# 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 ETL 21.0065X**

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Certificate history:

Issue 3 (2024-02-26)
Issue 2 (2022-04-13)
Issue 1 (2022-03-14)
Issue 0 (2021-11-30)

Status: **Current**

Issue No: 4

Date of Issue: 2024-03-12

Applicant: **United Electric Controls Co.**
180 Dexter Avenue
Watertown, MA 02471
**United States of America**

Equipment: **Gas Detector: UE Vanguard: TCD60**

Optional accessory:

Type of Protection: **Flameproof - db, Intrinsic Safety - ia, Inherently Safe Optical Radiation - op is**

Marking: Ex db ia op is [ia] IIC T4 Gb IP66 (*Excludes Sensor)

Tamb: X

Intrinsically Safe HART Entity Parameters:

Uo=4.935V; Io=0.179A; Po=0.220W; Co=25uF, Lo=0.25mH

Ui=3.80V; Ii=64uA; Ci and Li = negligible

IECEx ETL 21.0065X

Approved for issue on behalf of the IECEx Certification Body: **Todd L. Relyea**

Position: **Certification Officer**

Signature:
(for printed version)

Date:
(for printed version)

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:

**Intertek**
**3933 US Route 11 South**
**Cortland NY 13045-2995**
**United States of America**

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Date of issue: 2024-03-12 Issue No: 4

Manufacturer: **United Electric Controls Company**
180 Dexter Avenue
Watertown, MA 02472
**United States of America**

Manufacturing locations: **United Electric Controls Company**
180 Dexter Avenue
Watertown, MA 02472
**United States of America**

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 60079-1:2014 Explosive atmospheres - Part 1: Equipment protection by flameproof enclosures "d"
Edition:7.0

IEC 60079-11:2011 Explosive atmospheres - Part 11: Equipment protection by intrinsic safety "i"
Edition:6.0

IEC 60079-28:2015 Explosive atmospheres - Part 28: Protection of equipment and transmission systems using optical radiation
Edition:2

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:

US/ETL/ExTR21.0063/00 US/ETL/ExTR21.0063/01 US/ETL/ExTR21.0063/02
US/ETL/ExTR21.0063/03

Quality Assessment Report:

US/UL/QAR07.0002/13

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

The product (TCD60H1*) is a Wireless Hart Communication based Gas Detector for use in Zone 1 potentially explosive atmospheres.

The product (TCD60H1*) is comprised of a certified component (U) flameproof enclosure manufactured by Killark-Hubbell Inc., certified for IIC. The component flameproof enclosure comes with two compartments (front and rear). The front compartment uses a glass window cover. The rear compartment uses a solid metallic cover. The covers are threaded onto the housing. The front and rear compartments of the component (U) enclosure are completely separated from each other. The flameproof enclosure includes three threaded entries. Two of the threaded entries go to the front compartment and the third threaded entry goes to the rear compartment. The certified component enclosure is then modified by United Electric. The modification includes drilling between the front and rear compartments and making a pass-through potted/cemented bushing and populating with the electronics assemblies.

The front compartment entries/exits are populated with a certified equipment antenna coupler connecting to either direct antenna or remote cable and antenna and a gas sensor seal/bushing/pass-through.

The front compartment is intended to be Flameproof (Ex d) with included Intrinsic Safety Barrier Circuits (QTY = 3) for connections to the Gas Sensor and the rear compartment items (Battery and HART Field Connection). The barriers are used to make the passed-through circuits suitable for Zone 1 outside the Ex db enclosure (Ex ia). *"Ex ia" employed for North American Division 1 Use/Certification.*

The Gas Sensors have two mounting options: on to the Flameproof Housing or with Remote Cable. The gas sensor circuitry exits the flameproof hosing using a custom glass-metal seal and includes additional circuitry for limitation and interface to meet the needs of the Sensor.

The rear compartment is intended to be Intrinsically Safe (Ex ia [ia]) only even though the rear compartment is a flameproof enclosure. It is intended to be able to change the battery pack housed in the rear compartment while the product is in the potentially explosive atmosphere. The Hart Field Connection [ia] is allowed for use in certified Hazardous Area. Instruction present in operation manual for service and repair.

The last digit of the model number can be any alphanumeric number. This represents the mounting means used by the end user and does not impact the explosion protection aspects of the equipment.

***The product's Ambient Temperature Ratings Vary Based on Configuration (Gas Sensor): The Configuration which is based on the fitted Gas Sensor is indicated by the marked code on the Gas Sensor Module Body (Label): Code A or Code B (See Table Below).**

**Housing Without Remote Gas Sensor (No Cable):**

| Gas Sensor | Max Ambient Code | Assembly (Housing And Gas Sensor) Ambient: |
|---|---|---|
| MIPEX (IECEx ITS 11.0047U) | B | -40ºC to +65ºC |
| NET (NO CERT) | B | -40ºC to +65ºC |
| CITY TECHNOLOGY (NO CERT) | B | -40ºC to +65ºC |
| eLICHENS (IECEx INE 19.0031U) | A | -40ºC to +60ºC |

**Housing With Remote Gas Sensor (With Cable):**

| Gas Sensor: | Max Ambient Code | Housing Ambient: | Gas Sensor Ambient: |
|---|---|---|---|
| MIPEX (IECEx ITS 11.0047U) | B | -40ºC to +65ºC | -40ºC to +65ºC |
| NET (NO CERT) | B | -40ºC to +65ºC | -40ºC to +65ºC |
| CITY TECHNOLOGY (NO CERT) | B | -40ºC to +65ºC | -40ºC to +65ºC |
| eLICHENS (IECEx INE 19 0031U) | A | -40ºC to +65ºC | -40ºC to +60ºC |

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

1. Solexy RX and SX series antenna couplers must be connected to an RF source with a minimum internal impedance of 50 Ω.
2. It is considered inappropriate to provide conventional IS parameters for this equipment. For connection to external antenna, refer to the Instruction and Operating Manual for clarification of the antenna requirements and calculation of the RF power.
3. Solexy RX and SX series antenna coupler does not provide any RF power limitation. The threshold power must be limited by the user in order to achieve the levels defined in IEC/EN 60079-0 Table 5.
4. Equipment marked with an ambient temperature of -40°C to +70°C/+85°C is limited to a max RF input of 2 W.
5. No repair/modification to the flameproof joints is permitted.

# IECEx Certificate of Conformity



**DETAILS OF CERTIFICATE CHANGES (for issues 1 and above)**
Corrected typographical error in markings.

**Annex:**

Annex for IECEx Certificate of Conformity IECEx ETL 21.0065X – Issue 3_1.pdf

# Annex to IECEx Certificate of Conformity

| Certificate No: | IECEx ETL 21.0065X | Issue No. 03 |
|---|---|---|
| Annex No. 1 | | |

| Technical Documents | | | |
|---|---|---|---|
| Title: | Drawing No.: | Rev. Level: | Date: |
| Vanguard Agency Drawing, GRP A-D | 62174-86 | A | 11/2/2021 |
| Molded Battery Pack | B-62149-181 | M | 3/10/21 |
| Battery Pack | B-62149-184 | C | 12/19/2017 |
| Group A Gas Detector Main PC Board Schematic | 6247-719 | A | 10/14/21 |
| Group A Methane Sensor Board Schematic | 6247-720 | A | 10/14/21 |
| Enhanced Gas Detector Sensor Schematic | 6247-721 | A | 10/14/21 |
| GROUP A PCB ASS'Y.<br>GAS DETECTOR | 63136-440 | A | 10/14/21 |
| GROUP A GAS DETECTOR<br>MAIN PCB | 62137-520 | A | 10/14/21 |
| GROUP A<br>ENHANCED GAS DETECTOR<br>SENSOR PCB ASSY. | 63136-441 | A | 10/14/21 |
| GROUP A<br>ENHANCED GAS DETECTOR<br>SENSOR PCB | 62137-521 | A | 10/14/21 |
| GROUP A<br>PCB ASS'Y VANGUARD<br>GAS DETECTOR METHANE | 63136-442 | A | 10/14/21 |
| GROUP A GAS DETECTOR<br>PCB, METHANE | 62137-522 | A | 10/14/21 |
| WirelessHART® Toxic & Combustible Gas Detector<br>P/N: TCD60H1X<br>Installation and Maintenance Instructions | IM_TCD60-01 | 1 | 11/06/2021 |
| VANGUARD TCD60 GROUPS A,B,C,D<br>ELECTROCHEMICAL SENSORS (PART 1) | 62174-87 | A | 10/29/2021 |
| VANGUARD TCD60 GROUPS A,B,C,D<br>ELECTROCHEMICAL SENSORS (PART 2) | 62174-88 | A | 10/29/2021 |
| VANGUARD APPROVED<br>ANTENNAS | 62174-77 | A | 10/29/2021 |
| VANGUARD APPROVED<br>ANTENNA COUPLERS | 62174-79 | A | 10/29/2021 |
| VANGUARD MIPEX SENSORS | 62174-78 | A | 10/29/2021 |

# Annex to IECEx Certificate of Conformity

| Certificate No: | IECEx ETL 21.0065X | Issue No. 03 |
|---|---|---|
| Annex No. 1 | | |

| Technical Documents | | | |
|---|---|---|---|
| Title: | Drawing No.: | Rev. Level: | Date: |
| *VANGUARD GAS DETECTOR, TCD60 AGENCY DRAWING | 62174-86 | B | 1/18/2024 |
| *VANGUARD AGENCY DRAWING, REMOTE ANTENNA OPTION | 62174-112 | A | 1/18/2024 |
| *VANGUARD AGENCY DRAWING, REMOTE SENSOR OPTION | 62174-113 | A | 1/18/2024 |
| *VANGUARD MIPEX SENSORS | 62174-78 | B | 01/18/2024 |
| *VANGUARD eLICHENS SENSORS | 62174-92 | A | 01/18/2024 |
| *Enhanced Gas Detector Sensor Schematic | 6247-721 | B | 1/9/24 |
| *GROUP A ENHANCED GAS DETECTOR SENSOR PCB ASSY BOM | 63136-441 | 2 | No Date |
| *Group A Methane Sensor Board Schematic | 6247-720 | B | 1/9/24 |
| *GROUP A PCB ASS'Y VANGUARD GAS DETECTOR METHANE BOM | 63136-442 | 2 | No Date |
| *E-Lichens Cranberry board | 6247-723 | A | 1/9/24 |
| *GROUP A ELICHEN SENSOR BOARD PCB ASSEMBLY BOM | 63136-448 | 1 | No Date |
| *Gas Detector Remote Socket Board | 6247-724 | A | 1/9/24 |
| *Group A Remote PCB Assembly | 63136-451 | 1 | No Date |
| *Group A PCB ASSY GAS Detector BOM | 63136-440 | 1 | No Date |
| *GROUP A ENHANCED GAS DETECTOR SENSOR PCB ASSY | 63136-441 | B | 2/1/2024 |
| *GROUP A PCB ASS'Y VANGUARD GAS DETECTOR METHANE | 63136-442 | B | 2/1/2024 |
| *Installation and Operation Instructions | IM_TCD60 | 02 | 2/2/2024 |

*Note: An * is included before the title of documents that are new or revised.*