



Very Early Fire Detection with Aspirating Smoke Detectors for Refrigerated Warehouses

TITANUS® – One of the highest levels of safety in fire detection



Introduction

Refrigerated warehouses pose a high fire risk due to their high density of goods and the highly flammable packaging material. Supported by the stack effect, flames spread quickly upwards and then spread to neighboring shelves – often with serious consequences: fire and extinguishing water damage often lead to total loss. It is therefore important to implement reliable, early fire detection despite the occurrence of condensing moisture while avoiding business interruptions due to maintenance and servicing of the fire detection and alarm system.

An overview of fire risks in refrigerated warehouses illustrates the risk potential in this application.

The Risk Analysis

The particular challenge for fire protection in refrigerated warehouses is to implement a reliable fire detection system that is highly immune to false alarms and not subject to complications caused by condensation.

THE RISKS AT A GLANCE

Stack effect

Vertical spaces between the stored goods favor the so-called stack effect, whereby a flame fire can spread upwards in a few seconds.

Radiant heat

The high radiant heat from burning stored goods causes a rapid spread to neighboring shelves. Without intensive extinguishing measures, this inevitably leads to the total loss of stored goods and infrastructure.

Smoke contamination

Even the smoke from a relatively small fire can contaminate the entire stored goods. Depending on the stored goods, this often means that they can no longer be sold.

Limited access

The generally high packing density of the stored goods makes it difficult to access the seats of fire and often prevents direct sprinkling by water extinguishing systems. In addition, the fire department is often faced with the challenge of not being able to achieve the necessary throw range with their jet pipes due to the height of the storage area and the required safety distances.

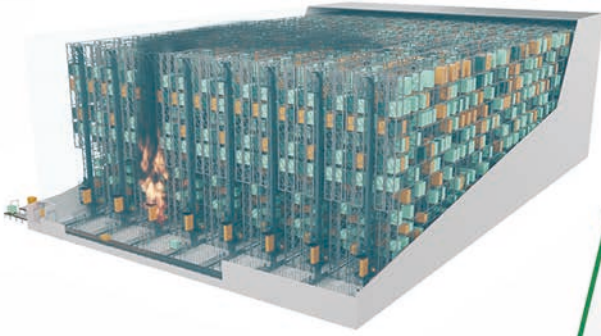
Ignition sources

Typical causes of fire in automatically stored refrigerated warehouses include electrical defects in storage and retrieval systems, defective lithium-ion batteries in the stored goods, and improperly performed potentially fire-hazardous work on the roof.

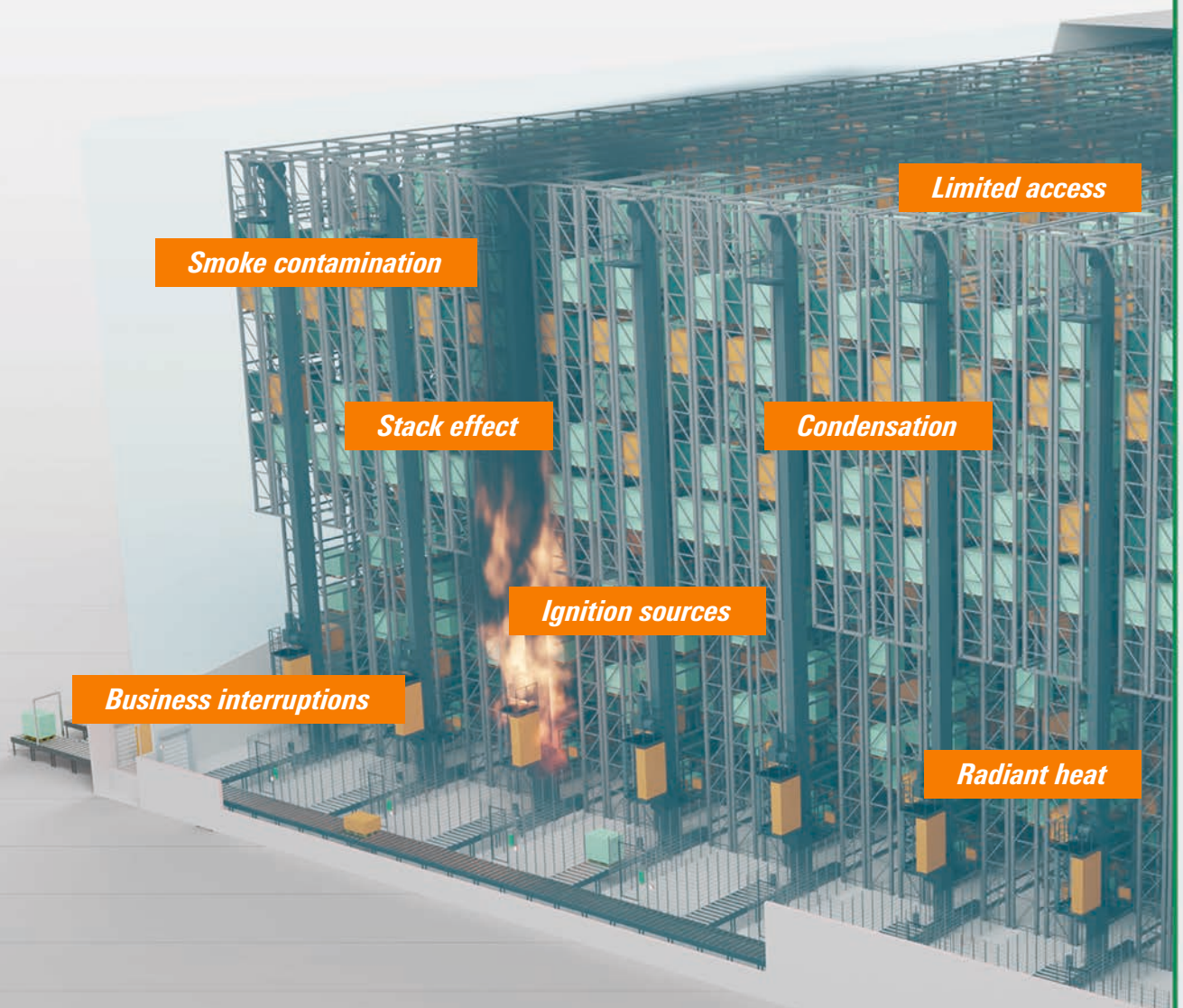
Business interruptions

Regular maintenance and servicing of fire detection and alarm systems may require interruptions to the operation of storage and retrieval systems.

Longer business interruptions due to a fire can quickly lead to a drop in sales, damage to reputation and loss of customers.



The Risks at a Glance





The Protection Goals: Fire Protection Requirements

Due to the rapid spread of fire and the high risk of smoke contaminating of the stored goods, it is crucial to detect fires in refrigerated warehouses at an early stage so that countermeasures can be initiated in time. Reliable early fire detection requires a particularly high degree of immunity to false alarms. At the same time, the fire detection and alarm system must be implemented in such a way that it does not interfere with operations and that maintenance and service are possible without interrupting operations. This requires special precautions to prevent faults due to condensation.

THE PROTECTION GOALS AT A GLANCE

Personal protection

Protection of personnel from the dangers of fire and the resulting decomposition products, which are highly harmful to health.

Protection against business interruptions

Avoiding business interruptions due to necessary maintenance and servicing work on the fire detection and alarm system; in particular, preventing faults in the fire detection and alarm system due to condensation.

Protection against the spread of fire

Avoiding the rapid spread of fire through the stack effect by detecting incipient fires at an early stage, before they have developed into a fully developed fire.

Protection against smoke contamination

Minimization of smoke contamination through early fire detection and initiation of countermeasures while the fire is still in its early stages.

Protection against consequential and reputational damage

Avoiding medium to long-term inability to deliver due to the loss of goods and, perhaps, the destruction of infrastructure.

The protection goals described form the basis for the development of an individual, holistic fire protection solution.

STANDARDS AND GUIDELINES

National standards and guidelines for fire detection in corresponding warehouses must be taken into account.

TITANUS® Aspirating Smoke Detectors for Early Fire Detection – Better Solutions in Fire Protection

Very early fire detection, as made possible by the systems of the TITANUS® product family, provides the decisive time advantage for protecting people and property and helps ensure business continuity. The earlier a fire is detected, the faster appropriate countermeasures can be initiated and major damage can be prevented.

TITANUS® aspirating smoke detectors are used in numerous warehouse applications worldwide and set new standards with their reliable early fire detection and ease of service.

TITANUS® aspirating smoke detectors protect refrigerated warehouse applications worldwide with high reliability and, thanks to LOGIC·SENS® fire pattern recognition, represent a benchmark in immunity to false alarms despite their high sensitivity to smoke particles.

In refrigerated warehouses, WAGNER condensate separators provide for the automatic drainage of any condensate that occurs, ensuring trouble-free operation. Our very early fire detection systems are installed in easily accessible locations. This means that they can be easily accessed at floor level for maintenance purposes at any time without having to interrupt the operation of the storage and retrieval systems. Our aspirating smoke detectors also reduce costly time spent by service staff and experts.

FUNCTIONAL PRINCIPLE

The structure of an aspirating smoke detection system is based on a basic device with a detector module and a pipe system with sampling points. A sampling point corresponds to a point-type smoke detector. The aspirating smoke detector uses a fan to constantly and actively take air samples from the ambient air via the pipe system and feeds them to a sensitive optical detector, which examines the air sample for the smallest smoke particles. The integrated airflow sensor constantly checks the pipe system for possible blockages and breakages to ensure the functionality of the air sampling system.

Further information on our TITANUS® portfolio:



Valuable time advantage

Very high immunity to false alarms

Protection against condensation

Reliability

Ease of service

High modularity

Customized solution

Approved quality





TITANUS® Advantages

The outstanding suitability of TITANUS® aspirating smoke detectors for monitoring a wide range of applications is based in particular on the following system features, which help you to achieve your protection goals:

VALUABLE TIME ADVANTAGE

- Very early and reliable fire detection with notification from a smoke density of 0.005% obs/m (0.0015% obs/ft) for the earliest possible countermeasures to be taken

VERY HIGH IMMUNITY TO FALSE ALARMS

- Proven LOGIC·SENS® fire pattern recognition for detection of deceptive scenarios
- Algorithms for consistent detection quality

RELIABILITY

- Maximum immunity to faults thanks to patented PIPE·GUARD airflow monitoring
- Use of an external filter tailored to the application to prevent contamination of the detector modules while extending the service life at the same time

EASE OF SERVICE

- Easy accessibility thanks to installation of the basic device in an easily accessible location
- Maintenance without interrupting operation
- Quick diagnostics without technical aids

HIGH MODULARITY

- Reduced costs with low detection requirements thanks to a graduated product portfolio
- Simple retrofitting and conversion when requirements change
- Field-replaceable detector modules

CUSTOMIZED SOLUTION

- Can be used with 2 detector modules per detector to monitor two separate zones or for a double-knock alarm verification
- TITANUS® network technology for remote diagnostics and direct connection to building management systems
- Detector variants for use in deep-freeze areas down to -40 °C (-40 °F)
- Operation from 23 dB(A) for monitoring noise-sensitive areas
- Almost invisible installation possible
- Extensive range of accessories for perfect adaptation to the application, even with heavy dust exposure and condensing humidity

APPROVED QUALITY

- Auditing by UL, FM and VdS as well as worldwide certifications prove compliance with the highest safety standards
- Made in Germany, tried and tested hundreds of thousands of times worldwide

TITANUS® Product Family

TITANUS® allows optimum fire detection in areas where other fire detection solutions reach their limits. The extensive product portfolio allows a cost-efficient solution to be tailored precisely to application-specific requirements.

TITANUS® basic devices	Suitable for refrigerated warehouses	Main approvals	Temperature range ¹	Double-knock option	Max. total pipe length	Max. no. of sampling points ¹	Min. noise level [dB(A)]
TITANUS MICRO-SENS® 1-channel small sized aspirating smoke detector - up to 2 alarm levels, depending on variant - optional smoke level bar graph display - up to 400 m ² (4,300 ft ²) area of coverage - optional: Ethernet/SNMP network connection, SD card data logger		VdS, LPCB, CE, CPD	–40 °C (–40 °F) to +60 °C (+140 °F)	No	50 m (164 ft)	8	40
TITANUS FUSION® 2-channel economic aspirating smoke detector - 1 alarm per detector module - up to 2 x 1,600 m ² (2 x 17,200 ft ²) area of coverage	✓	VdS, CE, CPD	–30 °C (–22 °F) to +60 °C (+140 °F)	Yes	2 x 160 m (525 ft)	2 x 20	45 (23 ²)
TITANUS PRO-SENS® 2-channel basic aspirating smoke detector - 1 alarm per detector module - up to 2 x 3,000 m ² ; UL: 2 x 1,003 m ² (2 x 10,800 ft ²) area of coverage	✓	UL, ULC, FM, VdS, LPCB, CE, CPD	–40 °C (–40 °F) to +60 °C (+140 °F)	Yes	2 x 300 m; UL: about 2 x 200 m (656 ft)	1 x 100 or 2 x 72; UL: 2 x 24	45 (23 ²)
TITANUS PRO-SENS®/net 2-channel universal aspirating smoke detector - up to 3 alarm levels per detector module, depending on variant - up to 2 x 3,000 m ² ; UL: 2 x 1,003 m ² (2 x 10,800 ft ²) area of coverage - optional: Ethernet/SNMP network connection, SD card data logger	✓	UL, ULC, FM, VdS, LPCB, CE, CPD	–40 °C (–40 °F) to +60 °C (+140 °F)	Yes	2 x 300 m; UL: about 2 x 200 m (656 ft)	1 x 100 or 2 x 72; UL: 2 x 24	45 (23 ²)
TITANUS TOP-SENS® 2-channel fully equipped aspirating smoke detector - 3 alarm levels per detector module, depending on variant - smoke level bar graph display - up to 2 x 3,000 m ² ; UL: 2 x 1,003 m ² (2 x 10,800 ft ²) area of coverage - optional: Ethernet/SNMP network connection, SD card data logger	✓	UL, ULC, FM, VdS, LPCB, CE, CPD	–40 °C (–40 °F) to +60 °C (+140 °F)	Yes	2 x 300 m; UL: about 2 x 200 m (656 ft)	1 x 100 or 2 x 72; UL: 2 x 24	45 (23 ²)

¹ Depending on equipment variant

² When using the SL variant and the type SD-1/a sound absorber

Fire protection as holistic solution. Trendsetting. Worldwide.



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BETTER SOLUTIONS IN FIRE PROTECTION

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