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Sugar Mill Of Low Rpm Dc Motors

A DC motor is a type of motor that uses electrical energy to convert electrical energy into mechanical energy. Sugar mill of low rpm dc motors have many advantages, such as adjustable speed, large torque, and good starting performance. In addition, DC motors can achieve constant speed by changing the stator current, providing great convenience for industrial production.

As a traditional type of motor, DC motors have been widely used in various fields, such as manufacturing, metallurgy, chemical industry, etc. In industrial production, DC motors can be used to drive various equipment and machinery, such as water pumps, fans, compressors, machine tools, etc.

As a large-scale agricultural enterprise, sugar mills require a large amount of energy consumption in their production process. Sugar mill of low rpm dc motors play an important role in multiple links such as crushing, production, and transportation, driving various mechanical equipment in the sugar factory to ensure efficient and stable production processes.
Different production processes require the selection of high-voltage motors with different speeds. For example, a high-speed rotating motor is required during the crushing process, while a low-speed rotating motor is required during the conveying process.
The power required by the motor should match the requirements of the production process. If the power is insufficient, it will cause the equipment to not work properly; Excessive power can cause waste. Choosing qualified DC motors can ensure stable operation of the equipment and extend its service life.

No.	Application	Sugar mill	Rolling mill
1	DC motor	yes	yes
2	Structure	steel plates welded	steel plates welded
3	Cooling method	IC06/IC86W	IC06/IC86W
4	Cooling feature	With blower at top/with water cooler at top	With blower at top/with water cooler at top

5	Protection class	IP21S/IP23/IP44	IP21S/IP23/IP44
6	Insulation	F/H	F/H
7	Mounting	IM1001,IM2001	IM1001,IM2001
8	Voltage	440/550/660/750V	440/550/660/750V
9	Duty	S1	S1,S3,S6
10	Tachometer generator/encoder	Tachometer generator	Tachometer generator,encoder

A DC motor is a type of motor that uses electrical energy to convert electrical energy into mechanical energy. Its basic structure includes components such as stator, rotor, magnetic poles, etc. When the current flows on the stator, a rotating magnetic field is generated around it, causing the rotor to rotate under the force of the magnetic field, thereby achieving the goal of converting electrical energy into mechanical energy.

Sugar mill of low rpm dc motors, this series of motors has good starting and speed regulation performance, a wide and smooth speed regulation range, strong overload capacity, and is less affected by electromagnetic interference. Moreover, DC motors are more energy-efficient and environmentally friendly than AC motors.

With the development of low-carbon globalization, the manufacturing industry is the first to be called upon to seek efficient and energy-saving production models, improve utilization efficiency, and reduce energy consumption.

Electrical Performance

Frame	315~710
Output range(KW)	50~2800
Voltage(V)	220/330/440/550/660/750/850/950V
Field voltage(V)	180/220/310V
Excitation	Sep.
Rate speed	100-1800rpm
Working duty	S1,S3,S5,S6
Enclosure	IP21S, IP23, IP44
Cooling	IC06, IC17, IC37, IC86W
Frequency(Hz)	50/60;3～100Hz
Encoder/tachometer generator	according to customers requirement
Mounting	IMB3, IMB35, IMV1

Blower position	DE side

型号 Type	额定功率 Rated Output	额定转速 Rated Speed		弱磁转速 Speed with Field Weaking	电枢电流 Arm. Curr.	励磁功率 Field Power	电枢回路电阻 Arm. Circuit Resistance	电枢回路电感 Arm. Circuit Inductance	磁场电感 Field Inductance	效率 Eff.	惯量矩 Moment of Inertia	重量 Wt.
	P_N	400V	440V	n_F	I_N	P_F	R	L_A	L_F		GD^2	
	kW	r/min		r/min	A	W	Ω(20℃)	mH	H	%	$kg.m^2$	kg
32	500	540		1200	1358	7100	0.0134	0.39	19.6	90.8	156	6000
	550		600							92		
32	453	450		1300	1228		0.0145	0.32	7.36	90		
	500		500							91.4		
Z4-450-32	408	360		1200	1130		0.0205	0.53	7.17	88.5		
	450		400							89.7		
32	309	270		900	875		0.0342	0.83	4.8	85.9		
	340		300							87.1		
31	200	180		600	595		0.0751	1.9	9.09	81.3		
	220		200							82.6		
42	545	540		1100	1492	7800	0.0134	0.51	28.2	90.3	174	6700
	600		600							91.5		
42	500	450		1100	1367		0.0145	0.43	18.6	90		
	550		500							91.4		
Z4-450-42	453	360		1200	1254		0.0178	0.42	5.85	88.9		
	500		400							90		
42	500	450		1100	1367		0.0145	0.43	18.6	90		
	550		500							91.4		
Z4-450-42	453	360		1200	1254		0.0178	0.42	5.85	88.9		
	500		400							90		
42	345	370		900	972		0.0275	0.81	5.62	86.8		
	380		300							88.1		
41	235	180		600	698		0.0612	1.7	5.73	81.7		
	260		200							83		

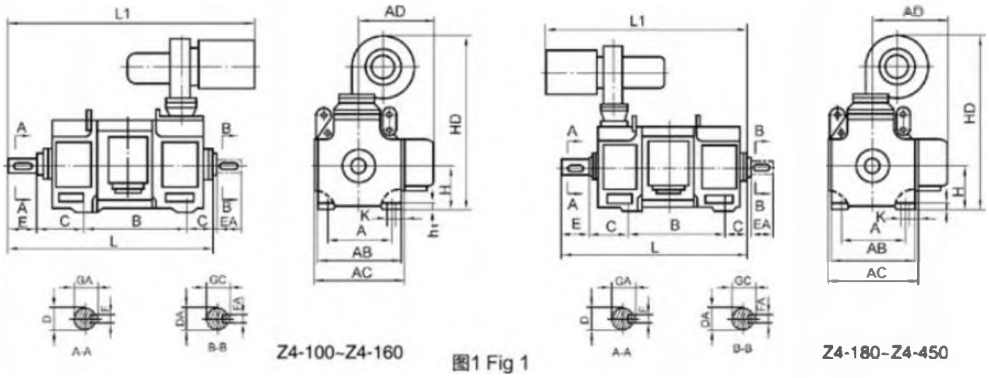


图1 Fig 1

卧式、机座带底脚 Horizontal Foot-Mounted

表3 Table 3 mm

型号 Type	安装尺寸 Mounting Dimensions in millimeter													外形尺寸 Outline Dimensions in millimeter						
	A	B	C	D	E	F	GA	DA	EA	FA	GC	H	K	AB	AC	AD	HD	L	L1	h
Z4-315-11	508	887	216	100	210	28	106	95	170	25	100	315	28	620	654	497	1221	1532	1897	30
Z4-315-12		977																1622	1987	
Z4-315-21		967																1612	1977	
Z4-315-22		1057																1702	2067	
Z4-315-31		1057																1702	2067	
Z4-315-32		1147																1792	2157	
Z4-315-41		1157																1802	2167	
Z4-315-42		1247																1892	2257	
Z4-355-11	610	968	254	110	210	28	116	110	210	28	116	355	28	700	734	701	1301	1689	2010	30
Z4-355-12		1058																1779	2100	
Z4-355-21		1058																1779	2100	
Z4-355-22		1148																1869	2190	
Z4-355-31		1158																1879	2200	
Z4-355-32		1248																1969	2290	
Z4-355-41		1268																1989	2310	
Z4-355-42		1358																2079	2400	
Z4-400-11	686	959	280	120	210	32	127	120	210	32	127	400	35	790	830	750	1620	1732	1817	35
Z4-400-12		1079																1852	1937	
Z4-400-21		1039																1812	1897	
Z4-400-22		1159																1932	2017	
Z4-400-31		1129																1902	1987	
Z4-400-32		1249																2022	2107	
Z4-400-41		1229																2002	2087	
Z4-400-42		1349																2122	2207	
Z4-450-11	800	1061	315	140	250	36	148	140	250	36	148	450	35	890	924	800	1720	1944	2050	40
Z4-450-12		1181																2064	2070	
Z4-450-21		1151																2034	2140	
Z4-450-22		1271																2154	2260	
Z4-450-31		1251																2134	2240	
Z4-450-32		1371																2254	2360	
Z4-450-41		1361		160	300	40	169											2294	2350	
Z4-450-42		1481																2414	2470	
Z4-450-51		1481																2414	2470	
Z4-450-52		1601																2534	2590	

Steel Plant Of Ball Bearing DC Motor

Steel plant of ball bearing DC motor can achieve variable speed control over a wide range and meet the requirements of different load conditions.The production of steel plants involves multiple processes, such as iron-making, smelting, rolling, etc., which require a large amount of electrical equipment. DC motor is a common type of electric motor in steel production, which can be used to drive various mechanical equipment, such as rolling mills, fans, water pumps, etc.

In steel production, it is necessary to drive large mechanical equipment, and steel plant of ball bearing DC motor can meet their requirements of high torque, high power, low speed, etc., with a wide range of application scenarios. For example, the rolling mill needs to drive the rollers through a DC motor for rolling, and equipment such as water pumps and fans in electronic steam boilers also need to use DC motors to meet flow, pressure, and other requirements.

Steel plant of ball bearing DC motors have the following advantages:

Wide speed range

DC motors can achieve adjustable speed control over a wide range, meeting the requirements of different load conditions;

Good starting performance

The torque of a DC motor is linearly related to the current, which can reach the rated torque in a short time, resulting in lower energy consumption for various mechanical equipment during starting and stopping;

Strong load capacity

DC motors can ensure normal operation under low speed and high load conditions;

High control accuracy

The DC motor adopts digital control technology to achieve high-precision speed and position control.

DC motor is a commonly used motor in steel production, and its unique advantages and application scenarios make it an indispensable part of the steel industry. Specifically, in which application scenarios can electric motors be used?

- **Blast furnace field**

The first step in steel production is to smelt molten iron in the blast furnace. The motors used in the blast furnace mainly include fans, blast furnace induced draft fans, gas induced draft fans, gas circulation fans, dust collectors, compressors, etc. The smooth operation of these equipment cannot be separated from the effectiveness of the motors, in which there are both AC and DC motors will be used.

- **Converter field**

In the process of steel production, it is necessary to go through multiple key steps such as reducing molten iron, adjusting the composition of molten iron, and insulation. These equipment bodies need to be used in

the converter, and the motors used in the converter mainly include temperature regulators, slag extractors, compressors, desulfurization machines, etc.

● **Continuous casting machine field**
Continuous casting is one of the key links in steel production, which determines the quality and efficiency of semi-finished products. Continuous casting machines mainly include crystallizers, swing angle and swing mechanisms, traction systems, and finished product cutting systems, all of which require motor of DC motors to drive and cooperate to ensure normal production.

● **Rolling mill field**
Rolling mills provide necessary auxiliary equipment for steel production and are applied in multiple processes such as cold rolling and hot rolling. The rolling mill equipment mainly includes entrance unit, four high machine, hot billet rolling mill, flaw detection machine, oiling machine, etc., all of which require steel plant of ball bearing DC motor to provide assistance.

● **Wind turbine field**
In the production process of steel mills, fans provide power for multiple equipment, such as the blast furnace top, tuyere, flue, desulfurization and dust removal. Fans are divided into blowers, induced draft fans, and smoke exhaust fans according to their uses, and are an indispensable part of steel production.

The mechanical characteristics of a DC motor refer to the motion characteristics of the motor in a mechanical system, including mechanical inertia, load inertia, friction, axial torque, etc. These characteristics will affect the changes in motor speed and torque, thereby affecting the performance of the entire system.



Technical Specifications

Standard	GB755 & IEC 600-34
Environment	-15~+40 deg.C, max.1000m
Armature voltage	400V, 440V, 550V, 660V, 700V
Field Voltage	180V, 220V, 310V, 330V
Application	Steel plant, rolling mill, paper-making plant,sugar mill
Type	heavy industry motor

Cooling method	IC06, IC17, IC37, IC86W
Protection rating	IP21S, IP23, IP44, IP54
Frame size	132~1000
Output	1.5kW~800kW
Excitation	Sep.
Rate speed	100-3000rpm
Mounting	IMB3, IMB35, IMV15, IMV1
Insulation class	F, H
Working duty	S1, S3
Encoder/tachometer generator	according to customers requirement.

Note

01.

If it's humid-tropical environment , we will produce motor with special making and mark "TH " after the model code.

02.

Blower can be needed or not, this will be made according to customers requirement.

03.

Blower can be assembled at DE side or NDE side, this will be made according to customers requirement. Usually it's at DE side.

04.

Special ambient environment and altitude, the motor models need to be calculated and confirmed by engineers.

Production Overview

Brush holder
The material of the brush hold for steel plant of ball bearing DC motor is copper.The brush box connects the internal and external power sources of the motor, serving as a bridge for energy transfer.

RTD
The full name of a thermistor RTD is Resistance Temperature Detector, which is a resistance temperature detector. The resistance of commonly used RTDs is 100 Ω, resulting in a resistance change of only 0.385 Ω per 1 ℃.

Shaft fixation
Shaft fixation is a fixing device used for the motor shaft during transportation. It can prevent axial displacement and radial run-out of the motor shaft, ensuring safe transportation.

NDE encoder
The function of an encoder is to convert angular or linear displacement into electrical signals. Assembly at the NDE side of steel plant of ball bearing DC motor, it can measure rotation angle or linear displacement, which is very important for systems that require precise control of speed and position.

Plastic Extruding Machine Dc Big Motor

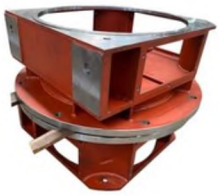
Plastic extruding machine DC big motor is the is a very commonly used motor category. Compared to AC motors, this type of DC motor has higher efficiency. Their motors have high conversion efficiency and can convert most of the input electrical energy into mechanical energy, thus having higher work efficiency. In practical applications, DC motors are usually used in situations that require high-precision control and high loads.

The principle of a plastic extruder is to use variable amplitude and frequency to control the rotational speed of the rotor, so that plastic can be fully melted and extruded from the discharge port through a specific shaped mold of the machine structure, thereby achieving the processing and production of plastic products.

The extrusion process of a plastic extruder includes three stages, namely feeding and melting, extrusion and forming, cutting and packaging. These three stages all require electric motors to drive different equipment, such as gearboxes, fans, etc.
Generally speaking, if you need a medium to high power extruder and need frequent output adjustment, an AC motor may be a better choice. If the output is small and the precision control requirements are relatively high, a plastic extruding machine DC big motor can be chosen. But if your goal is to achieve higher productivity and efficiency in a shorter amount of time, you should consider using an AC motor.

One advantage of DC big motors is that they can provide greater peak torque in high load applications. In addition, compared to AC motors, the speed of DC motors can be more accurately adjusted, making them more suitable for precision applications and controlled production scenarios. The operating efficiency of DC motors under lower load conditions is usually higher than that of AC motors, and they can be started and reversed more easily.

DC motors have many significant advantages, particularly in terms of adaptability and operational stability. However, it also has certain drawbacks, with a more pronounced response in energy consumption and maintenance.



The advantages of DC big motors

Adjustable speed

DC motors can adjust their speed by controlling the voltage and current between the electrodes, suitable for scenarios that require speed adjustment, such as back and forth motion, uniform motion, etc..

01

High starting torque

DC motors can output a large torque at the moment of starting, which is very suitable for scenarios that require high starting torque, such as lifting machinery, lifting machinery, etc.

02

High reliability

DC motors have a simple structure, reliable operation, and can be adjusted, repaired, and maintained.

03

Good load adaptability

DC motors have high load adaptability and can adapt to various load changes.

04

The disadvantages of DC big motors

01.

High energy consumption

Due to the need for DC motors to rotate through conduction between electrodes, the energy consumption is high and not suitable for high-power scenarios.

02.

High maintenance cost

The maintenance cost of DC motors is high, requiring regular replacement of electrodes, brushes, and other components, which affects their application scope.

03.

DC power supply required

DC motors require DC power supply to function properly, so additional conversion equipment and costs need to be added when AC power is needed.

04.

Electrode welding problem

Due to the tendency of DC motors to generate arcs during operation, electrode welding problems and mechanical vibrations occur, requiring additional maintenance and upkeep.

With the development of low-carbon globalization, the manufacturing industry is the first to be called upon to seek efficient and energy-saving production models, improve utilization efficiency, and reduce

energy consumption.Therefore, based on comprehensive consideration of production scenarios and usage requirements, selecting a suitable plastic extruding machine DC big motor is necessary to ensure production stability while effectively controlling production costs.

Technical Specifications

Standard	GB755 & IEC 60034
Encoder/tachometer generator	according to customers requirement
Application	plastic industry, sugar mill, steel plant, rolling mill, paper-making plant
Type	heavy industry motor
Environment	-15~+40 deg.C, max.1000m
Frame size	132~1000
Armature voltage	400V, 440V, 550V, 660V, 700V
Field Voltage	180V, 220V, 310V, 330V
Output	1.5kW~800kW
Excitation	Sep.
Rate speed	100-3000rpm
Cooling method	IC06, IC17, IC37, IC86W
Protection rating	IP21S, IP23, IP44, IP54
Mounting	IMB3, IMB35, IMV15, IMV1
Insulation class	F, H
Working duty	S1, S3

Note

If it's humid-tropical environment , we will produce DC big motor with special making and mark "TH " after the model code.
Blower can be needed or not, this will be made according to customers requirement.
Blower can be assembled at DE side or NDE side, this will be made according to customers requirement. Usually it's at DE side.

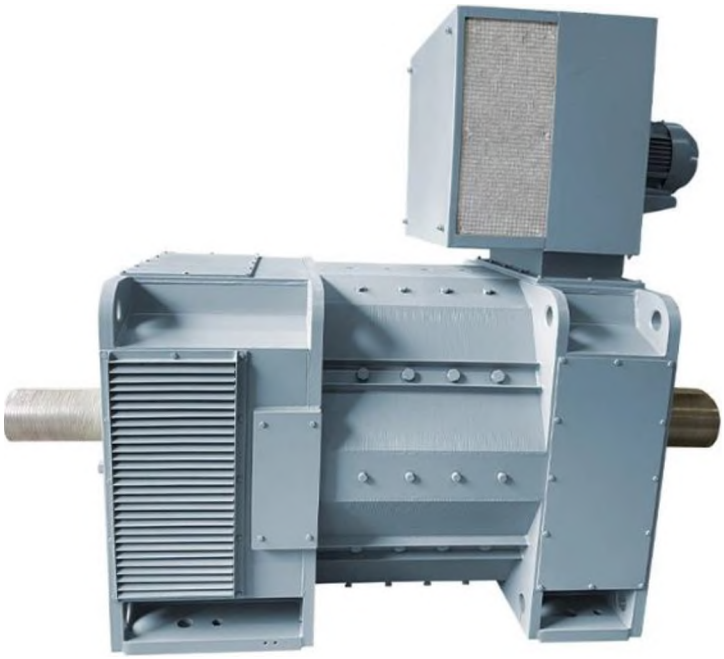
Special ambient environment and altitude, the motor models need to be calculated and confirmed by engineers.

Brush holder
The function of the carbon brush holder is to apply pressure to the carbon brush in sliding contact with the commutator or collector ring surface through a spring, so that it can stably conduct current between the fixed body and the rotating body.

Vibration sensor
Vibration sensors mainly monitor the vibration situation of rotating machinery, and each type of equipment has its own vibration standard. If the vibration value exceeds, it indicates that the machine has malfunctioned. Therefore, vibration sensors play a protective role in vibration.

Temperature sensor
Thermocouples are the most commonly used temperature sensors in temperature measurement. Its main benefits are a wide temperature range and adaptability to various atmospheric environments, and it is sturdy, cost-effective, does not require power supply, and is also the cheapest.

Encoder
Encoder is a device that converts angular or linear displacement into electrical signals. Encoder selection should pay attention to the following three aspects - mechanical installation size, resolution, and electrical interface.



Shredder Application 1200 Kw Motor

The main characteristics of shredder application 1200 kw motor include high efficiency, stability, durability, and strong adaptability. This kind of motors are designed to handle large quantities of metal materials, such as aluminum and steel, and therefore require high efficiency and stability to ensure smooth production processes. In addition, due to the high durability requirements of metal material processing for motors, these motors usually use high-quality materials and advanced technology to ensure long-term stable operation.

Brief Introduction

● In the current industrial development, shredders have appeared in various industrial fields, with the most common being steel mills and aluminum plants. The shredder belongs to heavy-duty equipment, and there are corresponding performance requirements for the shredder application 1200 kw motor that drives its operation.

● Specifically, the shredders used in steel and aluminum plants are typically driven by DC motors that possess the following characteristics.

● Efficiency
The motor design is efficient and can provide powerful power, ensuring that the shredder can maintain high efficiency when processing large amounts of metal materials.

● Stability
The motor operates stably and can maintain stable performance in long-term, high load working environments, reducing failure rates.

● Durability
The motor uses high-quality materials and advanced technology to ensure long-term stable operation even in harsh working environments.

● Adaptability
Shredder application 1200 kw motor usually has strong adaptability and can adapt to different working environments and material characteristics, meeting the diverse production needs of steel mills and aluminum plants.

● For this shredder application DC motors, their frame can vary from 315 to 710, power from 200kW to 2000kW and cooling method either by air or by water.

● The installation dimensions, performance, and technical requirements of this series motor fully comply with the relevant provisions of JB/T9577 "Technical Conditions for Z-Series Medium sized DC Motors" and GB/T755 "Rating and Performance of Rotating Electrical Machines".

● The vibration of motor complies with the provisions of the central standard GB10068 "Mechanical Vibration, Vibration Measurement, Evaluation and Limits for Motors with Shaft Center Height of 56mm and Above".

● The noise of motor complies with the provisions of GB/T10069.3 "Methods and Limits for Noise Determination of Rotating Electrical Machines" standard.

Technical Specifications

Type	Heavy-load equipment and industry
AMB TEMP	-15~+40 deg.C
Altitude	Max.1000m
Application	Plastic industry, sugar mill, steel plant, rolling mill, paper-making plant,cement plant,textile,rubber plant,aluminium plant,etc.
Frame size	315~710
Output	50kW~2800kW
Armature voltage	220/330/440/550/660/750/850/950V
Field Voltage	180/220/310V
Excitation	Sep
Rate speed	100-1800rpm
Mounting	IMB3, IMB35, IMV1
Insulation class	F, H
Working duty	S1,S3,S5,S6

Cooling method	IC06, IC17, IC37, IC86W
Protection rating	IP21S, IP23, IP44
Encoder/tachometer generator	According to customers requirement
Standard	GB/T755 & IEC 60034-1

Note

Special ambient environment and altitude, the motor models need to be recalculated and confirmed by engineers.

01

Blower/cooler can be needed or not, this will be made according to customers requirement.

02

Blower can be assembled at DE side or NDE side, this will be made according to customers requirement. Usually it's at DE side.

03

If it's humid-tropical environment , we will produce motor with special making and mark "TH " after the model code.

Brush rod
The importance of the brush rod lies in its role as a key component in the motor of shredder application 1200 kw motor, responsible for conducting current between rotating and stationary parts. It connects the circuit between the power source and the electric motor, and contacts rotating parts (such as brushes) through friction, thereby converting electrical energy into mechanical energy or converting mechanical energy into electrical energy.

Carbon brush
Carbon brush is a very important component in DC motors. Generally speaking, the lifespan of higher-level carbon brushes is around 1000 hours, while the lifespan of intermediate brushes can reach 500-800 hours, and the lifespan of lower level brushes is around 200-300 hours. If used infrequently and in a dry and easy to cool environment, the lifespan can be increased to over 1300 hours.

Encoder
During the operation of shredder application 1200 kw motor, an encoder is used as the front-end measuring element to monitor parameters such as current, speed, and relative position of the shaft in the circumferential direction in real time, determine the status of the motor body and the dragged equipment, and further control the operation status of the motor and equipment in real time, thereby achieving many specific functions such as servo and speed regulation.

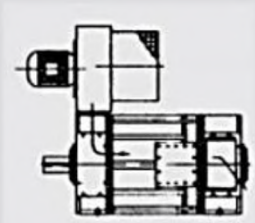
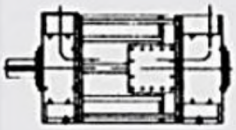
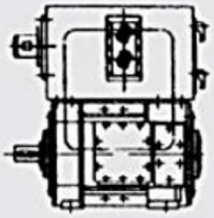
Metal gland
Metal gland heads are usually made of brass or stainless steel, which have good mechanical properties and corrosion resistance, and can adapt to various harsh working environments. The characteristics of metal gland heads make them widely used in electrical, marine, petrochemical and other fields, especially in places where electrical explosion prevention is required.

型号说明 Type Designation

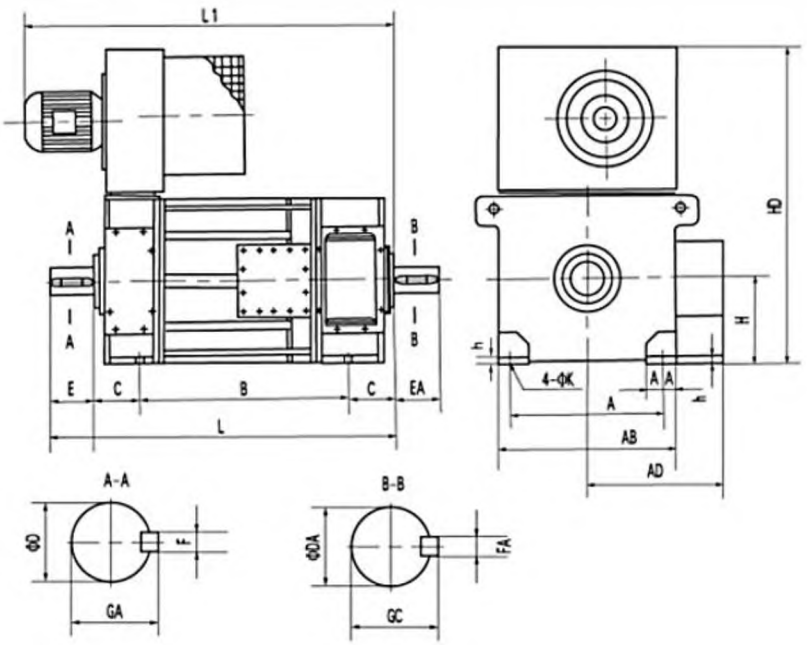
举例 For example:

Z 560 — 4 A

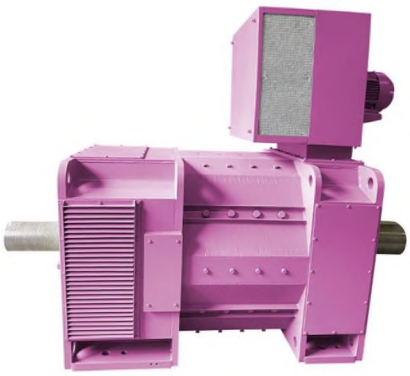
- A — 电机类别代号 字母A、B分别表示第一类和第二类电动机
  Classification code of motor: Letters A and B represent Type 1 and Type 2 motors respectively.
- 4 — 电枢铁心长度代号
  Length code of armature core
- 560 — 电机中心高 以mm表示
  Motor central height (mm)
- Z — 系列代号Z：直流电动机（冷却方式IC06、IC17、IC37）
  Series code Z: DC motor (Cooling form IC06, IC17 or IC37)
- ZKSL — 系列代号ZKSL：带空／水冷却器直流电动机（冷却方式IC86W）
  Series code ZKSL: DC motor with air/water cooler (Cooling form IC86W)

冷却方式 Cooling form	IC06 配有骑式鼓风机 With motor blower	IC17 管道进风、自由出风 Air inlet piping and free outlet	IC37 管道进、出风 Air inlet and outlet piping	IC86W 带空／水冷却器 With air/water cooler
图示 As shown in Figure				
防护等级 Class of protection	IP23（防滴式） 防护直径大于12mm固体异物 防滴水进入 IP23 (Drip-proof) Protecting against solid substances with diameter of over 12mm Preventing from drip water		IP44（防溅式） 防护直径大于1mm固体异物 防溅水进入 IP44 (Splash-proof) Protecting against solid substances with diameter of over 1mm Preventing from splash water	

编号 Series no.	额定电压UN下的转速 Rotating speed under the voltage below rated voltage Un r/min					功率 Output PN kW	额定电流 Rated current Ia A	效率 Effi-ciency η• %	最大转速 Max speed Πmax r/min	励磁功率 Exci-tation power Pf kW	转动惯量 Moment of inertial J kg.m²	通风 Ventilation		电枢回路 Armature circuit	
	220V	330V	440V	550V	660V							风量 volume Q m³/s	风压 pressure H Pa	电压降 voltage drop ΔU V	电感 inductance La mH
01	197					59	357	71.3	600	4.7	11.2	1.5	1430	52.2	1.5
		327				96	350	80.2	1000	4.7	11.2	1.5	1430	51.2	1.4
			456			133	347	84.6	1500	4.7	11.2	1.5	1430	50.9	1.3
				586		168	342	87.3	1500	4.7	11.2	1.5	1430	50.1	1.3
					716	202	337	89.1	1500	4.7	11.2	1.5	1430	49.4	1.3
02	258					78	441	77.1	800	4.6	11.2	1.4	1260	40.3	0.92
		416				124	435	84.0	1500	4.6	11.2	1.5	1430	39.7	0.87
			574			167	424	87.5	1500	4.7	11.2	1.5	1430	38.8	0.86
				733		209	417	89.6	1500	4.6	11.2	1.5	1430	38.2	0.86
					891	248	407	90.9	1500	4.6	11.2	1.5	1430	37.3	0.87
03	365					105	566	81.6	1200	4.6	11.5	1.5	1430	31.3	0.51
		579				163	555	87.0	1500	4.6	11.5	1.5	1430	30.7	0.49
			794			217	540	89.7	1500	4.6	11.5	1.5	1430	29.9	0.49
				1008		267	524	91.3	1500	4.6	11.5	1.6	1610	29.1	0.50
					1223	312	506	92.2	1500	4.6	11.5	1.6	1610	28.2	0.51
04	439					127	666	84.2	1500	4.7	12.2	1.5	1430	25.7	0.36
		690				194	650	88.7	1500	4.7	12.2	1.5	1430	25.1	0.35
			940			255	628	90.9	1500	4.7	12.2	1.6	1610	24.4	0.36
				1191		309	603	92.1	1500	4.7	12.2	1.6	1610	23.4	0.37
					1442	355	573	92.8	1500	4.7	12.2	1.7	1800	22.4	0.38
05	578					166	848	87.0	1500	4.7	12.2	1.5	1430	19.9	0.21
		898				246	811	90.5	1500	4.7	12.2	1.6	1610	19.2	0.22
			1219			315	768	92.0	1500	4.7	12.2	1.7	1800	18.3	0.22
				1540		371	719	92.8	1500	4.7	12.2	1.8	2000	17.2	0.24



型　号	安装尺寸													外形尺寸						
	A	B	C	D	E	F	GA	DA	EA	FA	GC	H	K	AB	AD	L	L1	HD	AE	h
Z315-1	508	770	216	90	170	25	95	90	170	25	95	315	28	620	490	1372	1427	1490	620	25
Z315-2		850														1452	1507			
Z315-3		930														1532	1587			
Z315-4		1030														1632	1687			
Z355-2	610	800	254	110	210	28	116	110	210	28	116	355	28	700	630	1515	1647	1720	700	35
Z355-3		900														1615	1747			
Z355-4		1000														1715	1847			
Z355-5		1120														1835	1967			
Z400-1	686	800	280	120	210	32	127	120	210	32	127	400	35	790	670	1560	1722	1870	790	35
Z400-2		900														1660	1822			
Z400-3		1000														1760	1922			
Z400-4		1120														1880	2042			
Z450-1	800	900	315	140	250	36	148	140	250	36	148	450	35	890	725	1775	1887	1990	890	40
Z450-2		1000														1875	1987			
Z450-3		1120														1995	2107			
Z450-4		1250														2125	2237			



Grinder Machine The Direct Current Motor

Grinder machine the direct current motor is usually driving for heavy load equipment. Heavy load refers to the big force and power that machines need to withstand, such as metallurgical equipment, belt conveyors on assembly lines, rolling mill, grinder,crusher and mixer on rough machining lines, etc. The characteristics of such heavy loads mainly include high starting current, frequent load changes, and large load fluctuations.

Brief Introduction

● Grinding machine is a specialized machine tool for precision grinding processes, mainly used for high-precision and high-quality surface processing of hard and brittle materials, such as processing metal work pieces, cutting tools, molds, steel balls and other metal components.

● Due to the hardness of the processing material, the size of the processed parts, and the regularity of the structure, the force and torque required by the grinder are also different for different processed parts. Therefore, when equipping grinder machine the direct current motor, it is necessary to comprehensively consider the selection of the most suitable model and performance. This not only enables efficient and stable completion of machining requirements, but also protects the performance and lifespan of the grinder equipment and electric motor.

●DC electric motors are classified with 2 kinds, Z series medium-size DC motors and Z series large-size DC motors, all of which are developed with adoption of up-to-date design and manufacture technologies and based on our over twenty years' experiences in this field.

● For Z series medium-size DC motors,there are six different center heights from 315 to 560, power from 100kW to 1000kW. For Z series large-size DC motors,there are 2 different center heights from 710 to 800, power from 800kW to 3500kW.

Ordering Instructions

1. Please specify the model, power, voltage, speed, excitation voltage, cooling method, number of output shafts, and position of the output box of the electric motor when placing an order.

2. Please specify the model, specifications, and quantity of accessories that need to be installed on the motor when placing an order.

3. If the usage environment is special and requires a humid tropical type, please indicate "TH" after the prototype number.

Technical Specifications

Type	Heavy-load equipment and industry
Application	Plastic industry, sugar mill, steel plant, rolling mill, paper-making plant,cement plant,textile,rubber plant,aluminium plant,etc.
Frame size	315~710
Output	50kW~2800kW
Armature voltage	220/330/440/550/660/750/850/950V
Standard	GB/T755 & IEC 60034-1
Field Voltage	180/220/310V
Excitation	Sep
Rate speed	100-1800rpm
Cooling method	IC06, IC17, IC37, IC86W
Protection rating	IP21S, IP23, IP44
Mounting	IMB3, IMB35, IMV1
Insulation class	F, H
Working duty	S1,S3,S5,S6
Encoder/tachometer generator	According to customers requirement
AMB TEMP.	-15~+40 deg.C
Altitude	Max.1000m

Note

Blower/cooler can be needed or not, this will be made according to customers requirement.

01

Blower can be assembled at DE side or NDE side, this will be made according to customers requirement. Usually it's at DE side.

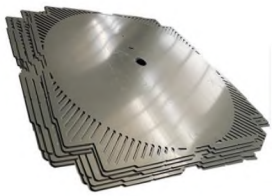
02

If it's humid-tropical environment , we will produce motor with special making and mark "TH " after the model code.

03

Special ambient environment and altitude, the motor models need to be recalculated and confirmed by engineers.



Bearing

The function of bearings is to support mechanical rotating bodies, reduce their friction coefficient during motion, and ensure their rotational accuracy. Sliding bearings do not have inner or outer rings nor rolling elements, and are generally made of wear-resistant materials. Commonly used for low-speed, heavy-duty, and difficult to lubricate and maintain mechanical rotating parts.

Brush holder

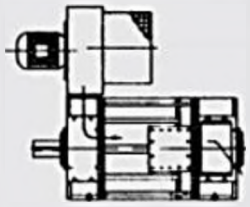
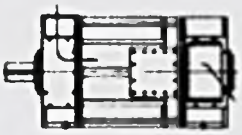
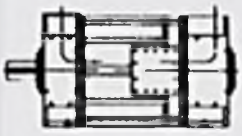
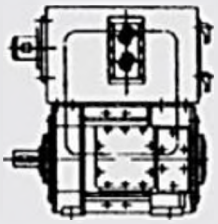
A brush holder is a component that accommodates electric brushes, usually made of insulating material. Its main function is to fix the electric brush and introduce current into the motor. The brush holder can be fixed to the fixed base by screws or clamps, and it is also connected to the circuit of the motor, so as to introduce current into the brush and ensure the normal operation of the grinder machine the direct current motor.

RTD

Temperature measuring RTD is a temperature sensor based on the resistance temperature effect, which works by utilizing the characteristic of the material's resistance changing with temperature. This type of sensor is made of materials such as platinum, platinum rhodium, nickel, copper, etc., and has high sensitivity and stability, making it significantly advantageous in the field of temperature measurement.

Silicon steel plate

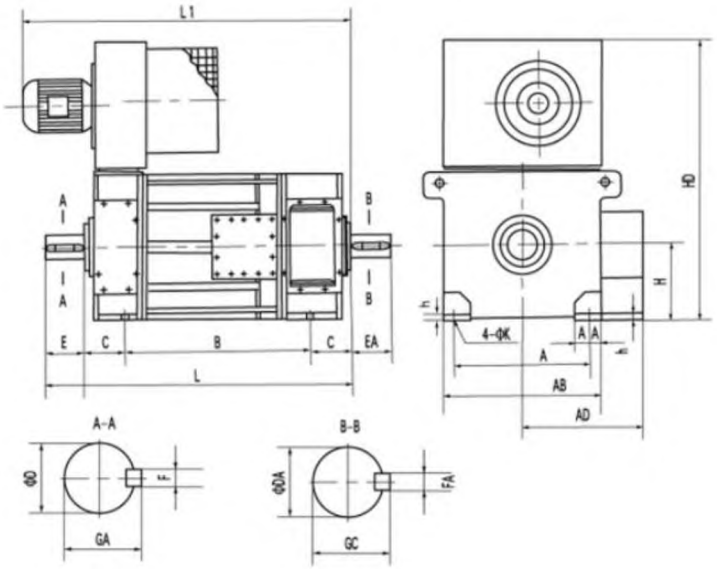
The main function of silicon steel sheets in grinder machine the direct current motor is to increase the electrical resistivity and maximum magnetic permeability of iron, while reducing coercivity, iron core loss (iron loss), and magnetic aging. The high magnetic permeability, low coercivity, and high resistance of silicon steel sheets result in small hysteresis and eddy current losses, thereby improving the efficiency and performance of the motor.

冷却方式 Cooling form	IC06 配有骑式鼓风机 With motor blower	IC17 管道进风、自由出风 Air inlet piping and free outlet	IC37 管道进、出风 Air inlet and outlet piping	IC86W 带空/水冷却器 With air/water cooler
图示 As shown in Figure				
防护等级 Class of protection	IP23(防滴式) 防护直径大于12mm固体异物 防滴水进入 IP23 (Drip-proof) Protecting against solid substances with diameter of over 12mm Preventing from drip water		IP44(防溅式) 防护直径大于1mm固体异物 防溅水进入 IP44 (Splash-proof) Protecting against solid substances with diameter of over 1mm Preventing from splash water	

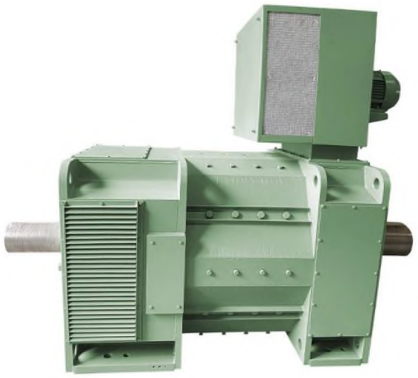
编号 Series no.	额定电压U_N下的转速 Rotating speed under the voltage below rated voltage Un r/min					功率 Output P_N kW	额定电流 Rated current Ia A	效率 Effi-ciency η• %	最大转速 Max speed Πmax r/min	励磁功率 Exci-tation power Pf kW	转动惯量 Moment of inertial J kg.m²	通风 Ventilation		电枢回路 Armature circuit	
	220V	330V	440V	550V	660V							风量 volume Q m³/s	风压 pressure H Pa	电压降 voltage drop ΔU V	电感 inductance La mH
01	144					94	563	72.4	500	6.5	40.8	2.2	1340	50.5	1.3
		237				154	559	80.9	800	6.5	40.8	2.3	1450	50.2	1.2
			330			213	555	85.2	1000	6.5	40.8	2.3	1450	49.9	1.2
				424		270	548	87.8	1500	6.5	40.8	2.3	1450	49.3	1.2
					517	326	543	89.5	1500	6.5	40.8	2.4	1570	48.8	1.2
02	179					118	674	76.5	600	6.5	40.8	2.3	1450	42.3	0.90
		289				189	666	83.7	1000	6.5	40.8	2.3	1450	41.9	0.85
			399			259	661	87.3	1200	6.5	40.8	2.4	1570	41.5	0.82
				509		325	650	89.4	1500	6.5	40.8	2.4	1570	40.9	0.82
					621	390	641	90.9	1500	6.5	40.8	2.4	1570	40.4	0.82
03	227					150	818	80.7	800	6.5	43.1	2.2	1340	33.5	0.58
		361				236	809	86.4	1200	6.5	43.1	2.3	1450	33.2	0.56
			495			317	793	89.3	1500	6.5	43.1	2.4	1570	32.6	0.55
				629		395	778	91.0	1500	6.5	43.1	2.4	1570	32.0	0.55
					764	468	761	92.1	1500	6.5	43.1	2.5	1690	31.3	0.56

04	328					211	1105	84.7	1200	6.5	43.1	2.4	1570	25.8	0.30
		515				325	1087	89.1	1500	6.5	43.1	2.5	1690	25.4	0.29
			702			431	1059	91.3	1500	6.5	43.1	2.5	1690	24.8	0.29
				888		530	1030	92.6	1500	6.5	43.1	2.6	1810	24.2	0.30
					1076	620	997	93.4	1500	6.5	43.1	2.7	1950	23.5	0.30
05	397					257	1320	86.7	1200	6.5	45.4	2.5	1690	21.7	0.21
		618				389	1285	90.4	1500	6.5	45.4	2.6	1810	21.2	0.20
			840			509	1241	92.2	1500	6.5	45.4	2.7	1950	20.5	0.21
				1061		617	1193	93.2	1550	6.5	45.4	2.8	2080	19.8	0.21

额定功率	额定电压Un下的转速 r/min				最高转速	电枢电流	励磁功率	效率 η	转动惯量 J
KW	750V	660V	550V	440V	r/min	A	KW	%	$kg^2 \cdot m$
720	600				1200	1035		91.8	
640		520			1200	1050		91.3	
550			430		1200	1100		89.7	
440				340	1000	1115		87.9	
830	720				1300	1180		93.1	
760		630			1200	1235		92.3	
650			520		1200	1280	7.0	91.3	150
530				410	1200	1320		90.1	
890		760			1250	1435		93.2	
770			640		1200	1500		92.5	
630				510	1200	1555		91.1	
935			820		1200	1810		93.2	
780				650	1200	1900		92.0	



型 号	安装尺寸													外形尺寸						
	A	B	C	D	E	F	GA	DA	EA	FA	GC	H	K	AB	AD	L	L1	HD	AE	h
Z315-1	508	770	216	90	170	25	95	90	170	25	95	315	28	620	490	1372	1532	1490	620	25
Z315-2		850														1452	1612			
Z315-3		930														1532	1692			
Z315-4		1030														1632	1792			
Z355-2	610	800	254	110	210	28	116	110	210	28	116	355	28	700	630	1515	1545	1720	700	35
Z355-3		900														1615	1645			
Z355-4		1000														1715	1745			
Z355-5		1120														1835	1865			
Z400-1	686	800	280	120	210	32	127	120	210	32	127	400	35	790	670	1560	1580	1870	790	35
Z400-2		900														1660	1680			
Z400-3		1000														1760	1780			
Z400-4		1120														1880	1900			
Z450-1	800	900	315	140	250	36	148	140	250	36	148	450	35	890	725	1775	1785	1990	890	40
Z450-2		1000														1875	1885			
Z450-3		1120														1995	2005			
Z450-4		1250														2125	2135			
Z500-1	900	1000	280	160	300	40	169	160	300	40	169	500	42	1090	900	2030	2130	1900	160	45
Z500-2		1120														2150	2250			
Z500-3		1250														2300	2400			
Z500-4		1400														2450	2550			
Z560-1	1000	1000	315	180	300	45	190	180	300	45	190	560	45	1200	1100	1930	2030	2250	190	55
Z560-2		1120														2050	2150			
Z560-3		1250														2200	2300			
Z560-4		1400														2350	2450			
Z560-5		1600														2550	2650			



Z Series Rolling Mill Dc Motor

The working principle of the Z series rolling mill dc motor is mainly based on the principle of the DC motor, which converts DC electrical energy into mechanical energy to achieve the rotation of the rolling mill. DC motors for rolling mills are widely used in industrial fields such as rolling large steel, metal plates, and wire rods. In the rolling mill, the motor often needs to run at high speed, so maintenance and upkeep of the motor are particularly important.

Brief Introduction

● Z series rolling mill dc motor is developed with adoption of up-to-date design and manufacture technologies and based on our over twenty years' experiences in this field. In Z series,motors are with seven different center heights from 315 to 710, power from 50kW to 2800kW.

● The installation dimensions, performance, and technical requirements of Z series high hp dc motor fully comply with the relevant provisions of JB/T9577 "Technical Conditions for Z-Series Medium sized DC Motors" and GB/T755 "Rating and Performance of Rotating Electrical Machines".

● The vibration of Z series high hp dc motor complies with the provisions of the central standard GB10068 "Mechanical Vibration, Vibration Measurement, Evaluation and Limits for Motors with Shaft Center Height of 56mm and Above".

● The noise of Z series high hp dc motor complies with the provisions of GB/T10069.3 "Methods and Limits for Noise Determination of Rotating Electrical Machines" standard.

● During the operation of the rolling mill, Z series rolling mill dc motor converts electricity into mechanical energy through gear transmission to drive the rolling mill. When the motor is working, the excitation current flows through the armature and group poles, forming a rotating magnetic field that rotates the motor. When adjusting the size of the demagnetization resistor or turning on the demagnetization switch, the demagnetization current passes through the demagnetization resistor and brush, and generates a back electromotive force between the armature and the group pole, eliminating the magnetic flux of the motor and stopping its rotation.

Our Services

1. Inquiry response within 6/24 hours;
2. Ensure every quotation is practical & customized according to your requirements;
3. Provide the technical specification of motors;

4. Provide the design drawing of motors;
5. Ensure motor spare parts' availability offer for 5 years;
6. Quality assurance: 18 months except consumable parts.

Standard features

Frame	315~710
Output range(KW)	50~2800
Voltage(V)	220/330/440/550/660/750/850/950V
Field voltage(V)	180/220/310V
Excitation	Sep.
Rate speed	100-1800rpm
Working duty	S1,S3,S5,S6
Enclosure	IP21S, IP23, IP44
Cooling	IC06, IC17, IC37, IC86W
Frequency(Hz)	50/60;3～100Hz
Encoder/tachometer generator	according to customers requirement
Mounting	IMB3, IMB35, IMV1
Application	plastic industry, sugar mill, steel plant, rolling mill, paper-making plant,cement plant,textile,rubber plant,aluminium plant,etc.
Blower position	DE side

Steel Plant Of Ball Bearing DC Motor

Steel plant of ball bearing DC motor can achieve variable speed control over a wide range and meet the requirements of different load conditions.The production of steel plants involves multiple processes, such as iron-making, smelting, rolling, etc., which require a large amount of electrical equipment. DC motor is a common type of electric motor in steel production, which can be used to drive various mechanical equipment, such as rolling mills, fans, water pumps, etc.

In steel production, it is necessary to drive large mechanical equipment, and steel plant of ball bearing DC motor can meet their requirements of high torque, high power, low speed, etc., with a wide range of application scenarios. For example, the rolling mill needs to drive the rollers through a DC motor for rolling, and equipment such as water pumps and fans in electronic steam boilers also need to use DC motors to meet flow, pressure, and other requirements.

Steel plant of ball bearing DC motors have the following advantages:

Wide speed range

DC motors can achieve adjustable speed control over a wide range, meeting the requirements of different load conditions;

Good starting performance

The torque of a DC motor is linearly related to the current, which can reach the rated torque in a short time, resulting in lower energy consumption for various mechanical equipment during starting and stopping;

Strong load capacity

DC motors can ensure normal operation under low speed and high load conditions;

High control accuracy

The DC motor adopts digital control technology to achieve high-precision speed and position control.

DC motor is a commonly used motor in steel production, and its unique advantages and application scenarios make it an indispensable part of the steel industry. Specifically, in which application scenarios can electric motors be used?

- **Blast furnace field**

The first step in steel production is to smelt molten iron in the blast furnace. The motors used in the blast furnace mainly include fans, blast furnace induced draft fans, gas induced draft fans, gas circulation fans, dust collectors, compressors, etc. The smooth operation of these equipment cannot be separated from the effectiveness of the motors, in which there are both AC and DC motors will be used.

- **Converter field**

In the process of steel production, it is necessary to go through multiple key steps such as reducing molten iron, adjusting the composition of molten iron, and insulation. These equipment bodies need to be used in the converter, and the motors used in the converter mainly include temperature regulators, slag extractors, compressors, desulfurization machines, etc.

- **Continuous casting machine field**

Continuous casting is one of the key links in steel production, which determines the quality and efficiency of semi-finished products. Continuous casting machines mainly include crystallizers, swing angle and swing mechanisms, traction systems, and finished product cutting systems, all of which require motor of DC motors to drive and cooperate to ensure normal production.

● Rolling mill field

Rolling mills provide necessary auxiliary equipment for steel production and are applied in multiple processes such as cold rolling and hot rolling. The rolling mill equipment mainly includes entrance unit, four high machine, hot billet rolling mill, flaw detection machine, oiling machine, etc., all of which require steel plant of ball bearing DC motor to provide assistance.

● Wind turbine field

In the production process of steel mills, fans provide power for multiple equipment, such as the blast furnace top, tuyere, flue, desulfurization and dust removal. Fans are divided into blowers, induced draft fans, and smoke exhaust fans according to their uses, and are an indispensable part of steel production.

The mechanical characteristics of a DC motor refer to the motion characteristics of the motor in a mechanical system, including mechanical inertia, load inertia, friction, axial torque, etc. These characteristics will affect the changes in motor speed and torque, thereby affecting the performance of the entire system.

Standard	GB755 & IEC 600-34
Environment	-15~+40 deg.C, max.1000m
Armature voltage	400V, 440V, 550V, 660V, 700V
Field Voltage	180V, 220V, 310V, 330V
Application	Steel plant, rolling mill, paper-making plant,sugar mill
Type	heavy industry motor
Cooling method	IC06, IC17, IC37, IC86W
Protection rating	IP21S, IP23, IP44, IP54
Frame size	132~1000
Output	1.5kW~800kW
Excitation	Sep.
Rate speed	100-3000rpm
Mounting	IMB3, IMB35, IMV15, IMV1
Insulation class	F, H
Working duty	S1, S3

Encoder/tachometer generator	according to customers requirement.

Note

01.

If it's humid-tropical environment , we will produce motor with special making and mark "TH " after the model code.

02.

Blower can be needed or not, this will be made according to customers requirement.

03.

Blower can be assembled at DE side or NDE side, this will be made according to customers requirement. Usually it's at DE side.

04.

Special ambient environment and altitude, the motor models need to be calculated and confirmed by engineers.

Production Overview




Brush holder

The material of the brush hold for steel plant of ball bearing DC motor is copper.The brush box connects the internal and external power sources of the motor, serving as a bridge for energy transfer.

RTD

The full name of a thermistor RTD is Resistance Temperature Detector, which is a resistance temperature detector. The resistance of commonly used RTDs is 100 Ω, resulting in a resistance change of only 0.385 Ω per 1 ℃.

Shaft fixation

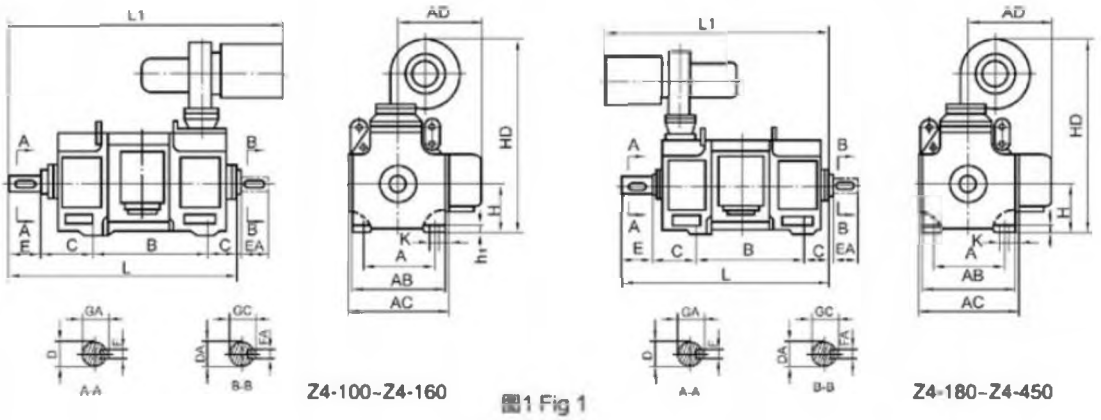
Shaft fixation is a fixing device used for the motor shaft during transportation. It can prevent axial displacement and radial run-out of the motor shaft, ensuring safe transportation.

NDE encoder

The function of an encoder is to convert angular or linear displacement into electrical signals. Assembly at the NDE side of steel plant of ball bearing DC motor, it can measure rotation angle or linear displacement, which is very important for systems that require precise control of speed and position.

Dimensions and Parts' codes

型号 Type	额定功率 Rated Output	额定转速 Rated Speed		弱磁转速 Speed with Field Weaking	电枢电流 Arm. Curr.	励磁功率 Field Power	电枢回路电阻 Arm. Circuit Resistance	电枢回路电感 Arm. Circuit Inductance	磁场电感 Field Inductance	效率 Eff.	惯量矩 Moment of Inertia	重量 Wt.
	P_N	400V	440V	n_F	I_N	P_F	R	L_A	L_F		GD^2	
	kW	r/min		r/min	A	W	Ω(20℃)	mH	H	%	$kg.m^2$	kg
Z4-355-12	406	900		1500	1094	4700	0.01259	0.36	37.6	91.8	42	2890
	450		1000							92.8		
	321	680		1500	877		0.02087	0.59	28.1	90.4		
	355		750							91.2		
Z4-355-11	253	540		1500	697		0.02952	0.91	22	89.2		
	280		600							90.2		
	180	450		1500	506		0.0502	1.5	8.91	87.6		
	200		500							88.9		
	166	360		1200	478		0.066	1.8	22.4	84.9		
	185		400							85.9		
Z4-355-22	361	680		1600	978	5600	0.01583	0.44	15.6	90.8	46	3170
	400		750							91.7		
	284	540		1500	783		0.02676	0.81	34.7	89.5		
	315		600							90.5		
	225	450		1600	624		0.03462	1.0	20.5	88.4		
	250		500							89.5		
Z4-355-21	180	360		1200	511		0.05642	1.6	35.5	86.3		
	200		400							87.5		
Z4-355-32	406	680		1100	1098	6000	0.01362	0.39	19	91.3	52	3490
	450		750							92.1		
	320	540		1600	877		0.02153	0.7	24.3	89.9		
	355		600							91		
	284	450		1500	789		0.0293	0.91	18.5	88.3		
	315		500							89.5		
Z4-355-31	197	360		1200	559		0.04957	1.3	34.6	86.6		
	220		400							88.4		



Z4-100~Z4-160

Z4-180~Z4-450

图1 Fig 1

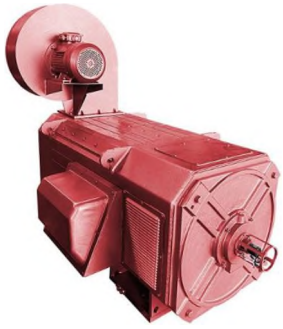
卧式、机座带底脚 Horizontal Foot-Mounted

表3 Table 3 mm

型号 Type	安装尺寸 Mounting Dimensions in millimeter													外形尺寸 Outline Dimensions in millimeter						
	A	B	C	D	E	F	GA	DA	EA	FA	GC	H	K	AB	AC	AD	HD	L	L1	h
Z4-315-11	508	887	216	100	210	28	106	95	170	25	100	315	28	620	654	497	1221	1532	1897	30
Z4-315-12		977																1622	1987	
Z4-315-21		967																1612	1977	
Z4-315-22		1057																1702	2067	
Z4-315-31		1057																1702	2067	
Z4-315-32		1147																1792	2157	
Z4-315-41		1157																1802	2167	
Z4-315-42		1247																1892	2257	
Z4-355-11	610	968	254	110	210	28	116	110	210	28	116	355	28	700	734	701	1301	1689	2010	30
Z4-355-12		1058																1779	2100	
Z4-355-21		1058																1779	2100	
Z4-355-22		1148																1869	2190	
Z4-355-31		1158																1879	2200	
Z4-355-32		1248																1969	2290	
Z4-355-41		1268																1989	2310	
Z4-355-42		1358																2079	2400	
Z4-400-11	686	959	280	120	210	32	127	120	210	32	127	400	35	790	830	750	1620	1732	1817	35
Z4-400-12		1079																1852	1937	
Z4-400-21		1039																1812	1897	
Z4-400-22		1159																1932	2017	
Z4-400-31		1129																1902	1987	
Z4-400-32		1249																2022	2107	
Z4-400-41		1229																2002	2087	
Z4-400-42		1349																2122	2207	
Z4-450-11		1061																1944	2050	
Z4-450-12		1181																2064	2070	
Z4-450-21		1151																2034	2140	

Z4-450-21	800	1151	315	140	250	36	148	140	250	36	148	450	35	890	924	800	1720	2034	2140	40
Z4-450-22		1271																2154	2260	
Z4-450-31		1251																2134	2240	
Z4-450-32		1371																2254	2360	
Z4-450-41		1361		160	300	40	169											2294	2350	
Z4-450-42		1481																2414	2470	
Z4-450-51		1481																2414	2470	
Z4-450-52		1601																2534	2590	

Z4 Series Ip23 Motor



Z4 series ip23 motor is an electric motor which is widely used for production machinery such as large reversible steel mills, mine winches, hotel high-speed elevators, gantry planers, electric locomotives, flame resistant locomotives, urban trams, subway trains, electric bicycles, paper-making and printing machinery, ship machinery, large precision machine tools, and large cranes.Due to its excellent starting and speed regulation performance, DC motors are often used in situations with high requirements for starting and speed regulation.

1. The working characteristics of Z4 series ip23 motor refer to the relationship between motor speed and motor torque under different loads. At rated voltage, these motors have higher rotational speed and lower torque under no-load conditions.Under load conditions, the motor speed will decrease while the torque will increase until it reaches the maximum torque point, at which point the speed is at its lowest. As the load continues to increase, the motor speed continues to decrease, but the torque begins to decrease until it reaches zero and the motor stops rotating.

2. A DC motor mainly consists of a stator and an armature (also known as a rotor). The stator includes a base, main magnetic pole, commutation pole, brush device, etc. The rotor mainly includes armature core, armature winding, commutator, shaft, and fan.

3. The mechanical characteristics of a DC motor refer to the motion characteristics of the motor in a mechanical system, including mechanical inertia, load inertia, friction, axial torque, etc. These characteristics will affect the changes in motor speed and torque, thereby affecting the performance of the entire system.

The advantages and disadvantages of Z4 series ip23 motor compared with AC motors

No.	Feature	Disadvantages	Advantages
1	Capacity	Limited over 3500rpm	Strong overload capacity
2	Speed	Limited over 3000rpm	Wide speed range
3	Torque		High level torque
4	Maintenance	More to do with carbon brushes replacement	Cheap in manufacturing
5	Environment	High noise	More friendly
6	Protection	Low grade	
7	Others	Complex structure	

Technical parameters

Frame	315~450
Output range(KW)	50~1000KW
Voltage(V)	220/330/440/550V
Field voltage(V)	180/220/310V
Excitation	Sep.
Rate speed	100-1800rpm
Working duty	S1,S3,S5,S6
Enclosure	IP21S, IP23
Cooling	IC06,
Frequency(Hz) of blower motor	50/60Hz
Encoder/tachometer generator	according to customers requirement
Mounting	IMB3, IMB35, IMV1
Blower position	DE side
Water cooler	Top side

Z4 Series Rolling Mill Motor

DC motor is an electric motor that converts DC electrical energy into mechanical energy. DC motors,like Z4 series rolling mill motor, have a high starting torque and can achieve a wide range of speed regulation uniformly and economically. Therefore, any machinery that starts under heavy loads or requires uniform speed adjustment, such as large reversible steel mills, winches, electric locomotives, trams, etc., will use DC motors.

Brief Introduction

Z4 series rolling mill motor is very mature products for steel and rolling mill industries. Because of dc motors' outstanding advantages of large starting torque and wide speed regulation range, they are widely used in the industrial field, mainly for driving mechanical equipment such as machine tools, presses, generator sets, fans, water pumps, conveyors, etc. DC motors have not only the advantages of large starting torque and wide speed regulation range, but also fast response speed and stable speed, which can meet the needs of different process flows. Meanwhile, DC motors can be regulated through electronic speed controllers to improve production efficiency and reduce energy consumption costs.

For industrial application, we use brushes DC motors. The two brushes (copper brush or carbon brush) of a brushed motor are fixed on the back cover of the motor through an insulation base, directly introducing the positive and negative poles of the power supply to the rotor's commutator. The commutator connects the coils on the rotor, and the polarity of the three coils continuously alternates, forming a force with the two magnets fixed on the outer shell to rotate. Due to the fixed connection between the inverter and the rotor, as well as the fixed connection between the brush and the casing (stator), the friction between the brush and the inverter during the rotation of the motor generates a large amount of resistance and heat.

Therefore, Z4 series rolling mill motor will need regular maintenance and upkeep for carbon brushes, fan filter and checking whether there are sparks problem around commutator areas.

The lifespan of carbon brushes in DC motors may vary depend on the duration of use and the environment in which they are used. Generally speaking, the lifespan of using higher-level carbon brushes is around 1000 hours, mid-level brushes can reach 500-800 hours, and lower level brushes can have a lifespan of around 200-300 hours. If used infrequently and in a dry and easy to cool environment, the lifespan can be increased to over 1300 hours.

Fan filter screen cover is a common accessory in air purification, ventilation or ventilation systems, usually installed at the outlet of the fan. Its main function is to filter the air, used to filter out dust, dirt, bacteria

and other debris, to ensure the freshness and cleanliness of the air.The filter cover of the fan is installed at the outlet of the fan, which can prevent dust, dirt, bacteria and other debris from entering the room or equipment with the air, purify the air, and ensure fresh and clean air.

Technical Specifications

Model	Z4
Application	driving machine
Type	heavy industry motor
Construction	shunt Wound
Commutation	carbon brush
Output	1.5kW~800kW
Armature voltage	400V, 440V, 550V, 660V, 700V
Field Voltage	180V, 220V, 310V, 330V
Excitation	Sep.
Rate speed	100-3000rpm
Protection rating	IP21S, IP23, IP44, IP54
Cooling method	IC06, IC17, IC37, IC86W
Mounting	IMB3, IMB35, IMV15, IMV1
Frame size	132~1000
Insulation class	F, H
Working duty	S1, S3
Certification	CCC, ISO,CE
Standard	GB755 & IEC 600-34
Encoder/tachometer generator	according to customers requirement.
Environment	-15~+40 deg.C, max.1000m

Note

If it's humid-tropical environment , we will produce motor with special making and mark "TH " after the model code.

01

Blower can be needed or not, this will be made according to customers requirement.

02

Blower can be assembled at DE side or NDE side, this will be made according to customers requirement. Usually it's at DE side.

03

Special ambient environment and altitude, the motor models need to be calculated and confirmed by engineers.

04

Production Overview

ENCODER

Encoder is a rotary sensor that converts rotational displacement into a series of digital pulse signals, mainly used in industries such as machine tools, elevators, servo motor matching, textile machinery, packaging machinery, printing machinery, lifting machinery, etc.

FAN

Cooling fans are generally composed of motors, fan blades, casings, bases, and other parts. They use natural or forced convection to reduce the temperature inside the components. The fan of Z4 series rolling mill motor is needed and at the top of DE side of motor.

SHAFT FIXATION

Shaft fixation can ensure the axial and radial fixation of the motor shaft, effectively prevent axial displacement and radial run out of the motor shaft during transportation, and ensure transportation safety.

TACHOMETER GENERATOR

The tachometer generator converts the speed into a voltage signal. The commonly used type is the permanent magnet DC tachometer generator, which uses high-performance permanent magnet excitation, is less affected by temperature changes, has small output changes, high slope, and small linear error.

型号 Type	额定功率 Rated Out put	额定转速 Rated Speed		弱磁转速 Speed with Field Weaking	电枢电流 Arm. Curr.	励磁功率 Field Power	电枢回路电阻 Arm. Circuit Resistance	电枢回路电感 Arm. Circuit Inductance	磁场电感 Field Inductance	效率 Eff.	惯量矩 Moment of Inertia	重量 Wt.
	P_N	400V	440V	n_F	I_N	P_F	R	L_A	L_F		GD^2	
	kW	r/min		r/min	A	W	Ω(20℃)	mH	H	%	$kg.m^2$	kg
32	500	540		1200	1358		0.0134	0.39	19.6	90.8		
	550		600							92		
32	453	450		1300	1228		0.0145	0.32	7.36	90		
	500		500							91.4		
Z4-450-32	408	360		1200	1130	7100	0.0205	0.53	7.17	88.5	156	6000
	450		400							89.7		
32	309	270		900	875		0.0342	0.83	4.8	85.9		
	340		300							87.1		
31	200	180		600	595		0.0751	1.9	9.09	81.3		
	220		200							82.6		
42	545	540		1100	1492		0.0134	0.51	28.2	90.3		
	600		600							91.5		
42	500	450		1100	1367		0.0145	0.43	18.6	90		
	550		500							91.4		
Z4-450-42	453	360		1200	1254	7800	0.0178	0.42	5.85	88.9	174	6700
	500		400							90		
42	345	370		900	972		0.0275	0.81	5.62	86.8		
	380		300							88.1		
41	235	180		600	698		0.0612	1.7	5.73	81.7		
	260		200							83		

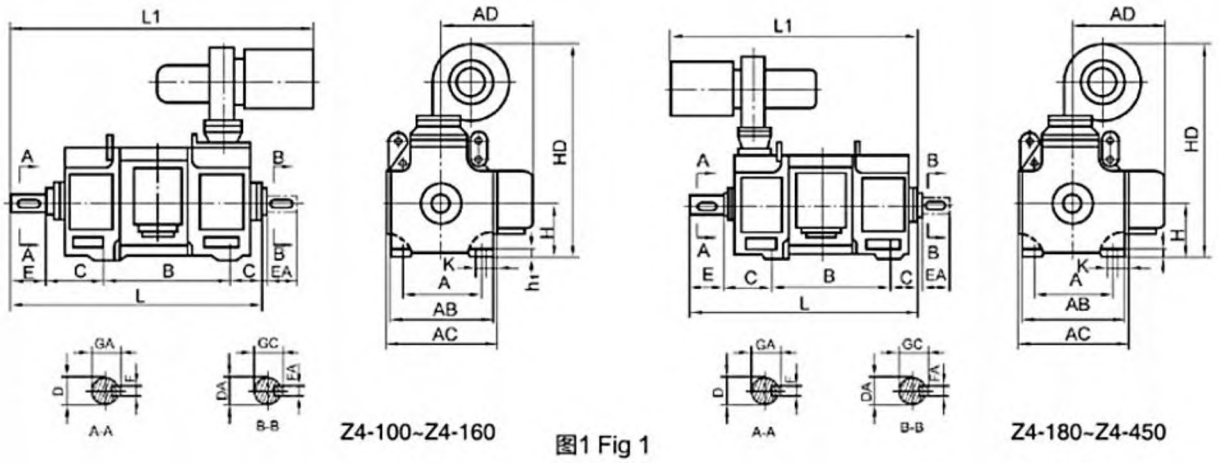


图1 Fig 1

卧式、机座带底脚 Horizontal Foot-Mounted

表3 Table 3 mm

型号 Type	安装尺寸 Mounting Dimensions in millimeter													外形尺寸 Outline Dimensions in millimeter						
	A	B	C	D	E	F	GA	DA	EA	FA	GC	H	K	AB	AC	AD	HD	L	L1	h
Z4-315-11	508	887	216	100	210	28	106	95	170	25	100	315	28	620	654	497	1221	1532	1897	30
Z4-315-12		977																1622	1987	
Z4-315-21		967																1612	1977	
Z4-315-22		1057																1702	2067	
Z4-315-31		1057																1702	2067	
Z4-315-32		1147																1792	2157	
Z4-315-41		1157																1802	2167	
Z4-315-42		1247																1892	2257	
Z4-355-11	610	968	254	110	210	28	116	110	210	28	116	355	28	700	734	701	1301	1689	2010	30
Z4-355-12		1058																1779	2100	
Z4-355-21		1058																1779	2100	
Z4-355-22		1148																1869	2190	
Z4-355-31		1158																1879	2200	
Z4-355-32		1248																1969	2290	
Z4-355-41		1268																1989	2310	
Z4-355-42		1358																2079	2400	
Z4-400-11	686	959	280	120	210	32	127	120	210	32	127	400	35	790	830	750	1620	1732	1817	35
Z4-400-12		1079																1852	1937	
Z4-400-21		1039																1812	1897	
Z4-400-22		1159																1932	2017	
Z4-400-31		1129																1902	1987	
Z4-400-32		1249																2022	2107	
Z4-400-41		1229																2002	2087	
Z4-400-42		1349																2122	2207	
Z4-450-11	800	1061	315	140	250	36	148	140	250	36	148	450	35	890	924	800	1720	1944	2050	40
Z4-450-12		1181																2064	2070	
Z4-450-21		1151																2034	2140	
Z4-450-22		1271																2154	2260	
Z4-450-31		1251																2134	2240	
Z4-450-32		1371																2254	2360	
Z4-450-41		1361		160	300	40	169											2294	2350	
Z4-450-42		1481																2414	2470	
Z4-450-51		1481																2414	2470	
Z4-450-52		1601																2534	2590	

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Оренбург (3532)37-68-04
Пенза (8412)22-31-16
Петрозаводск (8142)55-98-37
Псков (8112)59-10-37
Пермь (342)205-81-47
Ростов-на-Дону (863)308-18-15
Рязань (4912)46-61-64
Самара (846)206-03-16
Санкт-Петербург (812)309-46-40
Саратов (845)249-38-78
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Саранск (8342)22-96-24
Симферополь (3652)67-13-56
Смоленск (4812)29-41-54
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Ставрополь (8652)20-65-13
Сургут (3462)77-98-35
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