Reliable operation of controlled electrical drives is one of the standard requirements set as a part of tender conditions and they must be met when designing technological systems in mining industry. Elements of power electronics play a crucial role in controlled electrical drives. In this paper reliability calculations, of one controlled drive with frequency converter and high-power cage induction motor, are shown. This setup is part of the multi-motor conveyor belt station in open-pit coal mine. Available data on reliability of individual components, automation, power electronics and mechanics have been provided by manufacturer or defined by appropriate standards. Possibilities for optimizing the reliability of one single drive have been analyzed depending on frequency converter and drive load.