

Mine Explosion-proof Dry Type Transformer

Product Description

Mine dry-type transformer with explosion-proof structure, so it can be used in mines with coal dust and gas explosion danger, as power supply of low-voltage power equipment. It is also the main power supply of fully mechanized mining face and tunneling face. It is an important part of mobile substation.



Product Features

1.Low no-load loss

- Adopt high-quality silicon steel sheet;
- The wound core transformer can make full use of the orientation of silicon steel sheet and recover its magnetism through annealing process, so its no-load loss can be reduced by 20% -35%.

2.Low noise

- The noise mainly comes from the core and is transmitted to the surrounding area by the enclosure.
- Noise reduction measures:
 - Reducing noise source, as the wound core is without joint in compact structure and low magnetostriction as well as low noise.
 - The joint place adds the silica gel plate, cut off the transmission way of the noise.

3.Light weight and small volume.

4.With explosion-proof and moisture-proof performance.

5.Energy-saving and environmental protection.

- Uses the imported DuPont Co., Ltd. class C insulation heat-resistant grade Nomex paper packaging line, with air insulation, cooling, pollution-free to the environment and long service life of the product, Products can be decomposed and recycled after their life;
- Adopting high-quality 30Q120 cold-rolled oriented silicon steel sheet and oxygen-free copper wire to make the actual total loss is lower than that of similar products both at home and abroad so as to save energy and reduce noise.

Technical Parameters

- Explosion-proof type:** Mine Explosion-proof type; **Explosion-proof sign:** Exd I Mb;
- Rated capacity:** 50/100/200/315/400/500/630/800/1000/1250/1600/2000/2500/3150/4000/5000/6300kVA
- Rated voltage:** Primary voltage 6000/10000V,
Secondary voltage 3450(3300)/1200(1140)/693(660)/400(380)V
- Rated frequency:** 50Hz
- Phase number:** Three-phase
- Cooling mode:** Air self-cooling (ANAN)
- Temperature resistance classes of insulation materials:** H/N/R
- Technical performance data and vector group symbol:** See Table 1 and Table 2

Table 1 The primary rated voltage 6 kV mine explosion-proof dry-type transformer performance parameters

Rated Capacity (kVA)	Voltage Combination (kV)		Vector Group Symbol	Loss		Impedance Voltage (%)	No-load Current (%)	
	Primary Voltage	Secondary Voltage		No-load	Load			
50	6±5%	0.693/0.4	Yy0(d11)	310	550	4	2.5	
100				470	920	4	2.5	
200				740	1550	4	2	
315		1.2/0.693		990	2150	4	1.8	
400				1170	2600	4	1.8	
500				1350	3100	4	1.5	
630				1620	3680	4	1.5	
800				1850	4500	4	1.0	
1000				2100	5400	4	1.0	
1250		1.2 3.45		2480	6500	4	1.0	
1600				3000	8000	4	0.8	
2000				3400	9500	4.5	0.6	
2500				4050	10600	5	0.6	
3150				4750	12500	5.5	0.6	
4000				5500	14000	6	0.6	
5000		3.45		Dy11	6400	15800	6	0.5
6300					7600	18000	6	0.5

Table 2 The primary rated voltage 10 kV mine explosion-proof dry-type transformer performance parameters

Rated Capacity (kVA)	Voltage combination (kV)		Vector Group Symbol	Loss		Impedance Voltage (%)	No-load Current (%)
	Primary Voltage	Secondary Voltage		No-load	Load		
50	10±5%	0.693/0.4	Yy0(d11)	350	680	4	2.5
100				500	1050	4	2.5
200				850	1800	4	2
315		1.2/0.693		1200	2500	4	1.8
400				1350	3000	4	1.8
500				1600	3500	4	1.5
630				1800	4100	4	1.5
800				2100	5100	4	1.2
1000				2350	6100	4.5	1.2
1250		1.2 3.45	Yy0 Dy11	2800	7400	4.5	1.0
1600				3450	8500	5	1.0
2000				3050	9700	5	0.7
2500				4700	10800	5.5	0.7
3150				5500	12800	5.5	0.7
4000				6300	15000	6	0.7
5000		3.45	Dy11	7300	17600	6	0.6
6300				8500	20000	6	0.6

Product Dimensions

Serial No.	Model	Length mm	Width mm	Height mm	Weight KG	Model	Length mm	Width mm	Height mm	Weight KG
1	KBSG-100/6	2425	703	1034	1300	KBSG-100/10	2566	778	1077	1400
2	KBSG-200/6	2624	784	1082	1550	KBSG-200/10	2806	797	1141	1700
3	KBSG-315/6	2682	862	1097	1900	KBSG-315/10	2837	886	1162	2100
4	KBSG-400/6	2730	863	1103	2400	KBSG-400/10	2920	891	1169	2500
5	KBSG-500/6	2802	870	1307	2600	KBSG-500/10	3057	897	1318	2750
6	KBSG-630/6	2937	879	1328	3150	KBSG-630/10	3163	931	1406	3300
7	KBSG-800/6	3044	962	1341	3800	KBSG-800/10	3209	952	1470	3850
8	KBSG-1000/6	3244	977	1402	4300	KBSG-1000/10	3346	998	1506	4600
9	KBSG-1250/6	3492	998	1650	4900	KBSG-1250/10	3542	1034	1650	5000
10	KBSG-1600/6	3590	1158	1690	6700	KBSG-1600/10	3610	1158	1690	7000
11	KBSG-2000/6	3710	1165	1700	8600	KBSG-2000/10	3860	1165	1700	9000
12	KBSG-2500/6	3820	1250	1750	10200	KBSG-2500/10	4070	1250	1750	10500
13	KBSG-3150/6	3982	1380	1780	12700	KBSG-3150/10	4132	1380	1780	13200
14	KBSG-4000/6	4370	1400	1800	14500	KBSG-4000/10	4420	1400	1800	15200
15	KBSG-5000/6	5200	1490	1600	18000	KBSG-5000/10	5250	1490	1600	19000
16	KBSG-6300/6	5360	1580	1720	24000	KBSG-6300/10	5410	1580	1720	25000

Application Areas

Mine explosion isolation dry-type transformer is suitable for wet underground environment and places contain gas and coal dust and with explosion danger. It provides power supply for comprehensive mechanized coal mining equipment or hand-held electric drill and lighting etc.



Flameproof Convertible
Mobile Substation for Mining

Product Description

Mine-used flameproof variable-current mobile substation refers to a special power transformer used in conjunction with a current converter. Current conversion is a general term for three operating modes: rectification, inversion, and frequency conversion, among which rectification is the most widely applied. A transformer used as the power supply for a rectification device is called a rectifying transformer. Most industrial DC power supplies are obtained from AC power grids through rectifying transformers and rectifying equipment.



Product Features

- a. The mine-used flameproof variable-current mobile substation is a high-tech, energy-saving, and environmentally friendly product. It supports multiple topologies of the main circuit of variable-frequency drives, including multiple rectifications, series-connected units, multi-level configurations, and phase-shifted converters. It can promote and achieve low-harmonic or even no-harmonic variable-frequency speed regulation for high-voltage series ordinary AC asynchronous motors, effectively addressing harmonic pollution issues in high-voltage variable-frequency applications from the source.
- b. The low-voltage output of the mine-used flameproof variable-current mobile substation is 2×1905V three-phase power supply, with a phase-shifting angle between each output power supply, which reduces harmonic currents. This lowers the voltage withstand requirements for power components such as IGBT in high-voltage variable frequency drives, making the system more reliable. Not only does it significantly reduce equipment purchase costs, but it also decreases the workload and maintenance costs of daily equipment maintenance, thereby improving the overall efficiency of the coal mining industry.
- c. The core silicon steel sheets of the mine-used flameproof variable-current transformer are made of WISCO' s 27Q100 grade, utilizing high-quality, high-permeability, low-loss cold-rolled grain-oriented silicon steel sheets. The 45° fully-inclined seams and multi-step stepped stacking structure effectively reduce no-load losses, no-load currents, and noise. The core surface is coated with high-temperature-resistant, rust-proof, and moisture-proof paint, while the core insulating components all utilize Class H insulating materials, ensuring no damage during long-term operation at high temperatures. The clamping structure ensures smooth ventilation. The high and low-voltage coil conductors are made of high-quality oxygen-free copper rods, and after computer-optimized design, they are wound using Class R insulated, DuPont Nomex paper-wrapped conductors. They undergo VPI (Vacuum Pressure Impregnation) with Class H solvent-free varnish and high-temperature curing, resulting in excellent strength, heat resistance, and moisture resistance. The transformer has superior partial discharge performance and strong overload capacity.

Technical Parameters

- 1.Execution standards: GB3836-2010 GB/T 8286-2017 Q/SXHX 040-2018
- 2.Explosion-proof type: Mine Explosion-proof type; Explosion-proof sign: ExdbMb

- 3.Rated capacity: 1250/1600/2000/2500/3150/4000 kVA
 4.Rated voltage: Primary voltage 6000/10000V
 Secondary voltage 2×1905V
 5.Rated frequency: 50Hz
 6.Phase number: Three-phase
 7.Cooling mode: Air self-cooling (ANAN)
 8.Temperature resistance classes of insulation materials: H/N/R
 9.Technical performance data and vector group symbol: See Table 1 and Table 2
 10.Performance parameters of high and low-voltage switches: see Table 3.

Table 1 Performance parameters of dry-type transformers for mine explosion-proof converter mobile substations with a primary rated voltage of 6kV

Rated Capacity (kVA)	Voltage Combination (kV)		Vector Group Symbol	Loss(W)			Impedance Voltage (%)	No-load Current (%)
	Primary Voltage	Secondary Voltage		No-load Loss	Winding Through Loss	Total Winding Loss During Operation		
1250	6	2×1.905	Dy11d0	3100	7400	11500	7.5	1.1
1600	6	2×1.905	Dy11d0	3500	8800	13500	7.5	1.0
2000	6	2×1.905	Dy11d0	4100	13700	19500	7.5	1.0
2500	6	2×1.905	Dy11d0	5000	15300	22000	8	0.8
3150	6	2×1.905	Dy11d0	6800	16500	25000	9	0.7
4000	6	2×1.905	Dy11d0	7800	17600	27000	10	0.5

Table 2 Performance parameters of dry-type transformers for mine explosion-proof converter mobile substations with a primary rated voltage of 10kV

Rated Capacity (kVA)	Voltage Combination (kV)		Vector Group Symbol	Loss(W)			Impedance Voltage (%)	No-load Current (%)
	Primary Voltage	Secondary Voltage		No-load Loss	Winding Through Loss	Total Winding Loss During Operation		
1250	10	2×1.905	Dy11d0	3400	8250	13000	7.5	1.1
1600	10	2×1.905	Dy11d0	3800	10500	15500	7.5	1.0
2000	10	2×1.905	Dy11d0	4600	14100	20500	8	0.9
2500	10	2×1.905	Dy11d0	5300	15800	23000	8	0.8
3150	10	2×1.905	Dy11d0	7000	16700	26000	9	0.7
4000	10	2×1.905	Dy11d0	7900	18000	28000	10	0.5
5000	10	2×1.905	Dy11d0	9350	19300	29500	11.5	0.5

Table 3 Performance parameters of high and low-voltage switches

High-Voltage Side Vacuum Switch	Rated voltage(kV)	6、10
	Rated current(A)	200、400
	Mechanical life (times) of vacuum circuit breaker	10000
Low-Voltage Side Protection Box	Rated voltage(V)	1905
	Rated current(A)	2×630、2×800、2×1000
	Overload current setting range	1.2-6 times
	Short-circuit current setting range	6-10 times
	Check insulation resistance setting of unit operation(KQ)	1905V single-phase 50
	Check locking resistance setting of unit operation(KQ)	1905V single-phase 100

Product Dimensions

Model	Mobile Substation (Length × Width × Height) mm	Weight kg
KBZSGZY-1250/6/2×1.905	4784×1226×1600	9200
KBZSGZY-1250/10/2×1.905	4792×1226×1650	9500
KBZSGZY-1600/6/2×1.905	4814×1205×1680	10800
KBZSGZY-1600/10/2×1.905	4845×1225×1680	11300
KBZSGZY-2000/6/2×1.905	4864×1252×1700	12300
KBZSGZY-2000/10/2×1.905	4904×1262×1700	12800
KBZSGZY-2500/6/2×1.905	4972×1270×1750	13500
KBZSGZY-2500/10/2×1.905	5022×1270×1750	14100
KBZSGZY-3150/6/2×1.905	5572×1410×1790	16500
KBZSGZY-3150/10/2×1.905	5663×1420×1790	17000
KBZSGZY-4000/6/2×1.905	6288×1540×1800	18300
KBZSGZY-4000/10/2×1.905	6288×1540×1800	19000

The explosion-proof converter mobile substation for mining is suitable for underground coal mine environments that are damp and contain gas, coal dust, as well as places with explosion hazards. It provides power supply for intelligent mining and transportation equipment and other devices.