

转矩电动机 TORQUE MOTOR

特征 Feature

- 具有宽调速范围 The Speed Can Vary Widely, Depending on the Sloping Characteristics

转矩电动机属于调速转矩大, 具有宽调速特征, 因此, 能够通过对电压进行调速。(电动机的转矩与电压的平方成正比)

Torque motors have a high starting torque and Torque motors have a high starting torque and sloping characteristics, allowing easy speedcontrol simply by changing the voltage of the power supply. (The motor torque changes approximately proportion to the square of the voltage.)

- 适用于卷绕作业 Suitable For Winding Applications

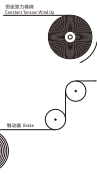
在恒定的张力条件下连续卷绕直径渐增的物体时, 若卷轴直径增大至2倍, 则电动机的输出转矩应增大3倍, 否则则转矩将随直径平方成正比关系。

In an application where an object is released continuously at a constant speed and wound up with constant tension, the torque must be doubled and the speed must be halved if the diameter of the winding speed is doubled.

- 可作为制动装置 Use As A Brake

电机的在低速-转矩特性的制动区域, 可作为制动使用。此外, 也可以通过调节励磁进行恒定张力控制。

By using the motor in the braking region of the speed-torque characteristics, it can serve as a brake. Constant tension operation can be achieved by applying a DC voltage.



转速-转矩特性图的阅读方法 How To Read Speed - Torque Characteristics

转矩电动机的转矩几乎与电压的平方成正比变化, 通过改变电动机的通电电压, 就能够得到电压平方比例具有了特性的转速-转矩特性曲线。

The motor torque changes approximately proportion to the square of the voltage. When the voltage applied to the motor is changed, speed - torque curves with a sloping characteristics torque is highest at 200 speed and decreases steadily with increasing speed) shifts to that of the corresponding voltage.

当电压为10V时, 将电压调整为10V, 80V, 40V电压, 电动机将分别以V1, V2, V3转速运行。如上所述, 通过改变电压, 能够简单地改变转速。

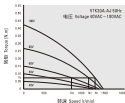
When the voltage is changed to 100 V, 80 V and 60 V while the load torque is TL, the motor rotates at the speeds V1, V2 and V3 respectively. Thus, the speed can be changed easily by varying the voltage.

选择转矩电动机时, 请了解必要的转矩和转速, 根据您连续使用还是短时使用, 参阅转速-转矩特性作出选择。在额定状态下使用时, 选择基本只考虑效率。

When choosing a torque motor, first determine the required torque and speed. Then select a motor using the speed - torque characteristics curves to determine whether the motor should be operated under continuous duty or limited duty. When used under loaded state conditions, only the torque factor is considered.

用于连续送料等会由温度上升问题的场合时, 可通过选择较大轴功率的产品以调整电压方式控制转速、转矩。

The temperature rise of the motor may cause a problem during continuous operation. In this case, choose a motor with an output power large enough for continuous operation and adjust the voltage to control the torque and speed.



■ 转矩电动机电压控制方法 Voltage Control Of Torque Motors

电压控制的一般方法是，使用固定可控硅中性的相位控制方式。是一种固定频率，通过改变触发角即可控制控制角 α ，使输入电压随着控制角 α 而变化的控制方法。

The method most commonly used to control voltage is by phase control using a triac. As shown in Fig 1, by changing the phase angle at which the triac switches, the input voltage is controlled as represented by the phase angle areas of the graph.

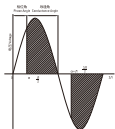


图-1 相位控制
Fig.1 Phase Control

■ 装有减速器时的输出转矩 Gear Motor – Torque Table

由于具有下垂特性，因此，转矩电动机可以实现从停止状态到额定转速之间的任一转速。装有减速器-中间减速器时输出转矩，请参照减速器特性曲线图，按照计算用的转速控制，按照下面的公式计算。

减速机输出轴转矩 M_0 =电动机转矩 \times 减速机减速比
减速机输出轴转速 n_0 =电动机转速 \div 减速机减速比

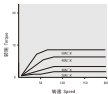
Due to the sloping characteristics, torque motors can be operated over a wide speed range, from locked rotor condition to the maximum speed. The permissible torque when a gearhead and a decimal gearhead are directly connected can be calculated according to the following formula, using the speed and torque determined from the speed – torque characteristics.

Speed of gearhead output shaft $(N/Motor\ speed) \times$ Gearhead gear ratio
Output torque of gearhead $T(Motor\ torque) \times$ Gearhead gear ratio \times Gearhead efficiency

■ 请注意，减速器的输出轴转矩不可大于减速器的最大的最大允许转矩

Please note, the output torque of the gearhead must be lower than the maximum permissible torque

● 减速器的最大允许转矩 Maximum Permissible Torque of Gearhead



减速机型号 Gearhead Model	减速机减速比 Gearhead Gear Ratio	减速机效率 Gearhead Efficiency
100E-X 100C-X 100L-X	2-12	87%
100S-X	25-35	73%
500E-X	50-300	68%

- 减速机、中间减速机列数。
Gear heads and decimal gear heads are listed separately.
- 减速机型号后二十为减速比的数值。
Enter the gear ratio in the box (□) with the model name

ZD中大电机: 15257416648

规格 Specifications

- 20, 30, 40V, 10V, 30W

型号 Model - 类型 Type 型号型 Lead/Alive Type		电机结构 (Motor) Mounting at Locked Rotor	电压 Voltage	频率 Frequency	启动转矩 Starting Torque	最大输出 功率 Max. Output Power W	最大输出功 率转速 Speed at Max. Output Power r/min	最大输出功 率转矩 Torque at Max. Output Power mNm	电容容量 Capacitor
电机轴型 Motor Shaft	轴轴型 Mount Shaft		V	Hz	mNm				μ F
ZD300A	ITCMA	电机	110	50	69	3.2	750	41	7.8750
		启动转矩	20		1.2	15			
		电机	110	60	68	3.2	800	37	
		启动转矩	25		1.3	11			
ZD300C	ITCMA-C	电机	220	50	69	3.2	750	41	1.5450
		启动转矩	20		1.2	16			
		电机	220	60	68	3.2	800	37	
		启动转矩	25		1.2	11			
ZD300A	ITCMA-A	电机	110	50	134	6.0	750	80	8.8250
		启动转矩	60		2.5	38			
		电机	110	60	134	6.5	800	74	
		启动转矩	60		2.8	30			
ZD300C	ITCMA-C	电机	220	50	134	6.0	750	80	2.8450
		启动转矩	60		2.5	36			
		电机	220	60	134	6.5	800	76	
		启动转矩	60		2.8	30			
ZD300A	ITCMA-A	电机	110	50	220	10	750	127	18.8750
		启动转矩	74		3.0	46			
		电机	110	60	25	10	800	127	
		启动转矩	50		3.0	50			
ZD300C	ITCMA-C	电机	220	50	260	10	750	127	2.5450
		启动转矩	80		3.0	46			
		电机	220	60	220	10	800	127	
		启动转矩	80		3.0	38			
ZD200A	ITCMA-A	电机	110	50	363	20	750	229	15.8250
		启动转矩	137		6.0	75			
		电机	110	60	294	20	800	216	
		启动转矩	188		6.0	66			
ZD200C	ITCMA-C	电机	220	50	363	20	750	229	3.8450
		启动转矩	137		6.0	75			
		电机	220	60	294	20	800	216	
		启动转矩	188		6.0	66			

• 各种安全标准以电动机结构上的型号取得认证。

When the motor is approved under various safety standards, the model name on the nameplate is the approved model name.

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■ 种类 Type

● 电动机 Motor

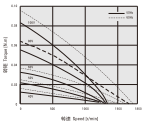
机座 Type	轴号 Shafted	
	凸缘轴型 Flange Shaft	圆轴型 Round Shaft
2W	ZT02A-A	ZT02A-A
	ZT02A-C	ZT02A-C
6W	ZT02A-A	ZT02A-A
	ZT02A-C	ZT02A-C
10W	ZT02A-A	ZT02A-A
	ZT02A-C	ZT02A-C
20W	ZT02A-A	ZT02A-A
	ZT02A-C	ZT02A-C

适用电动机输出功率 (适用轴号) Applicable Motor Output Power (Flange Shaft Type)	减速机型号 Gearhead Model	减速比 Gear Ratio
20W	3GCX	3, 3.6, 5, 6, 7.5, 9, 12.5, 16, 18, 25, 30, 36, 50, 60, 75, 90, 100, 125, 150, 180, 200
		3GM 50W (中间减速机 Decoral Gearhead)
60W	3GCX	3, 3.6, 5, 6, 7.5, 9, 12.5, 16, 18, 25, 30, 36, 50, 60, 75, 90, 100, 125, 150, 180, 200
		3GM 50W (中间减速机 Decoral Gearhead)
100W	4GCX	3, 3.6, 5, 6, 7.5, 9, 12.5, 16, 18, 25, 30, 36, 50, 60, 75, 90, 100, 125, 150, 180, 200
		4GM 50W (中间减速机 Decoral Gearhead)
200W	5GCX	3, 3.6, 5, 6, 7.5, 9, 12.5, 16, 18, 25, 30, 36, 50, 60, 75, 90, 100, 125, 150, 180, 200
		5GM 50W (中间减速机 Decoral Gearhead)

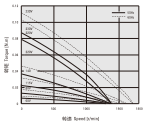
● 减速机型号轴中心力或轴心位置
Enter the gear ratio in the box (□) within the model name

■ 转速-转矩特性 (参考值) Speed - Torque Characteristics (Reference Values)

● ZT02A-A, ZT02A-C

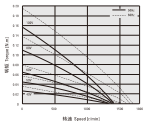


● ZT02A-C, ZT02A-C

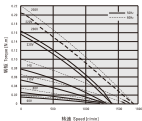


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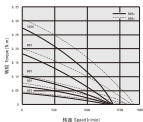
● ZT800HA, ZT80A



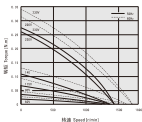
● ZT800HC, ZT80C



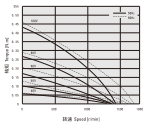
● ZT1000HA, ZT100A



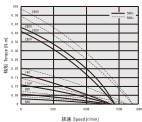
● ZT1000HC, ZT100C



● ZT1200HA, ZT120A



● ZT1200HC, ZT120C



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■外形图 (单位 mm) Dimensions(Unit mm)

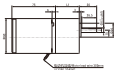
减速机均有安装用螺钉(Mounting screws are included with gearbox).

● 2W

电动机/减速机 Motor/Gearhead

重量 Weight: 电动机 Motor: 0.75kg

减速机 Gearhead: 1.4kg



电动机型号 Motor Model	减速机型号 Gearhead Model	减速比 Gear Ratio	L1
ZDGN-A ZDGN-C	2GN-C	3-18	33
		25-200	47.5

● 减速机型号中的C-为减速机齿数

Enter the gear rate in the box (□) within the model name

● 电动机轴封轴型 Shaft Section Of Fouled Shaft Type

ZDGA-A ZDGA-C

除重量及轴封外电动机外形与齿轴轴型相同。

Excluding weight and the shaft section motor shape are the same as those of the pinion shaft type.



● 中轴减速机 Bevel Gearhead

可连接ZDGN型 Gear be connected to ZDGN type

ZD100K

重量 Weight: 0.24kg



■外形图 (单位 mm) Dimensions(Unit mm)

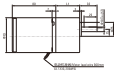
减速机均有安装用螺钉(Mounting screws are included with gearbox).

● 4W

电动机/减速机 Motor/Gearhead

重量 Weight: 电动机 Motor: 1.1kg

减速机 Gearhead: 0.5kg



电动机型号 Motor Model	减速机型号 Gearhead Model	减速比 Gear Ratio	L1
ZDGN-A ZDGN-C	3GN-C	3-18	33
		25-200	42

● 减速机型号中的C-为减速机齿数

Enter the gear rate in the box (□) within the model name

● 键·键槽 (减速机附件)

Key · Keyway(Accessory of Gearhead)



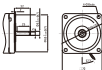
ZD中大电机: 15257416648

● 圆轴型轴伸部分 Shaft Section Of Round Shaft Type

ZTKA-A ZTKA-C

除重量及轴伸外形与电动机相同。

Excluding weight and the shaft section/motor shape are the same as those of the prior shaft type.



■ 外形图 (单位 mm) Dimensions (Unit mm)

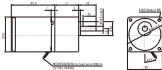
此系列所有电机均标配 Mounting screws are included with gearhead.

● 10W

● 电动机/减速机 Motor/Gearhead

重量 Weight: 电动机/Motor: 1.8kg

减速机/Gearhead: 0.8kg

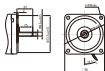


● 圆轴型轴伸部分 Shaft Section Of Round Shaft Type

4TK0A-A 4TK0A-C

除重量及轴伸外形与电动机相同。

Excluding weight and the shaft section/motor shape are the same as those of the prior shaft type.



● 带齿圆盖 Decoral Gearhead

可安装ZTKA型 Can be connected to ZTKA type

32W/60W

重量 Weight: 0.57kg



电机型号号 Motor Model	减速机型号 Gearhead Model	减速比 Gear Ratio	L1
4TK100A-A 4TK100A-C	4BE_CX	3~18	32
		25~200	43.5

● 减速比型号的 □ 中为减速比的数值

Enter the gear ratio in the box (□) within the model name

● 键、键套 (减速机附件)

Key · Keyway (Accessories of Gearhead)



● 带齿圆盖 Decoral Gearhead

可安装4TK100型 Can be connected to 4TK100 type

43W/60W

重量 Weight: 0.47kg



ZD中大电机：15257416648

■ 连接图 Wiring Diagram

■ 从前方视角从轴端的轴端来看，CW表示顺时针方向，CCW表示逆时针方向。

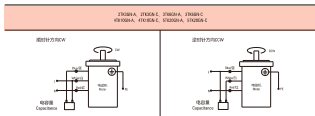
The direction of motor rotation is as viewed from the shaft end of motor. CW represents the clockwise direction, while CCW represents the counterclockwise direction.

■ 表中所列名称为轴端轴端，圆端轴端。

Name indicated in the list is pinion shaft type, also valid for the equivalent round shaft type.

■ 括号在□中为美国彩色编码系统的，UNGS符号。

Specify the type of the capacitor to be included by entering J or C in the box (□) within the model name.



请注意 Note:

单相电机反转方向的切换应在电机停止后进行。

Change the direction of single-phase motor rotation only after bring the motor to a stop.

若在电机停止时切换旋转方向，可能发生无反转或反转方向切换时间较长的情况。

If an attempt is made to change the direction of rotation while the motor is rotating, motor may ignore reversing command or change its direction of rotation after some delay.