



*World's Technical Leader in
Industrial Brakes, Clutches and Controls for Extreme Machines*

Downhill Conveyor Braking Systems

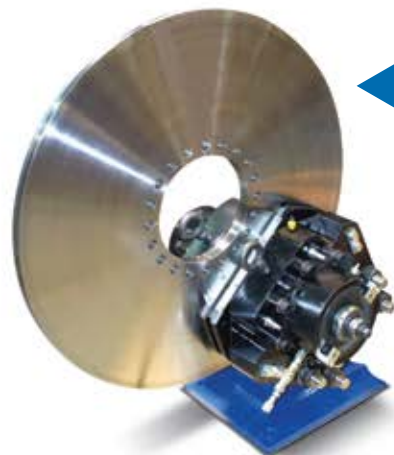
Since 1978 PT Tech has been manufacturing clutches and brakes for the most demanding mining equipment, rock crushers and a host of other extreme machine applications.

For the past 20 years PT Tech downhill braking systems have been used in installations around the world.

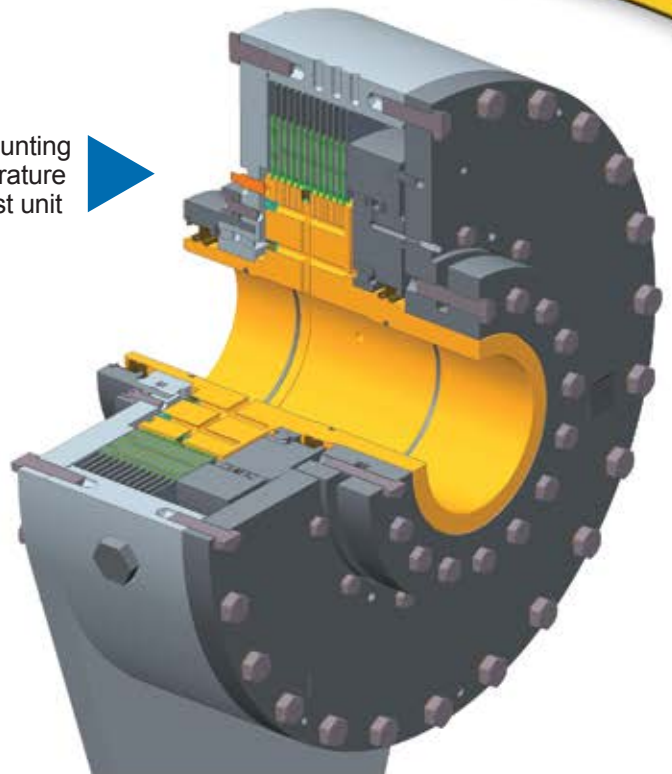
PT Tech is the only brake manufacturer to offer; caliper disc or totally enclosed brakes with each available with standard (open loop) or smart (closed loop) systems.

Meeting your particular need is PT Tech's business.

Totally Enclosed Oil Cooled Brakes developed for mounting onto underground conveyors headshafts. Speed, temperature and pressure sensors are built into the brake. The largest unit to date provided 80,000 lb-ft of torque.



Caliper Disc Brakes offer the most flexible approach to braking because disc size and number of calipers can be combined to offer the desired torque within a given envelop parameters. Built in sensors detect brake status (on/off), wear adjust and friction pad wearout.





Closed Loop System

Stopping time independent of load

PT Tech's closed looped conveyor brake system integrates brains and brawn. It includes spring applied, hydraulically released brakes (caliper or enclosed) a PLC with a PID Loop capability, a hydraulic power unit and a DC tachometer. Using a proportional control valve and tachometer feedback the PLC can achieve a consistent stopping time that is independent of the loading on the conveyor.

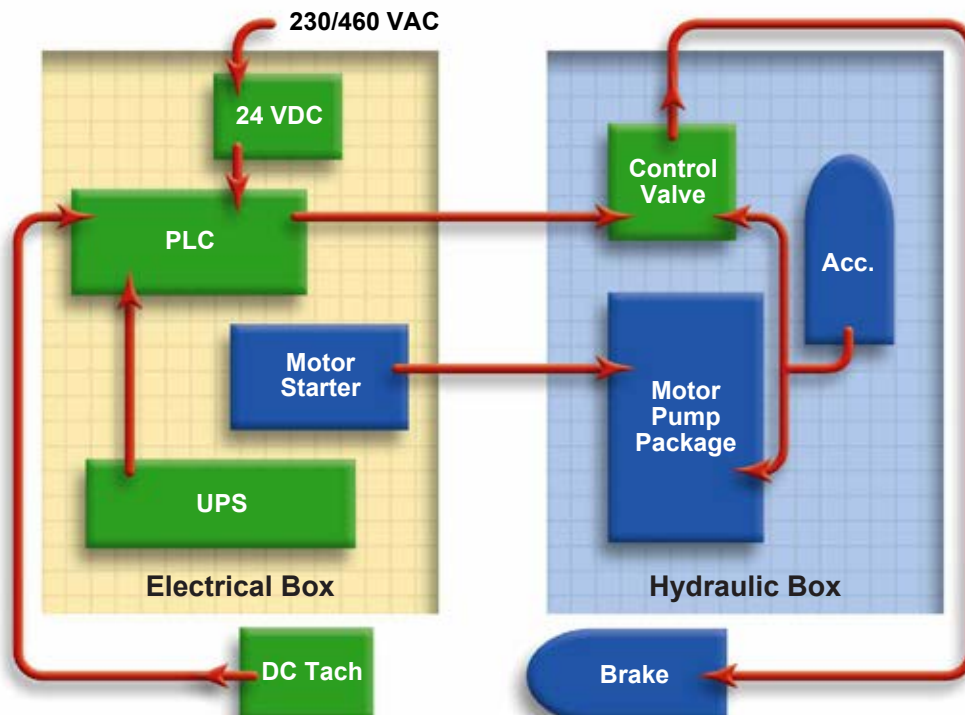
The PLC performs a second function by monitoring several system parameters. The parameters consist of both critical (if not within acceptable limits then brakes will either not be released or will be applied) and noncritical conditions.

The PLC can be a stand only system or integrated into the conveyor's master control system.

The hydraulic unit has two circuits that can regulate the brake. The primary circuit will control the stopping time when the system has external power and the secondary (or backup) circuit will operate during a power outage.

During a power outage the secondary circuit will control the brake. System pressure will drop across a pressure relief valve and an adjustable orifice. The pressure relief valve allows the brake to quickly come into contact with the disc. The adjustable orifice allows system pressure to continue to drop allowing the brakes to gradually build torque. Stopping time is dependent on the conveyor's load.

Brains & Brawn





Brains & Brawn

PT Tech's closed loop braking system (Brains & Brawn)

couples a PLC, tachometer and proportional control valve "Brains" to an open loop system "Brawn". The adjustable orifice in the open loop system acts a redundant circuit for the proportional control valve in the closed loop system. Conveyor stopping time is independent of the load.

Brains

PT Tech's "Brains" include a PLC with PID loop capability, DC tach generator and a proportional control valve.

Electronics

- PID loop allows for a consistent stopping time regards of the load on the conveyor.
- PLC can be upgraded to allow for sophisticated communications between the conveyor's PLC and the braking system's PLC providing real time information.
- PLC controlled proportional valve is added to the standard hydraulic package.
- The system's UPS allows the PLC to operate during power outages.

PT Tech's open loop braking system (Brawn)

uses spring applied direct acting caliper disk brakes and a hydraulic power unit. Brakes are applied when system pressure drops across an adjustable orifice (tamper resistant). Conveyor stopping time is dependent on the load.

Brawn

PT Tech's hydraulic power units are made from off-the-shelf components. The brake and hydraulic unit can be equipped with transducers/sensors/switches that provide important system status data. A large accumulator allows for smooth braking over stopping times up to 30 seconds.

Hydraulics

- All components are readily available from local sources
- Hydraulics and electrical circuits are housed in separate enclosures
- Quick disconnect fitting located on side of panel to brake.

Brakes

- Direct acting calipers are very reliable and low maintenance
- Pivoting shoes allow for even wear on friction pad
- Independent stroke setting for each caliper half makes on site adjusting easy.
- Three brake caliper sizes and customized disc diameters are available.



Options



Brakes

Custom Mounting Bases

For all three caliper sizes

Custom Disc Size

Available up to 60 inches in diameter

Wear Adjust Switch

Indicates when brakes need adjusting due to friction material wear.

Brake Pad Replacement Circuitry

indicates when brake pads need to be replaced

Brake Status Switch

Indicates when brake caliper is engaged/disengaged

Hydraulics

Hand Pump

Permanently mounted inside enclosure it allows for manual release

Fluid Level Status Switch

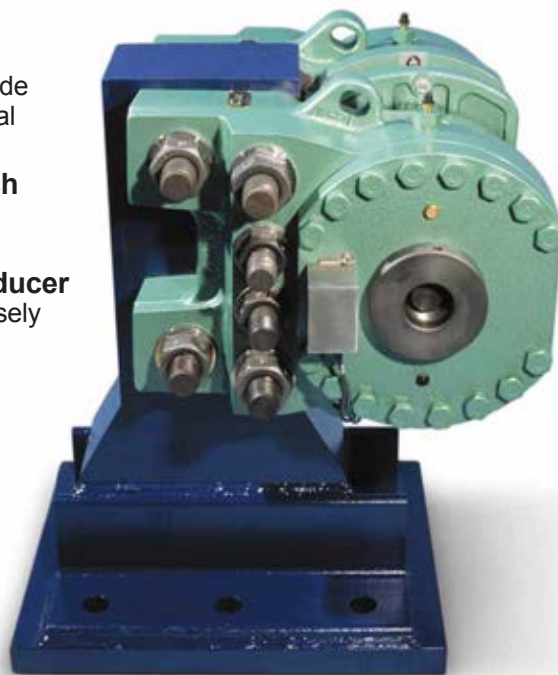
Indicates when reservoir need more fluid

System Pressure Transducer

Analog output to more closely monitor system pressure

NEMA 4X

Stainless steel enclosure



Brains

Processor Upgrade

Allows for improved communications between the brake PLC and the conveyor's master PLC

Panelview

Test display screen that mounts on the outside of the enclosure.

System wide fault diagnostics

- Low oil level in reservoir
- Tachometer fault
- Wear adjustment
- Lining wear out
- Brake proving switch, motor status
 - Clogged filter
 - Monitor the frequency of cycles of the motor pump
 - Monitor main conveyor PLC for start/stop sequence
 - Close brake enabled circuit

2nd Tachometer

Used as a redundant feedback source.

NEMA 4X

Stainless steel enclosure.



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ISO 2001:2008
with design