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## Trackguard Retarder TKG

Piston retarders and gradient compensation retarders for train formation yards



## Trackguard Retarder TKG piston retarder

Efficient speed control in train formation yards

Piston retarders are primarily used in speed control systems on classification tracks for deceleration and coasting runs. Their level of effectiveness can be set depending on the speed involved.

Trackguard Retarder TKG piston retarders control themselves by means of a hydraulic valve system in the damper and do not need to be supplied with power. The hydraulic damper is the active retarding element and is based on a speed-dependent valve system. Hydraulic dampers can be permanently set to different response speeds and damper forces.

#### **Operating principle**

When a car traverses the retarder, the wheel flange presses against the piston tube and thus forces down the piston rod of the damper. The speed-dependent valve system in the damper then decides whether the car continues to roll retarded or unretarded.

If the traversal speed of the car is greater than the response speed of the retarding element damper, the valve system extracts energy from the car at the level of the retarding energy and causes the car to be retarded. This is referred to as the "load stroke". If the traversal speed of the car is lower than the response speed, this is the "idle stroke". The valve system extracts only minimum energy from the car at the level of idle energy, causing no retarding. The level of retarding energy generated by different damper types depends on the actuation speed and is also virtually independent of the damper temperature.



#### **Technical features of piston retarders**

#### Dimensioning

The piston retarders used are dimensioned on the basis of each track's height and dimensioning is confirmed during humping simulation.

#### Installation conditions

Trackguard Retarder TKG piston retarders can be used in combination with all rail profiles, rail fastening accessories and sleeper types. They are not subject to any restrictions with regard to distances between track centers, curves and gradients. Piston retarders are installed in the same way, irrespective of whether rails are worn or new. They are fitted by drilling appropriate holes in the rail web or by adjusting the retarding elements to the installation conditions up to a wear level of 7 mm.

### Weather conditions and ambient temperature

The retarding elements function constantly at the weather conditions prevailing in Central Europe. The ambient temperature range extends from -25 °C to +40 °C.

#### Water protection

The guide cylinder of a Trackguard Retarder TKG piston retarder surrounds the damper at its lower end like a pot. It is designed as an oil drip pan which safely collects any oil which might escape in the event of damage.

#### Operation, maintenance and inspection

No special tools are required for operation, maintenance and inspection. In the majority of cases, trackside maintenance and inspection work can be performed by one person without having to connect up to a power supply. A grease gun is required for greasing the retarding elements.



# Trackguard Retarder TKG gradient compensation retarder

The innovative element for the automation of train formation yards

Gradient compensation retarders are used to retard cars, primarily in train formation yards. More or less considerable gradients entail the operation of gradient compensation retarders so that moving cars do not accelerate excessively. Trackguard Retarder TKG Gradient compensation retarders can be actively or inactively positioned at any time, without interrupting operations. In the inactive position, the gage is not infringed and a car can run along the track unobstructed. This prevents bad runners being retarded prematurely and thus impeding any further shunting. Furthermore, the noise emitted when a train leaves the retarding zone is considerably reduced and trains can be moved out faster.

#### **Operating principle**

Gradient compensation retarders comprise up to 24 piston retarders and a device for lowering the piston tubes. A lowering device causes the gradient compensation retarder to move into an active or inactive position. It is driven by an electric gear motor installed outside the track and by electric position detection sensors. If requested, the gradient compensation retarder can also be driven pneumatically.

#### Control

Control of the Trackguard Retarder TKG gradient compensation retarder is an integral part of humping and can be activated or deactivated at any time, irrespective of whether humping operations take place during retarding or whether cuts run in, run out or run through. Two-way traffic is permitted as well as the oscillation of cuts within gradient compensation retarders. The "retarding position" and "locomotive driving position" functions are stable positions which are monitored and indicated by a position detector.

#### Dimensioning

Like the piston retarder, the gradient compensation retarder is dimensioned on the basis of the height of each track and this is confirmed during humping simulation.



- The retarding system and the lowering device are functionally separate from each other.
- As with piston retarders, the lowering device can be simply installed by being bolted to the rail web without modifying or adjusting the superstructure.
- The electric gear motor with position detection sensors as a drive unit is located outside the track.

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#### Locomotive driving position

Cars are not retarded in the locomotive driving position. In line with UIC 505.4, the piston retarders are lowered to 55 mm above the top of the rail and thus do not come into contact with the wheels and other parts of rail vehicles.





#### Retarding position

In line with UIC 505.4, piston retarders in their retarding position have an engagement height of 80 mm above the top of the rail. Only idle energy is encountered below the response speed and is less than 3% of the nominal energy. The retarding ability on which dimensioning is based is achieved above the response speed.



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