

RAILNEWS

THE WAGNER RAIL CUSTOMER MAGAZINE
2018 ISSUE



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TECHNOLOGY

Effectively protected
with smoke switches

REFERENCE

WAGNER on the new
Siemens platform, Mireo

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Safely through the narrow Victorian
subway system in Glasgow



Dear business friends,
Dear readers,

Space and time. Two variables that meet in every kind of locomotion. All over the world, commuters and tourists alike want to arrive quickly and comfortably at their destinations. However, in the cities, individual traffic is becoming increasingly congested. Many people are therefore choosing the railway as a means of transport – and the trend is rising. Rail networks are being expanded worldwide. Asia and Eastern Europe in particular are recording strong growth in order to cope with the further increase in traffic volume. Operators and train manufacturers are constantly developing new solutions to make rail traffic even more efficient, transporting many people quickly from A to B in a small space – with a maximum of safety.

Fire protection that stays on track

More passengers also mean more lives that must be protected from the dangers of fire. WAGNER Rail is setting the pace in fire protection for railway vehicles. With our expertise from almost 20 years of practical experience, we adapt our technologies to future challenges and offer individual customer solutions: We place our fire protection solutions flexibly on, in, or under the trains – this applies to both driver-guided and autonomous vehicles.

No matter where the journey is heading - we keep up with the times and stand by our customers all over the world. In this issue of RailNews as well as at our booth at the fair at InnoTrans, you can find out about our solutions of the future.

We hope you enjoy reading this issue!

A stylized, handwritten signature in black ink, appearing to read 'Markus Kock'.

Markus Kock

WAGNER Rail GmbH Managing Director



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At the top: Water mist secures train ride at 1,800 metres

WAGNER solutions protect separable multiple-unit trains of the Rhaetian Railway



Powerful curves and a good view: The geographical conditions in the Swiss canton of Graubünden are unique. The breathtaking surroundings amaze passengers of the Rhaetian Railway at all times of the year. However, they pose a number of challenges for the fire protection of the trains. WAGNER Rail has faced them.

The trains of the Rhaetian Railway meander through the mountainous Alpine massif. In rain or sunshine, they transport hikers, skiers, and the like from point A to point B. This is now to be done much more comfortably and efficiently: The line operator has ordered 36 new four-car separable multiple-unit trains from train manufacturer Stadler. From December 2019 on, the trains are to run mainly on the Vereina line in Prättigau and Engadine. On board: innovative fire protection solutions from WAGNER Rail!

Playing it cool: WAGNER fire protection

"As nice as the region is to look at, its geographical location calls for highly individualised fire protection solutions for the trains", says Stephan Bech Technical Director WAGNER Rail. In many places, the average temperature in winter falls below zero degrees Celsius – and it is constantly fluctuating. Therefore, the requirement was: even at -35°C and at altitudes of up to 1,800 m, fire protection must still function without restriction! Together with train manufacturer Stadler, WAGNER has developed a solution that not only withstands the harsh environmental conditions and gradients but is also space-saving.

The fire protection solution comprises several components: Smoke detectors reliably detect fires. In the passenger area, a fire is fought with water

The water mist module on the roof



Compact and built into a lightweight aluminium housing, the water mist module contains a tank with distilled water, a nitrogen cylinder and lots of cables and pipe lines. "The tank and pipe lines are even heated to ensure that the extinguishing water on the roof remains liquid even at sub-zero temperatures", reports Bech. This heating concept was decisive for the customer because, according to the specification, the module must achieve its full performance at outside temperatures from -35°C to $+40^{\circ}\text{C}$.

Thanks to the maintenance flap, all important pipes and fittings can be accessed quickly. The water tank can be refilled or the nitrogen cylinder can be quickly replaced on board the train. The module does not have to be removed for this.

mist – which also prevents the spread of toxic gases. The heart of the fire protection solution, the water mist module, is installed on the roof along the direction of travel in order to save space. "The module can withstand acceleration and has been adapted to

the aerodynamic profile of the train", explains Bech.

The finest sensor technology for every gradient

The water mist module has been precisely adapted to the extreme location. The biggest challenge in addition to the potentially icy temperatures: The lowest station in the area of operation is at 523 m above sea level and the highest at 1,814.7 m. Because of the sometimes very steep gradients, WAGNER has refined the sensors in the water tank: "When the vehicles go uphill and downhill a lot, the movement causes the water in the tank to shift. By means of intelligent sensors, we ensure that error messages about the level of extinguishing water are not generated even in the event of height differences", explains Bech. The result is a solution suitable for even the most extreme routes. In terms of fire protection, nothing more stands in the way of a safe and promising excursion through the Graubünden Alpine region! ■



Planned operation of separable multiple-unit trains

The procurement of the separable multiple-unit trains is the largest project in the history of the Rhaetian Railway and is intended to modernise the fleet. The trains will start in Landquart as 16-part trains (in quadruple traction), be split at Klosters Platz, and travel to St Moritz and Davos as eight-part trains. On the way back, they can be automatically reconnected from Klosters Platz onwards.

◀ Soon the new generation of Rhaetian Railway trains will be under way on routes like this one.

Effectively protected with smoke switches

In order to ensure maximum personal safety in rail traffic and to minimise the extent of any damage in the event of fire, the earliest possible fire detection is essential. Areas to be protected in trains can therefore be equipped with early fire detection systems and monitored automatically. WAGNER Rail offers customised solutions for this.

There are several options for fire detection on the tracks. Which solution is used depends on individual criteria. However, manufacturers of rail vehicles usually prefer solutions that are easy to install – because complex installations often also mean high investment costs.

“This calls for technically mature solutions that function reliably and offer an optimum cost-benefit ratio”, says Guido Conrad, Product Manager Rail of the WAGNER Group. “If you

are looking for appropriate solutions, you will find them at WAGNER Rail.”

Universal smoke switch for more safety in rail traffic

For example, the new optical smoke switch ensures greater safety in rail traffic – individual areas such as control cabinets, containers, toilets, and general passenger areas can be monitored. The sensors of the smoke detector meet all fire detection requirements and detect white and black smoke particles in the monitored area at an early stage. Special algorithms ensure that sensor signals are verified and deceptive signals are filtered out.

Smoke detection is based on the scattered light principle. The degree of contamination of the optical sensor is also monitored, partially compensated by the measured value tracking, and indicated via the integrated LED. “The smoke switch



THE ADVANTAGES AT A GLANCE



The optical smoke switch from WAGNER Rail

- 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 from WAGNER Rail

- 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)
- Reacts to rapid temperature increases independent of the initial temperature
- Comfort of use and safety thanks to automatic adaptation to fire parameters for smoke and temperature



” If you are looking for appropriate solutions, you will find them at WAGNER Rail.“

Guido Conrad,
Product Manager Rail of the WAGNER Group

from WAGNER Rail also displays alarm and fault signals separately”, explains Stephan Bech, Technical Director at WAGNER Rail. “In the event of an alarm, for example, the air conditioning system is immediately switched off and the extinguishing system is activated. In the event of a

malfunction, the train crew receives a message for further inspection and evaluation.”

Multi-sensor switches ensure optimum safety

The multi-sensor smoke switch is new at WAGNER Rail. The special feature of the multi-sensor: Depending on the situation, it can use two detection principles for fire detection. Like the optical smoke switch, the multi-sensor also detects smoke particles early on using the scattered light principle. It also reacts to temperature: If the temperature increases, the sensitivity of the smoke detection is also increased. If the temperature

increases by more than 20 Kelvin within five minutes, an alarm is automatically triggered. The multi-sensor smoke switch also uses special algorithms to ensure that sensor signals are verified and deceptive signals are filtered out. The sensor system is also monitored for contamination and compensated within a bandwidth.

“Because the multi-sensor features both optical and thermal fire detection, it is particularly resistant to false alarms”, explains Conrad. “It is recommended for use wherever particularly high safety standards are required, for example in sleeping cars and technical areas.” ■

Cost-effective aerosol extinguishing for diesel generators

Many regional trains are bimodal: they can be driven electrically as well as with diesel. For British rail traffic, line operator Abellio East Anglia has currently ordered 58 new trains from Stadler – 38 of which are bimodal. In an event of fire, the engine compartments of the PowerPacks are automatically

extinguished by fire protection solutions from WAGNER Rail. It is the first WAGNER project in which aerosol is used to protect diesel engines.

Aerosol extinguishing is an efficient and cost-effective chemical extinguishing process. If a linear heat sensor installed in the PowerPack registers unusually high temperatures, it automatically triggers the extinguishing process via the Rail 138 fire alarm control panel. Within a few seconds, a special

mixture emerges from the extinguishing container – this stops the chemical combustion reaction and physically cools the source of the fire. The big advantage of this: If a fire originates from the diesel generator, it is fought immediately on the spot. Weight and space are also saved because the train does not carry bulky extinguishing cylinders.

The 38 trains with PowerPacks will operate as regional trains north east of London to London. East Anglia is also expanding its fleet with 20 inter-city electric trains, including the highly frequented Stansted Express airport route. ■



Fire detection for Hungary's first double-deck coaches

Rush-hour. Commuters are packed tightly in the regional train. What is already familiar in many places is increasingly becoming a challenge on the busiest suburban routes around Budapest. In order to cope with the constantly increasing number of passengers, train operator MÁV-Start has ordered Stadler double-deck trains – the first in Hungary! WAGNER Rail is on board.

Six cars, a total length of 155.88 m, a width of 2.8 m, a height of 4.6 m, and room for 600 passengers: The KISS EMU double-deck train can hold around 50 percent more passengers than a single-deck vehicle, which is good news for commuters in the Budapest

area. But more passengers also mean more lives that need to be protected in an emergency. For the early detection of fires, Stadler therefore relies on WAGNER Rail's fire detection system, which features a safeguard against false alarms. In passenger and technical areas, multi-sensor switches and linear heat detectors will ensure reliable monitoring. The information is managed via the Rail 138 fire alarm control panel. The first ten of up to 40 trains are to relieve the highly frequented Budapest-Vác-Szob and Budapest-Cegléd-Szolnok suburban lines by 2020 at the latest. ■



▲ Commuters in Hungary will soon be able to enjoy more space in double-deck trains.



WAGNER on the new Siemens platform, Mireo

With its new Mireo train platform, Siemens has set the course for more sustainable regional transportation. Compared with trains of similar capacities, the Mireo consumes up to 25 percent less energy. WAGNER Rail will provide the appropriate fire protection.

The train manufacturer Siemens has been relying on the fire protection solutions from WAGNER for nearly ten years. Following the predecessor model Desiro, WAGNER now also equips the new Mireo platform with the TITANUS MICRO-SENS® air sampling smoke detectors. Low-noise and invisibly installed, they continuously take air samples from the passenger areas and analyse them precisely. Together with Siemens, WAGNER has again developed a project-specific system for fire detection that remains unnoticed by the passengers and does not disturb the appearance of the flexible interior.

The room layout of the train follows the concept of the “empty tube”: The entire area is available to passengers, and the interior can be reconfigured again and again without great effort,

thus adapting to the number of passengers.

Deutsche Bahn has commissioned 24 three-car units of the new articulated trains, which are to be used as regional trains on the route from Offenburg to Basel/Neuchâtel via Freiburg starting in 2020. Above all, with the new vehicles, the Deutsche Bahn will be more environmentally friendly than ever before. Thanks to lightweight construction, improved aerodynamics, intelligent on-board management, and more efficient components, resource consumption, emission values, and noise are reduced. Siemens also uses environmentally friendly materials so that – according to the manufacturer – up to 95 percent of the components can be recycled at the end of the train’s service life. The approximately ten million people who are expected to travel by train every day in 2030 will

be delighted! By using the Mireo, they will not only protect the environment but also escape traffic jams and the increasingly difficult search for a parking space. And: Not least because the best fire protection technology, they are also much safer than cars. ■



Travelling through the Rhineland in an environmentally friendly and flexible manner: The new Mireo train platform scores with a great deal of space as well as energy-efficient components.



On the tracks of history

Safely through the narrow Victorian subway system

It is one of the oldest subway systems in the world: for more than 120 years, the Glasgow Subway has been carrying commuters and tourists through Scotland's largest city. Soon fire protection solutions from WAGNER Rail – space-saving and prepared for the future – will also be driving through the historic tunnels!

December 1896: the first Subway carriages rolled along two traction cables and were driven by steam engines from a power station just below Glasgow's streets. Even then, the

extremely narrow platforms, low ceilings, and tunnels with a diameter of only 3.4 m made the subway system unique. The trains still travel on the narrow-gauge tracks with the unusual track width of 1,219 mm. However, lateral conductor rails have quickly replaced the traction cables. Since 1935, Glasgow Subway has exclusively been electrically powered.

New trains for driverless operation

The current operator, Strathclyde Partnership for Transport (SPT), is now looking to the future and plans eventually to move to Unattended



Many stations still look like this: ▶
Narrow tunnels and platforms are not uncommon in Glasgow.

row em

Train Operation (UTO). This project is part of an extensive modernisation effort. All of the 15 stations are being renovated with 11 out of the 15 now complete.

SPT has also ordered 17 new trains with four carriages from train manufacturer Stadler. The goal: maximising comfort where space is at a premium. 116 seats and 206 standing spaces as well as folding seats and space for wheelchairs are planned for a train that is only about 2 m wide and 2.7 m high because of the narrow structure gauge.

WAGNER protects when things get tight!

One thing in particular must not be underestimated in the narrow Victorian tunnels: that in the unlikely event of fire, smoke can spread incredibly quickly. Reliable and, above all, early fire detection is therefore indispensable. WAGNER Rail is therefore equipping the Stadler trains with one TITANUS MICRO-SENS® air sampling smoke detector per carriage. Minimal smoke development can be localized very early via sensitive sensors. In the event of smoke detection, the trains are able to run to the next

platform to ensure the safe exit of passengers.

But how “slim” can the fire detection system be so that the passenger area does not become even smaller? “It is not easy to install the 40 to 50 metres of hose system per air sampling smoke detector in such a small space”, reports Christoph Schubert, project manager of WAGNER Rail. “But our technology allows us to adapt perfectly to the difficult installation conditions”. In addition, a multi-sensor fire detector and an aerosol extinguishing system are installed in the train’s technical container. In the event of a fire, the extinguishing system is automatically activated and extinguishes a fire in the PowerConverter. If space is at a premium, WAGNER fire protection solutions ensure fast and precise detection and enable passengers to be evacuated quickly and safely. The historic Scottish Subway is thus optimally equipped for its way into a modern future. ■



GOOD TO KNOW!

After London (1863) and Budapest (May 1896), Glasgow’s Subway is the third oldest in the world. It is a two circles route running completely in the tunnel and has never been extended.

Two trains run along the 10.5 km route: one on the outer ring and the other in the opposite direction on the inner ring. The Subway transports up to 40,000 passengers daily.

Experience WAGNER Rail
fire protection solutions live!

Get in touch with us – we
look forward to hearing from you!

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