Centrifuges

BONITRON

Chemical
Food & Beverage
Gold Processing
Oil Processing
Pharmaceuticals
Water/Wastewater
+ More!

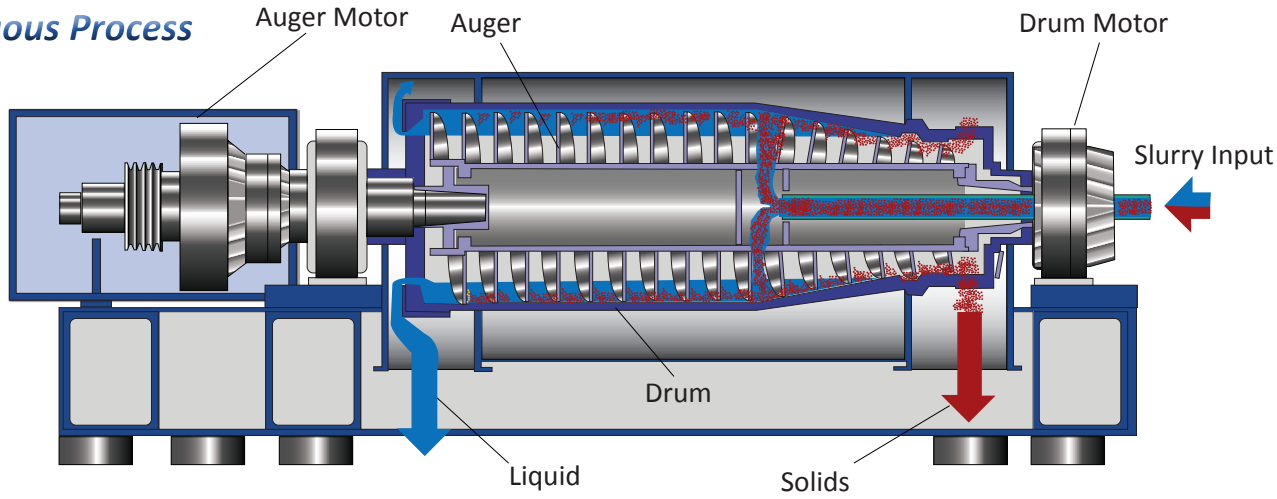
- *Maximize drive system efficiency and reliability*
- *Utilize braking current to power other drives*

Products

Braking Resistors
Braking Transistors
Line Regeneration
Common Bus Power Supplies
Common Bus Diodes

Overvoltage Solutions

Continuous Process

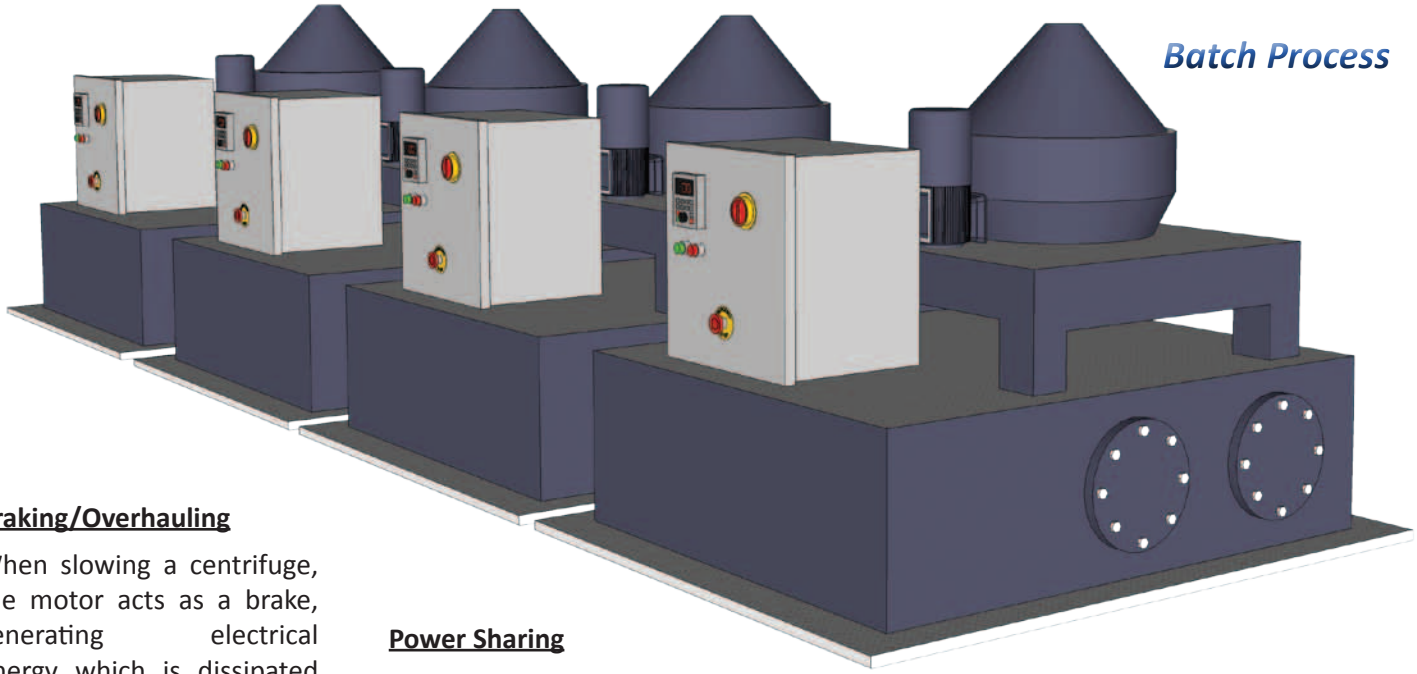


Centrifuges are used extensively in industry to seperate particles or materials from a solution and the non-usable material is discharged. The electric motor of a centrifuge is commonly controlled by a variable frequency drive (VFD), allowing for precise control of the centrifuge.

Continuous process centrifuges typically have a separate drum motor and auger motor. The drum spins faster than the auger, causing excess power to be generated by braking to maintain the slower speed of the auger. The Bonitron Line Regen is the solution for continuous duty processes such as these. With a common DC bus, the power generated by the auger can be used by drum motor.

Batch centrifuges require stopping when the process is complete. Bonitron Dynamic Braking and Line Regeneration would allow for braking the centrifuge, increasing throughput of the centrifuge by increasing uptime.

Batch Process



Braking/Overhauling

When slowing a centrifuge, the motor acts as a brake, generating electrical energy which is dissipated by a Bonitron Regen or Transistor/Resistor units.

Power Sharing

Motors generating electricity while braking can share power with other motors on a DC bus using Bonitron Common Bus Sharing Diodes.

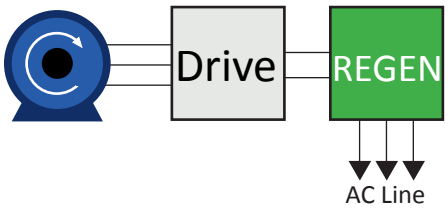
Common Bus

Multiple motors in a system can share braking components and reduce wiring by utilizing a common DC bus. This is achieved by using a Bonitron Common Bus Power Supply.

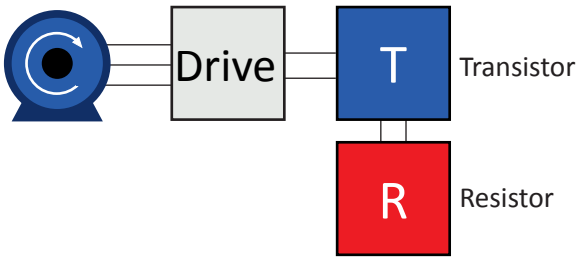
Transistor & Resistor vs. Line Regeneration

Braking units prevent overvoltage faults on drives. A **dynamic brake** or "chopper" uses transistors that turn on before overvoltage situations occur, allowing excess energy to be dissipated to connected resistors. A **regenerative brake** channels the energy back onto the utility grid where it can be used by other equipment within the facility.

Line Regeneration



Dynamic Braking

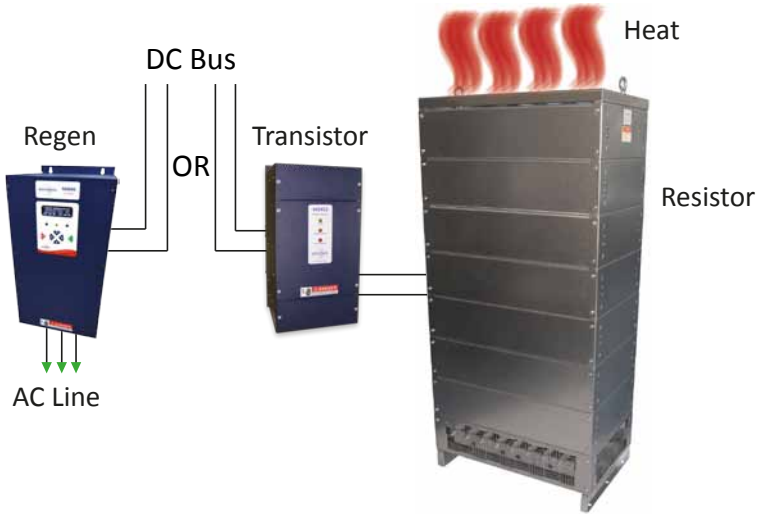


Dynamic Braking

The dynamic brake method typically has a lower upfront cost, but heat generated by resistors can increase cost two ways. If the resistors are indoors, added cooling capacity may be required for the room. Large resistor banks may be kept outside, far from the drive, but this results in more wiring and conduit cost. Resistors also need time to cool down after a braking cycle. ***Regen units are rated for continuous use and so are typically a better choice for high duty applications where utility power is used.***

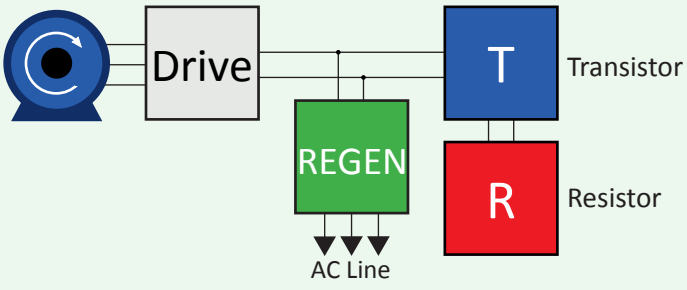
Line Regeneration

Line regen solutions have many advantages. First, because the unit does not generate high levels of heat (99% efficient), it can be integrated into the drive cabinet. Second, the lack of heat generation allows its use in environments where there might be flammable material such as dust or fuel vapor. ***The regen also boosts energy efficiency as it puts electricity back onto the AC line where it can be used by other equipment, considerably reducing the demand from the utility.***



Combination

A regen is most effective for frequent or continuous braking up to 300A, while a transistor/resistor is more suited to higher peak loads for shorter durations. If necessary, transistor/resistor and regen units can be used together for a more efficient solution where the ***regen handles continuous braking needs and the dynamic brake activates when the regen's capacity is surpassed.***



Common DC Bus

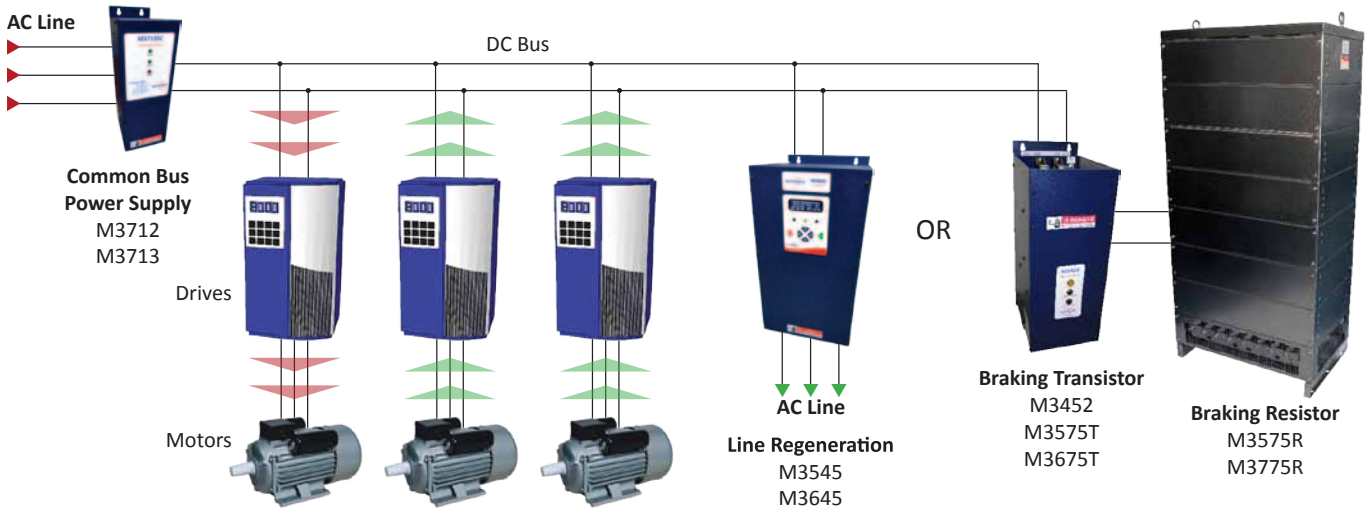
Centrifuge applications can require the use of multiple electric motors in a system and can benefit from the use of a common DC bus. The use of a common bus allows for the **reduction of wiring and components** in the system as the linked drives can now share many components. It can also allow for the direct **sharing of power between drives**, reducing amount of power needed from the grid. This can be achieved with either a common bus power supply or with diode sharing.

Common Bus Power Supply

M3712, M3713

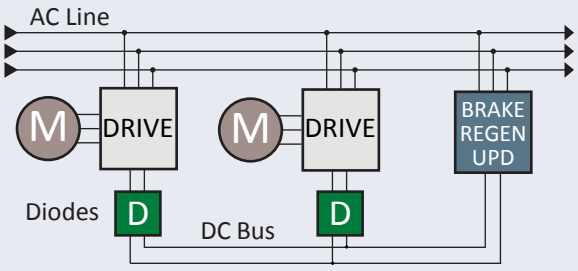
Using a common bus power supply reduces the amount of wiring and components in a system, resulting in a reduction of maintenance and footprint of the system. In a system with multiple motors, some motors may be regenerating while others are motoring. ***The common bus allows the regenerating drives to share power with the motoring drives, thus reducing the amount of power needed from the grid.*** If the drives are creating a net surplus of energy, a single line regen or braking unit can be installed to dissipate the excess energy.

A common bus power supply can also allow the use of single phase AC power with 3-phase motors without having to oversize the drive. The M3712 can create a common DC bus from single phase power while the M3713 uses 3-phase input power.



Common Bus Sharing Diodes

- M3345CBM
- Allows for shared power and components between drives on the DC bus
- Prevents potentially damaging circulating currents between drives



Common Bus Isolation Diodes

- M3460D
- Allows one-way flow of power
- Create a common DC Bus to share components while isolating the drives from each other

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