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 12.0070X**

Certificate history:
Issue 1 (2013-03-22)
Issue 0 (2012-11-19)

Status: **Current**

Issue No: 2

Date of Issue: 2020-05-19

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

Equipment: **Digital Output Module (DOM), Type 9475/3*-**-****

Optional accessory:

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

Marking:
Type 9475/32-**-e* (with e = 1-6):
Ex ia [ia Ga] IIC T4 Gb
[Ex ia Da] IIIC
Type 9475/33-**-e* (with e = 1-6):
Ex ec ia [ia Ga] IIC T4 Gc
[Ex ia Da] IIIC
Type 9475/32-**-e* (with e = 1-7):
Ex ia [ib Gb] IIC T4 Gb
[Ex ib Db] IIIC
Type 9475/33-**-e* (with e = 1-7):
Ex ec ia [ib Gb] IIC T4 Gc
[Ex ib Db] IIIC

Approved for issue on behalf of the IECEx Certification Body: **R. Schuller**

Position: **Certification Manager**

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 www.iecex.com or use of this QR Code.

Certificate issued by:

DEKRA Certification B.V.
Meander 1051
6825 MJ Arnhem
Netherlands

IECEx Certificate of Conformity

Certificate No.: **IECEx DEK 12.0070X**

Date of issue: 2020-05-19

Issue No: 2

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 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 60079-25:2010-02 Explosive atmospheres – Part 25: Intrinsically safe electrical systems
Edition:2.0

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 Report:

NL/DEK/ExTR12.0069/02

Quality Assessment Report:

DE/BVS/QAR10.0002/15

IECEx Certificate of Conformity

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

Digital Output Module (DOM) Type 9475/3*-**-**, 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 eight intrinsically safe output circuits for connection of passive, galvanically isolated and unearthed actuators like solenoid, piezo and booster valves. Optionally the Digital Output Module is equipped with an active and a passive Plant-STOP Input to switch off of all digital outputs at once.

The intrinsically safe output and input 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 9475/32-**-** is intrinsically safe and can be installed in an explosive gas atmosphere requiring equipment of Equipment Protection Level (EPL) Gb.
Module type 9475/33-**-** is in type of protection Ex ec and can be installed in an explosive gas atmosphere requiring equipment of Equipment Protection Level (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 output circuits of Modules Type 9475/3*-**-e* (with e = 1 - 6) are intrinsically safe Ex ia or Ex ib;
the output circuits of Modules Type 9475/3*-**-7* are intrinsically safe Ex ib.

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

The Digital Output Modules Type 9475/3*-**-** may be disconnected or connected to the IS1 or IS1+ Bus Rail while in operation.

Refer to Annex 1 for electrical and thermal data.

SPECIFIC CONDITIONS OF USE: YES as shown below:
When installed in an explosive gas atmosphere:
The Digital Output Module (DOM) Type 9475/3*-**-** 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.

IECEx Certificate of Conformity

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-ExTR12 0069 02-Annex (DOM).pdf

Annex 1
To IECEx DEK 12.0070X and NL/DEK/ExTR12.0069/02.
Digital Output Module (DOM) Type 9475/3*-**-**

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 450 mA.

Address- and Databus (communication); Plug to BusRail V101/ Pin: 4 (Bus Red.); 5 (Bus Prim.);
14, 15, 16, 24 (Bank 1-4); 1, 11, 21 (Mod. Select):
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:

8-Channel Devices Model 9475/3*-08-**:
X1 – Channel 0 (1+/2-); Channel 1 (3+/4-); up to; Channel 7 (15+/16-)

4 Channel Devices Model 9475/3*-04-**:
X1 – Channel 0 (1+/2-); Channel 1 (5+/6-); Channel 2 (9+/10-); Channel 3 (13+/14-)

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.

The internal capacitance per channel is already taken into account in the L_o and C_o values shown in the tables below. The internal inductance is negligibly small.

Annex 1
To IECEx DEK 12.0070X and NL/DEK/ExTR12.0069/02.
Digital Output Module (DOM) Type 9475/3*-**-**

Type 9475/3*-04-1*
4 output circuits in type of protection intrinsic safety Ex ia IIB/IIC, Ex ia IIIC with the following maximum values (per channel):
U_o = 19.7 V, I_o = 142 mA, P_o = 698 mW (linear source), C_i = 11 nF; L_i = 0 mH.

Table for IIC							
L_O [mH]	1.3	1.1		0.5	0.2	0.1	0.05
C_O [nF]	99	109		119	149	189	220
Table for IIB / IIIC							
L_O [mH]	7.5	5.0	2.0	0.5	0.2	0.1	0.05
C_O [nF]	669	879	889	889	989	1189	1439

in type of protection intrinsic safety Ex ib IIB/IIC, Ex ib IIIC with the following maximum values (per channel):
U_o = 19.7 V, I_o = 53.8 mA, P_o = 617 mW (trapezoidal characteristic, bent at 11.8 V / 52.7 mA),
C_i = 11 nF; L_i = 0 mH.

Table for IIC							
L_O [mH]	3.1	2.0	0.6	0.5	0.2	0.1	0.05
C_O [nF]	109	109	119	119	149	189	220
Table for IIB / IIIC							
L_O [mH]	27.0	20	10	5.0	0.2	0.1	0.05
C_O [nF]	499	609	869	899	1089	1189	1439

Type 9475/3*-04-2*
4 output circuits in type of protection intrinsic safety Ex ia IIB/IIC, Ex ia IIIC with the following maximum values (per channel):
U_o = 25.7 V, I_o = 110 mA, P_o = 708 mW (linear source), C_i = 7.2 nF; L_i = 0 mH.

Table for IIC							
L_O [mH]	1.45	0.75	0.5	0.37	0.2	0.1	0.05
C_O [nF]	-	56	67	76	93	95	95
Table for IIB / IIIC							
L_O [mH]	10	5.0	2.0	1.0	0.5	0.2	0.1
C_O [nF]	323	323	333	393	473	633	783

in type of protection intrinsic safety Ex ib IIB/IIC, Ex ib IIIC with the following maximum values (per channel):
U_o = 25.7 V, I_o = 49.5 mA, P_o = 648 mW (trapezoidal characteristic, bent at 13.6 V / 48.5 mA),
C_i = 7.2 nF; L_i = 0 mH.

Table for IIC							
L_O [mH]	1.5	1.0	0.86	0.5	0.37	0.2	0.1
C_O [nF]	43	51	55	69	76	93	95
Table for IIB / IIIC							
L_O [mH]	24	20	2.0	1.0	0.5	0.2	0.1
C_O [nF]	333	333	343	393	483	633	783

Type 9475/3*-04-3*

4 output circuits in type of protection intrinsic safety Ex ia IIB/IIC, Ex ia IIIC with the following maximum values (per channel):
U_o = 26.0 V, I_o = 90 mA, P_o = 585 mW (linear source), C_i = 5.2 nF; L_i = 0 mH.

Table for IIC							
L_O [mH]	2.44	2.2	1.0	0.5	0.38	0.2	0.05
C_O [nF]	-	39	55	71	79	94	94
Table for IIB / IIIC							
L_O [mH]	16	10	2.0	1.0	0.5	0.2	0.1
C_O [nF]	335	335	345	395	475	625	765

in type of protection intrinsic safety Ex ib IIB/IIC, Ex ib IIIC with the following maximum values (per channel):
U_o = 26.0 V, I_o = 50.4 mA, P_o = 508 mW (trapezoidal characteristic, bent at 10.4 V / 49.7 mA),
C_i = 5.2 nF; L_i = 0 mH.

Table for IIC							
L_O [mH]	3.4	2.4	2.0	1.0	0.5	0.39	0.2
C_O [nF]	35	41	44	57	73	80	94
Table for IIB / IIIC							
L_O [mH]	32	20	1.0	0.5	0.2	0.1	0.05
C_O [nF]	345	345	405	485	635	765	765

Type 9475/3*-08-4*

8 output circuits in type of protection intrinsic safety Ex ia IIB/IIC, Ex ia IIIC with the following maximum values (per channel):
U_o = 11.5 V, I_o = 74.8 mA, P_o = 216 mW (linear source), C_i = 5.2 nF; L_i = 0 mH.

Table for IIC							
L_O [mH]	7.9	5.0	2.0	1.0	0.5	0.2	0.05
C_O [nF]	285	395	585	735	905	1195	1635
Table for IIB / IIIC							
L_O [mH]	34	20	10	5.0	1.0	0.2	0.02
C_O [nF]	1195	1695	2195	2695	4295	6995	11195

in type of protection intrinsic safety Ex ib IIB/IIC, Ex ib IIIC with the following maximum values (per channel):
U_o = 11.5 V, I_o = 39.2 mA, P_o = 194 mW (trapezoidal characteristic, bent at 5.1 V / 38.4 mA),
C_i = 5.2 nF; L_i = 0 mH.

Table for IIC							
L_O [mH]	22	10	5.0	2.0	1.0	0.5	0.05
C_O [nF]	155	345	475	635	775	935	1635
Table for IIB / IIIC							
L_O [mH]	100	50	20	5.0	1.0	0.2	0.02
C_O [nF]	565	1295	1895	2895	4395	6995	11195

Type 9475/3*-08-5*

8 output circuits in type of protection intrinsic safety Ex ia IIB/IIC, Ex ia IIIC with the following maximum values (per channel):
U_o = 19.4 V, I_o = 143 mA, P_o = 692 mW (linear source), C_i = 16.5 nF; L_i = 0 mH.

Table for IIC							
L_O [mH]	1.44	1.4	0.65	0.5	0.2	0.1	0.05
C_O [nF]	-	103	113	113	153	183	227
Table for IIB / IIIC							
L_O [mH]	7.5	5.0	2.0	0.5	0.2	0.1	0.02
C_O [nF]	673	883	943	943	1083	1183	1493

in type of protection intrinsic safety Ex ib IIB/IIC, Ex ib IIIC with the following maximum values (per channel):
U_o = 19.4 V, I_o = 37.8 mA, P_o = 506 mW (trapezoidal characteristic, bent at 14.0 V / 36.5 mA),
C_i = 16.5 nF; L_i = 0 mH.

Table for IIC							
L_O [mH]	6.3	2.0	0.65	0.5	0.2	0.1	0.05
C_O [nF]	113	113	123	123	153	193	227
Table for IIB / IIIC							
L_O [mH]	58	20	10	5.0	0.2	0.1	0.02
C_O [nF]	363	723	953	963	1083	1283	1493

Type 9475/3*-08-6*

8 output circuits in type of protection intrinsic safety Ex ia IIB/IIC, Ex ia IIIC with the following maximum values (per channel):
U_o = 25.7 V, I_o = 107 mA, P_o = 688 mW (linear source), C_i = 5.2 nF; L_i = 0 mH.

Table for IIC							
L_O [mH]	1.57	1.1	1.0	0.9	0.5	0.2	0.1
C_O [nF]	-	49	52	54	69	95	97
Table for IIB / IIIC							
L_O [mH]	11	5.0	1.0	0.5	0.2	0.1	0.05
C_O [nF]	335	335	395	485	635	785	785

in type of protection intrinsic safety Ex ib IIB/IIC, Ex ib IIIC with the following maximum values (per channel):
U_o = 25.7 V, I_o = 26.3 mA, P_o = 468 mW (trapezoidal characteristic, bent at 19.1 V / 24.9 mA),
C_i = 5.2 nF; L_i = 0 mH.

Table for IIC							
L_O [mH]	7.0	5.0	2.0	1.0	0.5	0.2	0.05
C_O [nF]	32	36	49	64	81	97	97
Table for IIB / IIIC							
L_O [mH]	100	50	1.0	0.5	0.2	0.1	0.05
C_O [nF]	245	365	425	505	655	785	785

Type 9475/3*-04-7*

4 output circuits in type of protection intrinsic safety Ex ib IIB/IIC, Ex ib IIIC with the following maximum values (per channel):
U_o = 15.4 V, I_o = 115.4 mA, P_o = 1475 mW (trapezoidal characteristic, bent at 13.2 V / 112.4 mA),
C_i = 33 nF; L_i = 0 mH.

Allowed external capacitance and inductance for group IIC:

L_O [mH]	0.11	0.1	-	0.05	0.02	0.01
C_O [nF]	257	267	-	337	477	488

When using cables with a maximum line length of 700 m, with a cable inductance of $L_c \leq$ 1 µH/m , a cable capacitance of $C_c \leq$ 200 pF/m and a cable resistance of $R_c \geq$ 10.76 mΩ/m, the following values for C_o and L_o remain:

L_O [mH]	0.05
C_O [nF]	217

Allowed external capacitance and inductance for group IIB and IIIC:

L_O [mH]	2.9	2.0	1.0	0.5	0.05	0.02
C_O [nF]	1467	1767	2367	2667	2767	3157

When using cables with a maximum line length of 2000 m, with a cable inductance of $L_c \leq$ 1 µH/m , a cable capacitance of $C_c \leq$ 200 pF/m and a cable resistance of $R_c \geq$ 10.76 mΩ/m, the following values for C_o and L_o remain:

L_O [mH]	2.0	1.0	0.5	0.02
C_O [nF]	1667	2367	2667	3967

Plant STOP

Plant-STOP I circuit, connector X3 terminals 1 (+) and 2 (-); (terminals 3, 4 open):
in type of protection intrinsic safety Ex ia IIB/IIC, Ex ia IIIC with the following maximum values:
U_o = 5.1 V, I_o = 0.44 mA, P_o = 0.50 mW (linear source), C_i = 5.2 nF; L_i = 0 mH.

Table for IIC						
L_O [mH]	100	10	2.0	1.0	0.2	0.01
C_O [nF]	2195	2595	3295	3695	5495	15995
Table for IIB / IIIC						
L_O [mH]	100	10	2.0	1.0	0.2	0.01
C_O [nF]	9995	12995	16995	19995	31995	159995

Plant-STOP II circuit, connector X3 terminals 3 and 4
in type of protection intrinsic safety Ex ia IIB/IIC, Ex ia IIIC, for connection of an intrinsically safe circuit, with the following maximum values:
U_i = 30 V, R_i = 4940 Ω, C_i = 0 nF; L_i = 0 mH

The Plant-STOP II circuit at X3 is galvanically isolated from all other intrinsically safe circuits.

Installation instructions

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