Specification for Gear Motor

Model: 225-001

客户确认回签 CONFIRMED & SIGNED BY CUSTOMER	供应商确认 CONFIRMED & SIGNED BY NFP
COMPANY,CHOP&SIGNATURE: 日期 DATE:	COMPANY,CHOP&SIGNATURE: 日期 DATE:

1.规格书请在一周内确认并回签，逾期未作回传会视作默认处理，请充分了解。

Pls countersign the specification within one week once approval.If no countersigning, we will consider it as accepted at your side. Please fully understand this situation.

2.在电机符合本规格书的前提下,我司出于技术进步或者生产效率的考虑,可能会自行更改制造过程。电机的性能参数以客户最终确认的样板为准。

With in the limit of satisfying this specification, the manufacturing processes may be changed without notice, for the purpose of improving performance and/or production efficiency of the motor. Reference for the characteristics of the motor are the final delivered samples as customer confirmed.

Prepared by	Checked by	Approved by
Hilton Qin	Sidney Li	Frank So

Customer Name: _____

Customer Model: _____

Customer Comment: _____

Customer Approval / Date: _____

减速箱基本规格 Main Technical Data for Gear Motor

This specification applys to the permanent magnet direct current motors for which Customer make purchase and NFP-Motor make production.

1：形式Type: 直流永磁减速电机 Permanent magnet direct current motor

2：型号 Model No. ：NFP-225-001

3：基本电气特性 ELECTRICAL CHARACTERISTICS

3.1:测试的基本条件MEASURING CONDITIONS

3.1.1:电源:稳压电源 Power supply: Regulated power supply

3.1.2:环境温度 Environment temperature:25±5degc

3.1.3:环境湿度 Environment humidity：60%RH

注Note: 如无争议，可在室温条件下测试 If no controversy,test can be done at room temperature.

3.2:在额定电压下,减速电机符合以下性能 Powered by rated voltage, the gear motor meets the following performance.

项 目 Item	性 能 Performance	单 位 Unit	条 件 说 明 Instruction
额定电压 Rated Voltage	12	V	稳压直流电源 DC regulated power supply
转向Direction of rotation	CW/CCW		CW当正极电压接正极端子时，从出力轴端观察With positive voltage applied to positive terminal (viewed from output end).
空载转速 No load Speed	1038±12%	RPM	
空载电流 No load Current	0.28(0.56Max)	A	
额定力矩 Rated Torque	1	Kgf.cm	间歇性运行 Intermittent service
额定转速 Rated Speed	859±12%	RPM	
额定电流 Rated Current	1.62(2.43Max）	A	
堵转电流 Stall Current	8.1	A	计算值 Calculated value
堵转力矩 Stall Torque	5.8	Kgf.cm	计算值 Calculated value

详细数据可参考电机曲线图More details please refer to motor curve.

4. 电机型号 Motor Number:NFP-225-001 **12 VDC** 178**00rpm**

4.1电机结构 Motor Structure

碳刷Carbon Brush

电木换向器Bakelite Commutator

转子涂敷High Temperature Insulation Coated Rotor

漆包线耐温等级Enameled wire heat resistance level： B

干压强磁Dry Pressing Anisotropic Magnet

无气孔机壳No air hole casing

5:外形尺寸按外形图 Dimension as OUTLINE.

6:绝缘电阻 Insulation Resistance : ≥2MΩ 250VDC 电机电源线或端子与壳间绝缘电阻 Measured between motor terminals and motor metal housing

7:寿命 Lifetime:

寿命条件Lifetime conditions	运行方式Duty cycle	运行要求Operating requirement
按样品水平 As per sample		

8:标识,在电机或齿轮箱规定的地方印字或贴付铭版。
Mark :To ink/laser printing or stick label on the specific position of motor casing.

9:规格书中没有规定的使用,运输,储存条件及试验方法等按双方商定。
For not mentioned usage, transport and storage conditions, test methods etc., as per the terms agreed by both parties.agreed by both parties.

10：本规格书中未规定之其它事项，如外观等以样品状态为参考基准。
For other term that is not stipulated in this specification, such as motor appearance,please take sample for reference.

11： 本规格书不仅适用于样品试作参考,同样对于生产时有效。
This specification now has to be valid for the production and not only for samples

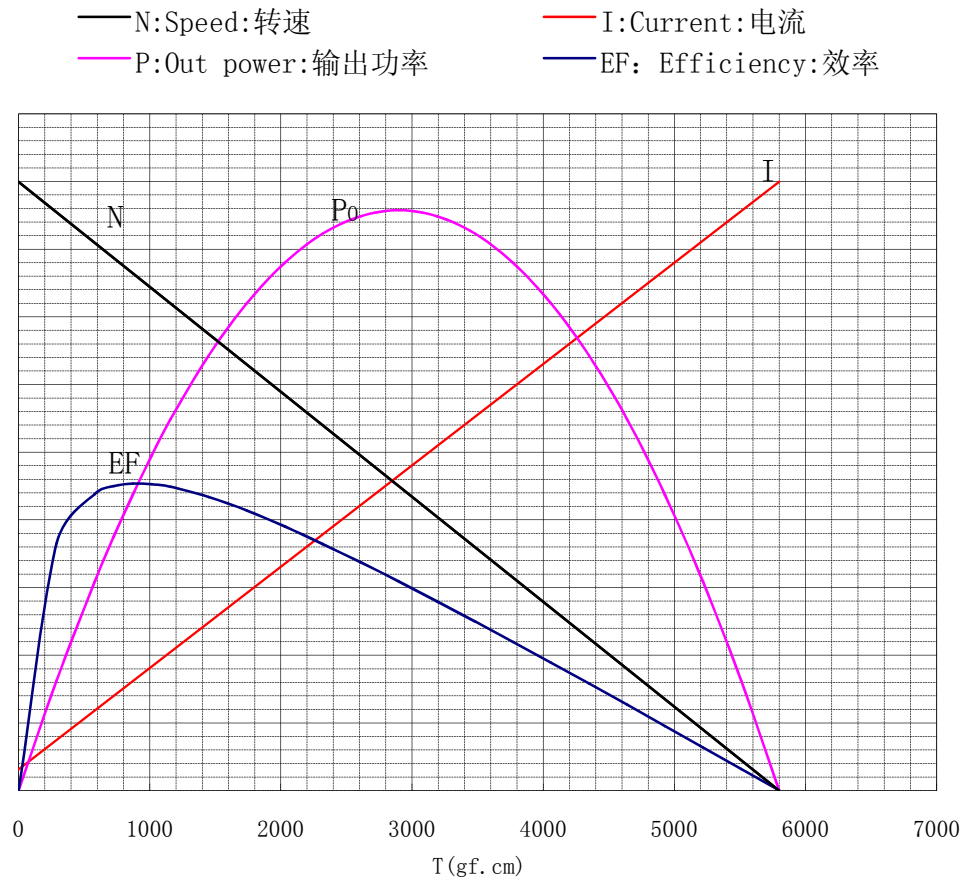
MOTOR CHARACTERISTICS(电机曲线图)

Motor code number(电机编号或型号)： NFP-225-001

Constant voltage(额定电压) :12V

Rotation(转向) :CW

P_0	EF	I	N
18	100	8946	1153
9	50	4473	577
[W]	[%]	[mA]	r/min

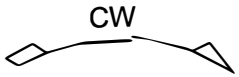


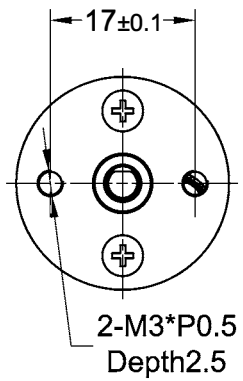
T:torque：力矩

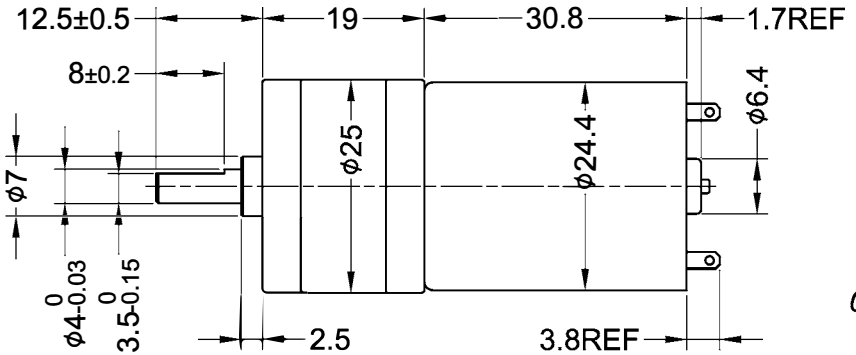
	T(mNm)	(gf.cm)	N(r/min)	I(mA)	P_0[W]	EF[%]
NO Load…N.I（空载）	0.00	0	1038.00	280	0.0	0.00
	19.61	200	1002.20	548	2.1	31.26
Start Point (起始点设定)	39.22	400	966.40	816	4.0	40.49
	58.82	600	930.60	1084	5.7	44.02
200	78.43	800	894.80	1352	7.3	45.25
Rated(定格)	98.04	1000	859.00	1620	8.8	45.32
stepped control (梯度控制)	117.65	1200	823.20	1888	10.1	44.72
	137.25	1400	787.40	2156	11.3	43.70
	156.86	1600	751.60	2424	12.3	42.40
200	176.47	1800	715.80	2692	13.2	40.91
	196.08	2000	680.00	2960	13.9	39.27
	215.69	2200	644.20	3228	14.5	37.53
	235.29	2400	608.40	3496	15.0	35.70
	254.90	2600	572.60	3764	15.3	33.81
	274.51	2800	536.80	4032	15.4	31.86
	294.12	3000	501.00	4300	15.4	29.87
Stop……T （堵转）	568.52	5799	0.00	8051	0.0	0.00
Max……P_0（最大功率）	284.26	2899	519.00	4165	15.4	30.88
Max……EF（最大效率）	89.36	911	874.85	1501	8.2	45.39

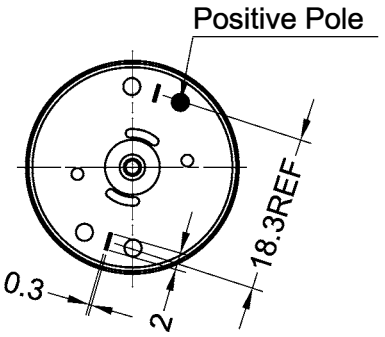
Check(确认)：	Make(作成)：	Date(时间)：	2016-6-27

DIRECTION OF ROTATION









NOTES:
1.DIRECTION OF ROTATION: Clockwise when viewing from the output shaft end with positive voltage applied to positive terminal.
2.ASSEMBLING MOTOR:NFP-225-001.

REV.	DESCRIPTION	SIGNATURE	DATE

Unit:mm	Weight:	g(Approx)
	SIGNATURE	DATE
Drawing By	Hou	
Check By		
Approved By		6/13/2016

TOLERANCE
(UNLESS OTHERWISE SPECIFIED)

0~29.99	30~400	Angle
±0.5	±1.0	±3°

SHENZHEN NFP MOTOR CO.,LTD

直流减速电机使用一般注意事项General Instructions for Use of DC Gear Motor

1：过负载及堵转Overload or Stall Condition

电机在运行时,由于线圈和铁芯内部发生能量转换而发热,温度渐渐上升。负载在额定范围内，发生热量和散发热量平衡，不会烧坏线圈。但在过负载及堵转的状态下长时间运行时会引起发热，线圈铜线上的绝缘膜被溶解，使铜线匝间短路，造成电流大从而烧坏电机和驱动板。过载也会影响齿轮的强度，造成齿轮的断裂或失效。请保证产品不超出额定工作条件下

The motor temperature would rise gradually due to the internal energy conversion between the windings and iron core during running. The windings will not be burnt under rated load because of the balance between the produced and vented heat. But if it's overloaded or stalled for a long time, the insulation film of copper wires might be dissolved due to high temperature. This will short-circuit the winding which causes high current even damages the motor and driving board. Besides, under overloaded condition, the strength of the gear or other parts attached on the shaft will be affected (tooth broken or wore out). So please make sure that motors are operated under rated working conditions.

2：电机低速运行 Motors Working at Lower Speed

DC电机一般使用碳刷，旋转的整流子和碳刷磨擦，在整流子换向处产生火花。电机在低速运行时，整流子与碳刷磨擦产生的碳刷粉在整流子的槽中堆积，容易造成短路，烧坏电机和驱动板，请注意。

For most of the dc motors, we use carbon brushes. When a motor runs, spark occurs in the contact area because of the friction between the brushes and commutator at the timing of the commutation. Carbon dust will accumulate in the commutator slots which might cause short circuit, burn the motor or the driving board if the motor runs at lower speed and the dust couldn't be burned in time. Please kindly pay attention to this condition.

3：PWM控制注意事项Remarks about PWM Controller

使用PWM控制时的碳刷要比额定电压（或固定电压）状态下使用寿命短，另外，根据使用的频率，碳刷有可能很快的磨损。DC马达使用的PWM调制的频率一般为10～20KH_Z。还有PWM调整控制时反复的开-关，有可能与电机部品的频率相近，会引起共振而发热。请使用上特别注意，PWM控制状态下，使用电解电容内藏时，在某一固定的频率下电机可能会不转，请尽量使用压敏电阻内藏的电机。

The lifetime of the brushes is shorter when the motor is powered with PWM controller not by rated voltage or constant voltage. And the carbon brushes might wear out easily under certain frequency of the PWM controller. Normally the frequency used for dc motors is 10～20KHZ. Heating might also occur because of sympathetic vibration if the frequency of the PWM switch is close to the motor components'. Besides, please be noted that the motor might not run if with integrated electrolytic capacitor under certain frequency. So we suggest motors with varistor inside if the motor is powered by PWM controller.

4：关于惯性和刹车About Inertia and Brake

电机断电后，由于惯性作用，出力轴还会转动，这是DC电机的惯性。如果要立即停止转动，在关掉电源后短路正负端子即可，使用这种刹车，是利用电机发电（反向电流）作用来实现,可能会电流增大而缩短电机的寿命。

It's very common that after power off, the motor shaft will still rotate for a while because of the inertia. If instant brake needed, you can short-circuit the positive and negative poles then the power generated by the motor (reverse current) can stop it quickly. But this might increase the motor current and even shorten the lifetime.

5：寿命 Lifetime

产品的寿命受使用条件的影响，如不同的电源类型，运行的方式，负载的种类等。 通常规格书提供的减速电机寿命为标准试验状态与条件下，减速电机的连续单方向运行寿命，仅作为参考使用，实际使用中，请与实物配套充分试验，确定实际使用寿命。

A motor's lifetime is related to the operating conditions such as the power supplier, duty cycle, and load conditions etc. The lifetime data on our spec is based on the rated testing conditions and motor running in one direction without any stop. It's just for reference only. For actual products, please make full testing to ensure the lifetime is long enough.

6：安装Assembling

电机安装设计了相对应的螺孔，请确认外观图上所记载的螺孔的有效深度及使用与之相应长度的螺丝。螺钉的锁紧扭力请按相关技术规范，过大扭力会造成螺钉的打滑失效。

There are screw holes designed for motor assembly. Please kindly refer to the outline and make sure the screw length is in the recommended range. As for the allowable torque, please kindly refer to the related technical standards. Over that range, it might slip the screw.

7：电机端子Motor terminals

电机端子在接线焊接时如果焊接温度过高会对电机的端子结构及内部造成破坏。建议使用烙铁40W，焊接温度380℃焊接时间小于3秒。另外端子上额外的加力，也会造成端子结构的破坏。

The motor terminal structures and inner parts might be broken when the soldering temperature is too high. The recommended operating way is using soldering iron 40W, 380℃, and less than 3 seconds. Besides, force on the terminals will also break the terminal structure.

8：轴向压力Axial force

当齿轮出力轴头压入齿轮或者其它部品时，出力轴另一端需要有工具支撑，另一端不可支撑的情况下，压力不允许超出允许的轴向压力。

When the gear output shaft heading into gear or other part, the other end need a tool to support.If without support, pressure cannot be beyond the allowable axial force.

9：冲击与落下Shock and Drop

电机如果有受到落地等冲击，有可能造成内部部品的破坏，以及潜在的品质不良的出现。

Inner parts might be broken and potential defection might occur when other impacts on the motor happens such as dropping on the ground from high position.

10：粘接剂的使用The Use of Binding Material

如果使用胶水等粘接剂时，不能让胶水附在出力轴的轴承上，有挥发性的胶水还有可能造成整流子的玷污，影响产品的使

If binding material like glue is used during the assembly, please make sure it will not be added to the output shaft bearing. For some volatile glue, it might also stain the commuatator which affect the motor performance.

11：反向旋转Reverse roration

不要在齿轮出力轴上加力，反向旋转，这样容易造成齿轮的破坏。

DON'T force to the output shaft of gear to reverse rotation. It's easy to make gear broken.

以上事项，使用中请充分注间，如遇到不能确认的其它问题，请直接与技术人员联络确认。

Please pay fully attention to the items mentioned above. If other issues during application, please kindly contact **NFP** for further information.