

TECHINFO

The LEITNER Line





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No other component of a ropeway is influenced by topographical conditions as much as the routing of the line. That is why it is crucial to develop a product that is adaptable in every respect, so that the limits of what can be achieved are defined not by the terrain but by normative provisions. Passengers are looking for maximum ride comfort and safety. Operators demand absolute reliability and maximum availability, not to mention easy maintenance of components. LEITNER has been solving these challenges in its development work for decades, which has placed it ahead of its time in many respects, such as rotation limitation at roller batteries. All of the components of a LEITNER line, such as standard round tube towers, roller batteries, maintenance platforms, support superstructures such as crossbars, and superstructures for lifting the rope are designed, certified, produced, assembled, and operated by LEITNER in compliance with the latest trans-European CEN standards. LEITNER towers are always equipped with access ladders, fall arrestors, spacious maintenance platforms, and superstructures for lifting the rope from the roller batteries. High towers have rest platforms on the way up.

Leitner Towers	04
Leitner Special Towers	06
Leitner Roller Batteries	08
The LEITNER CPS	10

LEITNER Towers

Custom project planning, optimum line profile

The LEITNER tower system is based on full variability and adaptability combined with maximum safety and quick build times.

LEITNER towers are of a central round tube design with solid walls. Each tower consists of an assembly of steel tubes of different lengths, diameters, and wall thicknesses. Transitions between the diameters are made using conical elements. Each tube and conical element is joined by welding. A tower may be divided into separate shafts depending on its weight and length, then assembled on site using flange connections to form the overall tower. All of a LEITNER tower's components are hot-dip galvanized, which guarantees lifelong corrosion protection. The tower shafts can also be painted in a RAL finish if required by the authorities. As well as planning the towers themselves, LEITNER can also take care of the complete planning of their foundations, from design to construction drawings.

BENEFITS Each tower on a LEITNER line is individually planned, designed, and produced according to the topographical and mechanical requirements. There is scope for choice in the composition of the different tube diameters and wall thicknesses, and the division of the tower into separate shafts. The height of each tower is produced to centimeter accuracy, which guarantees maximum flexibility, and the ideal topographical line can always be achieved without adjusting the foundation overhang. The use of standard tubes guarantees short production and replacement times.

TECHNICAL SPECIFICATIONS

- + Maximum tower height 30 m
- + Maximum length/shaft depending on transport conditions and assembly factors, standard length approx. 12 m
- + Maximum weight/shaft depending on transport conditions and assembly factors, standard weight approx. 3000 kg
- + Wall thickness between 8 and 16 mm
- + Surface finish hot-dip galvanizing, and painting in choice of RAL colors if required



LEITNER Special Towers

Reach new heights with standard components

Towers over 30 meters high are built by LEITNER as special central towers, two- or four-legged towers, or lattice towers. The uppermost shaft of all of these types can be designed as a Y-piece.

The two-/four-legged tower is divided into two tube sections by an intermediate section below the uppermost tower shaft. If required on account of structural considerations and tower height, a two-leg structure can be divided into a four-leg structure by means of additional intermediate sections. Standard round tube tower components are used throughout (tubes, conical transitions, flange connections), with the exception of the intermediate sections. The various elements are always divided up in a way that facilitates easy transport and assembly. In the case of the Y-tower, a Y-piece is placed on top of the uppermost tower shaft, dividing the tower into two heads. Again, the head section of a Y-tower consists of standard round tube components. Special central towers can be built with ladder access inside the shaft as an option. In the case of a lattice tower, the uppermost tower component is identical to that of a standard tubular tower and is connected to the lattice substructure by means of a flange joint. All of our towers are hot-dip galvanized or can be painted in a RAL color of your choice.

BENEFITS Different tube diameters, wall thicknesses, and divisions can be combined to suit the special tower's structural engineering requirements. Standard components are used for the round tube supports, guaranteeing short production and replacement times. Because of this, a special tower only takes slightly longer to assemble than a standard round tube tower. The special central tower with a Y-head can be built very high, but it requires only a small footprint, so it is ideally suited to urban use.

TECHNICAL SPECIFICATIONS

- + Maximum tower height approx. 65 m for two-/four-leg and special central tower, and even higher with lattice supports
- + Maximum length per shaft (round tube) depending on transport and assembly factors, standard length approx. 12 m
- + Maximum weight per shaft (round tube) depending on transport and assembly factors, standard weight approx. 3000 kg
- + Wall thicknesses between 6 and 25 mm, variable with conical shaft depending on structural engineering requirements



LEITNER Roller Batteries

Pioneering designs for many years

Safety is not a matter of compromise. LEITNER's roller batteries have for many years had design features that were only definitively required by changes to European ropeway legislation in 2004.

The outer flange and main body of each roller are made of a single piece of cast aluminum, which virtually eliminates the possibility of the roller flange failing completely. The roller insert consists of a one-piece rubber ring whose compound is subject to minimal flexing, thus minimizing friction losses. Roller flange projection and groove depth are designed to match LEITNER grips, which guarantees maximum derailment protection. The rope catchers on the outside of the battery are designed to handle passage over a derailed grip, while the rope guides on the inside of the battery prevent the rope from moving towards the inside of the line. Since 1993, LEITNER roller batteries have been equipped with rotation limiting devices, which ensure that grips can be passed even if a roller is lost or a rope derails. The last rope rocker on each grip is designed in such a way that, in conjunction with the breaking rods, rope derailment is reliably detected, even if the rope catcher has been missed.

BENEFITS High roller flange projection and maximum possible groove depth provide the utmost protection against derailment. Roller batteries can be adjusted biaxially, which is ideal for setting up the roller battery along the rope axis. LEITNER roller batteries operate with high roller pressures, which allows a reduction in the number of rollers and therefore less maintenance and less outlay for spare parts. The rubber compound used in LEITNER rope rollers is subject to minimal flex, which significantly reduces the power required of the ropeway's drive system.

TECHNICAL SPECIFICATIONS

- + Number of rollers: Compression roller battery with 8, 10, 12 and 16 rollers Supporting roller battery with 4, 6, 8, 10 and 12 rollers Mixed roller battery with +/- 4 rollers und +/- 8 rollers
- + max. roller pressures: Compression roller battery 6 kN Supporting roller battery 10 kN
- + Monitoring device: Fracture rods for rope derailment and rip wire for rope cuts Optional: CPS Cable Position Supervision
- + Compression rollers: D420
- + Support rollers: D420, D460 and D550
- + Load change: D550/420 and D460/420 or D420/420



The LEITNER CPS

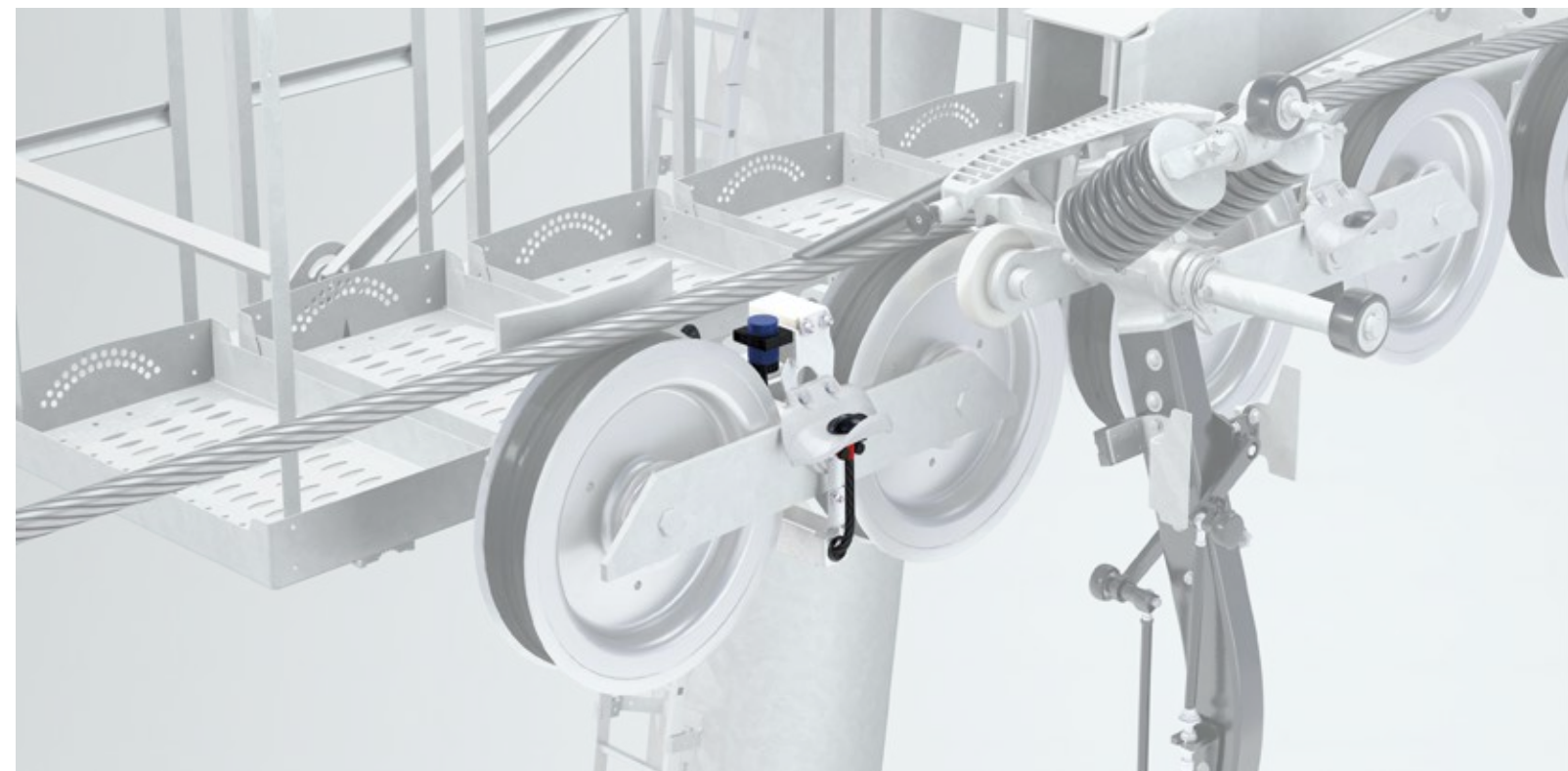
Maximum safety and availability

The new CPS (Cable Position Supervision) system is a further development of the proximity switches used by LEITNER for cable position monitoring in North America for many years.

The CPS consists of a central evaluation unit in the drive station and inductive proximity sensors on the towers. Only two sensors are used on each roller battery; they are attached to its first and last twin rockers. The sensors detect if the rope is in the wrong position and report it to the evaluation unit. The main control system then immediately initiates the appropriate safety action (slow down or stop), depending on the condition of the rope. The evaluation unit and proximity sensors are networked via an ultra-modern safety bus system. Stop buttons on the towers and the fracture rods can also be connected to the bus system. Power is supplied to the towers via an additional supply cable.

BENEFITS The CPS can also be used on compression towers. The full range of monitoring functions can be used if additional pressure rollers are installed. The LEITNER CPS guarantees the highest level of rope position safety and system availability, because as soon as the rope leaves its groove, it is detected. The safety bus system reduces cabling work to a minimum. The safety bus also detects faults at each individual sensor, enables selective bypassing of any sensor, and thus reduces replacement work to a minimum. The CPS can be installed purely as an additional system without a safety function, or integrated as a redundant system into the ropeway's safety circuit.

- TECHNICAL SPECIFICATIONS**
- + Voltage supply:
 - 230V AC for central evaluation unit
 - 120V DC for the equipment on the towers
 - + Signal transmission: Safety bus / diagnostic bus
 - + Monitoring functions:
 - Rope course level 1 Action: Slow down
 - Rope course level 2 Action: Stop
 - Rope too close to sensor Action: Stop
 - + Electrical class:
 - AK4 (fail-safe) for monitoring rope course level 2
 - AK2 for monitoring rope course level 1 and rope too close to sensor



LEITNER®

LEITNER AG

I-39049 Sterzing

Tel. +39 0472 722 111

info@leitner.com

www.leitner.com