



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 PTB 12.0030

Issue No: 0

Certificate history:

[Issue No. 0 \(2012-06-19\)](#)

Status: **Current**

Page 1 of 3

Date of Issue: **2012-06-19**

Applicant: **Hans Turck GmbH & Co. KG**
Witzlebenstr. 7
45472 Mülheim an der Ruhr
Germany

Equipment: **Analog output module, type AOH40Ex and AO41Ex**

Optional accessory:

Type of Protection: **Intrinsic Safety "I", Protection by Intrinsic Safety "ID"**

Marking:

Ex ib [ia Ga] IIC T4 Gb and [Ex ia III C Da] alternatively Ex ib [ia] IIC T4 and [Ex ia IIIC]

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

Dr.-Ing. U. Johannsmeyer

Position:

Department Head "Intrinsic Safety and Safety of Systems"

*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:

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





IECEx Certificate of Conformity

Certificate No: IECEx PTB 12.0030

Issue No: 0

Date of Issue: 2012-06-19

Page 2 of 3

Manufacturer: **Werner Turck GmbH & Co. KG**
Goethestr. 7
58553 Halver
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 : 2007-10 Explosive atmospheres - Part 0: Equipment - General requirements
Edition: 5

IEC 60079-11 : 2006 Explosive atmospheres - Part 11: Equipment protection by intrinsic safety "i"
Edition: 5

IEC 61241-11 : 2005 Electrical apparatus for use in the presence of combustible dusts - Part 11: Protection by intrinsic safety 'iD'
Edition: 1

*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/PTB/ExTR12.0039/00](#)

Quality Assessment Report:

[DE/PTB/QAR06.0012/02](#)



IECEx Certificate of Conformity

Certificate No: IECEx PTB 12.0030

Issue No: 0

Date of Issue: 2012-06-19

Page 3 of 3

Schedule

EQUIPMENT:

Equipment and systems covered by this certificate are as follows:

The 4-channel analog output, type AOH40Ex and AO41Ex, is part of the excom field bus system for the module racks, type MT... . In conjunction with this module rack unit, the 4-channel analog output may only be operated within the excom system. All modules are used to safely electrically isolate intrinsically safe field circuits of category "ia" from intrinsically safe bus and supply circuits of category "ib".

The field circuits are electrically isolated from the supply circuit and the CAN bus.

The ambient temperature range is -20 °C ... +60 °C.

For further information see schedule.

SPECIFIC CONDITIONS OF USE: NO

Annex:

[C120030_schedule.pdf](#)



Schedule

The 4-channel analog output, type AOH40Ex and AO41Ex, is part of the excom field bus system for the module racks, type MT... to guarantee the degree of protection IP20. In conjunction with this module rack unit, the 4-channel analog output may only be operated within the excom system.

The analog output module of type AOH40Ex are produced as HART versions. They are used to control actuators in a process engineering environment with digital HART communication.

The analog output modules of type AO41Ex are also used to control actuators in a process engineering environment, however without using HART communication.

All modules are used so safety electrically isolate intrinsically safe field circuits of category "ia" from intrinsically safe bus and supply circuits of category "ib".

The field circuits are electrically isolated from the supply circuit and the CAN bus.

The ambient temperature range is -20°C up to +60°C.

Electrical data

- I) Supply circuit Only for connection to the certified intrinsically safe module rack of the type MT...
Plug connector X101
connecting pins 15, 16 with the following maximum values:

$$\begin{aligned}U_{\max} &= 20 \text{ V AC (amplitude)} \\f &= 307 \text{ kHz } \pm 5 \text{ kHz} \\P_i &= 2.5 \text{ W (power consumption)}\end{aligned}$$

The intrinsically safe AC supply circuit is safely electrically isolated from intrinsically safe field circuits and the CAN-signal circuits of the module is in accordance with IEC 60079-11 table 5.

- II) Signal circuit (CAN-Bus) (internal circuit only; no external connections)

- III) Address coding (internal circuit only; no external connections)

- IV) Field circuits for AOH40Ex and AO41Ex for passive actuators

Terminals at the
system module rack (X102)
Channel 1: +19, -21
Channel 2: +3, -15
Channel 3: +7, -9
Channel 4: +1, -3

type of protection Intrinsic Safety
Ex ia IIC/IIB and Ex ib IIC/IIB
Maximum values per channel:
 $U_0 = 22.1 \text{ V}$
 $I_0 = 93 \text{ mA}$
 $P_0 = 640 \text{ mW}$

Output characteristic: trapezoidal, with

$$\begin{aligned}U_Q &= 27.54 \text{ V} \\R &= 292 \text{ } \Omega\end{aligned}$$

Effective internal capacitance: $C_i \leq 1.1 \text{ nF}$
Effective internal inductance: $L_i \leq 0.22 \text{ mH}$



The maximum values of the external capacitance C_0 and the external inductance L_0 are shown in the table below. They already consider the effective internal values.

Type of protection	Ex ia/ib IIC	Ex ia/ib IIB
Maximum inductance L_0	0.5 mH	2 mH
Maximum capacitance C_0	65 nF	270 nF

All the channels of the field circuits are electrically interconnected via ground. The channels of the four intrinsically safe field circuits are safety electrically isolated from each other up to a voltage of 30V as shown in IEC 60079-11, table 5. The values in the table above thus apply to each channel.

Special conditions for safe use
None