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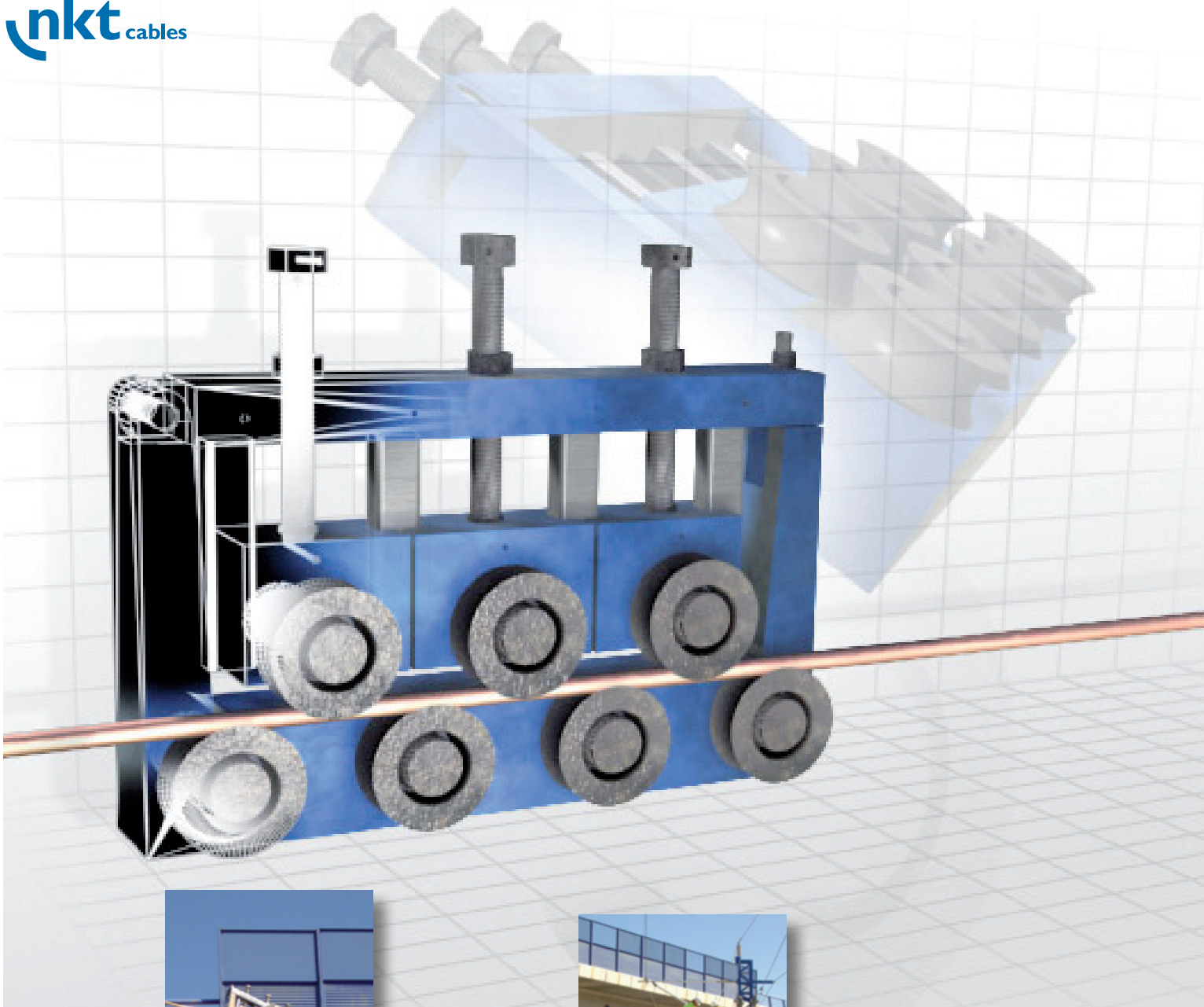
Levelling Device for installation of High Speed Contact Wires

RRG07

A development of **SIEMENS** and **nkt cables**



Completing the picture



When installing catenary systems, the straight and level installation is of extreme importance. In order to avoid sparking due to loss of contact of the pantograph, the tolerances in the horizontal have to be kept extremely low. This is extremely important for high speed lines and speeds above 200 km/h. For these applications the required tolerances for deviations from the horizontal are normally $\leq 0.1\text{mm}$. One of the methods to meet these

requirements is the use of exactly monitored brakes for the drums for the control of the installation tension. The higher the tensile strength of the contact wire material the higher is the required tension for the straightening of the contact wire during installation.

When using contact wires with very high tensile strength, such as copper-magnesium or coppertin alloys, the

exact monitoring of the braking tension of the drums becomes even more important for the quality of the catenary system. For these contact wires the "Window" for the tension to install the contact wire level and the tension that leads to the elongation of the contact wire or undesired drawing of the contact wire into the lower layers of the drums is very small.

The new nkt cables levelling device

Scope of Application and Installation

Advantages

Following up on the idea to ensure the level installation of the contact wire not only by monitoring the braking tension but by additionally using a mechanical levelling device, **nkt cables** in cooperation with Siemens TS EL – has developed the levelling device RRG07.

Construction and Function

The levelling device has seven stainless steel rolls that are arranged in two levels above each other. The axles of the rolls can be adjusted with very high accuracy; i.e. a contact wire running through the exactly adjusted roll system will be straightened out completely, even when the applied tension is low. This allows extreme straightness for all types of contact wire while applying tensions that are much lower than normally used during installation.

The levelling device can be used for the installation of all types of contact wires. In coordination with the user **nkt cables** offers a device for fixed installation on all installation vehicles. Due to the highly sophisticated construction of the levelling device, no extensive training for the installation personnel is necessary.

The device can be used for all kinds of curves and does not influence the height of the installation vehicle.

The patented levelling device offers a great number of economical and qualitative advantages for its users due to the simple handling and its mature construction:

- ▶▶ the straightness of the contact wire is achieved nearly independently from the applied tension (Drum brake) and the speed of the installation vehicle
- ▶▶ the installation speed can be increased
- ▶▶ avoidance of elongation
- ▶▶ avoidance of drawing the contact wire into the lower drum layers
- ▶▶ avoidance of expensive and complicated levelling after installation
- ▶▶ avoidance of damage of the contact wire surface
- ▶▶ can be used for alloys to be developed in the future without new construction
- ▶▶ precise installation can be reached with low additional effort

nkt-new product development: CuMg contact wire with improved properties

cross section 120mm ² (example)		CuMg0,5		CuMg0,2	
		standard	new	standard	new
Tensile strength ²⁾	[N/mm ²]	≥ 490	≥ 490	≥ 430	≥ 450
Breaking strength ¹⁾	[kN]	≥ 57,0	≥ 57,6	≥ 50,1	≥ 52,9
Conductivity	[m/Ohm* mm ²]	≥ 36,0	≥ 40,6	≥ 44,6	≥ 46,4
	% IACS	≥ 62	≥ 70	≥ 77	≥ 80
Use of levelling device	RRG07 during installation	no	yes	no	recommended
Micro waves after installation	mm amplitude	≤ 0,1	≤ 0,1	≤ 0,1	≤ 0,1

1) Calculated on minimal cross section of 98% (EN 50149 : 97%)

2) Other Tensile strength on request

The advantages of using the levelling device can be shown especially when installing high-strength contact wires which are normally used for high speed lines. With the exactly straightened contact wires the quality of the current transmission via the pantograph is improved and danger that can arise by the very high speed is minimised. The use of the levelling device RRG07 also increases the life cycle of pantographs and catenary systems.

The construction

The levelling device is made of high quality stainless steel and does not need maintenance. The device is delivered with an application manual and can be installed by the user according to the instructions given or by **nkt cables** installation team using prefabricated or adjusted fixing devices. Before using the Leveling Device RRG07 a licence agreement is necessary.

