

Application solution for hoisting and lifting equipments in the mineral resources exploitation with EcoDriveCN variable speed drives (VSD, VFD, inverters)

The features of traditional solution for mine hoists (mine winders).

Mine hoists include two kinds, such as single hook and twin hook. To control speed for wound-rotor AC motors, old mine hoists (mine winders) use rotor series resistance. Through on-off operation of contactor, the stepping speed adjustment of motor is achieved.

But this method of speed adjustment has the following drawbacks:

1. Series resistance speed control is step speed regulation. Shocks of starting are large. During the process of speed transition, speed discontinuity exists. And it's dangerous, easy to derail. That impacts the production efficiency and safety of human being seriously.
2. Electricity is wasted on the resistance when adopting series resistance speed control. The less the speed, the more the waste. When the goods is lowering, the motor is generating. Then the waste of electricity is more serious.
3. Frequent switching results in the frequent damages of contactor, thus speed control is not working. This brings safety problems, and increases the maintenance workflow.
4. The stability is bad. The speed is varied when the load changes.
5. The starting torque is not enough. This is obvious that reboot can't be done when power off in a slope. The goods should be slammed down to the smooth place, then reboot, seriously affecting the production efficiency.

V&T integrated solutions on hoisting and lifting equipments are specially designed for motor control of mine hoists (mine winders). There are several advantages to drive the motor:

1. Adopt advanced DSP chip, and excellent vector control technology. This makes the power of mine hoists (mine winders) and output power of variable speed drives equivalent.
2. The starting current is low, the starting speed is smooth, without impaction, decreasing the derail greatly.
3. Robustness. The variable speed drives have mature protection functions, such as over-current protection, over-voltage protection, over-load protection, short circuit protection.
4. Light maintenance workflow. No need to replace the contactor as the old solution, decreasing

Manufacturer of vector control & torque control frequency inverters (AC drives, variable speed drives, variable frequency drives, VSD, VFD), servo, motor soft starters...

the maintenance cost greatly.

5. Wide speed adjustable range. Step-less speed regulation, during acceleration and deceleration, motor control is smooth. The speed regulation is soft, increases the robustness. Meanwhile there's no heating of series resistance, improving the operation environment.

6. Large energy saving. When the mine hoists are raising the goods, the save energy is proportional to the speed. When the mind hoists are lowering the goods, motor is generating. If the regenerative brake units are adopted, not only proportional with the speed, but also include the regenerative power.

7. Automatic switching between human beings and goods. There is automatically max speed limitation during human being transportation. This makes it safer and more comfortable.

8. Perfect match with mechanical braking and safe circuit. When using mechanical brake, no over-load or over-current for variable speed drives (VSDs). And for emergency or power failure, mechanical brake is operated automatically, maximizing the protection of safety.

9. Productivity has risen greatly. Good stability. The speed won't change as the change of load.

10. Can eliminate hook sliding phenomena. Even the mechanical braking is done during the process of rise, it can also raise the heavy goods in midway, without sliding down. No need to put the goods to the level ground and restart.

11. Interlock of rising and falling. Few operation errors.

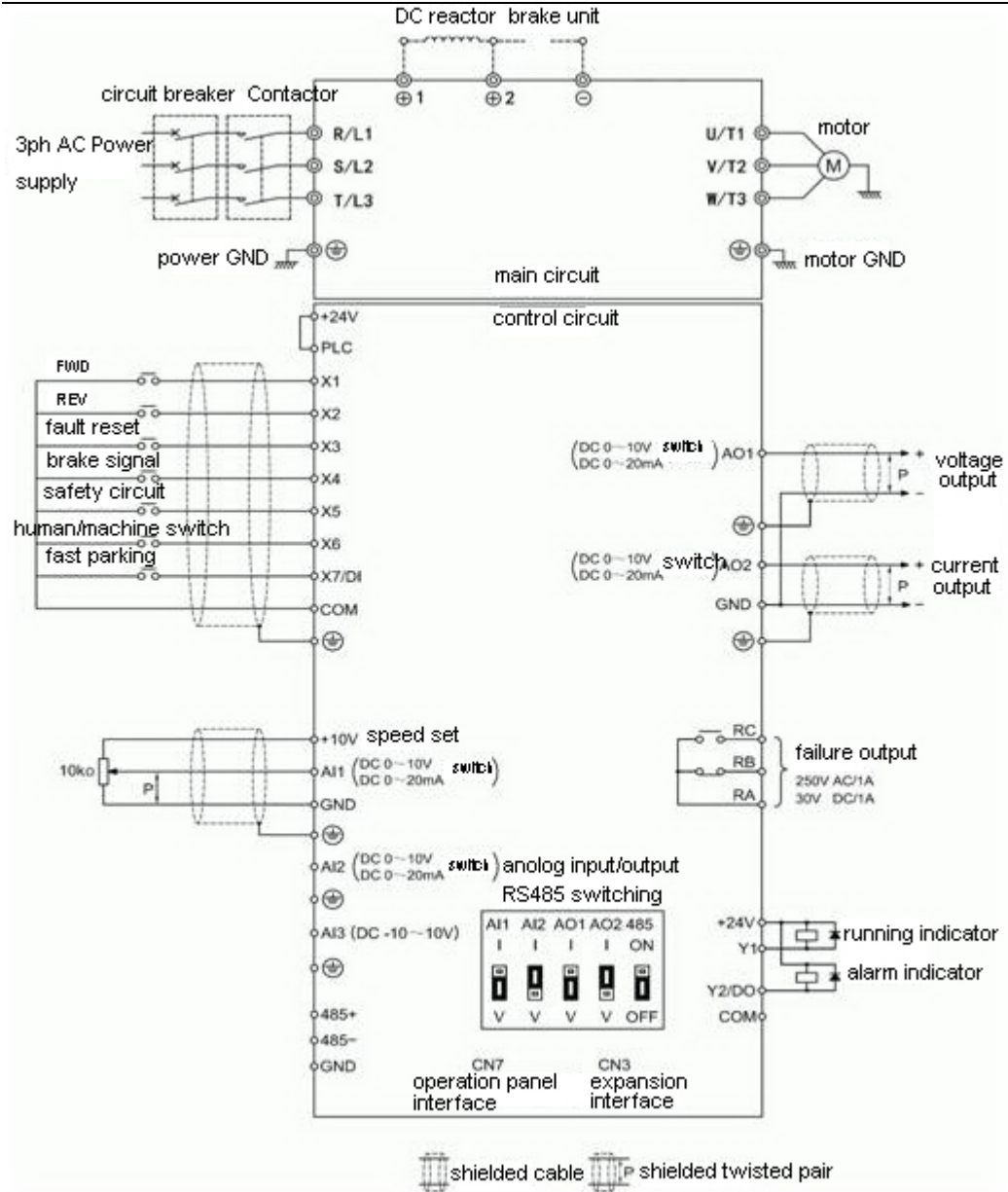
12. Can't change the direction casually for high speed, avoiding automatic stop or reverse of variable speed drive because of the wrong signal indicator during the running process.

13. No need to change the operation habit.

14. Support switching between power frequency and variable frequency.

15. Parameters copying function for operation panel, reducing the workflow of tuning and maintenance greatly.

Wiring diagram of EcoDriveCN variable speed drive with hoisting and lifting equipment



V&T Technologies Co., Ltd. (<http://www.EcoDriveCN.com>) has rich experiences in the field of mine winch. This brings us good reputation in the mine exploration industry.



Control room of V&T **EcoDriveCN** variable speed drive with regenerative brake unit for mine hoist.



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Coal resources exploration with our V&T variable speed drives (variable frequency drives)



Coal winch field with **EcoDriveCN** drives

V&T Technologies Co.,Ltd. (<http://www.EcoDriveCN.com>) was certificated as a "National Hi-tech and Double-Software Enterprise" in China. We are engaged in Variable Frequency Drive (VFD, frequency inverter, AC drive, variable speed drive), Servo Drive, Electric Vehicle Controller, Inverter and other power electronics products, with independent intellectual property rights, which cover related R&D, manufacturing, marketing.

With the profound know-how in the field of motor control, motion control, and energy saving, we have won the technical innovation prize, the most competitive brands prize, Champions of National Hybrid Electric Vehicle competition and one of Top Ten Variable Frequency Drive Enterprises in China and etc.

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