

## Permanently lubricated contacts with silver iodide coating A patented solution for reducing mechanical wear

We are now introducing silver iodide coating on the change-over selector contacts for tap selectors III and F, used in the (V)UC tap-changers. The silver iodide (AgI) is patented by ABB and functions as permanent lubrication and thereby significantly reduces mechanical wear on the contacts.



### Background

Change-over selector contacts can be in the same position for extended periods, and with the low contact forces that are required in tap-changers to ensure compliance with the high requirements for mechanical service life, the contact is not stable unless materials with high electrical conductivity and corrosive resistance are used, such as silver.

Friction between solid silver and silver-plated copper is at least three times greater than between solid silver and copper, and sometimes even higher. This increases both wear on the silver layer as well as the torque required for operating the tap-changer. With high rated currents and silver necessary on both contact surfaces, there are two ways of dealing with the high friction that occurs:

- Increasing the hardness of the silver coating by adding antimony, for example. This hardens the surface of the silver and thereby reduces friction. The drawback is that the resistance increases.
- The other option is silver iodide, which provides low contact resistance and low friction, and thereby high resistance to mechanical wear, making the tap selectors truly maintenance-free.

### Silver iodide

Silver iodide can be produced with electrolysis or an ultrasound process. ABB uses an ultrasound process developed in collaboration between Uppsala University in Sweden and ABB Corporate Research.

The silver iodide initially has relatively high resistance that is reduced after a small number of operations. The maximum allowed resistance is stated in the internal test instructions and the pre-selector is operated at least 50 times in each direction in the routine test, followed by resistance measurements to ensure low resistance when the tap-changer is delivered from the factory.

Silver iodide coating makes the contacts dark grey. The lubricating properties remain even though all visible silver iodide is removed from the surface that the moving contact passes. This has been verified in mechanical endurance tests with 2,000,000 operations.

# Contact us

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