

# On-track for tailored fire protection

## Functionality of standalone system solutions in fire protection

**Autonomous fire detection and extinguishing for all rail-bound vehicles**

**Standalone fire protection systems are simple and cost-effective solutions that require neither fire alarm control panels nor complex cabling.**

In tramways, light rail vehicles, elevated trains, high-speed trains, commuters, magnetic levitation trains and people movers, WAGNER Rail installs autonomous - standalone - fire protection systems that are directly connected to the vehicle control system. These solutions are not only an effective solution for new vehicles, but are also particularly interesting for retrofit projects of existing vehicles, for example, when fire protection systems have to be retrofitted due to changes in standards. Because standalone fire protection solutions are easy to install while providing reliable protection against fires, many railroad operators are already using such a standalone solution. You can find standalone solutions in many railroads, such as:

- HGV
- Commuter
- Locomotives
- Streetcars and light rail vehicles
- Metro
- People Mover
- Monorail

**Innovative standalone system solutions for new vehicles and retrofit of existing vehicles**

### Overview WAGNER Rail Standalone Systems

- Air sampling smoke detectors TITANUS MICRO·SENS® and TITANUS PRO·SENS® with innovative corrugated tube system
- Smoke switches (multi-criteria detectors) "non SIL" or "SIL"
- Linear heat detectors
- Aerosol extinguishing technology
- as preassembled subrack with air sampling smoke detector, air filter, service adapter and connections.

## Functionality of standalone system solutions in fire protection

In an autonomous fire protection system, all fire detectors are directly connected to the train control and management system (TCMS) via relay contacts for alarm and fault.

A fire alarm panel, which is used in integrated fire protection solutions and communicates with the TCMS there, is not necessary. If a fire detector has detected a fire in the early stages, it sends a corresponding signal to the control system of the railroad.

Extinguishing systems for extinguishing fires can also be controlled directly via the TCMS. ■

### Standalone systems



**TITANUS®**  
Air sampling smoke detector

**Smoke switch**  
Optical/optical thermal

**Fire extinguishing**  
with aerosols for technical areas

### Advantages

- **Fire alarm panel not necessary**  
A fire alarm panel is not required. This saves money for purchase and maintenance.
- **Fire detection**  
direct connection to TCMS.
- **Ethernet connection**  
Ethernet connectivity is possible.
- **Plug & Play**  
Installation is very fast due to the possibility of prefabricated assemblies.
- **SIL 1 and 2**  
With standalone fire protection solutions, a safety integrity level according to *SIL 1* and *SIL 2* is possible.
- **Retrofit**  
Standalone solutions are well suited for upgrading existing vehicles.

## TITANUS® RAIL AIR SAMPLING SMOKE DETECTOR

### Strikingly inconspicuous fire protection

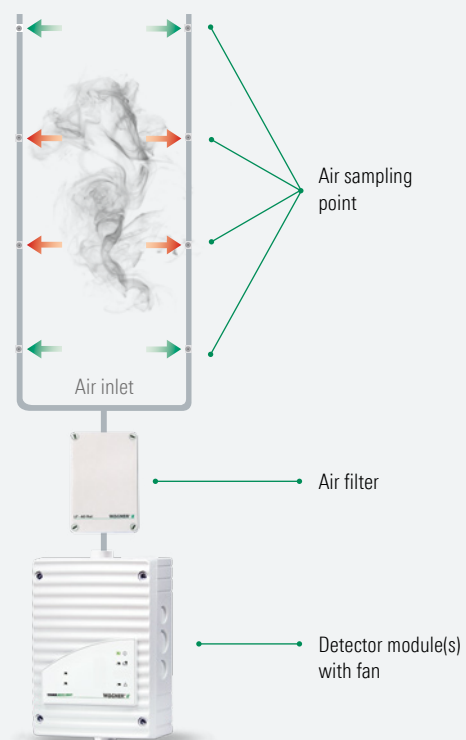
**WAGNER has many years of experience as a manufacturer of highly sensitive air sampling smoke detectors which can detect even the smallest amount of smoke particles. Detectors in the TITANUS® family**

detect fires at a very early stage – when they are just starting. TITANUS® is reliably protected from false alarms by the integrated LOGIC-SENS® technology. The smoke sampling orifices can be well concealed, e.g. installed behind panels, thus offering excellent protection against vandalism. This makes TITANUS® ideal for use in passenger areas.

The air sampling smoke detector system for early fire detection continuously takes samples of the ambient air and can thus detect small amounts of smoke particles and detect a fire even in the developing phase. Using High Power Light Source optical detection technology, all TITANUS® devices offer a sensitivity level up to 2,000 times greater than conventional point detectors. █

### Functional principle

- **Air sampling**  
Sample air is sucked in from the monitoring area via a connected pipe system using a fan.
- **Air sample preparation**  
Various air filters filter out the external substances that are not required for fire detection.
- **Monitoring the function**  
Precise monitoring of airflow and detector chamber monitoring.



### Advantages

- The sensitivity of the smoke detection can be individually adjusted as required.
- LOGIC-SENS® intelligent signal analysis enables the detection and exclusion of deceptive phenomena such as dust or exhaust fumes, even in difficult conditions.
- The futuristic technology of the High Power Light Source and the special construction of the measurement chamber mean that TITANUS® can provide the very highest detection quality and complies with or exceeds all standard test fire requirements.
- A blockage or break in the extraction piping and any failure of suction power is reliably signalled by the PIPE-GUARD air flow monitoring equipment.
- Meets the material requirements of EN 45545-2, HL 3 and is free of halogen.
- Meets the environmental requirements according to EN 50125-1, Class Tx and AX.
- The sampling orifices of the system are virtually invisible, offering protection against sabotage and vandalism.
- SIL 2 certification for TITANUS MICRO-SENS®.
- Not susceptible to vibrations.

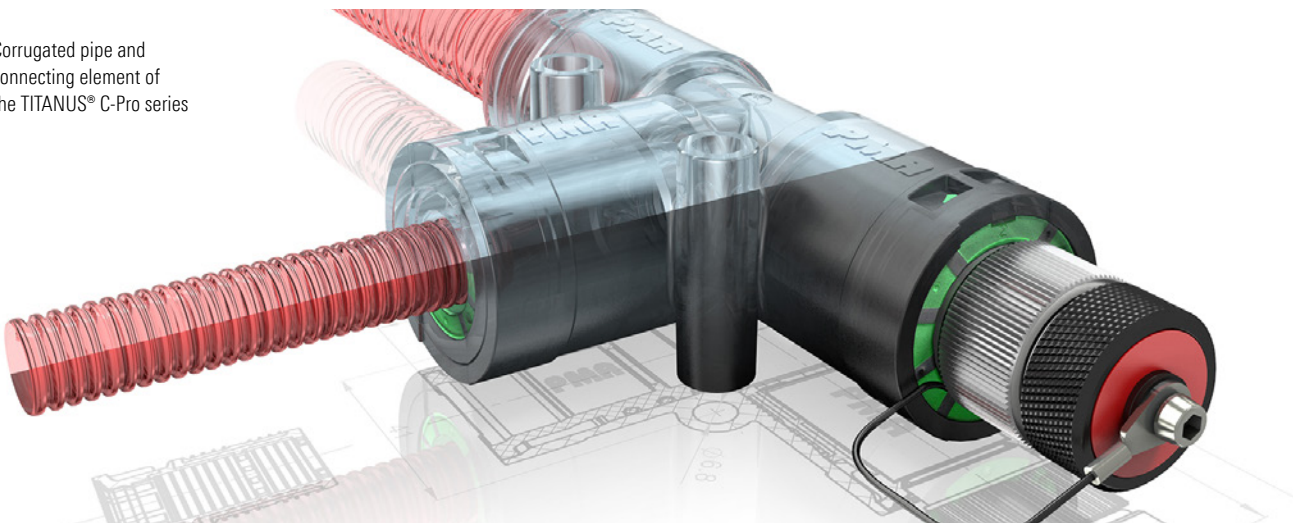
## Early fire detection with sophisticated modular system

TITANUS® C-Pro series reduces error rate and saves time during assembly

**The new TITANUS® C-Pro series offers early fire detection with a sophisticated modular principle. The PMA corrugated pipe system has been specially developed for use in rail vehicles in cooperation between WAGNER Rail and ABB.**

Since rail vehicles are constantly in motion, the intake pipes must be flexible and the connections between the individual components must be very stable. The TITANUS® C-Pro series, which was specially developed for use in rail transport, is characterized above all by its high stability and tightness. For this purpose, WAGNER Rail offers the proven PMA corrugated pipe system from ABB, modified and designed as a pneumatic system. This achieves a classification according to EN 45545-2 HL3, which describes the requirements for the fire behavior of materials. Thanks to the seals and the special snapping connection elements, the TITANUS® air sampling smoke system achieves the highest level of tightness. ■

Corrugated pipe and connecting element of the TITANUS® C-Pro series



### Further advantages of the TITANUS® C-Pro series

- **Simple assembly**  
The pipe system can be installed easily and quickly. Thanks to audible snapping of the components, functional reliability is ensured.
- **No false alarms**  
The air filter of the TITANUS® C-Pro series has been optimized so that the deception alarm reliability, e.g. against brake dust, is increased.
- **Tight**  
The new TITANUS® C-Pro series benefits from the extremely tight sealings.
- **Tools**  
Tools for quality assurance, commissioning, as well as maintenance of the fire detection system are available.
- **Approved**  
The corrugated pipe has an approval according to NFPA 130.
- **Color coding**  
Color coding helps assemble the corrugated tube system and the color red of the corrugated tube helps identify the fire detection system.

### Suitable as a preassembly system

The early fire detection system can be optionally equipped as a fire protection solution with a preassembled subrack consisting of an air sampling smoke detector, air filter, service adapter and connections. The solution is suitable for new vehicles and especially for retrofit vehicles.

### Applications

Typical application areas for TITANUS® air sampling smoke detectors in the rail sector include:

- **Passenger areas**
- **Electrical cabinets**
- **Engine rooms**
- **Air supply and exhaust ducts of air conditioning systems**
- **Undercarriage areas**

*Effectively protected with the multi-sensor switch*

## SMOKE SWITCH

At WAGNER Rail the multisensor switch is used for the selective monitoring of individual objects such as switch cabinets, containers, toilet and wet rooms or general passenger areas and the driver's cab. What is special about the multisensor is that it can use two detection principles for fire detection depending on the situation. Like any optical smoke switch, the multisensor detects smoke particles at an early stage thanks to the scattered light principle. In addition, it reacts to temperature. Special algorithms also ensure that sensor signals are verified and deceptive signals filtered out in the multi-sensor switch. The sensor system is also monitored for contamination. ■



### The optical smoke switch

- Universal smoke switch for early fire detection (smoke detection in accordance with EN 54-7)
- Simple and easy installation
- 360° visible status display for contamination, alarm, and fault
- Signal verification using algorithms to safeguard against deceptive signals
- Signals for alarm and fault are available separately (potential-free contacts)

### The optical thermal multi-sensor switch

- Simple and easy installation
- 360° visible status display for contamination alarm, and fault valid (for OTM-RS-1)
- Signal verification using algorithms to safeguard against deceptive signals
- Signals for alarm and fault are available separately (potential-free contacts)
- Reacts to rapid temperature increases independent of the initial temperature
- Alarm when exceeding maximum temperature

### Functional principle

The monitoring of the fire parameters smoke and temperature is carried out according to the optical scattered light principle and thermal differential circuits with maximum temperature difference. Alarms and fault messages are then forwarded to potential-free contacts.

### Applications

Selective monitoring of individual objects, such as:

- **Control cabinets**
- **Containers**
- **WC and bathroom units**
- **Passenger areas**
- **Driver's cabins**

## *Fire fighting in technical containers*

# AEROSOL FIRE EXTINGUISHING

Aerosol systems are suitable for use in technical containers and power packs. When activated, the extinguishing systems release fine aerosols, which can then safely fight

a fire in the closed area. Aerosol systems are used in areas where gas extinguishing systems with cylinders are cost efficient and less complex.

The extinguishing effect of the aerosol system is based on an interaction of the flames with the aerosol. In a cartridge, a defined amount of solid is stored, which is ignited via the TCMS for standalone application in the event of an alarm or initiates the extinguishing process by self-activation at approx. 300 degrees. At the same time, the flooding of the extinguishing area is practically pressureless, so that no special measures are required to relieve the pressure. ■



*Examples with standalone fire protection solutions*

## CURRENT REFERENCES

Worldwide reference projects include Metro Newcastle, ICE4 Deutsche Bahn, Velaro Eurostar, Velaro MS, Velaro neo, Desiro ML, Desiro HC, Max Bögl, Thameslink UK, Metro Glasgow, Indian Railways, Stadtbahn Dortmund and many more. ■

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ICE-4



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