

A510s Variable Speed Drive for High Breakaway Loads | TECO

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TECO A510s Variable Speed Drive: Current Vector Control for High Breakaway Loads

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The TECO A510s is a current vector control variable speed drive, known in some plants as a variable frequency drive or VFD, built for the loads that are hard on a drive: high breakaway torque, frequent starts, overhauling loads, and continuous duty in dust, heat and remote conditions. It runs a sensorless vector algorithm on a dual-core platform (32-bit MCU plus ASIC), holding torque accurately down to low speed without an encoder. IP20 covers standard cabinet installs; IP00 open-frame is for panel builds where you control the enclosure and cooling.

Most VSD selections fail for one of two reasons: not enough torque at the speed the load actually starts, or undersized for the duty so it trips or derates in service. The TECO A510s is built around both.

200% torque at 0.5 Hz, where the load needs it

The TECO A510s delivers up to 200% torque at 0.5 Hz. On a four-pole motor that is about 15 rpm, so you get full-load starting torque at crawl speed. That is where it earns its place: a loaded conveyor breaking away with a full belt after a shutdown, a choked crusher, a positive-displacement pump against static head, a mixer starting in a setting product. The kinds of loads a V/Hz VSD stalls on.

Four-quadrant control for overhauling loads

Four-quadrant control covers the other hard case — loads that drive the motor. Winches paying out, downhill conveyors, cranes lowering, centrifuges coasting. The TECO A510s holds speed on the overhauling side instead of letting the load run away. Overhauling loads may require dynamic braking resistors, depending on the braking duty and application requirements.

Speed, torque and positioning on one platform

The TECO A510s supports positioning functions and multiple control modes on the same hardware platform, so one platform covers speed, torque and positioning without a hardware change.

Normal duty or heavy duty: size the A510s on duty, not nameplate kW

The TECO A510s carries dual ratings, normal duty (ND) and heavy duty (HD), and choosing between them is the selection decision that matters most. A 45 kW ND VSD is not a 45 kW HD VSD: HD trades nominal kW for higher continuous and overload current, which is what breakaway-heavy loads draw.

Size on ND for variable-torque loads (centrifugal pumps, fans). Size on HD for constant-torque and high-inertia loads (crushers, conveyors, PD pumps, mixers). Sizing a high-breakaway load on the ND figure is one of the most common causes of nuisance overload trips.

Built-in PLC logic and PID control

PLC logic and PID are built in. For standalone duties such as a booster pump maintaining pressure, a fan trimming to a setpoint, or a sequenced start, the built-in PLC logic and PID can eliminate the need for an external controller: less panel hardware, less wiring, and fewer potential failure points on small skids and packaged plant.

Modbus RTU, LCD keypad and parameter lock

For integrated plant, Modbus RTU over RJ45 is built in for setpoint, run/stop and diagnostics. An LCD keypad handles commissioning, and a parameter lock stops a commissioned VSD from being altered on site.

IP20 or IP00: choosing the VSD enclosure

IP20 mounts in a standard cabinet and includes a built-in EMC filter up to 45 kW, holding conducted emissions in check without an external filter on most installs; above that rating, an external filter is used.

IP00 is open-frame, for panel builders designing their own enclosure. You engineer the cooling for the real ambient instead of accepting a fixed enclosure, but ingress protection and thermal design are then yours to own. On dirty sites, IP00 in a sealed, air-conditioned panel is often more reliable than a higher-rated standalone unit in a poorly sealed cabinet.

Built for Australian and New Zealand site conditions

VSDs fail in service, not on the bench, and ANZ conditions are hard on them:

Ambient. Inland and Pilbara switchrooms sit well above 40°C. Ratings derate with ambient, so read the ND/HD figure against the real switchroom temperature — not a 40°C baseline.

Long cable runs. Remote pump stations and spread-out conveyors mean long motor cables, which raise reflected-wave stress on winding insulation and lift EMC levels. Design output filtering in from the start.

Dust, washdown, coast. These are why the enclosure decision, local stock and support all matter. A VSD on a remote site is only as effective as the support behind it and the time required to obtain a replacement or service technician.

Motor protection: PTC thermistor input and fire override

PTC thermistor input — the motor reports its own temperature rather than the VSD inferring it from current. Essential on motors run slow for long periods, where self-cooling drops off.

Fire override mode keeps the motor running during a fire, commonly used on smoke-spill and stairwell-pressurisation fans where continued operation may be required.

Parameter lock protects the commissioned configuration.

Industries using the TECO A510s

Constant- and variable-torque duties across cement, oil and gas, food and beverage , HVAC, lumber and milling, machine building, marine, metals, mining , power generation, pulp and paper, rubber and plastics, water and wastewater , and general industry.

A510s VSD applications by load type

Specified across a broad range of motor-driven equipment, TECO A510s earns its keep on the loads that punish an undersized or V/Hz VSD:

High breakaway torque / constant torque: loaded conveyors, cone/jaw/rotary crushers , extruders, mixers, positive-displacement and slurry pumps, presses, roller mills.

Overhauling / four-quadrant: winches, winders, cranes, bow thrusters, coilers.

Variable torque: centrifugal and bore pumps, dampered and undampered fans, axial blowers, cooling towers.

General duty: augers and screw feeds, chippers, debarkers, drilling machines, edgers, escalators, grinders, hydraulic power packs, millscreens, pelletisers, planers, sanders, band and circular saws, shredders, slabbers, stirrers, tumblers and dryers, vibrating screens, calendering and carding machines, wire drawing machines, cutters, and compressors.

TECO A510s frequently asked questions

Current vector control vs V/Hz: what is the practical difference?

V/Hz has no direct control of torque, so it struggles at low speed and under load. Vector control regulates torque directly, holding it down to near-zero speed. On the TECO A510s that is 200% at 0.5 Hz — enough to start a fully loaded constant-torque machine.

Should I specify IP20 or IP00?

IP20 for standard cabinet installs, with an integrated EMC filter on models up to 45 kW. IP00 open-frame for custom MCC and panel builds where you want control of the cooling and enclosure.

Normal duty or heavy duty: which rating do I size on?

ND for variable-torque loads (centrifugal pumps, fans). HD for constant-torque and high-inertia loads (crushers, conveyors, PD pumps, mixers). Sizing a high-breakaway load on ND is the usual cause of overload trips.

VSD or soft starter: which one do I need?

A soft starter only manages the start. No speed control, no energy recovery. Choose a VSD when the process needs speed control, when the load overhauls and needs four-quadrant control, or for energy

savings on variable-torque loads, where power falls with the cube of speed.

Local A510s support across Australia and New Zealand

The TECO A510s is supported by TECO across Australia and New Zealand, with local stock and technical support .

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Specify and select a three phase motor in this order: load and duty, then the drive arrangement, then the site, and only then the efficiency class and the frame. Wrong

[Read more](#) What is a variable speed drive?

A variable speed drive (VSD) is a power electronic controller that sets the speed of an AC motor by varying the frequency and voltage it supplies, instead of running the

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