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

Certificate No.:	**IECEx DEK 13.0046X**	Page 1 of 4

Status:	**Current**	Issue No: 1

Date of Issue: 2020-05-19

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

Equipment: **Temperature Input Module (TIM), Type 9482/3*-**-*1**

Optional accessory:

Type of Protection: **Ex ia, Ex ec**

Marking:
Type 9482/32-08-1*:
Ex ia [ia Ga] IIC T4 Gb
[Ex ia Da] IIIC

Type 9482/33-08-1*:
Ex ec ia [ia Ga] IIC T4 Gc
[Ex ia Da] IIIC

Approved for issue on behalf of the IECEx
Certification Body:

R. Schuller

Position:

Certification Manager

Signature:
(for printed version)

Date:

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Manufacturer:

R. STAHL Schaltgeräte GmbH
Am Bahnhof 30
74638 Waldenburg
Germany

Additional
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
Edition:7.0

Explosive atmospheres - Part 0: Equipment - General requirements

IEC 60079-11:2011
Edition:6.0

Explosive atmospheres - Part 11: Equipment protection by intrinsic safety "i"

IEC 60079-7:2017
Edition:5.1

Explosive atmospheres - Part 7: Equipment protection by increased safety "e"

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 Report:

NL/DEK/ExTR13.0045/01

Quality Assessment Report:

DE/BVS/QAR10.0002/15

EQUIPMENT:
Equipment and systems covered by this Certificate are as follows:

Temperature Input Module (TIM) Type 9482/3*-08-1*, for operation in the Remote I/O Systems IS1 and IS1+.

The module is connected to the system via a Bus Rail and it provides up to 8 intrinsically safe input circuits for connection of temperature sensors (channels 0 to 7). Each channel can be used as input for a 2-/3- or 4-wire RTD, potentiometer, thermocouple or mV sensor. Channels 6 and 7 can also be used for connection of an external cold junction compensation (CJC) via RTDs.

The intrinsically safe input/output circuits are infallibly galvanically isolated from the IS1 and IS1+ bus supply and data circuits up to a peak voltage of 60 V.

Module type 9482/32-08-1* is intrinsically safe and may be installed in an explosive gas atmosphere requiring equipment of Equipment Protection Level (EPL) Gb.
Module type 9482/33-08-1* is in type of protection Ex ec and may be installed in an explosive gas atmosphere requiring equipment of EPL Gc.
Both types of modules may be installed in an explosive dust atmosphere requiring equipment of EPL Db or EPL Dc if mounted in a suitable enclosure that meets the requirements of an appropriate, recognized type of protection in accordance with IEC 60079-0.

The enclosure of the module provides a degree of protection IP20 according to IEC 60529.

The Temperature Input Module (TIM) Type 9482/3*-08-1* may be disconnected or connected to the IS1 or IS1+ Bus Rail in the hazardous area and while in operation. The intrinsic safe Terminals X1 and X2 may also be connected or disconnected while in operation and in the hazardous area.

Refer to Annex 1 for electrical data and temperature data.

SPECIFIC CONDITIONS OF USE: YES as shown below:
When installed in an explosive gas atmosphere:
The Temperature Input Module (TIM) Type 9482/3*-**-** shall be placed in an enclosure or cabinet that meets the requirements of an appropriate, recognized type of protection in accordance with IEC 60079-0.
It shall be used in an area of not more than pollution degree 2, as defined in IEC 60664-1.

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DETAILS OF CERTIFICATE CHANGES (for issues 1 and above)
Assessed per IEC 60079-0 : 2017 (Ed. 7) and IEC 60079-7 : 2017 (Ed. 5.1)

Annex:

224190000-9482-Annex-NL DEK ExTR13 0045 01 (TIM).pdf

Electrical and thermal data:

Ambient temperature range:
-40 °C to +75 °C;
-40 °C to +65 °C (upside down installation).

Circuit connecting to the IS1 or IS1+ System:

Power supply (input); Plug to BusRail V101/ Pin 7, 8, 9, 10 (+), Pin 27, 28, 29, 30 (–):
in type of protection intrinsic safety Ex ia IIC, with the following maximum values:
U_i = 26.2 V.
The circuit is equipped with an internal current limitation that limits the current to 100 mA.

Address- and Databus (communication); Plug to BusRail V101/ Pin: 4 (Bus Red.); 5 (Bus Prim.);
14, 15, 16, 24 (Bank 1-4):
in type of protection intrinsic safety Ex ia IIC, only for connection to the internal Address- and
Databus of the IS1/IS1+ System with the following maximum values:
U_o = 6.6 V; I_o = 102 mA; P_o = 168 mW
U_i = 6.6 V; C_i = 0 nF; L_i = 0 mH

Electronic switch control (input); Plug to BusRail V101/ Pin: 18, 19:
in type of protection intrinsic safety Ex ia IIC, with the following maximum values:
U_o = 26.2 V; I_o = 5.4 mA.

Intrinsically safe field circuits:

The values of L_o and C_o in the following tables are the maximum values for combined inductance and
capacitance (including cable inductance and capacitance). The values for L_o and C_o marked in grey are
the values determined according to the curves and tables of IEC 60079-11, Annex A. These grey marked
values may be used for the assessment as per IEC 60079-11, clause 10.1.5.2.for the following
connections.

Grounded - the channels are connected via a common ground together by installation.
Ungrounded - the channels are installed galvanically separated to each other and to ground

The source is linear in all applications.

The stated U_i is a sum on all inputs.

If an U_i is applied at one channel, the U_i might occur in addition to U_o at another channel. Therefore the L_o
and C_o values are calculated with $U_{o\,ext} = U_i + U_o$.

Ungrounded only RTD or Potentiometer

For connection of up to 8 passive, galvanically isolated and ungrounded I.S. circuits in type of protection intrinsic safety Ex ia IIB/IIC, Ex ia IIIC, with the following maximum values:

2-Wire:	Connector X1 / X2 – Channel 0 (1/4); Channel 1 (5/8) up to Channel 7 (29/32)												
Input	$U_o = 6.42$ V			U_i = n/a			$U_{o\,ext}$ = n/a			$I_o = 6.5$ mA		$P_o = 10.5$ mW	
3-Wire:	Connector X1 / X2 – Channel 0 (1/3/4); Channel 1 (5/7/8); up to Channel 7 (29/31/32)												
Input	$U_o = 6.42$ V			U_i = n/a			$U_{o\,ext}$ = n/a			$I_o = 7.8$ mA		$P_o = 12.5$ mW	
4-Wire:	Connector X1 / X2 – Channel 0 (1/2/3/4); Channel 1 (5/6/7/8); up to Channel 7 (29/30/31/32)												
Input	$U_o = 6.42$ V			U_i = n/a			$U_{o\,ext}$ = n/a			$I_o = 9.8$ mA		$P_o = 15.7$ mW	
	Table for IIC							Table for IIB / IIIC						
L_O [mH]	100	50	20	2	0.2	0.02	0.002	100	50	20	2	0.2	0.02	0.002
C_O [µF]	1.1	1.2	1.4	2.0	3.2	7.0	25	5.8	6.3	7.1	10	19	51	570

Ungrounded RTD or Potentiometer connected in a mixed configuration with U_i

For connection of up to 8 passive, galvanically isolated and ungrounded I.S. circuits in type of protection intrinsic safety Ex ia IIB/IIC, Ex ia IIIC. Thermocouples and external CJC circuit might also be connected, their calculation is below. Calculated with the following maximum values:

2-Wire:	Connector X1 / X2 – Channel 0 (1/4); Channel 1 (5/8) up to Channel 7 (29/32)												
Input	$U_o = 6.42$ V		**$U_i = 6.5$ V**		$U_{o\,ext} = 12.92$ V		$I_o = 13.1$ mA		$P_o = 42.2$ mW				
3-Wire:	Connector X1 / X2 – Channel 0 (1/3/4); Channel 1 (5/7/8); up to Channel 7 (29/31/32)												
Input	$U_o = 6.42$ V		**$U_i = 6.5$ V**		$U_{o\,ext} = 12.92$ V		$I_o = 15.7$ mA		$P_o = 50.6$ mW				
4-Wire:	Connector X1 / X2 – Channel 0 (1/2/3/4); Channel 1 (5/6/7/8); up to Channel 7 (29/30/31/32)												
Input	$U_o = 6.42$ V		**$U_i = 6.5$ V**		$U_{o\,ext} = 12.92$ V		$I_o = 19.6$ mA		$P_o = 63.3$ mW				
	Table for IIC							Table for IIB / IIIC						
L_O [mH]	100	50	20	5	1	0.5	0.2	100	20	10	2	1	0.5	0.1
C_O [µF]	0.19	0.25	0.31	0.40	0.54	0.63	0.78	1.3	1.7	1.9	2.5	3.0	3.5	5.7

2-Wire:	Connector X1 / X2 – Channel 0 (1/4); Channel 1 (5/8) up to Channel 7 (29/32)												
Input	$U_o = 6.42$ V		**$U_i = 3.5$ V**		$U_{o\,ext} = 9.92$ V		$I_o = 10.0$ mA		$P_o = 24.9$ mW				
3-Wire:	Connector X1 / X2 – Channel 0 (1/3/4); Channel 1 (5/7/8); up to Channel 7 (29/31/32)												
Input	$U_o = 6.42$ V		**$U_i = 3.5$ V**		$U_{o\,ext} = 9.92$ V		$I_o = 12.0$ mA		$P_o = 29.8$ mW				
4-Wire:	Connector X1 / X2 – Channel 0 (1/2/3/4); Channel 1 (5/6/7/8); up to Channel 7 (29/30/31/32)												
Input	$U_o = 6.42$ V		**$U_i = 3.5$ V**		$U_{o\,ext} = 9.92$ V		$I_o = 15.0$ mA		$P_o = 37.3$ mW				
	Table for IIC							Table for IIB / IIIC						
L_O [mH]	100	50	20	1	0.1	0.05	0.02	100	50	20	1	0.1	0.05	0.02
C_O [µF]	0.40	0.47	0.56	0.92	1.6	2.0	2.8	2.3	2.5	2.9	5.1	9.8	13	20

Grounded RTD or Potentiometer connected in a mixed configuration with U_i

For connection of up to 8 passive I.S. circuits in type of protection intrinsic safety Ex ia IIB/IIC, Ex ia IIIC. Thermocouples and external CJC circuit might also be connected, their calculation is below. Calculated with the following maximum values:

2-Wire:	Connector X1 / X2 – Channel 0 (1/4); Channel 1 (5/8) up to Channel 7 (29/32)												
Input	U_o = 6.42 V		U_i = 6.5 V		$U_{o\,ext}$ = 12.92 V		I_o = 47.9 mA			P_o = 155.0 mW			
3-Wire:	Connector X1 / X2 – Channel 0 (1/3/4); Channel 1 (5/7/8); up to Channel 7 (29/31/32)												
Input	U_o = 6.42 V		U_i = 6.5 V		$U_{o\,ext}$ = 12.92 V		I_o = 58.5 mA			P_o = 189.0 mW			
4-Wire:	Connector X1 / X2 – Channel 0 (1/2/3/4); Channel 1 (5/6/7/8); up to Channel 7 (29/30/31/32)												
Input	U_o = 6.42 V		U_i = 6.5 V		$U_{o\,ext}$ = 12.92 V		I_o = 68.8 mA			P_o = 222.0 mW			
	Table for IIC							Table for IIB / IIIC						
L_O [mH]	9	5	2	1	0.5	0.2	0.1	40	20	10	5	1	0.5	0.1
C_O [µF]	0.23	0.31	0.41	0.50	0.60	0.76	0.93	0.94	1.3	1.6	1.9	2.9	3.4	5.6

2-Wire:	Connector X1 / X2 – Channel 0 (1/4); Channel 1 (5/8) up to Channel 7 (29/32)												
Input	U_o = 6.42 V		U_i = 3.5 V		$U_{o\,ext}$ = 9.92 V		I_o = 36.6 mA			P_o = 91.0 mW			
3-Wire:	Connector X1 / X2 – Channel 0 (1/3/4); Channel 1 (5/7/8); up to Channel 7 (29/31/32)												
Input	U_o = 6.42 V		U_i = 3.5 V		$U_{o\,ext}$ = 9.92 V		I_o = 44.8 mA			P_o = 111.0 mW			
4-Wire:	Connector X1 / X2 – Channel 0 (1/2/3/4); Channel 1 (5/6/7/8); up to Channel 7 (29/30/31/32)												
Input	U_o = 6.42 V		U_i = 3.5 V		$U_{o\,ext}$ = 9.92 V		I_o = 52.6 mA			P_o = 131.0 mW			
	Table for IIC							Table for IIB / IIIC						
L_O [mH]	17	10	5	2	1	0.2	0.02	71	50	10	2	1	0.2	0.02
C_O [µF]	0.34	0.46	0.58	0.74	0.78	1.3	2.8	1.4	1.8	2.9	4.2	4.9	7.8	20

Ungrounded Thermocouple or mV Sources in a mixed configuration with U_i

For connection of up to 8 passive or active, galvanically isolated and ungrounded I.S. circuits in type of protection intrinsic safety Ex ia IIB/IIC, Ex ia IIIC. RTD and Potentiometer might also be connected, their calculation is above. The external CJC circuit might also be connected, the calculation is below. Calculated with the following maximum values:

	Connector X1 / X2 – Channel 0 (2/3); Channel 1 (6/7) up to Channel 7 (30/31)												
Input	U_o = 6.42 V		U_i = 6.5 V		$U_{o\,ext}$ = 12.92 V		I_o = 6.53 mA			P_o = 21.1 mW			
	Table for IIC							Table for IIB / IIIC						
L_O [mH]	100	50	10	5	1	0.5	0.2	100	50	10	1	0.5	0.2	0.1
C_O [µF]	0.30	0.32	0.38	0.42	0.55	0.63	0.79	1.5	1.6	1.9	3.0	3.5	4.6	5.7

Grounded Thermocouple or mV Sources in a mixed configuration with U_i

For connection of up to 8 passive or active I.S. circuits in type of protection intrinsic safety Ex ia IIB/IIC, Ex ia IIIC. RTD and Potentiometer might also be connected, their calculation is above. The external CJC circuit might also be connected, the calculation is below. Calculated with the following maximum values:

	Connector X1 / X2 – Channel 0 (2/3); Channel 1 (6/7) up to Channel 7 (30/31)												
Input	U_o = 6.42 V			**U_i = 6.5 V**			$U_{o\ ext}$ = 12.92 V			I_o = 25.0 mA		P_o = 81.0 mW	
	Table for IIC							Table for IIB / IIIC						
L_o [mH]	72	50	10	2	1	0.5	0.2	100	20	5	1	0.5	0.2	0.1
C_o [µF]	0.17	0.22	0.34	0.46	0.53	0.62	0.78	1.2	1.6	2.1	3.0	3.5	4.5	5.7

	Connector X1 / X2 – Channel 0 (2/3); Channel 1 (6/7) up to Channel 7 (30/31)												
Input	U_o = 6.42 V			**U_i = 3.5 V**			$U_{o\ ext}$ = 9.92 V			I_o = 19.2 mA		P_o = 48.0 mW	
	Table for IIC							Table for IIB / IIIC						
L_o [mH]	100	50	10	2	1	0.2	0.02	100	20	5	1	0.5	0.1	0.02
C_o [µF]	0.33	0.43	0.60	0.80	0.92	1.3	2.8	2.2	2.9	3.6	5.0	6	9.8	20

Ungrounded RTD for external CJC circuit connected in a mixed configuration with U_i

For connection of up to 8 passive, galvanically isolated and ungrounded I.S. circuits in type of protection intrinsic safety Ex ia IIB/IIC, Ex ia IIIC. Thermocouples and RTD and Potentiometer might also be connected, their calculation is above. Calculated with the following maximum values:

2-Wire:	Connector X2 – Channel 6 and 7 (25/32)												
Input	U_o = 6.42 V			**U_i = 6.5 V**			$U_{o\ ext}$ = 12.92 V			I_o = 13.1 mA		P_o = 43.0 mW	
3-Wire:	Connector X2 – Channel 6 and 7 (25/29/32)												
Input	U_o = 6.42 V			**U_i = 6.5 V**			$U_{o\ ext}$ = 12.92 V			I_o = 17.4 mA		P_o = 56.2 mW	
4-Wire:	Connector X2 – Channel 6 and 7 (25/28/29/32)												
Input	U_o = 6.42 V			**U_i = 6.5 V**			$U_{o\ ext}$ = 12.92 V			I_o = 26.1 mA		P_o = 84.3 mW	
	Table for IIC							Table for IIB / IIIC						
L_o [mH]	66	50	20	5	1	0.5	0.2	100	20	5	1	0.5	0.2	0.1
C_o [µF]	0.17	0.21	0.29	0.39	0.53	0.62	0.78	1.2	1.6	2.1	2.9	3.5	4.5	5.7

2-Wire:	Connector X2 – Channel 6 and 7 (25/32)												
Input	U_o = 6.42 V			**U_i = 3.5 V**			$U_{o\ ext}$ = 9.92 V			I_o = 10.0 mA		P_o = 24.9 mW	
3-Wire:	Connector X2 – Channel 6 and 7 (25/29/32)												
Input	U_o = 6.42 V			**U_i = 3.5 V**			$U_{o\ ext}$ = 9.92 V			I_o = 13.4 mA		P_o = 33.2 mW	
4-Wire:	Connector X2 – Channel 6 and 7 (25/28/29/32)												
Input	U_o = 6.42 V			**U_i = 3.5 V**			$U_{o\ ext}$ = 9.92 V			I_o = 20.1 mA		P_o = 49.7 mW	
	Table for IIC							Table for IIB / IIIC						
L_o [mH]	100	50	10	2	1	0.2	0.02	100	20	5	1	0.5	0.1	0.02
C_o [µF]	0.31	0.43	0.60	0.80	0.91	1.3	2.8	2.2	2.8	3.6	5.0	6	9.8	20

<u>Grounded RTD for external CJC circuit connected in a mixed configuration with U_i</u>

For connection of up to 8 passive I.S. circuits in type of protection intrinsic safety Ex ia IIB/IIC, Ex ia IIIC. Thermocouples and RTD and Potentiometer might also be connected, their calculation is above. Calculated with the following maximum values:

2-Wire:	Connector X2 – Channel 6 and 7 (25/32)												
Input	U_o = 6.42 V		U_i = 6.5 V		$U_{o\,ext}$ = 12.92 V			I_o = 47.9 mA			P_o = 155.0 mW		
3-Wire:	Connector X2 – Channel 6 and 7 (25/29/32)												
Input	U_o = 6.42 V		U_i = 6.5 V		$U_{o\,ext}$ = 12.92 V			I_o = 68.6 mA			P_o = 222.0 mW		
4-Wire:	Connector X2 – Channel 6 and 7 (25/28/29/32)												
Input	U_o = 6.42 V		U_i = 6.5 V		$U_{o\,ext}$ = 12.92 V			I_o = 87.1 mA			P_o = 281.1 mW		
	Table for IIC							Table for IIB / IIIC						
L_O [mH]	5.6	5	2	1	0.5	0.2	0.1	25	20	10	5	1	0.5	0.1
C_O [µF]	0.25	0.27	0.39	0.48	0.58	0.75	0.92	1	1.1	1.5	1.9	2.8	3.4	5.6

2-Wire:	Connector X2 – Channel 6 and 7 (25/32)												
Input	U_o = 6.42 V		U_i = 3.5 V		$U_{o\,ext}$ = 9.92 V			I_o = 36.8 mA			P_o = 91.1 mW		
3-Wire:	Connector X2 – Channel 6 and 7 (25/29/32)												
Input	U_o = 6.42 V		U_i = 3.5 V		$U_{o\,ext}$ = 9.92 V			I_o = 52.6 mA			P_o = 131.0 mW		
4-Wire:	Connector X2 – Channel 6 and 7 (25/28/29/32)												
Input	U_o = 6.42 V		U_i = 3.5 V		$U_{o\,ext}$ = 9.92 V			I_o = 66.8 mA			P_o = 166.0 mW		
	Table for IIC							Table for IIB / IIIC						
L_O [mH]	10	5	2	1	0.2	0.1	0.02	44	20	10	2	1	0.1	0.02
C_O [µF]	0.37	0.53	0.71	0.85	1.3	1.6	2.8	1.5	2.3	2.8	4.1	4.9	9.8	20

Installation instructions

The instructions provided with the equipment shall be followed in detail to assure safe operation.