TEMPERATURE MONITORING IN POTENTIALLY EXPLOSIVE AREAS

Isen, September 2025
Early warning with the d-LIST and LIST system

This white paper highlights the particular challenges of fire protection in potentially explosive areas and shows how the LIST and d-LIST linear heat detection systems from LISTEC GmbH reliably locate fires and thus effectively protect people, buildings, and valuable goods.

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1. Introduction & Press Reports

Fires in potentially explosive areas are among the greatest risks in industry and commerce. Even the smallest ignition sources can have devastating consequences, as flammable gases, vapours or dusts react explosively. Special protective measures and clear rules are therefore necessary to reliably protect people, equipment and the environment.

Fires in potentially explosive areas.
Examples from press reports:

June 04, 2025, Tirol
Explosion in silo:
Fire department must flood

https://www.wochenblatt-dlv.de/oesterreich/explosion-silo-feuerwehr-fluten-581046

September 10, 2025, Oberpfalz
Millions in damage after fire in Upper Palatinate industrial area

https://www.br.de/nachrichten/bayern/millionenschaden-nach-brand-in-oberpfaelzer-industriegebiet,UwO7kPH

2. Fire hazards & triggers

In potentially explosive areas (EX zones) such as silos, mills, conveyor systems or industrial halls, early fire and temperature monitoring is crucial. Open flames or sparks are not the only hazards – even slight temperature increases at bearings, conveyor belts or machines can trigger fires and cause serious damage in an explosive atmosphere.

Typical industries and systems:

- Conveyor belt systems in mining, cement, coal and grain industries
- Silos, mills, storage areas with combustible dusts (flour, wood, sugar, coal)
- Chemical industry, paint shops, systems with solvent vapours

Typical triggers:

- Overheated bearings, rollers and motors
- Belt slips or material jams on conveyor belts
- Sparks, arcing or short circuits in electrical systems
- Spontaneous combustion of organic dusts or bulk materials

Particular hazard:

In dusty or gaseous atmospheres, a single ignition pulse is enough to trigger an explosion. **Early detection and precise localisation** of the temperature increase are therefore essential.

3. LISTEC solutions

LISTEC GmbH has been developing, manufacturing and distributing sensor cable systems for early fire detection and temperature monitoring for over 30 years. Our company headquarters are located near Munich, from where we supply customers worldwide with solutions **made in Germany**.

Thanks to its robust, enclosed design, our sensor cable is ideal for use in harsh environments. For example, in dusty, dirty or damp conditions, or where there are significant temperature fluctuations. EX areas are one of our main areas of focus.
Early detection of overheating is crucial, especially in EX areas: overheating rollers or material jams can quickly lead to fires. Our sensor cable has integrated temperature sensors at defined intervals, which enable the precise localisation of temperature increases along the entire length of the belt. This allows critical areas such as deflection stations, drives or transfer areas to be reliably monitored and risks to be detected at an early stage.

Thanks to this technology, LISTEC has been ensuring greater safety and operational continuity in potentially explosive areas for decades – worldwide and under the most adverse conditions.

Temperature monitoring of potentially explosive areas

For early fire detection and efficiency monitoring, continuous temperature monitoring of the systems is essential. The **LIST and d-LIST systems** can enable significant improvements in this area.

- Protection of human life
- Comprehensive early fire detection and detection
- Temperature monitoring
- Control of cooling and extinguishing systems
  (see existing VdS protection concept S619004)
- Control of systems and disconnection from the mains

Advantages of the LIST system (SEC 20 + LISTcontroller) and d-LIST system (SEC 15 + d-LISTcontroller)

- Resistant to dust/dirt/gases/vibrations
- Differential and maximum temperature evaluation
- Installation possible in single-line operation or with multiple branches
- Measurement resolution (always 0.1 °C, internally 0.0625 °C for d-LIST)
- Repeat accuracy (always ± 0.1 K along the entire cable length)
- Detection of overheating along the entire length of the cable
- Freely selectable sensor spacing, individual identification possible at any time via cable markings
- Systems are generally maintenance-free, resulting in long-term cost savings
- Low commissioning and maintenance costs
- Calibration-free and pinpoint location resolution in the event of a fire over the entire service life

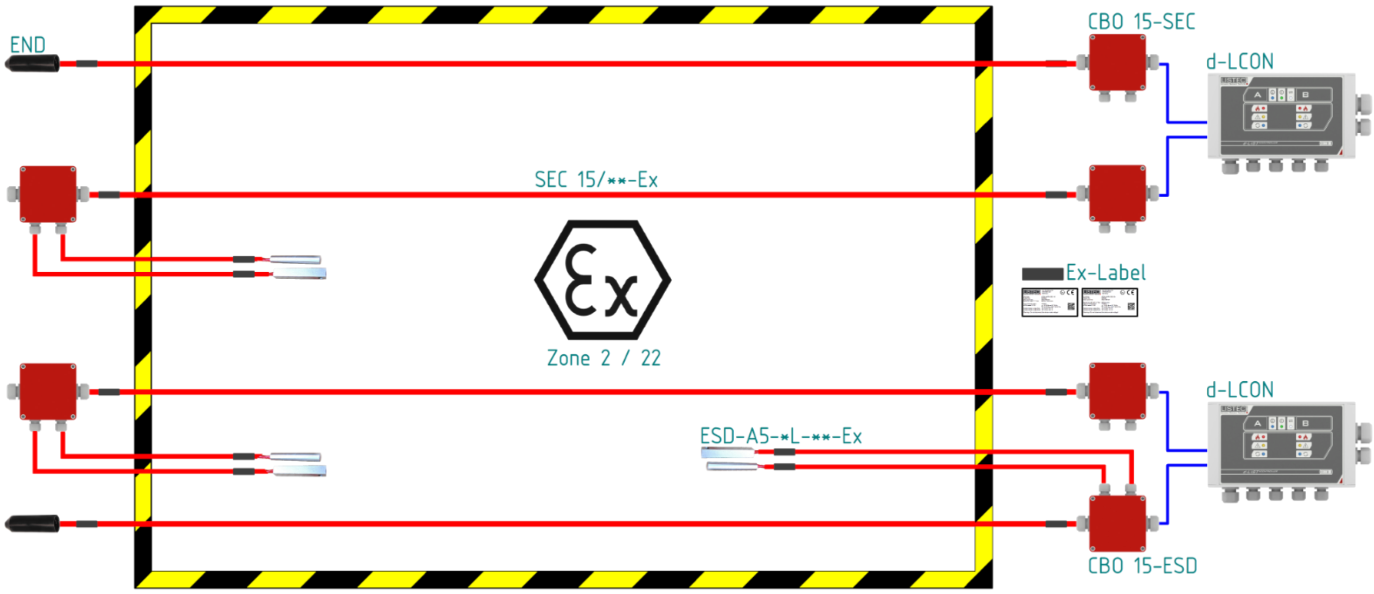
4. Application/ Installation /Monitoring

Explosive areas require maximum safety in early fire detection. With its resettable linear heat detectors LIST and d-LIST, LISTEC GmbH offers a proven, robust and certified solution that is specially designed for environments at risk of dust and gas explosions.

Thanks to addressable sensor cables, **ATEX approval** and decades of experience, LISTEC enables reliable monitoring of conveyor belts, silos and industrial plants, even under the most adverse conditions – for maximum safety, availability and investment protection.

- Conveyor systems, pipes, containers and filling stations
- Production halls. Monitoring of hotspots with individual sensors
- Mechanical equipment with a particular fire risk
- Hard-to-access areas in warehouses
- Warehouse ceiling monitoring with precise temperature readings
- Warehouses with highly flammable materials
- Warehouses with extensive temperature monitoring

Partial installation of components in **EX zones 2/22**, **d-LCON** evaluation unit and **CBO 15-SEC, CBO 15-ESD** connection boxes, as well as **END** caps outside EX zones.



5. Certificate excpert

The **LIST / SEC 20 system and d-LIST / SEC 15 system** are, among other things, VdS-approved systems in accordance with EN 54-22:2015+A1:2020 and may also be used in EX zones 2 and 22:

Anerkennung
Approval

von Bauteilen und Systemen
of Components and Systems

Inhaber der Anerkennung / Holder of the Approval

LISTEC GmbH
Am Sandberg 34
DE-84424 Isen

Anerkennungs-Nr. / Approval No.	Anzahl der Seiten / No. of pages	gültig vom (TT.MM.JJJJ) / valid from (dd.mm.yyyy)	gültig bis (TT.MM.JJJJ) / valid until (dd.mm.yyyy)
G 221004	14	26.06.2023	25.06.2027

Gegenstand der Anerkennung / Subject of the Approval

Rücksetzbarer linienförmiger Wärmemelder /
Resettable line-type heat detector
d-LIST

Verwendung / Use

in automatischen Brandmeldeanlagen /
in automatic fire detection and fire alarm systems

Anerkennungsgrundlagen / Basis of the Approval

VdS 2344:2014-07
VdS 2543:2021-03
EN 54-17:2005 + AC:2007
EN 54-22:2015 + A1:2020

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G 213072	14	31.10.2024	30.10.2028

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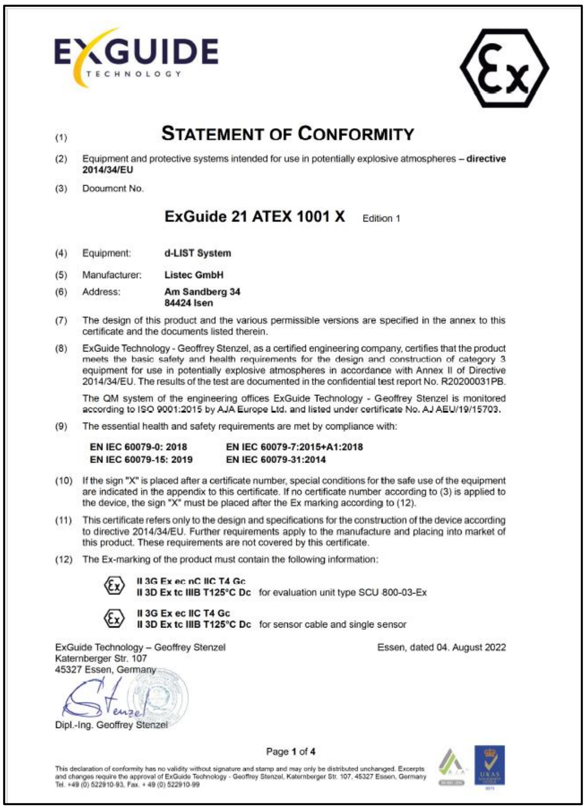

EXGUIDE TECHNOLOGY

(1) STATEMENT OF CONFORMITY

(2) Equipment and protective systems intended for use in potentially explosive atmospheres – **directive 2014/34/EU**

(3) Document No.

ExGuide 21 ATEX 1001 X Edition 1

(4) Equipment: **d-LIST System**

(5) Manufacturer: **Listec GmbH**

(6) Address: **Am Sandberg 34**
84424 Isen

(7) The design of this product and the various permissible versions are specified in the annex to this certificate and the documents listed therein.

(8) ExGuide Technology - Geoffrey Stenzel, as a certified engineering company, certifies that the product meets the basic safety and health requirements for the design and construction of category 3 equipment for use in potentially explosive atmospheres in accordance with Annex II of Directive 2014/34/EU. The results of the test are documented in the confidential test report No. R20200031PB.

The QM system of the engineering offices ExGuide Technology - Geoffrey Stenzel is monitored according to ISO 9001:2015 by AJA Europe Ltd. and listed under certificate No. AJ AEU/19/15703.

(9) The essential health and safety requirements are met by compliance with:

EN IEC 60079-0: 2018 **EN IEC 60079-7:2015+A1:2018**
EN IEC 60079-15: 2019 **EN IEC 60079-31:2014**

(10) If the sign "X" is placed after a certificate number, special conditions for the safe use of the equipment are indicated in the appendix to this certificate. If no certificate number according to (3) is applied to the device, the sign "X" must be placed after the Ex marking according to (12).

(11) This certificate refers only to the design and specifications for the construction of the device according to directive 2014/34/EU. Further requirements apply to the manufacture and placing into market of this product. These requirements are not covered by this certificate.

(12) The Ex-marking of the product must contain the following information:

II 3G Ex ec nC IIC T4 Gc
II 3D Ex tc IIIB T125°C Dc for evaluation unit type SCU 800-03-Ex

II 3G Ex ec IIC T4 Gc
II 3D Ex tc IIIB T125°C Dc for sensor cable and single sensor

ExGuide Technology – Geoffrey Stenzel
Katernberger Str. 107
45327 Essen, Germany

Essen, dated 04. August 2022

Dipl.-Ing. Geoffrey Stenzel

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This declaration of conformity has no validity without signature and stamp and may only be distributed unchanged. Excerpts and changes require the approval of ExGuide Technology - Geoffrey Stenzel, Katernberger Str. 107, 45327 Essen, Germany Tel. +49 (0) 522910-93, Fax. + 49 (0) 522910-99

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