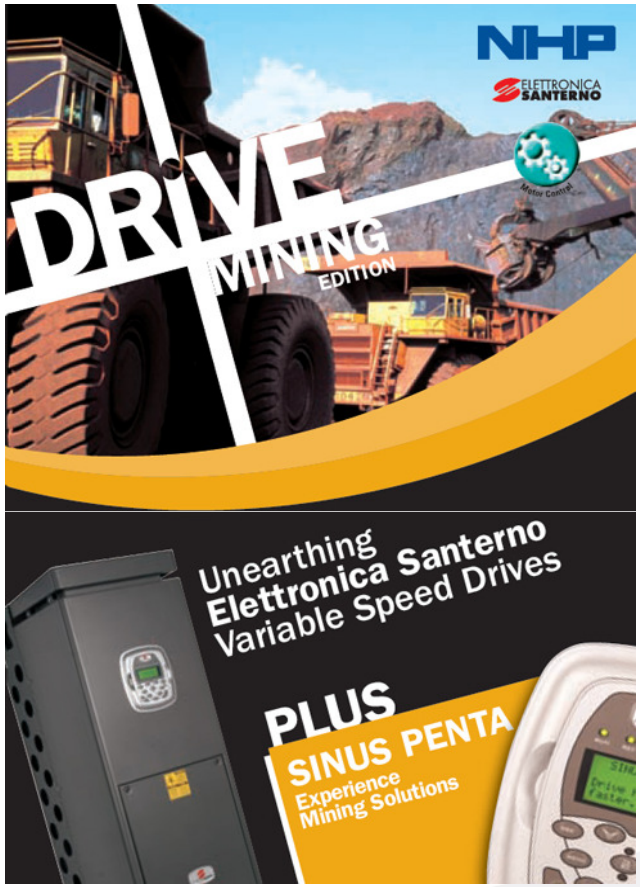
SANTERNO
GRUPPO CARRARO

5 km Regenerative Conveyor Belt

Australia

5km Regenerative Conveyor Belt

Country: Australia
City: Newcastle (NSW)



Technical Specifications:
Length of unloader #1: 300m
Length of unloader #2: 5 Km
n.3 motors, 900kW 50Hz @ 690Vac
n.1 motor, 500kW 50Hz @ 690Vac
Unloader speed: 5m/s

5km Regenerative Conveyor Belt

At the unloading station all wagons loaded of coal are sent. The coal is unloaded in an underground conveyor screw..

…where, through a 300m conveyor (1 500kW motor is brought at the surface level and sent to the main conveyor belt.

5km Regenerative Conveyor Belt

The motors drive the 5Km conveyor belt which transports the coal to the thermoelectric power.

Each conveyor is driven by 2 motors in master-slave connection one 900kW motor in the head and one in the tail; the communication between inverters and PLC in via Ethernet.

5km Regenerative Conveyor Belt

All motors are driven by SINUS-PENTA inverter
controlled using the F.O.C. algorithm.

The motor inverters (n.3 SINUS PENTA 0831 and n.1 SINUS-PENTA 0457)
are Dc supplied by as many regenerative PENTA-RGN inverters of the same sizes.

5km Regenerative Conveyor Belt

Each motor inverter is equipped with an
Ethernet card for supervision purposes only.
The PLC sends hardware commands and a hardware
reference (analog reference).

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Master-Slave Motors 900 kW

5km Regenerative Conveyor Belt

The 5 km route

5km Regenerative Conveyor Belt

5km Regenerative Conveyor Belt

Thermoelectric Power Plant

5km Regenerative Conveyor Belt

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DRIVE

NHP
ELETTRONICA SANTERNO

Conveyor applications:

SINUS PENTA has the in-built capabilities to cater for:

- Fixed or variable speed control
- Synchronisation with parallel conveyors

Hoist applications:

The SINUS PENTA offers:

- High overload capability
- Integrated functions to handle brake control & fluxing to ensure optimum motor magnesiation
- The load is always controlled without need for encoder feedback
- Regeneration caused by lowering loads can be handled by brake resistors OR by using a fully regenerative drive

Refer to page 7 of the Elettronica Santerno catalogue (ESD-C) for overload requirements.

Crusher applications:

The SINUS PENTA has:

- Standard (140 % overload) and Heavy (175 % overload) ratings to suit cone, jaw and vertical impact crushers
- Ability to vary the operating speed to allow optimal feed rate of material into the crusher to match current conditions and increasing throughput

Fans & Underground Ventilation applications:

SINUS PENTA includes:

- PID functionality using external inputs to accommodate unusual ambient conditions and to adjust the speed of the fan accordingly – i.e excess CO2, lack of O2, dust, smoke, etc
- Fire mode to allow continuous operation of the drive under normal fault conditions
- IP 54 enclosures standard up to 132 kW or higher on request to suit underground environments

Regenerative / Active Front End Solutions

Elettronica Santerno provides Regenerative / Active Front end solutions.

The output section utilises a standard Sinus Penta option, whilst the input stage uses standard Sinus Penta hardware with special (RGN) software loaded. By coupling these with some additional line filtering a regenerative/ active front end system can be created.

OTHER APPLICATIONS

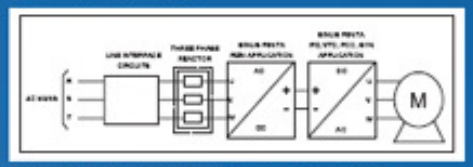
Benefits of Regenerative/ Active Front End Solutions

Reduction in harmonics:
Active front end solutions can be used to reduce harmonics in order to comply with Power Authority requirements.

Energy saving:
Regenerative braking converts mechanical energy from the load into electric energy and regenerates the power back into the mains supplies. This method is far more efficient to the dynamic braking method which converts regenerated energy into heat via brake resistors.

Benefits Include:

- Reduced energy consumption & operating costs
- High tolerance against power irregularities and outages
- Eliminates harmonics



Principle block diagram of the Sinus Penta inverter connection, used as a regenerative feeder, feeding another Sinus Penta controlling the motor.

Flexibility

One drive, many mining applications
Sinus Penta is suited to a range of mining applications including:

- Hoist / crane
- Conveyors (belt, roller, screw, cone, jaw, rotary, vertical impact)
- Elevator
- Fan (axial, centrifugal, high pressure)
- Winder (winding / unwinding)
- Mill (ball, hammer, roller)
- Pump – bore, centrifugal, positive displacement)
- Vibrating screen
- Crusher

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