客户&工程师 如何使用本产品手册
Customer & Engineer how to use this product manual

NEWSTART® 纽氏達特

产品目录&产品页的阅读方法 / Product catalog & product page reading method

本目录主要刊载了纽氏达特NEWSTART行星减速机目前的主要标准机型，并不囊括纽氏达特NEWSTART所有的产品。

特殊定制产品、行星减速机衍生产品、特殊传动产品不在本手册刊载。如有特殊产品需求，请致电我们的技术销售工程师。

我们的研发工程师也会到现场与客户商讨确定最佳解决方案。

本手册主要刊载了以下几个模块：关于纽氏达特、产品目录表、选型流程图、关于安装、专用名词解释、不同系列产品主要性能指标雷达比对图、产品页。

产品页信息主要包括：产品综合性能参数表、订货说明、产品外形尺寸图、产品性能参数、产品输出方式示意图。

有关产品的详细信息及使用注意事项等，请阅读使用说明书。

使用说明书可从官方网站下载或洽询本公司客户咨询中心：TEL 0533-6288333/6288444。

This catalogue mainly publishes the main standard models of the NEWSTART planetary reducer, and does not

include all NEWSTART products. Our R & D Engineer will also come to the site to discuss with the client to determine the best solution.

Special custom products, planetary gear reducer derivatives and special drive products are not included in this manual. For special

product needs, please call our technology sales engineer. .

This manual mainly contains the following modules: about Newsdart, catalogue table of products, selection flow chart, about installation,

special term interpretation, radar comparison diagram of main performance indicators of different series of products, product pages.

Product page information mainly includes: product comprehensive performance parameter table, order description, product shape and

size diagram, product performance parameters, product output schematic diagram.

For detailed information about products and precautions for use, please read the instructions.

The instructions can be downloaded from the official website or consulted with our customer advisory center: TEL 0533-6288333/6288444.

选择产品之前需注意事项 / Matters needing attention before choosing products

1.纽氏达特NEWSTART行星减速机主要配合电机马达使用，客户&工程师单独选择行星减速机时一定确认好电机马达和行星减速机外

形图纸尺寸；如果客户没有选择好电机马达或者选择的电机不确定，也可咨询我们的技术部门。

如果客户&工程师不清楚减速机选择的是否合适，也可咨询我们的技术部门。

2.关于交货后的换货、退货：产品在运送过程中如发生意外而破损，或与订购的产品不同时，本公司负责更换。

产品必须退货换货时，请咨询购买产品的我公司销售部门或经销商。

请注意：已经使用过的产品不接受退换。

1. NEWSTART planetary gear reducer is mainly used with motor. The client-engineer must confirm the motor when selecting the

planetary gear reducer separately. Motors and planetary reducers outline drawings size; if the customer did not choose a good

motor motor or motor selection is uncertain, you can also consult our technical department.

If the client & Engineer is not clear about the suitability of the reducer, we can also consult our technical department.

2. About the replacement and return after delivery: if the product is damaged by accidentor different from the product ordered,

the company is responsible for the replacement.

When products are required to be returned, please consult the sales department

or distributor of our products.

Please note: the product department that has been used is subject to refund.

关于产品保修 / About products warranty

1.购买的产品在保修期限之内确定产品本身故障时，本公司将负责免费修理。

2.保修期限：客户确认收货后的18个月之内。

3.免责事项：下列情况不属于保修范围

　a.非本公司进行的改造或修理引起故障时

　b.因产品以外的因素而引起故障时

　C.因天灾、灾害等非本公司责任范围内的原因引起故障时

1. The company will be responsible for free repairs of the purchased products when the warranty

period determines the failure of the products themselves.

2. warranty period: 18 months after receipt of customer's confirmation.

3. exemption: the following circumstances are not covered by the warranty.

a. failure caused by failure of the company's renovation or repair.

b. failure due to factors other than products

c. failure due to natural disasters, disasters and other reasons not within the company's responsibility.

影响精密行星减速机选型的相关因素
Factors affecting the selection of precision planetary gear reducer

NEWSTART® 纽氏達特

产品目录&产品页的阅读方法 / Product catalog & product page reading method

面对客户和优秀的产品设计师，NEWSTART除了将自己的产品状况尽可能全方位呈现您，同时NEWSTART也有责任将多年来关于产品应用方面取得的经验奉献给您，这些经验也是影响产品选型的重要相关因素，正确的考量这些因素将会给您和优秀设计师带来不少帮助。

Faced with customers and excellent product designers, NEWSTART is not only responsible for presenting your product status as fully as possible, but also responsible for contributing years of experience in product application to you. These experiences are also important factors influencing product selection. Correct consideration of these factors will be given. It brings a lot of help to you and excellent designers.

你好，精密行星减速机选型第一步是什么？
Hello, precision planetary gear selection what is the first step?

您好！
选型第一步应该是确认减速机的使用环境。比如：超高低温，海拔，防腐，霉菌，防爆，防水，辐射等要求需要定制。
Hello! The first step should be to confirm the working environment of the reducer. For example: ultra high and low temperature, altitude, anti-corrosion, mold, explosion-proof, waterproof, radiation and other requirements need to be customized.

然后第二步呢？
And then the second step?

第二步，确定您的使用工况。比如频繁启动停止，运转周期特性，冲击负荷，安全系数，重复定位精度等要求来确定外力对减速机的性能指标要求。
The second step is to determine your working condition. For example, frequent start and stop, operating cycle characteristics, impact load, safety factor, repetitive positioning accuracy and other requirements to determine the external force on the performance of the reducer requirements.

然后第三步呢？
And then the third step?

第三步，确定传动链结构形式：比如：齿轮齿条，同步带，联轴器，滚珠丝杠，凸轮等来保证获取最佳传动链精度，正确选取不同结构系列的减速机产品。
The third step is to determine the structural form of the transmission chain. For example: gear and rack, synchronous belt, coupling, ball screw, cam, etc. to ensure the best transmission chain accuracy, the correct selection of different structure series of reducer products.
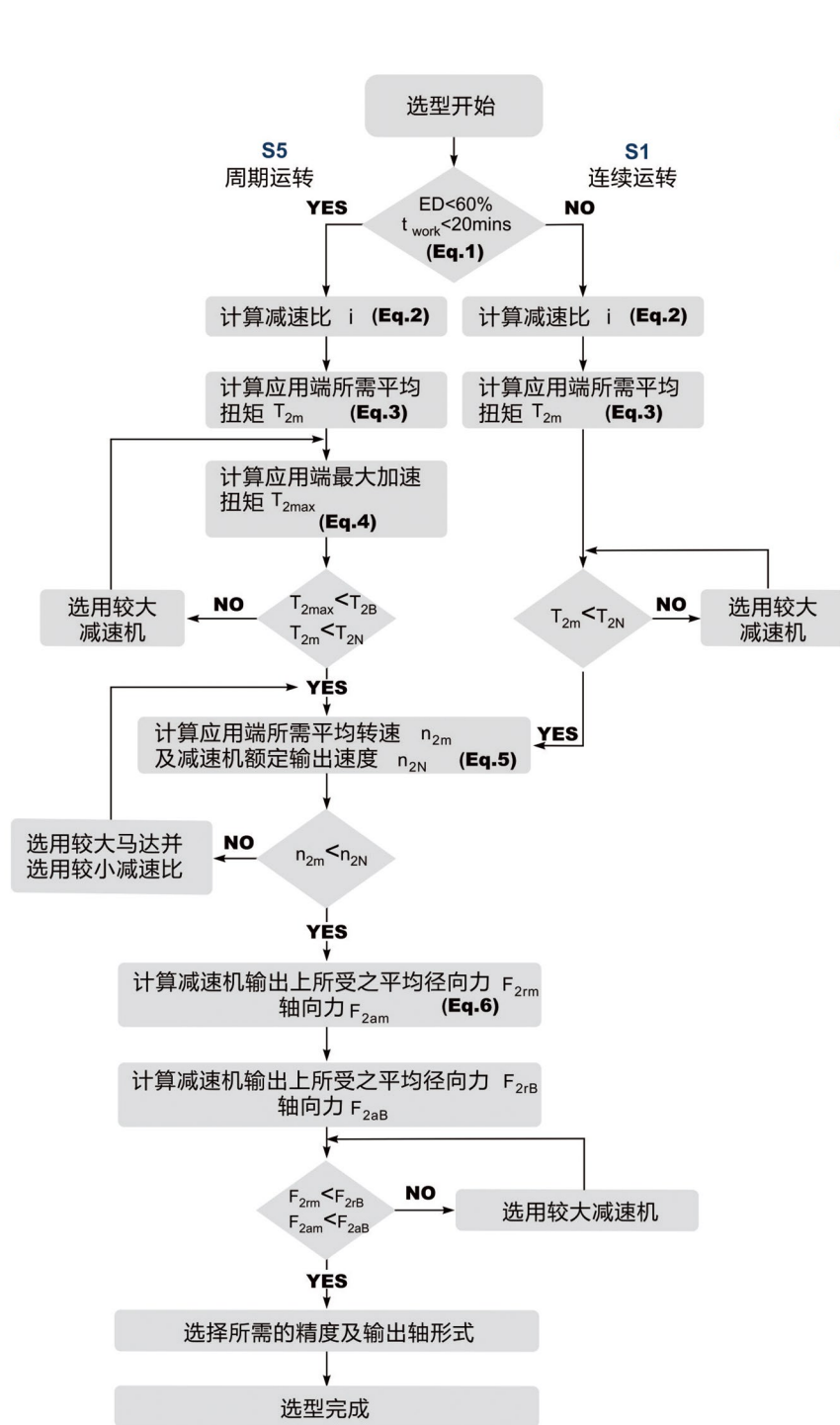
哦，第四步呢？
Oh, the fourth step?

然后在根据我们《产品综合型录》中的精密行星减速机-选型流程图，计算所需减速机的额定输出扭矩，转速，速比，精度，轴向力径向力等参数，然后最终选择适合您要求的减速机。
Then, according to the precise planetary reducer-selection flow chart in our "Product Comprehensive Catalogue", the rated output torque, speed, speed ratio, accuracy, axial force and radial force of the required reducer are calculated, and then the reducer suitable for your requirements is finally selected.

如果标准型号不能符合我的要求怎么办？
What if the standard model fails to meet my requirements?

如果标准型号不能符合您的要求，那么我们会有专业的技术研发工程师与您直接沟通，以满足您的定制要求。
If the standard model can not meet your requirements, then we will have professional technical research and development engineers to communicate with you directly to meet your customization requirements.

好的，谢谢！
That's fine. Thank you!

不客气！如果您还有别的诉求，随时联系我们客服TEL：0533-6288333/6288444
You are welcome! If you still have no understanding, please feel free to contact us at customer service TEL:0533-6288333/6288444.

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**精密行星减速机–选型流程图**
Precision planetary gear - Selection Chart

选型流程图 / Flow chart of selection

精密行星减速机–不同系列产品主要性能指标雷达比对图
Precision planetary reducer - Radar comparison chart of main performance indexes of different products

减速机专用名词解释 / Specil–purpose term explanation

选型流程图

选型开始

S5 周期运转   **S1** 连续运转

$ED<60\%$ $t_{work}<20mins$ **(Eq.1)**

YES → 计算减速比 i **(Eq.2)**   NO → 计算减速比 i **(Eq.2)**

计算应用端所需平均扭矩 T_{2m} **(Eq.3)**   计算应用端所需平均扭矩 T_{2m} **(Eq.3)**

计算应用端最大加速扭矩 T_{2max} **(Eq.4)**

选用较大减速机 ← NO — $T_{2max}<T_{2B}$ $T_{2m}<T_{2N}$

$T_{2m}<T_{2N}$ — NO → 选用较大减速机

YES

计算应用端所需平均转速 n_{2m} 及减速机额定输出速度 n_{2N} **(Eq.5)**

选用较大马达并选用较小减速比 ← NO — $n_{2m}<n_{2N}$

YES

计算减速机输出上所受之平均径向力 F_{2rm} 轴向力 F_{2am} **(Eq.6)**

计算减速机输出上所受之平均径向力 F_{2rB} 轴向力 F_{2aB}

$F_{2rm}<F_{2rB}$ $F_{2am}<F_{2aB}$ — NO → 选用较大减速机

YES

选择所需的精度及输出轴形式

选型完成

S5 周期运转之建议事项

一般的应用惯量须符合以下公式

$$\frac{J_L}{i^2} \leq 4 \times J_m$$

最适当的应用惯量须符合以下公式

$$\frac{J_L}{i^2} \cong J_m$$

J_L **负载惯性**
J_m **马达惯性**

应用端运动模式

输出轴扭矩

输出轴承受作用力

输出转速

时间
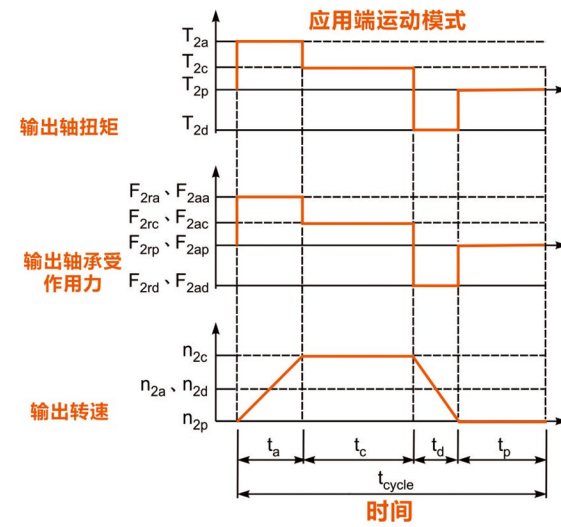
1. $ED = \dfrac{t_a+t_c+t_d}{t_{cycle}} \times 100\%$, $t_{work} = t_a+t_c+t_d$

下标说明：a.加速 c.等速
d.减速 p.停止   **(Eq.1)**

2. $i \cong \dfrac{n_m}{n_{work}}$

n_m **马达输出速度**
n_{work} **实际应用速度**   **(Eq.2)**

3. $T_{2m} = \sqrt[3]{\dfrac{n_{2a} \times t_a \times T_{2a}^3 + n_{2c} \times t_c \times T_{2c}^3 + n_{2d} \times t_d \times T_{2d}^3}{n_{2a} \times t_a + n_{2c} \times t_c + n_{2d} \times t_d}}$ **(Eq.3)**

4. $T_{2max} = T_{mB} \times i \times K_s \times \eta$

K_s 负载系数

K_s	周期次数 / 小时
1.0	0 ~ 1,000
1.1	1,000 ~ 1,500
1.3	1,500 ~ 2,000
1.6	2,000 ~ 3,000
1.8	3,000 ~ 5,000

T_{mB} **马达最大输出扭矩**

η **减速机运转效率**   **(Eq.4)**

5. $n_{2a} = n_{2d} = \dfrac{1}{2} \times n_{2c}$

$n_{2m} = \dfrac{n_{2a} \times t_a + n_{2c} \times t_c + n_{2d} \times t_d}{t_a + t_c + t_d}$
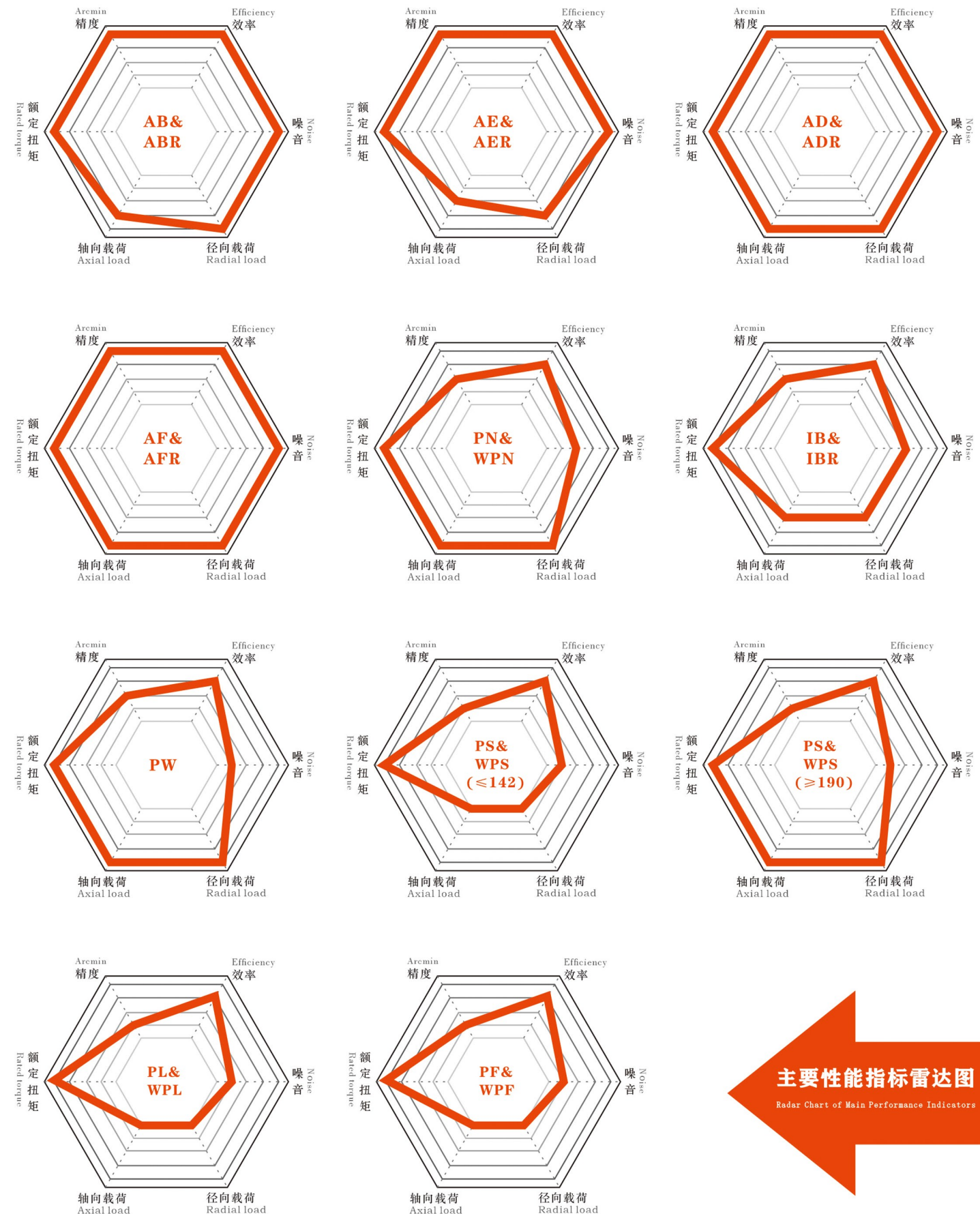
$n_{2N} = \dfrac{n_{1N}}{i}$ **(Eq.5)**

6. $F_{2rm} = \sqrt[3]{\dfrac{n_{2a} \times t_a \times F_{2ra}^3 + n_{2c} \times t_c \times F_{2rc}^3 + n_{2d} \times t_d \times F_{2rd}^3}{n_{2a} \times t_a + n_{2c} \times t_c + n_{2d} \times t_d}}$

$F_{2am} = \sqrt[3]{\dfrac{n_{2a} \times t_a \times F_{2aa}^3 + n_{2c} \times t_c \times F_{2ac}^3 + n_{2d} \times t_d \times F_{2ad}^3}{n_{2a} \times t_a + n_{2c} \times t_c + n_{2d} \times t_d}}$ **(Eq.6)**
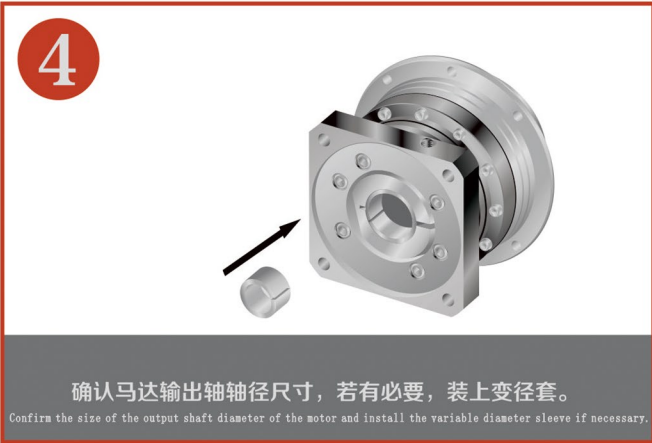

雷达图各轴标签：Arcmin 精度、Efficiency 效率、Noise 噪音、径向载荷 Radial load、轴向载荷 Axial load、额定扭矩 Rated torque

AB& ABR

AE& AER

AD& ADR

AF& AFR

PN& WPN

IB& IBR

PW

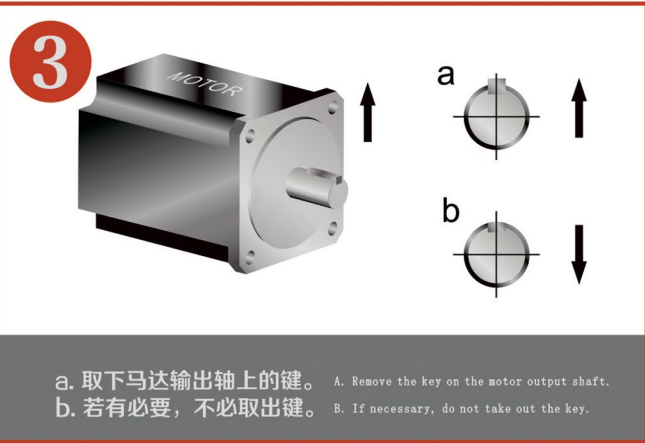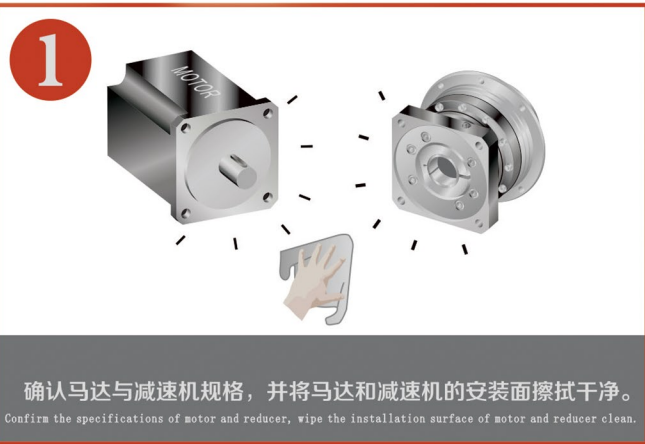PS& WPS (≤142)

PS& WPS (≥190)

PL& WPL

PF& WPF

主要性能指标雷达图
Radar Chart of Main Performance Indicators

额定输出力矩 T_N [Nm]
Rated output torque

减速机输出端以00r/min 连续运转（S1 ）下，可容许的输出扭矩。此数值在环境温度 20 –25℃、KA=1、寿命20000h 测得。实际运转时，箱体温度不得超过90℃。

The output terminals of the reducer operate under the continuous operation of 100r/min (S1), and the allowable output torque. The value is measured at ambient temperature of 20-25℃, KA=1 and 20000h of life. In actual operation, the temperature of the box should not exceed 90℃.

最大加速力矩 T_{2B} [Nm]
Maximum acceleration torque

工作周期每小时少于1000 次时允许短时间加载到输出端的最大力矩 。
The maximum torque is allowed to load at short time to less than 1000 times per hour.

急停扭矩 T_{2Not} [Nm]
Sudden stop torque

即紧急制动力矩，指减速机输出端所能加载的最大力矩。这个力矩可在齿轮箱寿命期内加载1000 次，禁止超过1000 次！

The emergency braking torque refers to the maximum torque that can be loaded at the output end of the reducer. This moment can be loaded 1000 times in the gearbox life period and prohibit

空载力矩 T_E [Nm]
No-load torque

减速机在空载时，加载到减速机上以克服减速机内的摩擦力的力矩。此数值在环境温 度20 –25℃下，输入端额定转速下所测的值。

The reducer is loaded on the reducer when no load is applied to overcome the torque torque of the reducer. This value is measured at the ambient temperature of 20-25℃, and the rated speed at the input terminal.

额定输入转速 [rpm]
Nominal input speed

减速机输入端在连续运转 （S1 ）下，可容许的输入转速 ，此数值在环境 温度20 –25 ℃下测得 。实际运行时， 箱体温度不得超过 90 ℃。

The allowable input speed of the reducer input terminal under continuous operation (S1) is measured at ambient temperature of 20-25℃. In actual operation, the temperature of the box shall not exceed 90℃.

最大输入转速 [rpm]
Maximum input speed

减速机输入端在周期运转 （S5 ）下，可容许的输入转速 ，此数值在环境 温度20 –25 ℃下测得 。实际运行时， 箱体温度不得超过 90 ℃。

The allowable input speed of the reducer input terminal under periodic running (S5) is measured at ambient temperature of 20-25℃. In actual operation, the temperature of the box should not exceed 90℃.

回程背隙 [arcmin]
Backgap backlash

指减速机输出轴与输入轴的最大偏差角 。测量时将减速机输入端固定 ，然后在输出端用力矩仪加载 ±2% 的额定力矩，以克服减速机内的摩擦力，测量得减速机的回程间隙 。1弧分等于 1/60 度，单位：arcmin 。

It refers to the maximum deviation angle between the output shaft and the input shaft of the reducer. The input end of the reducer is fixed in measurement, and then the rated torque of 2% is loaded with the torque meter at the output end to overcome the friction force in the reducer, and the clearance gap of the reducer is measured. The 1 arc is equal to 1/60 degree, unit: arcmin.

噪音 [db]
Noise

减速机额定输入转速下空载时 ，将分贝仪与减速机相隔 1m 所测的的数值。 此数值在环境温度 20 –25 ℃，环境噪音 ＜50dB 时测得 。

When the reducer is rated at the rated speed, the value of the decibel gauge and the decelerator will be separated from 1m when no load is applied. The value is measured at ambient temperature of 20-25℃ and ambient noise ＜ 50dB.

容许最大径向负载 [N]
Maximum radial load

减速机输出轴转速 100r/min 时，作用于减速机输出轴中点位置 ，作用方向垂直于输出轴 ，减速机寿命满足 20000h 时减速机输出轴所能承受的最大径向作用力 。

When the speed reducer's output shaft speed is 100r/min, it acts on the middle point position of the output shaft of the reducer, and the direction of action is perpendicular to the output axis. The life of the reducer satisfies the maximum radial force that the output shaft of the reducer can bear when 20000h

容许最大轴向负载 [N]
Maximum axial load

减速机输出轴转速 100r/min 时，作用于减速机输出轴中心位置 ，作用方向平行于输出轴 ，减速机寿命满足 20000h 时减速机输出轴所能承受的最大轴向作用力 。

When the speed reducer's output shaft speed is 100r/min, it acts on the center position of the output shaft of the reducer, and the direction of action is parallel to the output axis. The life of the reducer meets the maximum axial force that the output shaft of the reducer can bear when it is 20000h.

满载效率 [%]
Full load efficiency

输出功率与输入功率之比。由于摩擦引起的损失总是使效率小于1,也就是少于100% 。

The ratio of the output power to the input power. Losses due to friction always make efficiency less than 1, that is less than 100%.

转动惯量 J [kgcm^2]
Moment of inertia

表示一个物体尽力保持自己转动或静止状态特性的一个值

A value that represents the characteristics of an object trying to maintain its rotation or stationary state.

惯量匹配-惯量比 λ
Inertia matching
Inertia ratio

负载惯量与传动系统惯量（电机+减速机）之间的比值。这个比值决定了系统的可控性。λ值越大，也就是各转动惯量差值越大,高动态的动作过程就是越难精确控制。纽氏达特NESTART 建议尽可能将λ 的值控制在＜ 5.减速机可将负载的惯量降低 $1/i^2$

The ratio between load inertia and transmission inertia(motor+ reducer).The ratio determines the controllability of the system.The larger the lambda value is, the greater the difference of inertia is. The more dynamic process is, the harder it is to control accurately Newstart NESTART suggested that as far as possible the value of lambda control in ＜ 5. reducer load can be reduced $1/i^2$ inertia

$$\lambda = \frac{J_{\text{负载惯量 Load inertia}} \cdot \frac{1}{i^2}}{J_{\text{电机+减速机 Motor+gearbox}}}$$

ps: 一般负载 λ ≤10； 低动态负载 λ ≤5； 高动态负载 λ ≤1。

A general load λ ≤10 ; low dynamic load≤5; high dynamic load≤1.

1 确认马达与减速机规格，并将马达和减速机的安装面擦拭干净。
Confirm the specifications of motor and reducer, wipe the installation surface of motor and reducer clean.

2 将丝堵或塑料孔堵取出，转动输入轴，直到锁紧螺栓对准边孔。
Remove the wire plug or plastic hole plug and rotate the input shaft until the locking bolt is aligned with the side hole.

3 a. 取下马达输出轴上的键。 A. Remove the key on the motor output shaft.
b. 若有必要，不必取出键。 B. If necessary, do not take out the key.

4 确认马达输出轴轴径尺寸，若有必要，装上变径套。
Confirm the size of the output shaft diameter of the motor and install the variable diameter sleeve if necessary.

5 Vertical mounting motor, with the screw torsion table (Table 1) recommended 5% of the torsion
直立式的装入马达，以螺丝扭力表（表一）建议扭力值的5%，
以1-4的顺序，用扳手将带弹垫的螺钉轻轻预紧（注意：不要锁紧）。
value, in order of 1-4, with a wrench to the bolt with cushion gently pre-tighten (note: do not lock).

6 Align the motor with the reducer vertically. Refer to the recommended torsion value in Table 2,
将马达与减速机直立摆正，参照表二建议的扭力值，
用扭力扳手将输入轴锁紧螺钉轻轻预紧（注意：不要锁紧）。
gently pre-tighten the input shaft locking screw with the torsion wrench (note: do not lock).

7 Align the motor and reducer vertically. Lock the screw in the order of 1-4 according to
将马达与减速机直立摆正，以螺钉扭力表（表一）建议值，
以1-4的顺序，用扭力扳手将螺钉锁紧！
the recommended value of the screw torsion meter (Table 1).

8 With the recommended value of the screw torsion meter (Table 1),
以螺钉扭力表（表一）建议值，
用扭力扳手将减速机输入轴螺钉锁紧！
the input shaft screw of the reducer is locked with the torsion wrench.

表一: 马达锁紧扭力建议表
Table 1: Suggestion Table of Motor Locking Torsion

螺钉尺寸 Screw size	六角头尺寸 Six corners head size	强度 8.8级 Strength grade 8.8		强度 10.9级 Strength grade 10.9		强度 12.9级 Strength grade 12.9	
	[mm]	[Nm]	[In-lbs]	[Nm]	[In-lbs]	[Nm]	[In-lbs]
M3 x 0.5P	2.5	1.3	12	1.8	16	2.1	19
M4 x 0.7P	3	3	27	4.1	37	4.9	44
M5 x 0.8P	4	6.1	55	8.2	73	9.8	87
M6 x 1P	5	11	98	14	124	17	151
M8 x 1.25P	6	25	222	34	302	41	364
M10 x 1.5P	8	49	434	67	594	80	709
M12 x 1.75P	10	85	753	116	1028	139	1232
M14 x 2P	12	137	1214	186	1648	223	1976
M16 x 2P	14	210	1860	286	2534	343	3038

表二: 减速机锁紧螺钉扭力建议表
Table 2: Suggestion Table for Torsion of Locking Screw of Reducer

规格段级 Specification segment level	马达轴径 Motor shaft diameter	螺钉尺寸 Screw size	六角头尺寸 Six corners head size	锁紧扭力 Locking torque	
	≦ [mm]	[mm]	[mm]	[Nm]	[In-lbs]
单 级 Single stage	d11	M4 x 0.7P x 12L	3	4.9	44
双 级 Double stage	d11	M4 x 0.7P x 12L	3	4.9	44
单 级 Single stage	d14	M5 x 0.8P x 14L	4	9.8	87
双 级 Double stage	d11	M4 x 0.7P x 12L	3	4.9	44
单 级 Single stage	d19	M6 x 1P x 16L	5	17	151
双 级 Double stage	d14	M5 x 0.8P x 14L	4	9.8	87
单 级 Single stage	d32	M8 x 1.25P x 20L	6	41	364
双 级 Double stage	d19	M6 x 1P x 16L	5	17	151
单 级 Single stage	d38	M10 x 1.5P x 25L	8	80	709
双 级 Double stage	d32	M8 x 1.25P x 20L	6	41	364
单 级 Single stage	d48	M10 x 1.5P x 25L	8	80	709
双 级 Double stage	d 38	M8 x 1.25P x 20L	6	41	364
单 级 Single stage	d55	M12 x 1.75P x 30L	10	139	1232
双 级 Double stage	d48	M12 x 1.75P x 30L	10	139	1232

NEWSTART 紐氏達特

产品目录
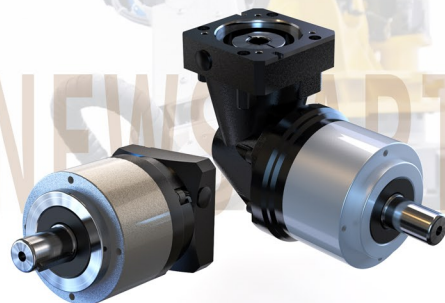Product Catalog

AB/ABR
更精密 高刚性*

SERIES

输出：斜齿 一体式输出轴
深沟球轴承 双支撑
Output: Inclined Tooth Output Shaft
Double support of deep groove ball bearing

AE/AER
更精密 高刚性*

SERIES

输出：斜齿 一体式输出轴
深沟球轴承 双支撑
Output: Inclined Tooth Output Shaft
Double support of deep groove ball bearing

AD/ADR
更精密 更坚固*

SERIES

输出：斜齿 一体式输出轴
圆锥滚子轴承 盘式输出
Output: Inclined Tooth Output Shaft
Disc Output of Tapered Roller Bearing

AF/AFR
更精密 高刚性*

SERIES

输出：斜齿 一体式输出轴
圆锥滚子轴承
Output: Inclined Tooth Output Shaft
Tapered roller bearing

PN/WPN
更精密 坚固*

SERIES

输出：直齿 一体式输出轴
圆锥滚子轴承
Output: Straight Tooth Integrated Output Shaft
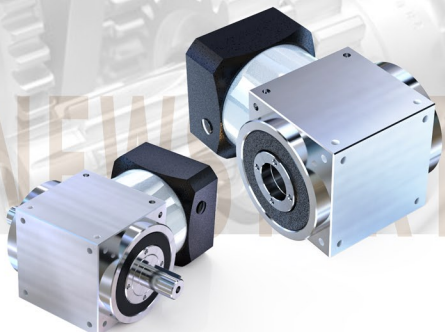Tapered roller bearing

IB/IBR
精密 刚性*

SERIES

输出：直齿 一体式输出轴
深沟球轴承 双支撑
Output: Straight Tooth Integrated Output Shaft
Double support of deep groove ball bearing

PW
新结构 更多应用*

SERIES

输出：螺旋伞齿轮 圆锥滚子/球轴承
Output: Spiral Bevel Gear
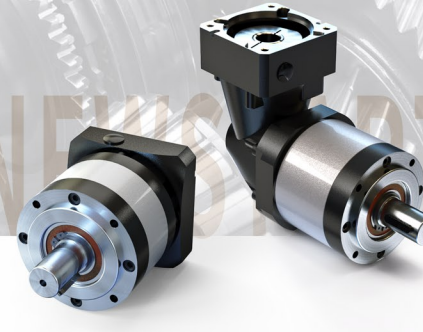Tapered Roller/Ball Bearing

PS/WPS
精密 经济*

SERIES

输出：直齿 圆锥滚子/球轴承 单支撑
Output: straight teeth Tapered Roller/
Ball Bearing Single Support

PL/WPL
精密 经济*

SERIES

输出：直齿 球轴承 单支撑
Output: straight teeth
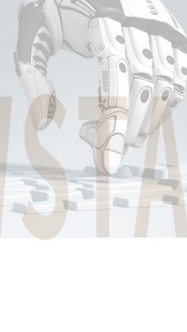Ball bearing
Single support

PF/WPF
精密 经济*

SERIES

输出：直齿 球轴承 单支撑
Output: straight teeth
Ball bearing
Single support

NTX
专业 定制*

SERIES

输出：按客户要求定制
Output: Customized to customer requirements