BELT SUBSTATIONS

Ampcontrol designs and manufactures belt substations which can include up to 10 power distribution outlets and are offered in both flameproof and ingress protected (IP56) enclosures.

Ampcontrol designs and manufactures a range of substations up to 7.5MVA and customises each to meet the applications required. Belt Substations are typically 11kV/1000V, up to 2.5MVA and are typically Ingress Protected (IP56) variations.

The Belt Substations can be designed to support both Fluid Coupling Starters such as CST and Voith systems or using VVVF Drive technology. With each different type of starter comes a set of different requirements for cooling of motors and gearboxes, conveyor braking requirements and winch tensioning needs.

In addition to these power needs the substations are designed to supply the control and communications needs for the belt and its field inputs. This can include:

- iMAC emergency stop system
- VoiceCom systems incorporating prestart, status and intercom messaging
- Remote isolation systems
- Conveyor motor temperatures
- Conveyor drive gearbox temperature
- Bearing temperature
- Vibration monitoring
- Belt wander & belt tear
- Conveyor magnet
- Belt speed/slip (speed encoder)
- Belt/winch tension
- Belt weigher, etc

FEATURES

- Supply power - 11kV (Options for 6.6kV available)
- Output power - (as required) 1000V or 690V (typical values)
- Typical power ratings - 2.5MVA (Up to 7.5MVA possible)
- Explosion proof or IP56
- Compliant to all Australian and state legislative requirements
- Up to 10 outlets
- Standard mounting - skid and solid rubber wheels
- Additional mechanical protection available
- Ampcontrol outlets provided with machine recognition
- Communication options including fibre optic/ ethernet connectivity
- SIL rated remote isolation

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11kV connections are typically provided via a flameproof coupler. All 11kV equipment is housed in the High Tension (HT) Enclosure of the substation. The HT Enclosure may incorporate switched or non-switched through supplies and 11kV DOL Conveyor Motor Starters. Integrated into the HT enclosure are the isolation, earthing and protection required for the main transformer. Protection will include meeting all requirements for electrical protection of a substation as detailed in AS4871.2012.

Transformer options available include nitrogen filled, dry type transformers (GNAN cooling system), mineral oil filled (ONAN) transformers and high flash point vegetable or silicon based oils. All GNAN transformers are built to meet IEC standards for explosion protection technique Ex p. The oil filled transformer options provide are built to Australian standards for the class of transformer specified.

Power distribution from the low voltage end of the substation may include up to 10 outlets in either IP56 or flameproof options. Low voltage distribution is from the Low Tension (LT) Enclosure. The LT Enclosure for Belt Substations is typically customised to include winch panels, conveyor brakes, oil pumps and cooling fans where required for CSTs, belt splicing outlets, magnets and other essential requirements for the conveyor system.

Each LT enclosure is customised to meet specific mine site communication requirements and can include PLC based control systems, HMI interface capabilities and SCADA packages. Customer required functionality including safety rated (SIL) isolation and earthing systems can be incorporated into the Control and HMI systems to ensure safe and reliable operation from behind closed doors.

The low voltage power distribution outlets are provided with protection by our integrated protection relays. This ensures the power distribution generally meets the electrical protection requirements of AS4871.2012.

The complete substation including HT, Transformer and LT enclosures are typically offered on a wheel mounted skid with rated towing and lifting facilities for easy relocation around site. Options are available for powered track systems or braked wheels to be utilised in the design.

Each Substation upon completion follows through a process of Factory Acceptance Testing, Compatibility Testing (where necessary) and Commissioning to ensure operational status on delivery. Manuals including flameproof dossier and drawings are provided and options are available for ongoing support for each product including lifecycle management.