Reliable and economical track vacancy detection

Clearguard ZP D 43 Electronic Wheel Detection Equipment

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Track Vacancy Detection

Siemens has the right solution whatever your needs. With trend-setting technology and specific know-how, we are world leaders in the field of signaling systems for railways. Over 200 rail operators from more than 50 countries have come to trust our signaling and safety products.

The electronic axle counting systems from Siemens make an important contribution to efficient rail transport. They supply reliable information about the state of the track vacancy detection sections. The Clearguard ZP D 43 electronic wheel detection equipment serves as a component of axle counting systems for train operators in mass transit and mainline services, as well as private and industrial railways.

It meets the stringent requirements of many rail operators with respect to reliability and cost-effectiveness.

Efficiency in the rail services
The ZP D 43 electronic wheel detection equipment makes a major contribution to the operational efficiency of the rail services. Wheel detection equipment (WDE) is characterized by low life-cycle costs:

- Long service life
- Low fault liability
- Low-costs associated with stocking spare parts
- Flexible application options in a broad speed range

Application and mode of operation of the Clearguard ZP D 43
The Clearguard ZP D 43 is the wheel detection component in track vacancy detection systems using the axle counting method.

The Clearguard ZP D 43 uses an electromagnetic wheel detection method with a generator frequency of 43 kHz. When a wheel enters the detection zone of the double wheel detector, it changes the strength of the alternating electromagnetic field thereby generating signal pulses. These pulses are evaluated in the counting head. This information translated to number of axles is transmitted to the Clearguard ACM 200.

Components of the Clearguard ZP D 43
The Clearguard ZP D 43 consists of a DEK 43 double wheel detector with the associated connecting cables and a trackside connection box. Two or more Clearguard ZP D 43 units establish a track vacancy detection section.

DEK 43 double wheel detector
Each DEK 43 double wheel detector consists of a transmitter section and a receiver section. The transmitters and receivers respectively of the two detectors are accommodated each in a single common housing. The transmitter housing is located on the outer side and the receiver housing on the gauge side of the rail.

Trackside connection box
The trackside connection box of the Clearguard ZP D 43 consists of a base plate and cover made of either aluminum or plastic.

Module for external power supply
The Clearguard ZP D 43 can be powered from an external AC or DC supply for long distances between the evaluation computer and wheel detection equipment greater than 6.5 km.
Technical Data

**Traversal speed**
for wheel diameters \( \geq 865 \text{ mm} \) \( \quad 450 \text{ km/h} \)

**Operating conditions**
- Operating distance between wheel detection equipment and evaluation computer
  - standard \( \leq 6.5 \text{ km} \)
  - external supply \( > 6.5 \text{ km} \)

**Cable type**
telecommunications cable, star-quad, or twisted pair cable

**Ties**
wood, steel, concrete

**Ballast resistance**
0 Ω to \( \infty \) Ω

**Rail profiles**
example R65, RE100, RE100 S49, S54, UIC 60

**Wheel diameter**
\( \geq 300 \text{ mm} \)

**Wheel width**
\( \geq 115 \text{ mm} \)

**Wheelbase**
\( \geq 600 \text{ mm} \)

**Wheel material**
steel or cast iron

**Distance between double wheel detector and trackside connection box**
\( \leq 4.2 \text{ m} \)
\( \leq 9 \text{ m} \) or
\( \leq 14.2 \text{ m} \)

**Deflector**

**Ambient temperature range**
\(-40 \degree \text{ C} \) to \(+80 \degree \text{ C} \)

**Protection against ingress of foreign bodies and water in accordance with EN 60529**

**Electrical data**
- Operating frequency
  \( 43 \text{ kHz} \)
- Signal transmission
  Combined frequency and amplitude modulation
- Supply voltage
  - at wheel detection equipment
    DC \( 40 \text{ V}_{\text{rms}} \) to DC \( 72 \text{ V}_{\text{rms}} \)
  - optional at WDE
    AC \( 30 \text{ V}_{\text{rms}} \) to AC \( 50 \text{ V}_{\text{rms}} \)
- Standoff voltage
  (double wheel detector to rail)
  10 kV DC
- Output impedance
  150 Ω
- Power consumption
  approx. 2.5 W

**Mechanical data**
- Dimensions, trackside connection box
  360 x 360 x 160 mm

**Standards**
- Low-voltage switchgear and control gear assemblies
  Part 1: Type-tested and partially type-tested assemblies
  **EN 60439-1** (04/04)
- Electromagnetic compatibility (EMC)
  Part 6–2: Generic standards – Immunity for industrial environments
  **EN 61000-6-2** (08/05)
- Electromagnetic compatibility (EMC)
  Part 6–4: Generic standards – Emission standard for industrial environments
  **EN 61000-6-4** (01/07)
- Electromagnetic compatibility (EMC)
  Part 4: Emission and immunity of the signalling and telecommunications apparatus
  **EN 50121-4** (07/06)