrumentation"**

Signature:  
(for printed version)

Date:  
(for printed version)

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Certificate issued by:

**Physikalisch-Technische Bundesanstalt (PTB)**  
Bundesallee 100  
38116 Braunschweig  
Germany





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Manufacturer: **R. STAHL Schaltgeräte GmbH**  
Am Bahnhof 30, 74638 Waldenburg, Germany  
**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 60079-18:2017](#) Explosive atmospheres - Part 18: Protection by encapsulation "m"  
Edition:4.1

[IEC 60079-7:2017](#) Explosive atmospheres - Part 7: Equipment protection by increased safety "e"  
Edition:5.1

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 Reports:

[DE/PTB/ExTR17.0052/03](#)

[DE/PTB/ExTR17.0052/04](#)

Quality Assessment Report:

[DE/BVS/QAR10.0002/17](#)



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## **EQUIPMENT:**

Equipment and systems covered by this Certificate are as follows:

The power Module serves as a voltage supply unit for the entire Remote I/O-System, type IS / IS+. It obtains its auxiliary power via the front-sided plug connector. The auxiliary power circuit is designed to types of protection Increased Safety "ec" or "eb". All circuits which are connected to the Remote I/O-System comply with the requirements to type of protection Intrinsic Safety.

The Power Module, type 9445/35-12 is intended for the installation in zone 2 or in the safe area.

The Power Module, type 9445/32-12 is intended for the installation in zone 1, zone 2 or in the safe area.

For further information, reference is made to the annex.

## **SPECIFIC CONDITIONS OF USE: YES as shown below:**

1. Inside the hazardous area the Power Module, type 9445/3\*-12 shall be installed into an enclosure that corresponds to an acknowledged type of protection according to EN 60079-0 and that provides a minimum degree of protection of IP 54 according to EN 60529.
2. Outside the hazardous area the Power Module, type 9445/3\*-12 shall be installed into an enclosure that provides a minimum degree of protection of IP 54 according to EN 60529 or inside an area having a maximum pollution degree 2 / overvoltage category III.
3. The Power Module, type 9445/3\*-12 shall only be operated with the Sockets, type 9496/3\*-03-00 and type 9496/3\*-04-00. Two Power-Modules are permitted as a maximum in one Remote I/O-system, type IS1 / IS1+. The respective system configuration and mounting position shall be taken from the operating instructions manual.
4. The front-sided plug connector for the auxiliary power shall only be plugged or unplugged in a de-energized state or if it is made sure that an explosive atmosphere does not exist (warning label).



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## **DETAILS OF CERTIFICATE CHANGES (for issues 1 and above)**

- Alternative version of the transformer with reduced amount of litz wires
- Mechanical adjustments to the transformer housings due to a modified tool
- Mechanical adjustments on the housing of the power module due to a change of the manufacturer
- Alternative electrical shunt regulators and transistors due to component discontinuations
- Adaption of the corresponding drawings and the safety-relevant descriptions to the changes made
- Removal of revised drawings



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**Additional information:**

For thermal and electrical specifications as well as special conditions for safe use, reference is made to the annex.

**Annex:**

[COCA170042X-04\\_1.pdf](#)



Applicant: R. STAHL Schaltgeräte GmbH  
Electrical apparatus: Power Module, type 9445/3\*-12

In addition to the CPU Module, type 9442/35-10-00 and the Sockets of types 9496/3\*-03-00 and 9496/3\*-04-00 which are separately certified, the Power Module, type 9445/3\*-12 is one of the basic modules of the Remote I/O-System, type IS1 / IS1+ . The Power Module is plugged into one of the 3 resp. 4 slots on the socket and bolted by a screw and it is hence electrically connected to the CPU Module and other system modules which are connected to the sockets or to the BusRail, type 9494/\*\*-\*\* that is also separately certified. Up to two Power Modules can be operated simultaneously within the system.

The power Module serves as a voltage supply unit for the entire Remote I/O-System. It obtains its auxiliary power via the front-sided plug connector. The auxiliary power circuit is designed to types of protection Increased Safety "Ex ec" (zone 2) or "Ex eb" (zone 1). All circuits which are connected to the Remote I/O-System comply with the requirements to type of protection Intrinsic Safety.

A sense-circuit with circuitry and limiting elements being fundamental part of the electronic circuitry enable plugging or unplugging of the module during operation. The plug connector for the auxiliary power must not be plugged or unplugged when it is energized.

The electronic circuitry is arranged on two PCB's which are mounted onto a metal carrier. This assembly is installed in a plastic enclosure and – except for the plug connectors – encapsulated completely. In Zone 2, the potting serves only to dissipate heat and reduce separation distances; for the Zone 1 version, the potting is designed to the type of protection Encapsulation "Ex mb". The metal carrier is also used as a heat sink by its plane surface connection to the socket when it is screwed tightly.

The Power Module, type 9445/35-12 is intended for the installation in areas requiring equipment of category 3 or in the safe area.

The Power Module, type 9445/32-12 is intended for the installation in areas requiring equipment of category 2, 3 or in the safe area.

The permissible range of the ambient temperature depends on the installation of the associated Socket, type 9496/3\*-0\*-00 as follows:

$T_a = - 40 \text{ °C} \dots + 65 \text{ °C}$	Mounted on a DIN-mounting rail (BusRail) without carrier plate
$T_a = - 40 \text{ °C} \dots + 75 \text{ °C}$	Mounted on a DIN-mounting rail (BusRail) and bolted onto a carrier plate



Electrical data:

Non-intrinsically safe circuit:

Auxiliary power

Front-sided plug connector

type of protection Increased Safety Ex ec  
or Ex eb

$U_N = 24 \text{ V}$  (min. 19 V ... max. 32 V)

$I_{\max} = 6.5 \text{ A}$

$P_N = 12 \text{ W}$

$U_m = 60 \text{ V DC}$

Intrinsically safe circuits:

The intrinsically safe circuits are considered system-internal circuits if the Power Module is plugged into the associated socket and bolted as intended.

Supply circuit

Slot connector V401, Pins A ... D

type of protection Intrinsic Safety Ex ia IIC

Maximum values:

$U_o = 26.2 \text{ V}$

$I_N = 4.5 \text{ A}$  (monitoring/disconnection  
via Sense-line)

Sense-line

Slot connector V401, Pins E, F

type of protection Intrinsic Safety Ex ia IIC

Maximum values:

$U_i = U_o = 26.2 \text{ V}$

$I_o = 13 \text{ mA}$

Linear characteristic

BusRail signal

Slot connector V401, Pins K, L

Without connection to the BusRail signal

Pins K, L are not used

Backplane signal

Slot connector V401, Pins S ... AJ

type of protection Intrinsic Safety Ex ib IIC

Maximum values:

V401, Pins	S, T; AI, AJ	AA, AB, AC, AD, AG, AH, Y, Z; AI, AJ
$U_i = U_o$	5 V	5V
$I_o$	800 mA	110 mA
characteristic	rectangular	linear
$L_i$	-	0
$C_i$	-	200 nF

The intrinsically safe circuits are safely electrically isolated from the non-intrinsically safe circuits up to a peak value of the nominal voltage of 90 V. The intrinsically safe supply circuit and the intrinsically safe Sense-line are electrically interconnected and safely electrically isolated from the Backplane signal up to a peak value of the nominal voltage of 60 V.



Specific conditions of use

1. Inside the hazardous area the Power Module, type 9445/3\*-12 shall be installed into an enclosure that corresponds to an acknowledged type of protection according to EN 60079-0 and that provides a minimum degree of protection of IP 54 according to EN 60529.
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3. The Power Module, type 9445/3\*-12 shall only be operated with the Sockets, type 9496/3\*-03-00 and type 9496/3\*-04-00. Two Power-Modules are permitted as a maximum in one Remote I/O-system, type IS1 / IS1+. The respective system configuration and mounting position shall be taken from the operating instructions manual.
4. The front-sided plug connector for the auxiliary power shall only be plugged or unplugged in a de-energized state or if it is made sure that an explosive atmosphere does not exist (warning label).

The marking reads:



**Ex ec [ia Ga] [ib Gb] IIC T4 Gc**  
**Ex eb mb [ia Ga] [ib Gb] IIC T4 Gb**

or