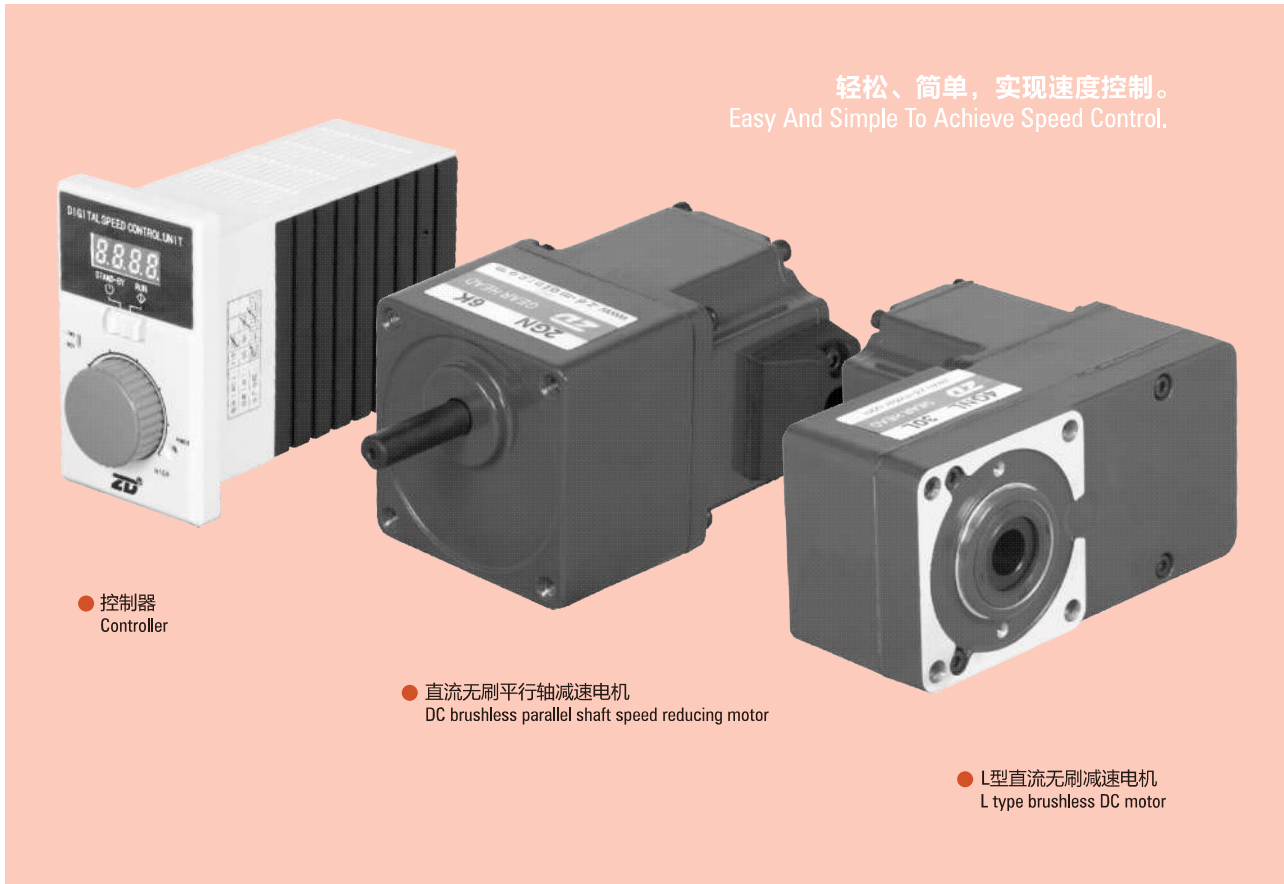


直流无刷减速电机 DC BRUSHLESS GEAR MOTOR

轻松、简单，实现速度控制。
Easy And Simple To Achieve Speed Control.

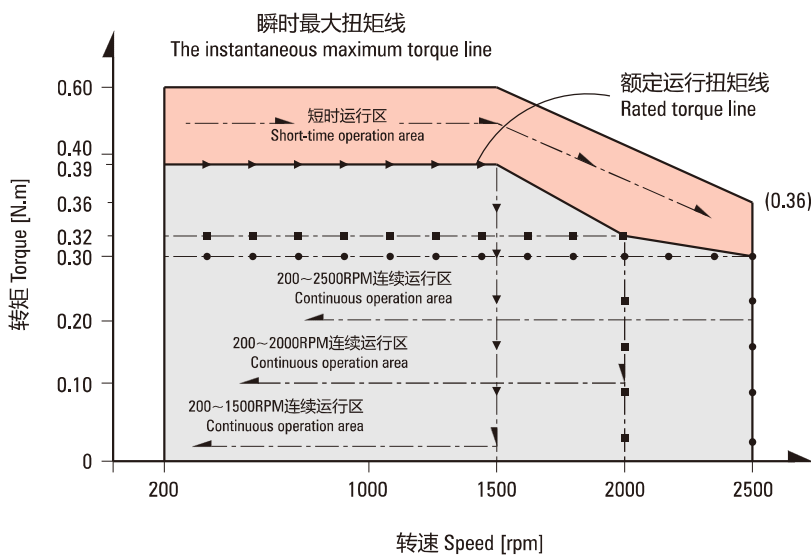


● 控制器
Controller

● 直流无刷平行轴减速电机
DC brushless parallel shaft speed reducing motor

● L型直流无刷减速电机
L type brushless DC motor

无刷直流电机特性曲线说明 Description Of Brushless DC Motor Characteristic Curve



- **瞬时最大扭矩线:** 电机启动、瞬间冲击负载的最大扭矩；超越此扭矩值时，会引起驱动器的过流保护，造成停机；
- **短时运行区:** 电机不同转速时，可在此力矩区间内短时运行，时间过长易引起电机发热，从而造成烧机或驱动过热保护启动，造成停机；
- **额定运行扭矩线:** 电机在不同转速下的额定力矩，可在此力矩下长时间运行；
- **连续运转区:** 在不同转速时，电机在此相应区间内连续运行；
- **The maximum of instantaneous torque line:** the motor starting the maximum torque of motor, instantaneous impact load; beyond the torque value, over-current protection will lead to stop.
- **Short-term running area:** when the motor at different speed, it can operate in a short time during this torque range, but after a long time it can cause heating of the motor, resulting motor break or drive overheat protection start, cause stopping working.
- **Rated torque Rated torque of the motor line:** at different speeds, the motor can run for a long time in this moment;
- **In Continuous operation area:** at different speed, the motor can operate continuous.

产品特点 PRODUCT FEATURES

■ 无刷电机的基本特点 The Characteristics Of Brushless Motor Suitable For Speed Control Are Introduced

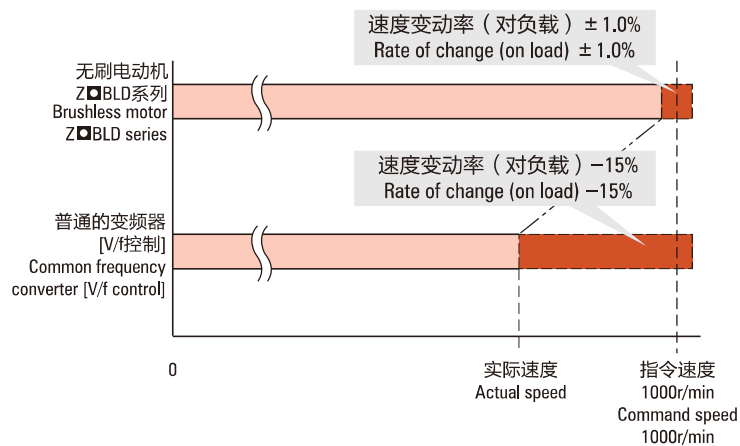
无刷电机上，无需使用通常被认为是DC电动机缺点的刷子和整流子等机械触点，DC电动机使用刷子和整流子进行旋转，因此需要定期进行维护；而无刷电动机使用霍尔IC检测到的信号，利用驱动电路的晶体管的ON/OFF进行旋转，因此无需维护。

On brushless motor ,it is unecessarily using brush ,commutator and any other mechanical contact. Brush motor need brush and commutator to running ,so it need to regular maintain. However ,brushless motor used Hall IC to detect the signal and used driving circuit of crystal catheter's ON/OFF. So it dispense with maintain.

■ 可进行稳定的速度控制 Stable Speed Control

无刷电动机持续对设定速度和来自电动机的速度反馈信号进行对比，来调节施加到电动机上的电压；因此，即使负载状况发生变化，仍可以从低速瞬间调整到设定速度，并以此稳定的速度运行。使用变频器控制的三相感应电动机不进行反馈控制，因此负载变大时，速度会大幅下降；对于速度稳定性要求较高的用途，建议使用无刷电动机。

Brushless DC motors compare the setting speed with the speed feedback signals from the motor at all times and adjust the motor's applied voltage. For this reason, even if the load changes, stable rotation is performed from low speed to high speed. Common inverter-controller three-phase induction motors do not have this type of feedback control and when the load changes, the speed can be affected. Brushless DC motors are recommended for applications that require the speed to be maintained regardless of the load fluctuation.



■ 宽广的速度控制范围 (ZD目前是限速到2500RPM，此驱动更改后可适用于4000RPM电机)

Wide Speed Control Range (ZD Is Currently The Rate Limiting To 2500RPM, This Drive Change Can Be Applied To The 4000RPM Motor)

无刷电动机的速度控制范围比AC调速电动机及变频器更广，由于不像AC调速电动机那样在低速时有使用转矩限制，因此，无刷电动机适用于从低速到高速都需要一定转矩的用途。

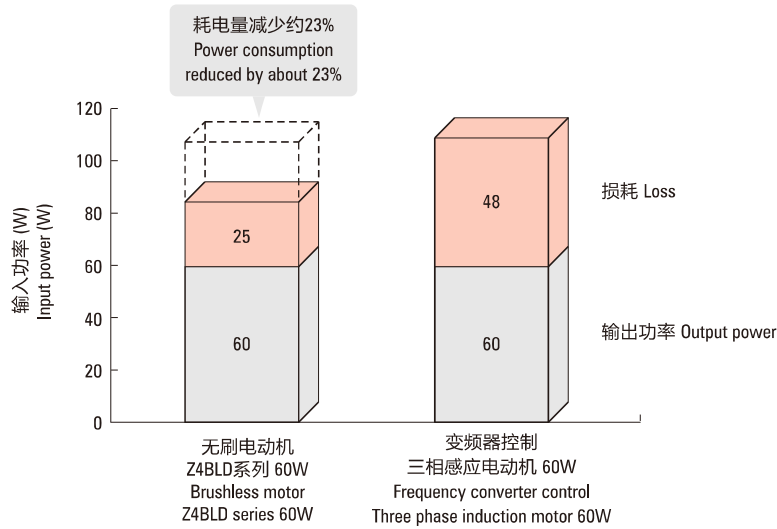
The brushless DC motor has a broader speed control range compared to three-phase inverter driven motors. Unlike three-phase inverter driven motors, the torque at low speed is not limited, so brushless DC motors are suited for applications that require constant.

产品样式 Product Style	速度控制范围 Speed Control Range	速度比 Rate Ratio
无刷电动机 Brushless motor	80~4000	50
变频器控制 Frequency converter control	200~2400	12
三相感应电动机 Three phase induction motor	50HZ: 90~1400	15
AC调速电动机 AC speed regulating motor	60HZ: 90~1600	17

有助于节能 Saving Energy

无刷电动机的转子使用了永磁铁，可减少转子的二次损耗，因此与采用变频控制的三相感应电动机相比，耗电量减少约23%，有助于装置的节能。

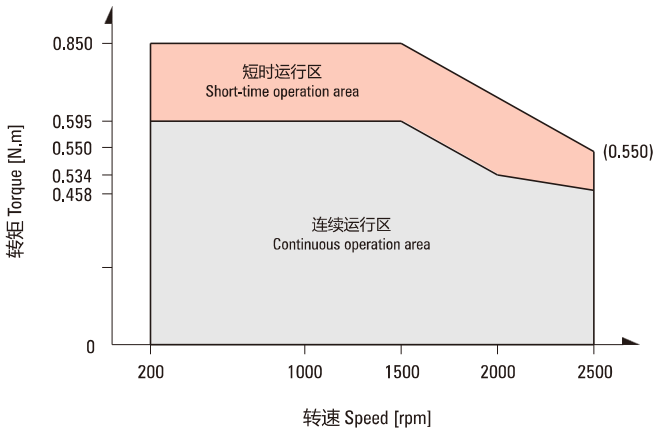
DC Brushless motor used permanent magnets, it can reduce the secondary loss of rotor. So compared with adopts frequency conversion control of three-phase induction motor, the power reduced 23%. This is in favour of saving energy.



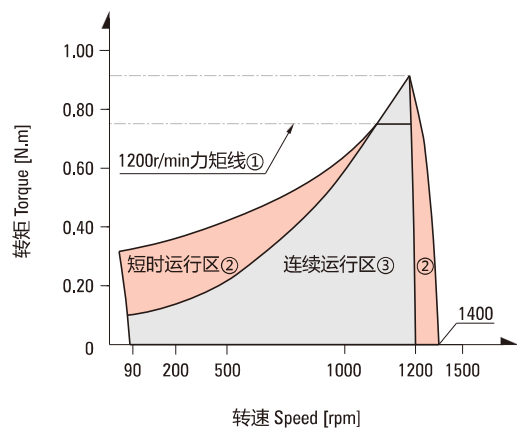
低速大力矩性能 Low Speed And High Torque Performance

无刷直流减速电机低速时可维持大力矩连续运行，且运行平稳。DC brushless motor have a steady big torque when running at low speed.

● Z5BLD120-220GU-25S 曲线图 Diagram (ZD标准驱动器 ZD Standard Drive)



● 51K120RGU-CF (220V/50Hz) (ZD标准驱动器 ZD Standard Drive)



①1200r/min torque line ②Short-time operating area ③Continuous operation area

无刷、交流调速且连续运行性能一览表 Working performance table of brushless motor and ac speed adjustable motor

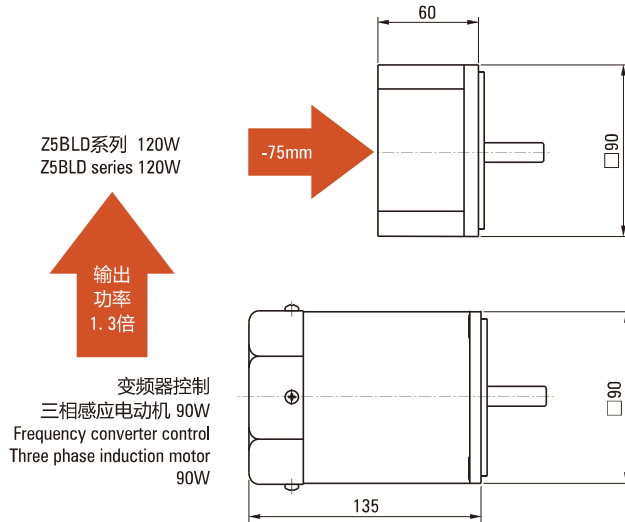
序号 Serial Number	Z5BLD120-220GU-25S					51K120RGU-CF				
	力矩 Moment N.m	转速 Speed rpm	电流 Current A	效率 Efficiency %	温升 Temperature Rise K	力矩 Moment N.m	转速 Speed rpm	电流 Current A	效率 Efficiency %	温升 Temperature Rise K
1	0.595	200	0.485	26.5	≤50K	0.010	200	0.850	3.00	≤80K
2	0.595	500	0.671	47.5	≤50K	0.150	500	1.070	8.00	≤80K
3	0.595	1000	0.966	62.0	≤40K	0.500	1000	1.186	32.5	≤80K
4	0.595	1500	1.200	69.0	≤40K	0.915	1400	0.981	60.0	≤55K

环境温度-10℃~+40℃下使用 Ambient temperature -10℃~+40℃ environment

■ 薄型、大功率 Thin, High Power

无刷电动机的转子使用永磁体，因此实现了薄型和大功率；比如，与安装尺寸90的三相感应电动机相比总长缩短>75mm，输出功率达到1.3倍。若采用无刷电动机，有助于实现装置的小型化。

Brushless DC motors have a slim body and provide high power due to permanent magnets being used in the rotor. For example, the overall length is 75mm shorter and the output power is 1.3 times higher than that of three-phase induction motors with a frame size of 90mm. Using brushless DC motors can contribute to downsizing and space saving.



■ 搭载保护功能，有助于保护设备系统的安全 Protection Function, Help To Protect The Safety Of The Equipment System

由于加载了过流、欠压、缺相等保护功能，因此可保证设备系统运行时的安全。

Due to the load of the overcurrent, undervoltage, open phase protection, for this reason can ensure the safety of equipment system.

■ 电机的一般规格——转速 Motor Spec——Speed

电机轴转速 Motor Speed	减速比 Reduction Ratio	出轴转速 Output Shaft Speed											
		3	3.6	5	6	7.5	9	10	12.5	15	18	20	25
200~1500RPM		67~500	56~417	40~300	33~250	27~200	22~167	20~150	16~120	13~100	11~83	10~75	8~60
2000RPM		667	556	400	334	267	223	200	160	134	112	100	80
2500RPM		833	695	500	417	334	278	250	200	167	139	125	100

电机轴转速 Motor Speed	减速比 Reduction Ratio	出轴转速 Output Shaft Speed											
		30	36	50	60	75	90	100	120	150	180	200	
200~1500RPM		7~50	6~42	4~30	3~25	3~20	2~17	2~15	2~12.5	1.5~10	1~8	1~7.5	
2000RPM		67	56	40	34	27	23	20	17	14	12	10	
2500RPM		84	70	50	42	34	28	25	21	17	14	12.5	

■ 电机的一般规格——产品种类 Motor Spec——Product Type

电动机 Motor	方形尺寸 Square Size	输出功率 Output Power	机型 Model	驱动器 Driver	电源电压 Voltage Supply
	60X60	15、25	标准型 Standard type IP40 或 Or IP54		DC24~48 单相 Single phase 100~120V 单相 Single phase 220~240V
	80X80	40、60			
	90X90(GN)	40、60			
	90X90(GU)	60、90、120			
	104X104	200、400			

电机的一般规格——基本性能 Motor Spec——Basic Performance

项目	电动机	驱动器
绝缘电阻（不得将电机与驱动连接状态下测试）	在常温常湿环境下连续运行后，以DC500V电阻表测试电动机线圈与外壳之间的测量值应在50MΩ以上	在常温常湿环境下连续运行后，电源端子与保护接地端子间、电源端子与输入/输出信号端之间的电阻值以DC500V电阻表测量达50MΩ以上
绝缘耐压（不得将电机与驱动连接状态下测试）	在常温常湿环境下连续运行后，线圈、外壳间以50Hz、AC1.5kV施加1分钟无异常，泄漏电流<10mA	在常温常湿环境下连续运行后，电源端子与保护接地端子间以50Hz、AC1.5kV，电源端子与输入/输出信号端之间以50Hz、AC1.5kV施加1分钟无异常
温度上升	在常温常湿环境下连续运行后，以热电偶法测量的线圈温度上升值在55℃以下、测量外壳表面温度上升值在40℃以下①	在常温常湿环境下连续运行后，以热电偶法测量的铝质散热板温度上升值在50℃以下
使用环境	环境温度	-10℃~+40℃ (无结冰)
	环境湿度	85%以下 (无凝霜)
	海拔高度	1000m以下
	介质环境	无腐蚀性气体、尘埃；不可在含有放射性物质、磁场及真空等特殊环境中使用
	振动	不可施加连续振动或过度冲击
保存环境②	环境温度	-10℃~+40℃ (无结冰)
	环境湿度	85%以下 (无凝霜)
	海拔高度	1000m以下
耐热等级	B级	/
保护等级	IP40&IP54	IP20

①为了使电动机外壳表面温度能保持在90℃以下，需将电动机安装在以下尺寸的散热板（材质：铝）上；25W:115X115X厚度5、60W:135X135X厚度5、120W:165X165X厚度5、200W:200X200X厚度5。(单位:mm)

②保护环境也包括运输途中的短期值。

Project Item	Motor	Driver
Insulation resistance (no motor and drive connection state test)	50MΩ or more when 500VDC megger is applied between the windings and the case after continuous operation under normal ambient temperature and humidity	50MΩ or more when 500VDC megger is applied between the power supply terminal and the protective earth terminal, and between the power supply terminal and the I/O signal terminal after continuous operation under normal ambient temperature and humidity
Insulation resistance (no motor and drive connection state test)	Sufficient to withstand 1.5kVAC at 50Hz applied between the windings and the case for 1 minute after continuous operation under normal ambient temperature and humidity	Sufficient to withstand 1.5kVAC at 50Hz applied between the power supply terminal and the protective earth terminal and the I/O signal terminal for 1 minute after continuous operation under normal ambient temperature and humidity
Temperature rise	The temperature rise of windings is 55℃ max, and that of the case surface is 40℃ max, measured by the thermocouple method after rated continuous operation under normal ambient temperature and humidity.	The temperature of the heat sink is 50℃ max, measured by the thermocouple method after rated continuous operation under normal ambient temperature and humidity
Use environment	Ambient temperature	-10℃~+40℃ (non-freezing)
	Ambient humidity	85% or less (no-condensing)
	Altitude	1000m following
	Medium environment	Non corrosive gas, dust; can not be used in a special environment containing radioactive substances, magnetic fields and vacuum, etc
	Vibration	Not to exert a continuous vibration or excessive impact
Save environment②	Ambient temperature	-10℃~+40℃ (non-freezing)
	Ambient humidity	85% or less (no-condensing)
	Altitude	1000m following
Heat resistance grade	B stage	/
Protection level	IP40 & IP54	IP20

① In order to make the motor shell surface temperature can be maintained below 90℃, the motor installed in the following dimensions of the radiating plate (material: aluminum); thickness of 25W: 115X115X5, the thickness of the 60W: 135X135X5, the thickness of the 120W: 165X165X5, the thickness of the 200W: 200X200X5, (unit: mm)

② The storage condition applies to a short period such as a period during transportation.