Drives system solution for open-pit mining
Application for ABB Industrial Drive ACS880

Drive application based on the Industrial Drive ACS880 multidrive specifically for the extreme environmental conditions in the discontinuous open-pit mining technology, with high mechanically robust design and high availability.

System solution for toughest conditions in open-pit mining
Our mining specialists developed and tested this system solution based on a model as well as wide-ranging simulations. It corresponds with the applicable standards and the exact specifications of the manufacturers of open-pit mining products with regard to shock and vibration load.

Advantages for you
• Suitable for tough operating conditions in open-pit mining
• Mechanically robust design, for example, by integrating support plates, reinforced bottom plates and bracing profiles
• Designed for a maximum of:
  1 g vibration load and 5 g shock load
• Modified ABB system solution based on ACS880 multidrive modules
• Easy installation: The system is preinstalled and is welded to the ground
• IGBT power semiconductor with improved thermic interface and sealing against dust

• System is tested based on applicable standards in operation
• Customer-specific set-up versions
• Reference systems in numerous mines world-wide
• Comprehensive application service:
  - Drives system analysis, dimensioning of drives
  - Development of application-specific software
  - Power network surveys and harmonic analysis
  - Commissioning and service
Technical Data

Modifications to the drives system
• Mounted on a stable basic frame
• Integrated support plates for mounting on the basic frame
• Additional profiles for module fixation
• Reinforced bottom plates
• Use of different bracing profiles
• Secured screw connections
• Stronger bolts for module mounting
• Additional door hinges
• Modified hoisting equipment
• Back-to-back installation
• DC busbar connection

Testing, specification and standards
• Vibrations: 5 m/s² (0.5 g), 4…11 Hz
7 m/s² (0.7 g), 13.4…50 Hz
10 m/s² (1 g), 51…100 Hz
• Shock: 50 m/s² (5 g), 16 ms

The facility was tested and modified in compliance with the following standards:
• IEC 68-2-6 – environmental tests (vibrations, sinus form)
• IEC 68-2-27 – environmental test (shocks)
• German Lloyd
• US Military Standard 167-1 – vibration test Marine

Test on shaking table and simulation
Test subject: ACS800 multidrive, ISU 2xR8i /LCL
Shaking table: 300 kN (IABG)
Simulation: ACS880 multidrive

Model-based development
The range of requirements for the vibration and shock tests was determined based on analysis of the applicable standards and specifications of the manufacturers of open-pit mining products. As a result, the following procedures were carried out:
• Creation of a model system for the simulation of a test subject
• Calculation of forces and ways in all three geometric axes
• Reinforcement and modification of the cubicle system in 35 individual measures
• Renewed model calculations for examining the increase in strength
• Specification of the modifications for the production of the test subject
• Execution of the application according to the test results