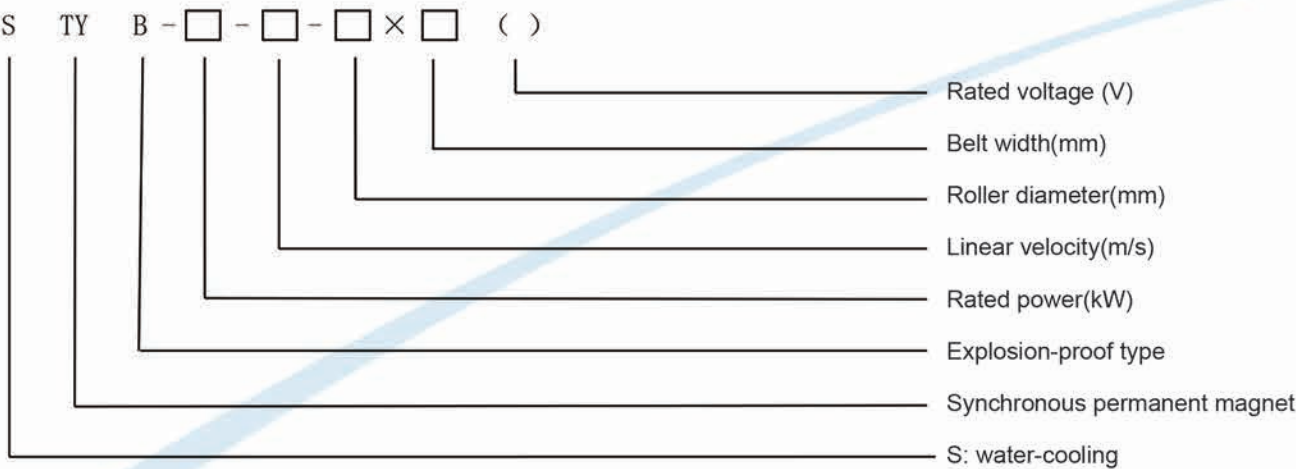


Technical Parameters



Drum diameter mm	Rated power level kW	Belt width mm	Linear velocity m/s	Rated voltage V
500	22/30/37/45/55/75/90/110	650~1200	1~5	380/660 660/1140
630	22/30/37/45/55/75/90/110/125/132	650~1800	1~5	380/660 660/1140
800	22/30/37/45/55/75/90/110/125/132 /160/185/200/220/250/280	800~1800	1~5	380/660 660/1140
900	22/30/37/45/55/75/90/110/125/132 /160/185/200/220/250/280/315	800~1800	1~5	380/660 660/1140
1000	45/55/75/90/110/125/132/160/185 /200/220/250/280/315/355/375/400	800~1800	1~5	380/660 660/1140
1100	55/75/90/110/125/132/160/185/200 /220/250/280/315/355/375/400/450	800~1800	1~5	380/660 660/1140
1250	55/75/90/110/125/132/160/185/200 /220/250/280/315/355/375/400/450/500	800~1800	1~5	380/660 660/1140
1400	75/90/110/125/132/160/185/200/220 /250/280/315/355/375/400/450/500/560/630	800~1800	1~5	380/660 660/1400

Application Field

As the driving power of belt conveyor and lifting equipment, it can replace the motor reducer type external driving device widely used at present to form a belt conveyor. It can transport bulk materials such as coal, ore, sand, cement and flour, as well as sacks, equipment and other components. It is widely used in mining, metallurgy, chemical industry, coal, building materials, electric power, grain, transportation and other departments.

TYJVFT Series Explosion-proof and Intrinsically Safe Permanent Magnet Synchronous Variable Frequency Speed Control all-in-one Machine for Mining



Product Overview

The application types of frequency conversion technology in conveyor mainly include: "frequency converter + asynchronous motor" mode and "asynchronous frequency conversion all-in-one machine" mode. The drive scheme of "frequency converter + asynchronous motor" has been popularized and applied in a large area and achieved good application results. The technical route of the conventional frequency conversion all-in-one machine scheme is the same as that of the split machine scheme. The matching motors are ordinary asynchronous motors, which are in the stage of market promotion and application.

Performance Characteristics

Table 1 Comparison of parameters for 1000kW/1140V permanent magnet all-in-one machine

Item name	Asynchronous frequency conversion all-in-one machine		Synchronous frequency conversion all-in-one machine
	Germany Bauer	Domestic manufacturers	Huaxin Electric
Length,width and height (mm)	2445×950×1293	2574×950×1363	2065×950×1355
Starting torque	1.8 times	2.0 times	2.5 times(measured value)
Weight	7T	8.2T	6.1T
Efficiency	93%	93.5%	94.5%
Power factor	>0.97	>0.97	>0.97

Table 2 Comparison of parameters for 1200kW/3300V permanent magnet all-in-one machine

Item name	Asynchronous frequency conversion all-in-one machine		Synchronous frequency conversion all-in-one machine
	Germany Bauer	Domestic manufacturers	Huaxin Electric
Length,width and height (mm)	2525×950×1426	2350×950×1432	2375×950×1395
Starting torque	2.2 times	2.2 times	2.5 times(measured value)
Weight	9.5T	9T	7T
Efficiency	94%	94%	95%
Power factor	>0.97	>0.97	>0.97

a. Larger starting torque: the zero speed starting torque of the permanent magnet frequency conversion speed regulation all-in-one machine can be 2.5 times the rated torque of the motor, which is significantly higher than that of the conventional asynchronous frequency conversion speed regulation all-in-one machine.

b. Smaller operating current: the motor rotor is made of rare earth permanent magnet, does not need excitation current, and the reactive power is close to zero. When the inverter outputs the same current, the output torque of permanent magnet motor is 10% - 20% higher than that of asynchronous motor.

c. The control is simple and the operation is more stable: the vector control technology of permanent magnet motor is simpler than that of asynchronous motor, the rotation speed is stable, the torque ripple coefficient is small, and the dynamic response is fast and accurate. The permanent magnet synchronous motor has stronger tolerance to torque disturbance and faster response speed than asynchronous motor.

d. The independent structure of variable frequency drive and motor can be divided, which is convenient for disassembly and reduces the maintenance cost.

e. The all-in-one permanent magnet synchronous frequency conversion has small heating and low cooling water flow.

The rotor magnetic field of asynchronous motor is generated by alternating current to form rotor heat source; The permanent magnet rotor has no current, and hence no heat source, low bearing temperature and long service life. The cooling water demand of the whole machine is lower.

f. High efficiency and energy saving: rated operating efficiency $\geq 94\%$, half load and light load operating efficiency is significantly better than that of the same type of asynchronous machine products. The efficiency is more than 10% higher than that of the asynchronous all-in-one machine under 60% ~ 70% load operating conditions.

g. Higher reliability: the frequency conversion technology adopts mature three-level vector control technology.

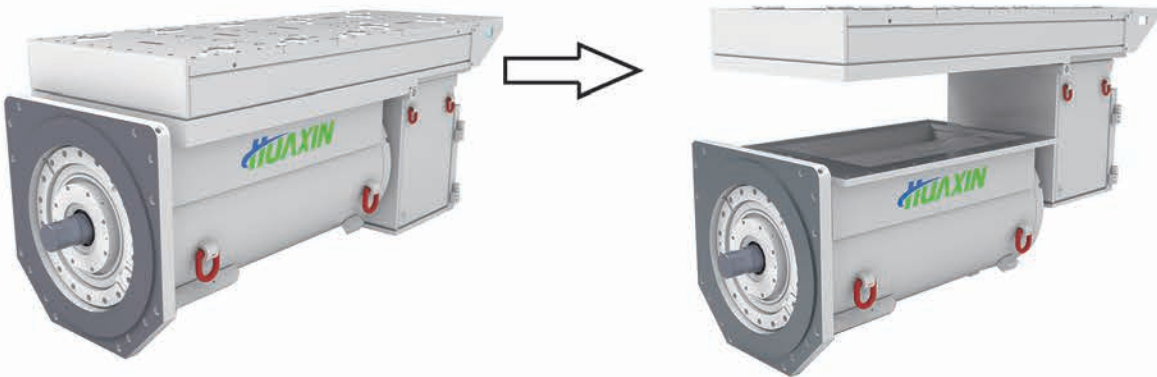


Figure 1. Detachable structure diagram of permanent magnet synchronous frequency conversion all-in-one machine

Technical Parameters

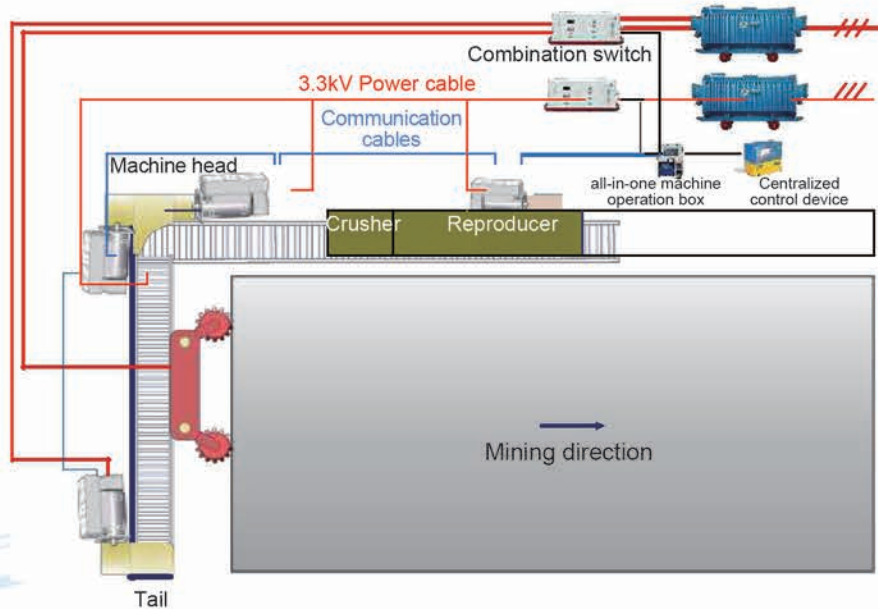
Voltage level	3300V	1140V
Power range	525kW~1600kW	160kW~1000kW
Output speed range	0~1800r/min	
Operation mode	Two quadrant operation	
Installation mode	IMB5 or IMB3	
Number of poles	6 poles	
Motor thermal classification	H level(180)	
Duty type	Continuous duty type(S1)	
Degree of protection	IP55	
Cooling mode	Water-cooling(IC3W7)	
Intrinsic safety parameters	U0:12VDC	I0:1.5A

3300V Permanent magnet synchronous frequency conversion speed regulating all-in-one machine

Product model	Rated power (kW)	Rated speed (r/min)	Rated torque (N.m)	Efficiency (η)
TYJVFT1-400S2-6(525/3300)	525	1500	3343	94.5%
TYJVFT1-400S4-6(700/3300)	700	1500	4457	94.5%
TYJVFT1-450M1-6(855/3300)	855	1500	5443	95%
TYJVFT1-450M2-6(1000/3300)	1000	1500	6367	95%
TYJVFT1-450M4-6(1200/3300)	1200	1500	7640	95%
TYJVFT1-450L3-6(1400/3300)	1400	1500	8913	95.5%
TYJVFT1-450L5-6(1600/3300)	1600	1500	10187	95.5%

1140V Permanent magnet synchronous frequency conversion speed regulating all-in-one machine

Product model	Rated power (kW)	Rated speed (r/min)	Rated torque (N.m)	Efficiency (η)
TYJVFT-355S-6(160/1140)	160	1500	1019	94%
TYJVFT-355M1-6(200/1140)	200	1500	1273	94%
TYJVFT-355M2-6(220/1140)	220	1500	1401	94%
TYJVFT-355M3-6(250/1140)	250	1500	1592	94%
TYJVFT-355L1-6(280/1140)	280	1500	1783	94%
TYJVFT-355L2-6(315/1140)	315	1500	2006	94%
TYJVFT-355L3-6(355/1140)	355	1500	2261	94%
TYJVFT-400S-6(355/1140)	355	1500	2261	94%
TYJVFT-400M1-6(400/1140)	400	1500	2547	94%
TYJVFT-400M2-6(450/1140)	450	1500	2865	94.5%
TYJVFT-400L-6(500/1140)	500	1500	3184	94.5%
TYJVFT-450S1-6(630/1140)	630	1500	4011	94.5%
TYJVFT-450M-6(700/1140)	700	1500	4457	94.5%
TYJVFT-450L1-6(855/1140)	855	1500	5443	96%
TYJVFT-450L2-6(1000/1140)	1000	1500	6367	97%

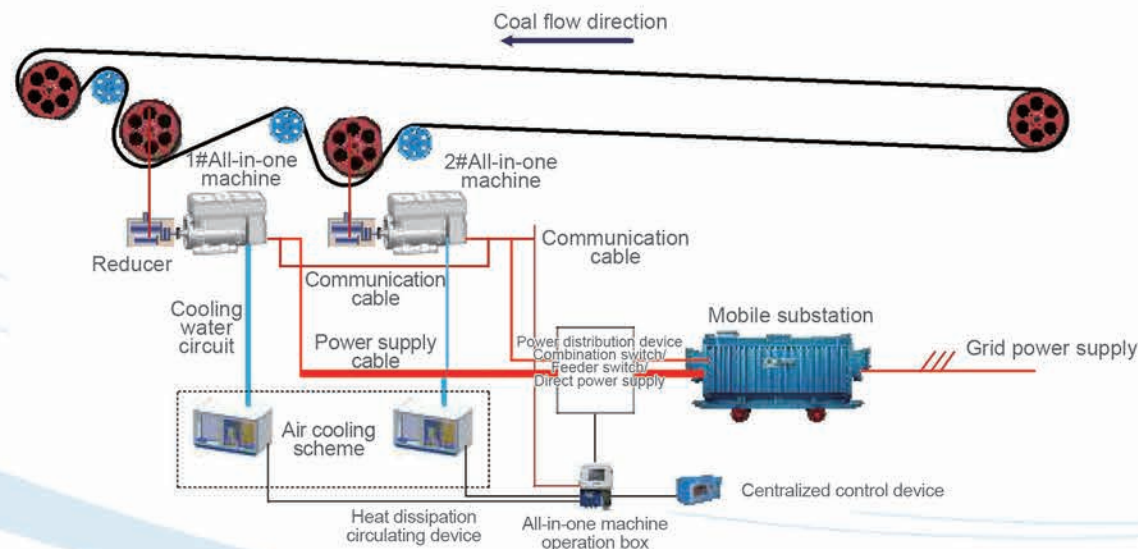


Application scheme of permanent magnet frequency conversion and speed regulation all-in-one machine for scraper conveyor

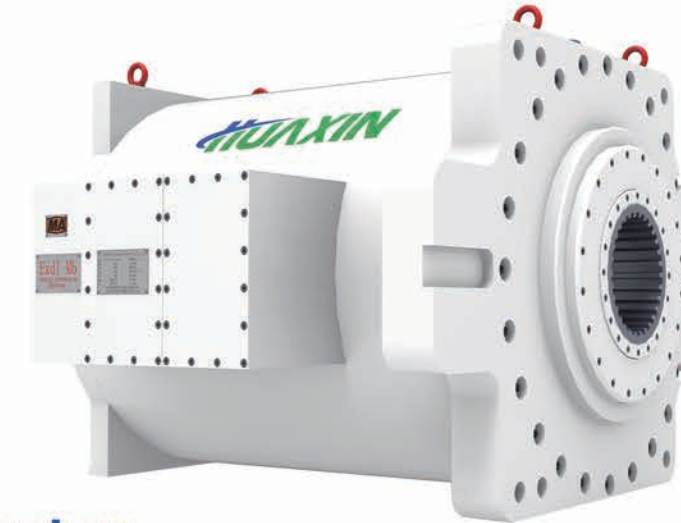
- The application of mine explosion-proof and intrinsically safe permanent magnet synchronous frequency conversion speed regulating all-in-one machine for scraper conveyor is similar to that of explosion-proof motor for conventional conveyor, which needs to be installed in scraper power driving part through reducer; Cooling water is required; The power supply cable only needs to use ordinary mining cable, which is connected to the all-in-one machine through explosion-proof cable connector.
- The power supply of the all-in-one machine comes from the mobile substation and supplies power to the all-in-one machine through the combination switch or feed switch to facilitate power shutdown and transmission, or it can directly supply power to the all-in-one machine without the switch.
- The operation box of all-in-one machine is the control center, which controls all-in-one machines through communication cables, including operation control, operation parameter setting, data acquisition and recording, data upload, etc. At the same time, it can interact with the centralized control device and power distribution device, and the user can realize the application of the all-in-one machine only by operating the centralized control device;
- The all-in-one machine is used for scraper conveyor, which can significantly shorten the length of equipment train, and has no electromagnetic interference on peripheral communication and weak current control equipment.
- The output power of the frequency converter is a modulated pulse wave close to sinusoidal, which is easily affected by the stray parameters of the output cable, while the input power supply is a conventional power frequency sine wave. The all-in-one machine is more suitable for the working condition of long cable power supply.

Application scheme of permanent magnet frequency conversion and speed regulation all-in-one machine for belt conveyor

- In the application of mine explosion-proof and intrinsically safe permanent magnet synchronous frequency conversion speed regulation all-in-one machine for belt conveyor, it is necessary to drive the belt conveyor with reducer.
- The power supply of the all-in-one machine comes from the mobile substation and supplies power to the all-in-one machine through the combination switch or feed switch to facilitate power shutdown and transmission, or it can directly supply power to the all-in-one machine without the switch.
- The cooling mode of the all-in-one machine is shell water cooling, and direct water supply can be adopted. If air cooling scheme is required, it can be equipped with the circulating heat dissipation device from our company.
- The operation box of all-in-one machine is the control center, which controls all-in-one machines through communication cables, including operation control, operation parameter setting, data acquisition and recording, data upload, etc. At the same time, it can interact with the centralized control device and power distribution device, and the user can realize the application of the all-in-one machine by operating the centralized control device.



TBVF Series Explosion-proof Deceleration Permanent Magnet Synchronous Variable Frequency Motor for Mining



Product Overview

The explosion-proof deceleration permanent magnet synchronous variable frequency motor for mining (hybrid permanent magnet motor) creatively integrates the permanent magnet motor with the first stage planetary reducer, which can directly replace the cumbersome transmission structure of asynchronous motors, hydraulic motors, three-stage reducers, etc., reducing the footprint by more than 60%, especially conducive to the use of limited space in mines. The overall length of the equipment is shortened by more than 60% compared to the original traditional system, the weight is reduced by 50%, and the overall comprehensive energy saving is more than 30%. At the same time, the overload start effect is good, and the impact on the equipment is small, which is in line with the current development trend of energy conservation, emission reduction, cost reduction, and efficiency increase in the coal industry.

Performance Characteristics

a. Extremely small volume, extremely large torque

Integrated design of permanent magnet motor and speed reduction structure, with small space occupation and low self weight, the length is shortened by more than 60% compared to the original traditional system, making it easy to arrange in limited space. Completely meeting the maximum torque requirements for the operation of the scraper starter, the starting torque reaches 2.5 times or more of the rated torque. The torque density reaches 30Nm/kg, which is 5-6 times higher than that of conventional direct drive motors.

b. New structure, compact and reliable

Drawing inspiration from the planetary gear mechanism in the wind power industry, the shaft of the permanent magnet motor serves as the sun gear of the primary planetary mechanism, with a compact shaft cover shared and a sun gear suction structure, and multiple advanced technologies, to create a futuristic product for the motor.

c. Simplified transmission and improved power

The transmission department of the scraper machine has been reduced from the original three-level gear transmission with a coupling to a one-stage planetary gear transmission, greatly improving the overall transmission efficiency. The output torque of the scraper machine sprocket end has been greatly increased, which is very suitable for the continuous production capacity improvement needs of frontline working faces in various mines across the country.

d. Ultra-high efficiency, low carbon and energy saving

Complying with the national environmental protection requirements for energy conservation and low carbon, the mea-