



Electrical drive of alternative current on system of current-parametrical asynchronous valve cascade

It is intended for reconstruction of lifting systems, trunk conveyors and other mining equipment, which demand the smooth starting and speed regulating according to the technology. The electrical drive can be applied in other branches of industries as well.

System of current-parametrical asynchronous-valve cascade (CPAVC) varies with its novelty and is designed by Donbass State Technical University conjointly with Electrodynamics Institute of Ukraine Academy of Science. Its main difference from the traditional schemes is its higher reliability, which is the main factor at reconstruction of mining equipment.

High reliability of electrical drive with CPAVC is provided due to the operation of driven electric engine in the regime of double power supply when stator is supplied from regulated voltage source, and the rotor – from non-regulated current source. Because of existing the current source in the rotor's circle the stubborn mechanical electric drive characteristics is formed automatically defending both mechanical equipment and electric engine from overload.

In electrical drive the starting electro-magnetic moment is stabilized using the parametrical method (without feedbacks and optimization regulators), which helps to obtain absolutely equally speed-up dynamics and positive influence to service life, for example of cables, gears in reducers, conveyor belts and other mechanical equipment. Fig 1 shows the oscillograms of current of rotor's phase and speed of electrical engine of mining lifting unit at starting moment using the CPAVC system. For comparison fig. 2 shows the same oscillograms but at starting moment using the relay-contactor scheme, which is now being used in 80% of mining lifting units.

In electrical drive with CPAVC system similar to traditional type of AVC the saving of electrical power is provided. Regulative properties of electric drive can be compared with the direct-current drive.

Russian-Ukrainian corporation "Triol" plans to open up the serial output of converters for the electrical drives with CPAVC.

Oscillograms of current and rotary speed of mining lifting engine

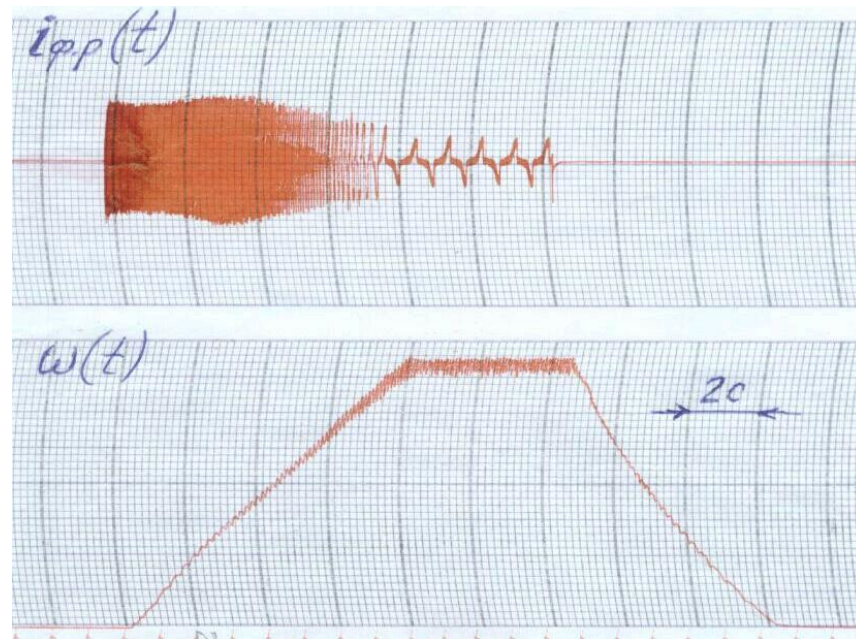


Fig.1 – Starting and breaking by stopway of electrical drive with CPAVC

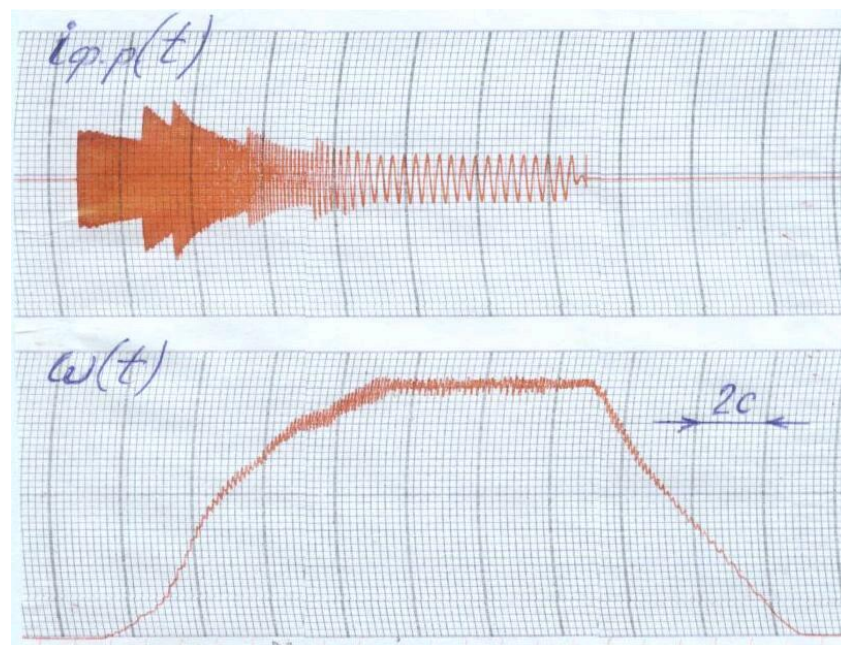


Fig.2 – Starting and breaking by stopway of electrical drive with relay-contactor scheme in rotor's circuit