

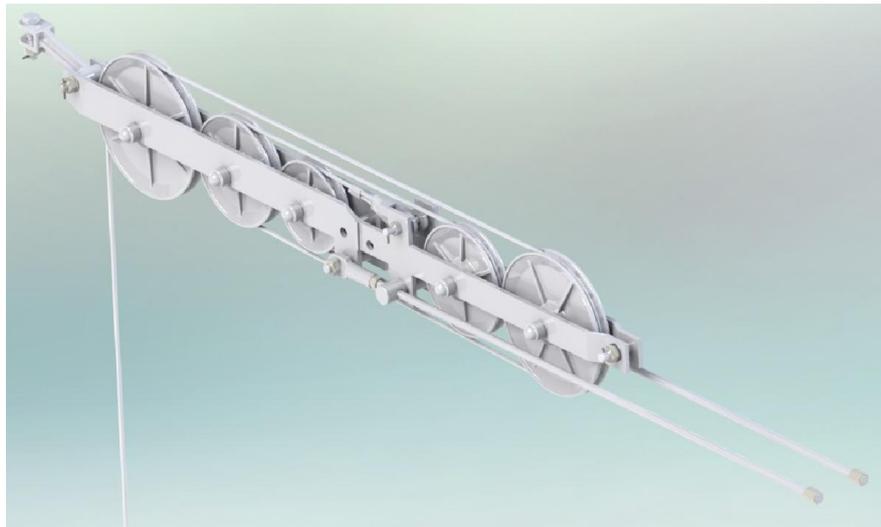


CARIBONI TENSION DEVICE

ALSTOM

TENSION DEVICE WITH SAFETY SYSTEM

TENSION DEVICE



Global description:

This tension device is a system that allows to keep the catenary line with a constant tension independently of the temperature variation.

It is made by 5 aligned aluminium pulleys with double safety system:

- 2 rods to stop the device in the case of cutting of the steel wire keep the counterweight.
- 1 special device that stops the fall of the counterweight in case of breaking of the conductor (contact wire or messenger wire).

The system with 5 pulleys allows to multiply by five the weight of the counterweight, for instance if it's necessary to have a tension of counterweights of 1200daN it's necessary to apply counterweight for 240daN.

Safety device description:

This tension device is equipped with double safety system, one that works in case of cutting of the cable that keep the counterweight and one that works in case of breaking of the conductor.

TENSION DEVICE WITH SAFETY SYSTEM

Anti contact wire fall safety system:

It's made by 2 steel rods assembled parallel to the tension device; in case of cutting of the cable that keep the counterweight the tension device will open completely till the nuts mounted at the end of the rods. The line will remain without tension but no damage appear on the cantilevers and the other system on the catenary.

To restart the line it's necessary to change the cable of the tension device and apply the counterweight.



Counterweight safety system:

It's made by a special device connected to a steel wire assembled parallel to the mast. In case of braking of a conductor (generally contact wire) the counterweight are free to fall down. This system stops the falling of the counterweights avoiding damage to the mast and foundation.

If this case appear it's necessary to substitute the safety device and the steel wire for the restart of the line.



Conclusion:

This system tension device adds the advantage of the standard aligned pulley tension device so height efficiency, easy assembly, 1:5 ratio, with the safety of other system so safety device anti-line falling and anti-counterweight falling.

Cariboni is a well-established European company, leader in the design, development and production of materials for railways and light rail. This entity was founded in 1908 and joined the Alstom Group in 2008.

It has an extensive global experience in designing, manufacturing and installing a wide range of catenary products and components, using historic knowledge acquired in Europe and leveraging of global innovation capability and experience.

The company benefits from certifications by AFNOR: ISO 9001, ISO 14001 and OHSAS 18001, regarding the design and manufacturing of bus bars, accessories for LV-MV-HV electrical lines, components and systems for electrification, traction, and low-voltage protection and control

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