



FLANDERS

FREEDOM® for Haul Trucks

INNOVATIVE HAUL TRUCK CONTROL SYSTEMS AND CLASS LEADING DECARBONIZATION TECHNOLOGY

Upgrade your existing fleet to state-of-the-art performance and emission reduction

Revitalize your current haul truck fleet with our advanced FREEDOM control systems, drives and FLANDERS traction motors. These systems combine class leading performance with OEM and power source agnostic emission reduction technologies.

Results you can achieve with FLANDERS FREEDOM technology upgrades

INCREASE ENGINE LIFE AND PRODUCTIVITY

FLANDERS battery hybrid systems increase the time between engine rebuilds and provide faster uphill/downhill speeds



UP TO 30% FUEL SAVINGS

With upgrades to FREEDOM battery hybrid drive systems.



SOPHISTICATED DATA ANALYSIS

All the truck operation data stored for you, owned by you, and cloud accessible.



Specialized services for haul trucks

- OEM and power source agnostic drive system upgrades
- Battery hybrid systems for mechanical and diesel-electric trucks
- DC to AC haul truck conversions
- 24/7 emergency field services
- New technology engineering
- Custom manufacturing of blower and traction motors, drives, rectifiers, and alternators
- Motor and alternator repairs and overhauls
- Onsite motor reconditioning, rewinds, cryogenic cleaning, and laser alignment
- Machine audits and failure forensics
- Preventative maintenance
- Rapid motor exchanges
- Grid blower, cabinets repairs and modifications

FREEDOM control systems

Bring your fleet into the 21st century with our open-architecture, power source, and OEM agnostic FREEDOM for HAUL TRUCKS control systems

Increase traction control

All-wheel speed sensing and an AC controller limits traction slip, mimicking ABS in a standard automobile and keeping the truck on a straight path.

Implement advanced HMI and eliminate "the black box"

See all the inner workings of truck operation in real-time and historically with a 24/7 running data recorder for all controlled truck signals.

Monitor bearings and windings

FREEDOM tracks vibration and temperature trends to show you when traction motors will need predictive maintenance to ensure safety and performance.

FREEDOM power systems

Gain higher performance and power source agnostic decarbonization technology across your fleet.

Fuel Savings

FREEDOM is designed to grow with you along your decarbonization journey. Add batteries, fuel cells, trolley, idle management, and smaller engines when you are ready.

Mechanical Trucks

FREEDOM hybrid systems can add decarbonization and performance gains to mechanical trucks.

OEM Agnostic

FREEDOM cabinets can be added to your entire mixed fleet from diesel-electric to mechanical with the same set of base components. This simplifies training, maintenance, and spare parts.

GRID BLOWER MOTORS

Better thermal management

Our high-power, variable-speed AC grid blower motor adjusts for true resistor cooling demands, significantly reducing noise on the truck deck and throughout the mine. Vertically positioned elements extend the life of the grid resistor by preventing accumulation of contaminants to reduce mechanical deterioration.

Have us transform your haul trucks into faster lower emission machines.





FLANDERS

FREEDOM[®]

dCarbonize - dDollarize™

Haul Trucks



Gain up to 30% fuel savings and increase performance

An open-architecture controls platform for implementing state-of-the-art technologies.

Decarbonization, Fuel Savings, and Performance Increases

With the FREEDOM upgrade, a mining duty power module and control system are installed on the existing truck. This extends the supported life of the truck and allows for advanced decarbonization options.

Add a battery to the existing engine, replace the engine with a fuel cell or full batteries, or install a trolley system. The FREEDOM upgrade is modular. The base system can be extended to support any combination of power sources.

Liquid cooling reduces dust exposure, weight, and drive system size. The drive is designed to be robust and easy to maintain.

Mechanical trucks can be upgraded with the complementary hybrid system. This consists of the modular drive system, battery, and FLANDERS designed hybrid motor. The hybrid system can be added without major mechanical changes to the truck.

FLANDERS battery options are liquid cooled, compatible with fast charging, and designed for the cycle life of a mining truck.

Onboard datalogging and diagnostics allow for easy integration with existing mine systems and the cloud. The data stored is fully accessible and owned by you.

FREEDOM design

Power Source Agnostic

Add decarbonization equipment when you are ready without replacing the base drive system components.

Safety Features

The DC link energy storage is discharged during a shutdown sequence by the traction inverter control cards. DC bus indicator lights are included in front of the main control enclosure.

Traction Control System

The complete card rack assembly simply consists of four cards mounted in a separate compartment.

Main Control Enclosure

This unit is custom designed to fit in the same existing enclosure footprint.

Dynamic Braking Grid Blower System

The grid itself is rated at 4000KW continuous. An innovative AC blower arrangement includes a fixed center mounted AC motor with fan blades attached to an external rotor.

Traction Inverters

Identical liquid cooled power modules are included in each of the traction motor inverters. Liquid cooling reduces maintenance, dust exposure, and redirects extra airflow to the wheel motors.

Learn more about what's possible with FREEDOM