WANSHSIN®
萬鑫精工

致力于打造世界一流的中国传动品牌

WORM GEAR MOTOR

CONTENTS

蜗轮蜗杆减速电机

CCC CE TX

经销商
Distributor

Committed to building a world-class
transmission brand

COMPANY **PROFILE**

万鑫精工(湖南)有限公司（简称万鑫精工）是集研发、生产、销售、服务于一体的专业化减速电机企业，主要生产高精密减速电机，产品广泛应用于机器人、机床、立体停车库等轻工自动化设备。作为一家专注于减速电机的制造商及智能自动化全套方案提供商，万鑫精工引入国外先进加工设备，致力于为全球客户提供技术前沿、品质卓越的各类减速电机产品，是国内减速电机行业的优质品牌。

为满足国内外客户的需求，全面开启国际化战略布局，万鑫精工立志走"精鑫"强企强国之路，先后引入国内外多名高新技术人才加盟，更加重视现有产品的质量提升以及新产品的研发。在未来的发展中，万鑫精工将继续秉持着"致力于铸就世界一流的中国传动品牌"的信念与愿景，为助推世界工业智能化发展而奋斗！

WANSHSIN SEIKOU (HUNAN) CO., LTD. (hereafter referred to as "WANSHSIN") is professional gear motor manufacturer integrates R&D, production ,sales and service. WANSHSIN mainly manufactures high–precision gear motors which are widely used in robots, machine tools, solid garages and other industrial automation. As a gear motor manufacturer and complete intelligent automation solutions provider, WANSHSIN introduced advanced import processing equipment, adopted advanced technology, to meet the strict high quality requirement for worldwide customers. All efforts made WANSHSIN a reputable and high quality brand in domestic gear motor industry.
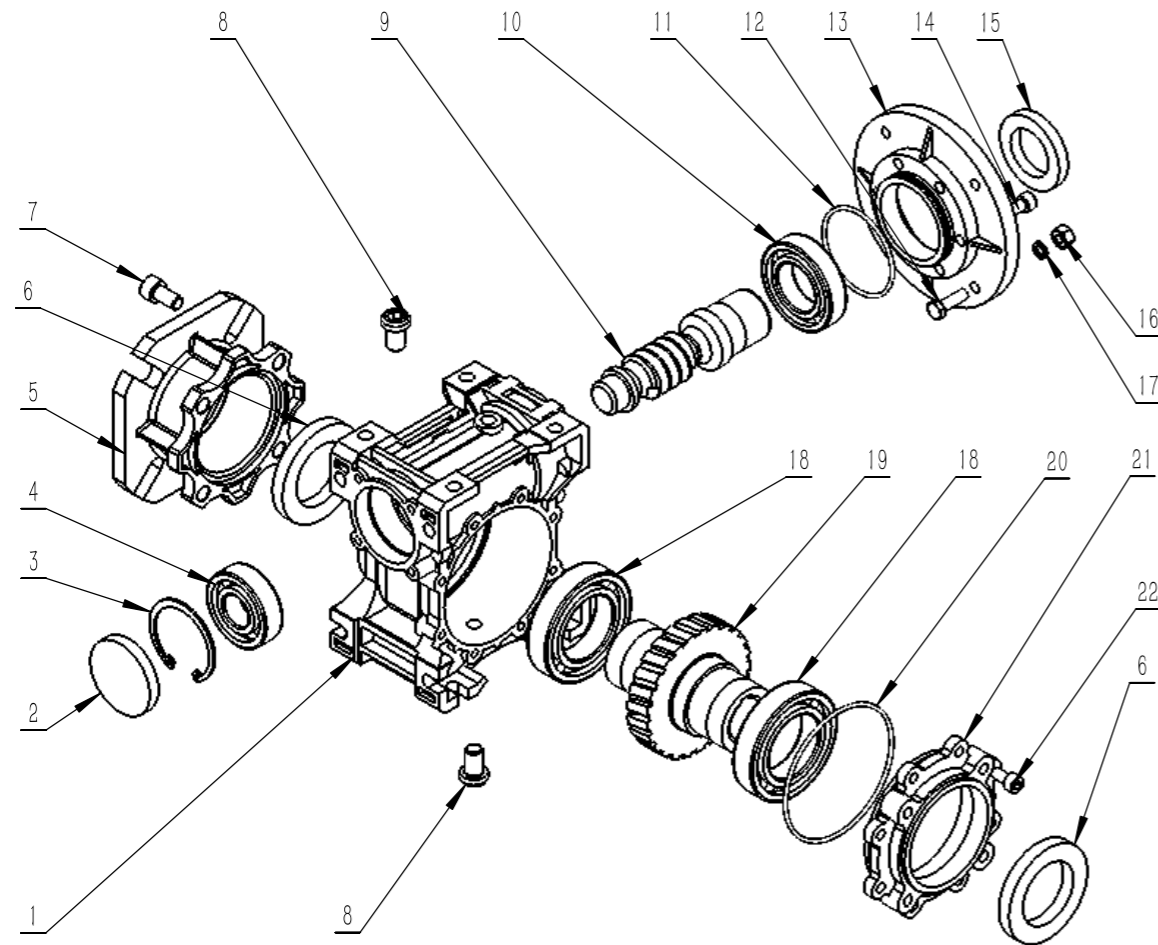
To satisfy domestic and foreign customers' requirements, WANSHSIN fully opened the international strategic layout, determined to follow the path of building a strong enterprise for a stronger country, WANSHSIN pays more attention to the quality improvement of current products and development of new products, and successively introduced high–tech talents, both domestic and international. In the future, WANSHSIN will continuously keep the faith that "Committed to build a world–class transmission brand" and strive to the development of the industrial intelligent system of the world.

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结构分解图 /STRUCTURE DIAGRAM

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2	油封盖/Oil seal cover	13	输入法兰/Input flange
3	孔用挡圈/Hole-circlip	14	内六角螺钉/Inner hex screw
4	轴承/Bearing	15	油封/Oil seal
5	输出法兰/Output flange	16	外六角螺母/Six hexagon nut
6	油封/Oil seal	17	垫圈/Washer
7	内六角螺钉/Inner hex screw	18	轴承/Bearing
8	油塞/Oil plug	19	蜗轮/Worm gear
9	孔输入蜗杆/Input hole worm	20	O型橡胶密封圈/O-ring
10	轴承/Bearing	21	输出端盖/Bearing support cover
11	O型橡胶密封圈/O-ring	22	内六角螺钉/Inner hex screw

产品概述 /PRODUCTS OVERVIEW

结构特点/Structure Features

1.优质铝合金铸造箱体,适应全方位的万能安装配置;

2.机体具有优良的热传导性能;

3.从025-130共9种机座规格;传递功率范围从60W-7.5KW;

4.速比范围大,每单个机座具有从7.5:1到100:1的11种减速比;

5.精密磨削加工的硬齿面传动蜗杆,效率高、输出扭矩大;

6.低噪声平稳运转,能适合在恶劣环境中长期连续工作;

7.重量轻,机械强度高。

1. High quality aluminum alloy casting box, suitable for universal mounting

2. The body has excellent thermal conductivity.

3. 9 kinds of frame specifications from 025-130; Transfer power range from 0.06kw to 7.5kW.

4. The speed ratio ranges from 7.5:1 to 100:1 with 11 kinds of speed ratio.

5. Hardened worm with fine grinding has the features of higher efficiency and big output torque.

6. Stably operation with low noise, suitable for long - term continuous work in harsh environment.

7. Light weight high mechanical strength.

主要材料/Main Materials

1.外壳:铝合金(机座：025--090),铸铁(机座：110--130);

2.蜗杆:20Cr钢,碳、氮共渗处理(精磨后保持齿面硬度HRC60,硬层厚度>0.5mm);

3.蜗轮：有特殊配制的耐磨镍青铜与市面通用的94铜两种材质可供选择。

1. Shell: Aluminum Alloy Base: 025-ron 090, CAST IRON BASE: 110-ron 130;

2. Worm: 20Cr carbonize& quencher heat treatment make the hardness of gear's surface up to 58-62HRC, retain carburized layers thickness between 0.3 and 0. 5mm after accurate grinding;

3. Worm gear: specially formulated wear-resistant nickel bronze and 94 copper are available in the market.

表面涂装/Surface Painting

1.先抛丸处理,再经特种防腐处理,保持银白金属感,并耐汽油、二甲苯等有机溶剂的腐蚀;

2.外观颜色有二种可供选择：烤漆RAL9002灰色，或者烤漆RAL5010蓝色。

1.Shot blasting then special anti-corrosion treatment, maintain the sense of silver metal, and resistant to gasoline, xylene and other organic solvents corrosion

2. Exterior colors are available in either RAL9002 clear gray or Ral5010 blue

型号说明 /MODEL DESCRIPTION

基本参数				输入输出结构						
公司代号	型号代码	减速箱规格	传动比	蜗杆出轴	输出法兰	扭力臂	蜗轮出轴	输入法兰	安装方位	接线盒位置
W	NMRV	63	40	E	FA1	A1	SS1	71B5	B3	1
①	②	③	④	⑤	⑥	⑦	⑧	⑨	⑩	⑪

1.品牌

W：代表万鑫精工

2.系列代号

NMRV：孔输入带带输入法兰(低端配制)
NMRW：孔输入带带输入法兰(高端配制)
NRV：轴输入不带输入法兰(低端配制)
NRW：轴输入不带输入法兰，所配蜗轮材质12-1铜;

3.蜗轮蜗杆减速机中心距对应9款减速箱体:

025/030/040/050/063/075/090/110/130

4. 减速机速比(11种)

7.5/10/15/20/25/30/40/50/60/80/100

5.蜗杆出轴

无代号表示不带蜗杆同向尾出轴;
E：带蜗杆同向尾出轴

6.输出法兰

无代号表示不带输出法兰;
F(A),FB,FC(1/2)；输出法兰号和位置

7.扭力臂

无代号表示无扭力臂;
A(1/2)：扭力臂和位置

8.蜗轮出轴

无代号表示孔输出;
SS(1/2)：单向输出轴和位置 （Single Shaft)
DS：双向输出轴(Double Shaft)

9.输入法兰规格型号

与电机配套选型 (详见性能参数选型表)

10.安装方位代号

B3,B8,B6,B7,V5,V6

11.接线盒位置： 1，2，3，4　　**出线方向：** X,F

产品型式 /TYPE

蜗轮蜗杆减速机Worm Reducer

蜗轮蜗杆减速机+电机
Worm Reducer+Three-phase Motor

蜗杆减速机选型相关参数/ WORM REDUCER MODEL SELECTION

功率P

$$P_1=P_2/\eta(kW)$$
$$P_{1n}\geqslant P_1 \cdot fs(kW)$$

P_1输入功率
P_{1n}输入电机额定功率
η传动效率

P_2输出功率
fs服务系数

在蜗杆减速机选型表中,这个功率P1n是指在输入转速为n1并且对应的服务系数fs＝1时,减速机的安全输入功率,单位kW。

传动效率η值是减速机经过足够长时间的跑合后计算得到的。跑合后在动转过程中,表面温度下降并最终稳定。

POWER P

$$P_1=P_2/\eta(kW)$$
$$P_{1n}\geqslant P_1 \cdot fs(kW)$$

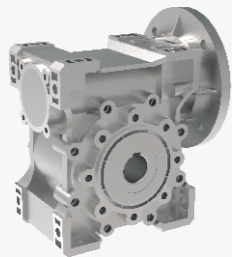P_1　Input power
P_{1n}　Rated input motor power
η　Transmission efficiency

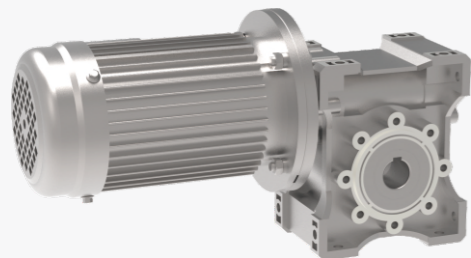P_2　Output power
fs　Service factor

The parameter can be found in the Worm Reducer rating charts and represents the kW that can be safely transmitted to the gearbox, based on input speed n1 and service factor fs=1.
Values of η are calculated for gearboxes after a sufficiently running-in and finally stabilizes. It may be worth high lighting that values of rated torque M2n given in the catalogue take the transmission efficiency η into consideration.

转速n/ Rotation Speed n

n_1 减速机输入转速
n_2 减速机输出转速
若是减速箱外部传动装置驱动,为了优化工作条件和提高使用寿命,建议使用1400r/min或更低转速。

n_1　Gear unit input speed
n_2　Gear unit output speed
If driven by the external gearing , 1400R/min or lower rotation speed is suggested so as to optimize the working conditions and prolong the service life.

传动比i/ Transmission Ratio i

$$i= n_1 / n_2$$

扭矩 M / Torque m

$$M_2=9550 \cdot P_1 \cdot \eta/n_2(Nm)$$
$$M_{2n}\geqslant M_2 \cdot fs(Nm)$$

M_2　输出扭矩
M_{2n}　额定输出扭矩
P_1　输入功率
η　传动效率
fs　服务系数

$$M_2=9550 \cdot P_1 \cdot \eta/n_2(Nm)$$
$$M_{2n}\geqslant M_2 \cdot fs(Nm)$$

M_2　Output torque
M_{2n}　Rated output torque
P_1　Input power
η　Transmission efficiency
fs　Service factor

蜗杆减速机选型相关参数/ WORM REDUCER MODEL SELECTION

服务系数fs/Service Factor fs

减速机上的从动机构的受驱动效果是用服务系数fs这个系数来衡量的。该服务系数根据每天的运转时间和启动频率Z而定的。三种负载分类取决于惯性加速系数,在下图中可读取实际应用的服务系数,按这图表选取的服务系数必须小于或者等于性能参数表中提供的服务系数。

The service factor fs, was used for measuring the driving effect of the driven machine on the gear motor. The service factor is based on the daily running time and startup frequency. The three load categories depend on the inertial acceleration coefficient. The actual service coefficient can be read in the figure below. The service coefficient selected according to this chart must be less than or equal to the service coefficient provided in the performance parameter table.
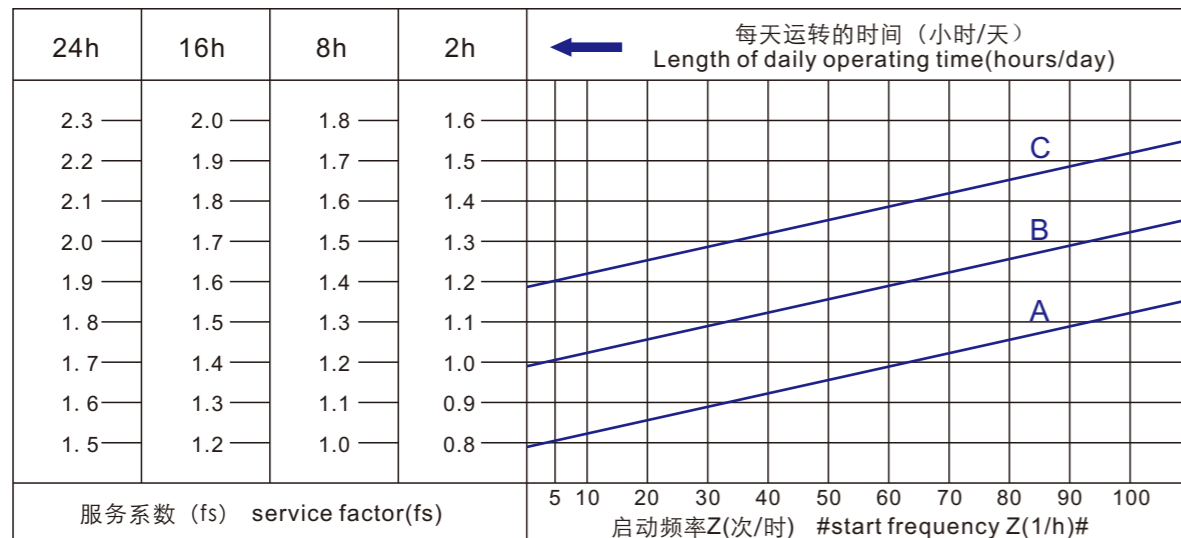
启动频率Z:周期包括所有启动,制作的次数以及变速电机高低速变化时的次数。
Start frequency Z: the cycle includes all The Times of starting, making and changing the high and low speed of the variable speed motor.

负载类型/Type Of Loading

负载性质:
A.均匀冲击负载,允许惯性加速系数Fα≤0.3
B.中等冲击负载,允许惯性加速系数Fα≤3
C.重冲击负载,允许惯性加速系数Fα≤10

Type of loading:
A. Uniform, permitted mass acceleration factor Fa≤0.3
B. Moderate shock load, permitted mass acceleration factor Fa≤3
C. Heavy shock load, permitted mass acceleration factor Fa≤10

蜗杆减速机选型相关参数/ WORM REDUCER MODEL SELECTION

负载类型:
轻负载的螺杆输送,风扇,装备线,输送带,小型搅拌器,电梯,清洗机器,过滤器,控制驱动。
卷扬机,木工机器进料器,货物起重机,平衡器,绞螺纹机器,中型搅拌器,重型输送带,绞盘,滑动闸门,挂料机,包装机械,混凝土搅拌机,行车驱动装置,铣床,齿轮泵。
大型搅拌器,剪床,压机,离心机,旋转支撑装置,重型绞盘和起重机,磨床,石材打磨机,翻斗机,钻床,冲床,凸轴压机,摺床,机床转盘,翻桶装置,振荡装置,破碎机。

Load Classifications:
Screw feeders for light materials, fans, assembly lines, conveyor belts for light materials, small mixers, lifts, cleaning machines, medium mixers, conveyor belts for heavy materials, winches, sliding doors fertilizer scrapers, packing machines, concrete mixers, crane mechanisms, milling cutters, folding machines, gear pumps.
Mixers for heavy materials, shears, presses centrifuges, rotating supports, winches and lifts for heavy materials, grinding lathes, stone mills, bucket elevators, drilling machines, hammer mills, campresses folding machines, turntables, tumbling barrels, vibrators, shredders.

惯性加速系数/Mass Acceleration Factor

惯性加速系数计算如下:
Fa=Jc/Jm
Fα惯性加速系数
Jc所有外部传动惯量(kgm2)
Jm驱动电机的传动惯量(kgm2)
如果惯性加速系数Fα>10,请与我们技术部联系。

The mass acceleration factor is calculated as follows:
Fa=Jc/Jm
Fa Mass acceleration factor
Jc All external mass moments of inertia(kgm2)
Jm Mass moment of inertia on the motor end(kgm2)
If mass acceleration factors fa> 10, please call our Technical Service.

受环境温度影响,服务系数fs仍须按以下调整:
1.环境温度30~40℃:fs×(1.1~1.2)
2.环境温度40~50℃:fs×(1.3~1.4)
3.环境温度50~60℃:fs×(1.5~1.6)
4.环境温度>60℃,请与我们技术服务人员联系。

Service factor fs should be adjusted as followings:
1. Ambient temperature is 30~40C: fsx(1.1~1.2)
2. Ambient temperature is 40~50C: fsx(1.3~1.4)
3. Ambient temperature is 50~60C: fsx(1.5~1.6)
4. Ambient temperature is >60C, please call our Technical Service.

为了保持减速机的使用寿命,从产品样本中所选择的服务系数fs应等于或略高于计算出的服务系数fs。

To keep the service-life of gear units, use factor fs selected from the catalogue must be equal or slight higher than the calculated use factor fs.

径向载荷Fr/ Radial Loads Fr

在决定影响径向载荷时,安装在轴端上的传动件类型必须考虑在内,不同类型的传动对应不同的传动附加系数fz,列表如下:

When determining the resulting radial loads, the type of transmission elements, mounted on the shaft end must be considered, Various transmission elements are corresponding with following transmission element factors fz.

蜗杆减速机选型相关参数/ WORM REDUCER MODEL SELECTION

传动件 Transmission element	传动附加系数fz Additional transmission factor	注释 Comments
齿轮 Gears	1.00	≥17齿 teeth
	1.15	<17齿 teeth
链轮 Chain sprockets	1.00	≥20齿 teeth
	1.25	<20齿 teeth
	1.40	<13齿 teeth
V 带轮 Narrow V-belt pulleys	1.75	有预紧力作用 Influence of the tensile force
平带轮 Flat belt pulleys	2.50	有预紧力作用 Influence of the tensile force
齿带轮 Toothed belt pulleys	2.50	有预紧力作用 Influence of the tensile force

作用在轴上的径向载荷按如下公式计算:

$$Fr= \frac{M \cdot 2000 \cdot fz}{d_0} \ (N)$$

Fr作用在轴上的载荷(N)
M作用在轴上的扭矩(Nm)
d_0安装在轴上传动件的平均直径(mm)
fz传动附加系数

当径向负荷不作用在轴中点时,按以下公式计算有效负荷:

$$F \times L = \frac{F_{r2} \cdot a}{(b+x)} \ (N)$$

F_{r2} 依据下面表格给出中底脚安装式齿轮减速机的许可径向载荷(X=L/2)(N)
a,b 减速机径向换算常量(mm)
x 轴肩到实际作用点的距离(mm)
a,b, F_{r2}的数值在下面表格给出:

当径向和轴向负载同时存在时,最大的允许轴向负载值只是径向负载值的1/5,图表中所表示的是输出轴的最大承重量。

The radial loads exerted on the motor or gear shaft is then calculated as follows.

$$Fr= \frac{M \cdot 2000 \cdot fz}{d_0} \ (N)$$

Fr Load exerted on the shaft(N)
M Exerted on the shaft(Nm)
d_0 Mean diameter of the transmisson element in mounted on the shaft(mm)
fz Transmission additional factor

When the radial load does not act on the midpoint of the axis, the effective load is calculated according to the following formula:

$$F \times L = \frac{F_{r2} \cdot a}{(b+x)} \ (N)$$

F_{r2} The allowable radial load of the midsole mounted gear reducer (X=L/2)(N) is given in the following table
a,b Gear unit constant for overhung load conversion(mm)
x Distance form the shaft shoulder to the force application point in(mm)
The values of a,b, F_{r2} are biven in the following tables:

The maximum admissible axial loads are 1/5 of the value of the given radial load when they are applied in combination with the radial load. The tables relating to the output shafts give the maximum admissible value.

蜗杆减速机选型相关参数/ WORM REDUCER MODEL SELECTION

输出轴径向载荷/Output shafts radial loads

$F_{a2}=F_{r2}x0.2$
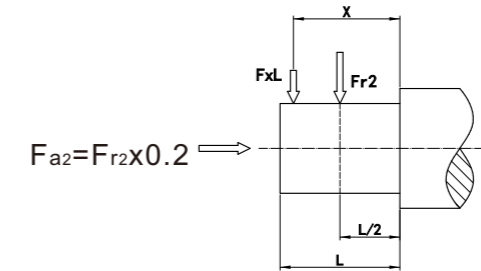
F_{a2}=输出轴向载荷 Output axial load

箱体中心距	025	030	040	050	063	075	090	110	130
a	50	65	84	101	120	131	162	176	188
b	38	50	64	76	95	101	122	136	148
F_{r2max}	1350	1830	3490	4840	6270	7380	8180	12000	13500

输入轴径向载荷/Intput shafts radial loads

$F_{a1}=F_{r1}x0.2$
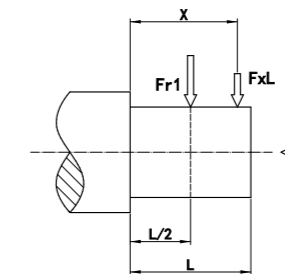
F_{a1}=输入轴向载荷 Intput axial load

箱体中心距	030	040	050	063	075	090	110	130
a	86	106	129	159	192	227	266	314
b	76	94.5	114	139	167	202	236	274
F_{r1max}	210	350	490	700	980	1270	1700	2100

选型表注释 / Selection Tables Comments

P_{1n}	输入电机额定功率(kW)	P_{1n}	Rated power of driving motor(kw)
n_2	输出转速(r/min)	n_2	Output speed(r/min)
M_{2n}	额定输出扭矩(Nm)	M_{2n}	Rated output torque(Nm)
M_{2max}	最大允许输出扭矩(Nm)	M_{2max}	Maximum Permissible output torque(Nm)
i	减速机速比	i	Ratio of gear motor
fs	服务系数	fs	Service factor
	减速机型号		Gear motor model
	电机型号		Motor model

蜗杆减速机选型相关参数/ WORM REDUCER MODEL SELECTION

选型举例分析/Selection example

减速电机

例:被驱动设备所需功率0.5kW,n1=1400r/min,均匀冲击负载,启动频率20次/小时,24小时连续运行,环境温度32℃,输出转速n2=93.3r/min,减速电机要求B3安装方位,则:

$$i=\frac{n_1}{n_2}=\frac{1400}{93.3}=15$$

查P12页啮合参数表,估计当i=15时,η_d=0.82查看调整服务系数得fs=1.53x1.12=1.714,$P_{1n}\geq P_2/\eta_d \cdot fS=0.5/0.82\times1.714=1.045(kW)$查WRW系列性能参数表可确定减速电机型号为:

WRW075/15/B3/GV1100S,输出扭矩M2计算:

$$M_2=\frac{9550 \cdot P_2}{n_2}=\frac{9550x0.5}{93.3}=51.18(Nm)$$

$$M_{2n}=95\geq M_2 \cdot fs=51.18x1.714(Nm)$$

GEAR MOTOR

Example: The input power of driver machine is 0.5kw, n1=1400r/min. Uniform impact load, start up frequency 20(1/h), continuous running for 24hours, the ambient temperature is 32℃, n2=93.3r/min, B3 mounted so:

$$i=\frac{n_1}{n_2}=\frac{1400}{93.3}=15$$

Check mesh table on P12, estimate when the i=15, η_d =0.82. Check and adjust the service factor, will get fs=1.53x1.12 =1.714,$P_{1n}\geq P2/\eta_d \cdot fS=0.5/0.82\times1.714=1.045(kW)$

Choose type: **WRW075/15/B3/GV1100S**

$$M_2=\frac{9550 \cdot P_2}{n_2}=\frac{9550x0.5}{93.3}=51.18(Nm)$$

$$M_{2n}=95\geq M_2 \cdot fs=51.18x1.714(Nm)$$

减速机

例:被驱动设备所需扭矩为300Nm,工作8小时连续运行,均匀冲击负载,启动频率5次/小时,环境温度30℃,即可选用系数fs=1.2×1.1=1.32,减速机输入转速n1=900r/min,输出转速n2=22.5r/min。

$$M_{2n}\geq M_2 \cdot fs=300x1.32=396(Nm)$$

$$i=\frac{n_1}{n_2}=\frac{900}{22.5}=40$$

查WRW系列性能参数表可确定减速机型号为:
WRW090/40

GEAR MOTOR

Example: Required torque 300Nm on driven machine, continuous running for 8 hours, uniform impact load, the ambient temperature is 30℃, then choose service factor fs=1.2 x1.1 =1.32,n1=900r/min,n2=22.5r/min.

$$M_{2n}\geq M_2 \cdot fs=300x1.32=396(Nm)$$

$$i=\frac{n_1}{n_2}=\frac{900}{22.5}=40$$

Choose type: **WRW090/40**

效率与自锁特性/Efficiency irreversibility character

效率是减速机一个重要参数,效率η的值取决于下列参数: 1.蜗轮蜗杆的螺旋角; 2.输入转速; 3.蜗轮蜗杆的磨合时间; 4.油品、油封和轴承的性能。在第12页上的啮合参数表列出了动态效率(η_1=1400)及静态效率参数。请注意:这些参数是指减速机磨合后性能稳定的计算值。另外,样本中规定的扭矩M2n也是减速机磨合性能稳定的计算值。上述的实际值可能会有上下偏差。

Efficiency is an important parameter of reducer, efficiency η depends on the following parameters: 1. The spiral Angle of worm and worm wheel; 2. Input speed; 3. The running time of worm gear;4. The performance of oil, oil seal and bearing。 The mesh parameters table on page 12 lists dynamic efficiency (n1=1400) and static efficiency parameters。 Remember that these values are only achieved after the unit has been run in. Torque values M2n indicated in the catalogue are calculated by considering the steady-state performance of the gearboxes. The actual values mentioned above may be have deflection.

选型相关参数/ WORM REDUCER MODEL SELECTION

动态自锁/Dynamic irreversibility

动态自锁是指当马达输入突然停止时,输出轴能同步停止。此条件要求动态效率η_d<0.4。

Dynamic self-locking means that the output shaft can stop synchronously when the motor input stops suddenly.The dynamic efficiency of the requirements eta d < 0.4

静态自锁/Static irreversibility

静态自锁是指当减速机处于静止状态时,输出轴上的负载不能把蜗轮推动。此条件要求静态效率η_s<0.5。

Static self-locking means that when the reducer is at rest, the load on the output shaft cannot push the worm wheel.This condition requires static efficiency eta s < 0.5.

η_d	>0.6	0.5~0.6	0.4~0.5	<0.4
动态自锁效果	动态不自锁	动态自锁很低	动态自锁良好	动态自锁
Dynamic irreversibility	Dynamic reversibility	Low dynamic reversibility	Good dynamic irresibility	Dynamic irreversibility

η_s	>0.55	0.5~0.55	< 0.55
静态自锁效果	静态不自锁	静态自锁很低	静态自锁
Ddynamic irreversibility	Static reversibility	Low static reversibility	Static irreversibility

上述表格中所有参数只是供大概参考,振动和冲击也会影响减速机的自锁功能。事实上要保证完全自锁是不可能的,我们建议需要时安装外部的安全制动的装置。对于一个组合减速机自锁条件时,必须考虑单减速机的自锁功能效率,因为整体自锁功能是: $\eta_{tot}=\eta_1 \times \eta_2$

All parameters in the above table are for general reference only. Vibration and impact will also affect the self-locking function of the reducer.In fact it is not possible to guarantee full self-locking, we recommend installing external safety braking devices when necessary.For a combination of speed reducer self-locking condition, must consider the self-locking function efficiency of single reducer, because of the self-locking function is: eta tot = 1 x eta eta 2

减速机啮合参数 / MESH DATA

Reducer↓	I→	7.5	10	15	20	25	30	40	50	60	80	100
025	m	1.25	1.25	1.25	1	–	1.25	1	0.8	0.65	–	–
	Z_1	4	3	2	1	–	1	1	1	1	–	–
	γ	21°48¹	16°42¹	11°19¹	10°53¹	–	5°43¹	5°29¹	4°34¹	3°23¹	–	–
	$η_d$	0.839	0.815	0.769	0.753	–	0.638	0.624	0.583	0.517	–	–
	$η_s$	0.701	0.667	0.594	0.562	–	0.438	0.413	0.362	0.32	–	–
030	m	1.5	1.5	1.5	1	1.75	1.5	1	0.9	0.75	0.55	–
	Z_1	4	3	2	2	1	1	1	1	1	1	–
	γ	20°19¹	15°31¹	10°29¹	5°42¹	6°10¹	5°17¹	2°52¹	3°26¹	2°52¹	1°58¹	–
	$η_d$	0.856	0.829	0.782	0.673	0.7	0.667	0.52	0.567	0.52	0.422	–
	$η_s$	0.675	0.637	0.559	0.461	0.442	0.4	0.308	0.319	0.275	0.221	–
040	m	2	2	2	1.6	1.25	2	1.6	1.25	1	0.8	0.65
	Z_1	4	3	2	2	2	1	1	1	1	1	1
	γ	21°48¹	16°42¹	11°19¹	11°19¹	8°8¹	5°43¹	5°43¹	4°5¹	2°52¹	2°52¹	2°29¹
	$η_d$	0.862	0.839	0.805	0.792	0.738	0.675	0.668	0.604	0.541	0.513	0.477
	$η_s$	0.703	0.661	0.589	0.559	0.502	0.434	0.411	0.351	0.284	0.276	0.243
050	m	2.5	2.5	2.5	2	1.6	2.5	2	1.6	1.25	1	0.8
	Z_1	4	3	2	2	2	1	1	1	1	1	1
	γ	21°48¹	16°42¹	11°19¹	11°19¹	9°5¹	5°43¹	5°43¹	4°21¹	2°52¹	2°52¹	2°17¹
	$η_d$	0.874	0.852	0.808	0.805	0.771	0.711	0.693	0.634	0.532	0.53	0.483
	$η_s$	0.695	0.654	0.581	0.561	0.517	0.434	0.403	0.352	0.289	0.27	0.227
063	m	3.25	3.25	2.5	2	1.6	2.5	2	1.6	1.25	1	0.8
	Z_1	4	3	2	2	2	1	1	1	1	1	1
	γ	24°31¹	18°53¹	12°51¹	11°19¹	8°45¹	6°30¹	5°43¹	4°24¹	3°3¹	2°52¹	2°12¹
	$η_d$	0.88	0.87	0.83	0.82	0.78	0.74	0.716	0.66	0.571	0.562	0.486
	$η_s$	0.71	0.67	0.6	0.557	0.51	0.45	0.409	0.36	0.304	0.276	0.229
075	m	4	4	4	3	2.5	4	3	2.5	2	1.6	1.25
	Z_1	4	3	2	2	2	1	1	1	1	1	1
	γ	28°4¹	21°48¹	14°56¹	11°19¹	11°19¹	7°36¹	5°43¹	5°43¹	3°49¹	4°21¹	2°52¹
	$η_d$	0.912	0.904	0.876	0.85	0.848	0.81	0.77	0.769	0.695	0.719	0.626
	$η_s$	0.712	0.683	0.614	0.57	0.542	0.466	0.42	0.395	0.342	0.316	0.267
090	m	5	5	5	3.75	3	5	3.75	3	2.5	1.9	1.5
	Z_1	4	3	2	2	2	1	1	1	1	1	1
	γ	33°41¹	26°34¹	18°26¹	14°02¹	11°19¹	9°28¹	7°08¹	5°43¹	4°46¹	3°53¹	2°52¹
	$η_d$	0.905	0.898	0.873	0.849	0.824	0.804	0.765	0.727	0.69	0.638	0.572
	$η_s$	0.734	0.706	0.65	0.606	0.563	0.505	0.459	0.414	0.38	0.342	0.271
110	m	5.9	5.9	5.9	4.6	3.75	5.9	4.6	3.75	3.15	2.4	1.9
	Z_1	4	3	2	2	2	1	1	1	1	1	1
	γ	28°46¹	22°22¹	15°21¹	14°20¹	14°02¹	7°49¹	7°17¹	7°08¹	5°48¹	4°54¹	3°37¹
	$η_d$	0.901	0.891	0.862	0.848	0.851	0.793	0.776	0.768	0.729	0.692	0.628
	$η_s$	0.721	0.691	0.631	0.618	0.598	0.482	0.478	0.451	0.415	0.372	0.319
130	m	7	7	7	5.4	4.4	7	5.4	4.4	3.75	2.75	2.25
	Z_1	4	3	2	2	2	1	1	1	1	1	1
	γ	29°15¹	22°47¹	15°39¹	13°47¹	12°24¹	7°58¹	7°00¹	6°17¹	6°07¹	3°56¹	3°41¹
	$η_d$	0.911	0.891	0.872	0.86	0.845	0.803	0.779	0.758	0.749	0.671	0.657
	$η_s$	0.721	0.691	0.631	0.61	0.583	0.492	0.46	0.435	0.406	0.335	0.308

备注：i-速比，Z1-蜗杆头数，γ-导程膜，m-模数，ηd-动态效率，ηs-静态效率。
NOTE: i-ratio, Z1-number of teeth, γ-helical angle, m-modulus, ηd-dynamic efficiency, ηs-static efficiency.

减速机选型表 / GEAR MOTOR SELECTION TABLES

Worm Reducer+Three-phase motor三相异步减速机组合表(n1=1400r/min)
Worm Reducer +Three-phase motor Possible geometrical combinations (n1=1400r/min)
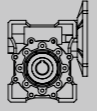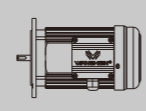
减速箱规格	Motor	7.5	10	15	20	25	30	40	50	60	80	100
025	60W					NO			▨	▨		
	90W					NO				▨	▨	
030	60W								▨	▨	▨	
	90W							▨	▨	▨	▨	
	120W				▨	▨	▨	▨				
	180W			▨	▨	▨	▨					
040	60W	●	●	●	●	●	●	●	▨	▨	▨	▨
	90W	●	●	●	●	●	●	●	▨	▨	▨	▨
	120W	▨	▨	▨	▨	▨	▨	▨				
	180W	▨	▨	▨	▨	▨	▨					
	250W	▨	▨	▨	▨	▨						
	370W	▨	▨	▨	▨							
	550W	▨	▨	▨								
050	120W	●	●	●	●	●	●	●	▨	▨	▨	▨
	180W	●	●	●	●	●	●	●	▨	▨	▨	▨
	250W	▨	▨	▨	▨	▨	▨	▨				
	370W	▨	▨	▨	▨	▨	▨					
	550W	▨	▨	▨	▨	▨						
	750W	▨	▨	▨	▨							
063	250W	●	●	●	●	●	●	●	▨	▨	▨	▨
	370W	●	●	●	●	●	●	●	▨	▨	▨	▨
	550W	●	●	▨	▨	▨	▨	▨	▨	▨		
	750W	▨	▨	▨	▨	▨	▨	▨				
	1100W	▨	▨	▨	▨	▨	▨					
	1500W	▨	▨	▨	▨	▨						
075	550W	●	●	●	●	●	●	▨	▨	▨	▨	▨
	750W	●	●	●	●	●	●	▨	▨	▨	▨	▨
	1100W	▨	▨	▨	▨	▨	▨	▨				
	1500W	▨	▨	▨	▨	▨	▨					
	2200W	▨	▨	▨	▨	▨						
	3000W	▨	▨	▨	▨							
	4000W	▨	▨	▨								
090	750W	●	●	●	●	●	●	●	▨	▨	▨	▨
	1100W	●	●	●	●	●	●	●	▨	▨	▨	▨
	1500W	●	●	▨	▨	▨	▨	▨	▨	▨		
	2200W	▨	▨	▨	▨	▨	▨	▨				
	3000W	▨	▨	▨	▨	▨	▨					
	4000W	▨	▨	▨	▨	▨						
110	1100W	●	●	●	●	●	●	●	▨	▨	▨	▨
	1500W	●	●	●	●	●	●	●	▨	▨	▨	▨
	2200W	▨	▨	▨	▨	▨	▨	▨				
	3000W	▨	▨	▨	▨	▨	▨					
	4000W	▨	▨	▨	▨	▨						
	5500W	▨	▨	▨	▨							
	7500W	▨	▨	▨								
130	1500W	●	●	●	●	●	●	●	●	▨	▨	▨
	2200W	●	●	●	●	●	●	●	▨	▨	▨	▨
	3000W	●	●	●	●	●	●	▨	▨	▨		
	4000W	▨	▨	▨	▨	▨	▨	▨				
	5500W	▨	▨	▨	▨	▨						
	7500W	▨	▨	▨	▨							

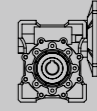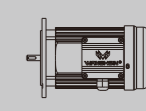注：●表示允许但不推荐的配置，空格部分为不允许的配置。带色框为推荐的配置。

Worm Reducer性能参数 / PERFORMANCE PARAMETER

Worm Reducer...Three-phase Motor...性能参数/Performance Parameter

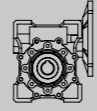| P_{1n} (kW)	n_2 (r/min)	i	M_{2n} (Nm)	F_{r2} (N)	fs		
0.06	280	7.5	5.2	683	3.5	WNMRW025 56B14	Y2-56M1-4
	186.6	10	6.6	752	2.7		
	140	15	9.3	861	1.9		
	93.3	20	12	948	1.5		
	70	25	14	1021	1.6		
	46.7	30	16	1085	1.3		
	35	40	19	1194	0.9		
	58	50	22	1286	0.8		
	23.3						
	186	7.5	2.6	683	7.0	WNMRW030 56B5/B14	Y2-56M1-4
	140	10	3.4	752	5.4		
	93.3	15	4.7	861	3.9		
	70	20	6	948	3.1		
	56	25	7	1021	3.1		
	46.7	30	8	1085	2.5		
	35	40	9.7	1194	1.9		
	28	50	11	1286	1.5		
	23.3	60	13	1367	1.3		
	17.5	80	14	1504	0.9		
0.09	186.7	7.5	3.9	503	2.8	WNMRW025 56B14	Y2-56M2-4
	140	10	5.1	553	2.4		
	93.3	15	7.3	633	1.6		
	70	20	9.3	697	1.3		
	46.7	30	13	798	1.0		
	35	40	16	878	0.8		

Worm Reducer性能参数 / PERFORMANCE PARAMETER

Worm Reducer...Three-phase Motor...性能参数/Performance Parameter

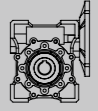| P_{1n} (kW)	n_2 (r/min)	i	M_{2n} (Nm)	F_{r2} (N)	fs		
0.12	186.7	7.5	5.2	683	3.5	WNMRW030 63B5/B14	Y2-63M1-4
	140	10	6.6	752	2.7		
	93.3	15	9.3	861	1.9		
	70	20	12	948	1.5		
	56	25	14	1021	1.6		
	46.7	30	16	1085	1.3		
	35	40	19	1194	0.9		
	28	50	22	1286	0.8		
	46.7	30	17	2087	2.7	WNMRW040 63B5/B14	Y2-63M1-4
	35	40	21	2298	1.9		
	28	50	25	2475	1.6		
	23.3	60	28	2630	1.3		
	17.5	80	33	2895	1.0		
	14	100	38	3118	0.8		
	23.3	60	29	3610	2.3	WNMRW050 63B5	Y2-63M1-4
	17.5	80	35	3973	1.9		
	14	100	39	4280	1.4		
0.18	186.7	7.5	7.7	683	2.3	WNMRW030 63B5/B14	Y2-63M2-4
	140	10	10	752	1.8		
	93.3	15	14	861	1.3		
	70	20	18	948	1.0		
	56	25	20	1021	1.0		
	46.7	30	24	1085	0.8		
	70	20	19	1824	2.1	WNMRW040 63B5/B14	Y2-63M2-4
	56	25	23	1964	1.7		
	46.7	30	25	2087	1.8		
	35	40	32	2298	1.3		

Worm Reducer性能参数 / PERFORMANCE PARAMETER

Worm Reducer...Three-phase Motor...性能参数/Performance Parameter

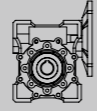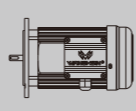| P_{1n} (kW)	n_2 (r/min)	i	M_{2n} (Nm)	F_{r2} (N)	fs		
0.18	28	50	37	2475	1.0	WNMRW040 63B5/B14	WSS0.18KW-4
	23.3	60	42	2630	0.9		
	35	40	33	3153	2.3	WNMRW050 63B5	Y2-63M2-4
	28	50	39	3397	1.9		
	23.3	60	43	3610	1.6		
	17.5	80	52	3973	1.2		
	14	100	59	4280	0.9		
0.25	186.7	7.5	11	1315	3.6	WNMRW040 71B5/B14	Y2-71M1-4
	140	10	14	1447	2.8		
	93.3	15	20	1657	2.0		
	70	20	26	1824	1.5		
	56	25	32	1964	1.2		
	46.7	30	35	2087	1.3		
	35	40	44	2298	0.9		
	70	20	27	2503	2.7	WNMRW050 71B5/B14	Y2-71M1-4
	56	25	32	2696	2.2		
	46.7	30	36	2865	2.3		
	35	40	46	3153	1.7		
	28	50	54	3397	1.4		
	23.3	60	60	3610	1.1		
	17.5	80	72	3973	0.9		
	28	50	55	4440	2.4	WNMRW063 71B5/B14	Y2-71M1-4
	23.3	60	63	4719	2.0		
	17.5	80	76	5193	1.6		
	14	100	87	5595	1.4		
	17.5	80	80	6130	2.4	WNMRW075 71B5	Y2-71M1-4
	14	100	94	6603	1.9		

Worm Reducer性能参数 / PERFORMANCE PARAMETER

Worm Reducer...Three-phase Motor...性能参数/Performance Parameter

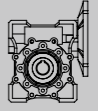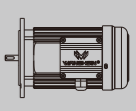| P_{1n} (kW)	n_2 (r/min)	i	M_{2n} (Nm)	F_{r2} (N)	fs		
0.37	186.7	7.5	16	1315	2.5	WNMRW040 71B5/B14	Y2-71M2-4
	140	10	21	1447	1.9		
	93.3	15	30	1657	1.3		
	70	20	39	1824	1.0		
	56	25	47	1964	0.8		
	46.7	30	52	2087	0.9		
	140	10	21	1987	3.4	WNMRW050 71B5/B14	Y2-71M2-4
	93.3	15	31	2274	2.4		
	70	20	39	2503	1.9		
	56	25	47	2696	1.5		
	46.7	30	54	2865	1.6		
	35	40	68	3153	1.1		
	28	50	80	3397	0.9		
	23.3	60	89	3610	0.8		
	35	40	70	4122	2.1	WNMRW063 71B5/B14	Y2-71M2-4
	28	50	82	4440	1.6		
	23.3	60	94	4719	1.4		
	17.5	80	113	5193	1.1		
	14	100	129	5595	0.9		
	23.3	60	97	5569	2.1	WNMRW075 71B5	Y2-71M2-4
	17.5	80	119	6130	1.6		
	14	100	139	6603	1.3		
0.55	186.7	7.5	24	1805	2.9	WNMRW050 80B5/B14	Y2-80M1-4
	140	10	32	1987	2.3		
	93.3	15	46	2274	1.6		
	70	20	59	2503	1.2		
	56	25	70	2696	1.0		
	46.7	30	80	2865	1.1		

Worm Reducer性能参数 / PERFORMANCE PARAMETER

Worm Reducer...Three-phase Motor...性能参数/Performance Parameter

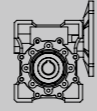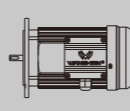| P_{1n} (kW)	n_2 (r/min)	i	M_{2n} (Nm)	F_{r2} (N)	fs		
0.55	70	20	60	3272	2.2	WNMRW063 80B5/B14	Y2-80M1-4
	56	25	72	3524	1.8		
	46.7	30	82	3745	1.9		
	35	40	104	4122	1.4		
	28	50	122	4440	1.1		
	23.3	60	140	4719	0.9		
	35	40	108	4865	2.0	WNMRW075 80B5/B14	Y2-80M1-4
	28	50	128	5241	1.6		
	23.3	60	144	5569	1.4		
	17.5	80	177	6130	1.1		
	14	100	206	6603	0.9		
	17.5	80	189	6783	1.5	WNMRW090 80B5/B14	Y2-80M1-4
	14	100	221	7306	1.2		
	17.5	80	201	8571	2.6	WNMRW110 80B5	Y2-80M1-4
	14	100	236	9232	2.0		
0.75	280	5	23	1577	2.7	WNMRW050 80B5/B14	Y2-80M2-4
	186.7	7.5	33	1805	2.1		
	140	10	43	1987	1.7		
	93.3	15	62	2274	1.2		
	70	20	80	2503	0.9		
	93.3	15	63	2973	2.2	WNMRW063 80B5/B14	Y2-80M2-4
	70	20	82	3272	1.6		
	56	25	98	3524	1.3		
	46.7	30	112	3745	1.4		
	35	40	141	4122	1.0		
	56	25	101	4160	2.0	WNMRW075 90B5/B14	Y2-80M2-4
	46.7	30	117	4421	2.0		
	35	40	147	4865	1.5		

Worm Reducer性能参数 / PERFORMANCE PARAMETER

Worm Reducer...Three-phase Motor...性能参数/Performance Parameter

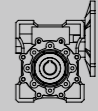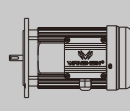| P_{1n} (kW)	n_2 (r/min)	i	M_{2n} (Nm)	F_{r2} (N)	fs		
0.75	28	50	174	5241	1.2	WNMRW075 90B5/B14	Y2-80M2-4
	23.3	60	196	5569	1.0		
	28	50	182	5799	1.9	WNMRW090 80B5/B14	Y2-80M2-4
	23.3	60	209	6163	1.5		
	17.5	80	258	6783	1.1		
	14	100	302	7306	0.9		
	17.5	80	274	8571	1.9	WNMRW110 80B5	Y2-80M2-4
	14	100	322	9232	1.5		
1.1	186.7	7.5	50	2359	2.6	WNMRW063 90B5/B14	Y2-90S-4
	140	10	65	2597	2.0		
	93.3	15	92	2973	1.5		
	70	20	120	3272	1.1		
	56	25	144	3524	0.9		
	46.7	30	164	3745	1.0		
	35	40	222	5383	1.6	WNMRW090 90B5/B14	Y2-90S-4
	28	50	266	5799	1.3		
	23.3	60	306	6163	1.0		
	28	50	278	7328	2.4	WNMRW110 90B5	Y2-90S-4
	23.3	60	324	7787	1.9		
	17.5	80	402	8571	1.3		
	14	100	473	9232	1.0		
	17.5	80	408	11210	2.1	WNMRW130 90B5	Y2-90S-4
	14	100	480	12076	1.5		
1.5	140	10	89	3065	2.2	WNMRW075 90B5/B14	Y2-90L-4
	93.3	15	129	3509	1.6		
	70	20	166	3862	1.3		
	56	25	202	4160	1.0		
	46.7	30	233	4421	1.0		
	70	20	170	4273	2.1	WNMRW090 90B5/B14	Y2-90L-4
	56	25	207	4603	1.6		

Worm Reducer性能参数 / PERFORMANCE PARAMETER

Worm Reducer...Three-phase Motor...性能参数/Performance Parameter

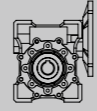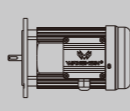| P_{1n} (kW)	n_2 (r/min)	i	M_{2n} (Nm)	F_{r2} (N)	fs		
1.5	46.7	30	239	4891	1.7	WNMRW090 90B5/B14	Y2-90L-4
	35	40	303	5383	1.2		
	28	50	363	5799	0.9		
	23.3	60	417	6163	0.8		
	35	40	315	6803	2.2	WNMRW110 90B5	Y2-90L-4
	28	50	379	7328	1.7		
	23.3	60	442	7787	1.4		
	17.5	80	548	8571	0.9		
	17.5	80	557	11210	1.5	WNMRW130 90B5	Y2-90L-4
	14	100	655	12076	1.1		
2.2	186.7	7.5	99	2785	1.9	WNMRW075 100B5/B14	Y2-100L1-4
	140	10	131	3065	1.5		
	93.3	15	189	3509	1.1		
	186.7	7.5	100	3081	2.9	WNMRW090 100B5/B14	Y2-100L1-4
	140	10	132	3391	2.3		
	93.3	15	191	3882	1.9		
	70	20	249	4273	1.4		
	56	25	304	4603	1.1		
	46.7	30	351	4891	1.2		
	70	20	255	5399	2.5	WNMRW110 100B5	Y2-100L1-4
	56	25	311	5816	2.2		
	46.7	30	356	6181	2.0		
	35	40	462	6803	1.5		
	28	50	555	7328	1.2		
	23.3	60	648	7787	1.0		
	35	40	468	8897	2.2	WNMRW130 100B5	Y2-100L1-4
	28	50	563	9584	1.7		
	23.3	60	657	10185	1.4		
	17.5	80	816	11210	1.0		
3.0	186.7	7.5	135	2785	1.4	WNMRW075 100B5/B14	Y2-100L2-4
	140	10	178	3065	1.1		
	93.3	15	258	3509	0.8		
	186.7	7.5	137	3081	2.1	WNMRW090 100B5/B14	Y2-100L2-4

Worm Reducer性能参数 / PERFORMANCE PARAMETER

Worm Reducer...Three-phase Motor...性能参数/Performance Parameter

P_{1n} (kW)	n_2 (r/min)	i	M_{2n} (Nm)	F_{r2} (N)	fs		
3.0	140	10	180	3391	1.7	WNMRW090 100B5/B14	Y2-100L2-4
	93.3	15	261	3882	1.4		
	70	20	340	4273	1.0		
	56	25	414	4603	0.8		
	46.7	30	479	4891	0.9		
	93.3	15	264	4905	2.5	WNMRW110 100B5	Y2-100L2-4
	70	20	348	5399	1.9		
	56	25	425	5816	1.6		
	46.7	30	485	6181	1.5		
	35	40	630	6803	1.1		
	28	50	757	7328	0.9		
	56	25	430	7607	2.2	WNMRW130 100B5	Y2-100L2-4
	46.7	30	491	8084	2.1		
	35	40	638	8897	1.6		
	28	50	767	9584	1.3		
	23.3	60	896	10185	1.0		
	17.5	80	1113	11210	0.8		
4.0	186.7	7.5	180	2785	1.0	WNMRW075 112B5/B14	Y2-112M-4
	140	10	237	3065	0.8		
	186.7	7.5	182	3081	1.6	WNMRW090 112B5	Y2-112M-4
	140	10	240	3391	1.3		
	93.3	15	348	3882	1.0		
	70	20	453	4283	0.8		
	140	10	240	4285	2.5	WNMRW110 112B5	Y2-112M-4
	93.3	15	352	4905	1.9		
	70	20	464	5399	1.4		
	56	25	566	5816	1.2		
	46.7	30	647	6181	1.1		
	56	25	573	7607	1.6	WNMRW130 112B5	Y2-112M-4
	46.7	30	655	8084	1.6		
	35	40	851	8897	1.2		
	28	50	1023	9584	1.0		
	23.3	60	1195	10185	0.8		

Worm Reducer性能参数 / PERFORMANCE PARAMETER

Worm Reducer…Three-phase Motor…性能参数/Performance Parameter

P_{1n} (kW)	n_2 (r/min)	i	M_{2n} (Nm)	F_{r2} (N)	fs		
5.5	186.7	7.5	250	3893	2.2	WNMRW110 132B5	Y2-132S-4
	140	10	330	4285	1.8		
	93.3	15	484	4905	1.4		
	70	20	638	5399	1.0		
	140	10	334	5605	2.5	WNMRW130 132B5	Y2-132S-4
	93.3	15	490	6416	1.9		
	70	20	638	7062	1.4		
	56	25	788	7607	1.2		
	46.7	30	900	8084	1.2		
	35	40	1171	8897	0.9		
7.5	186.7	7.5	341	3893	1.6	WNMRW110 132B5	Y2-132M-4
	140	10	450	4285	1.3		
	93.3	15	660	4905	1.0		
	186.7	7.5	345	5092	2.2	WNMRW130 132B5	Y2-132M-4
	140	10	455	5605	1.8		
	93.3	15	668	6416	1.4		
	70	20	870	7062	1.0		
	56	25	1074	7607	0.9		
	46.7	30	1228	8084	0.8		
	35	40	1596	8897	0.7		

备注：WNMRV的选型同上。

WNMRW连接尺寸图表/CONNECTING DIMENSION SHEET

WNMRW..Three-phase motor输入法兰尺寸图/WNMRW Input Flange Dimension

Worm Reducer	Type of Input Flange 输入法兰型号	N B5	N B14	M B5	M B14	P B5	P B14	7.5	10	15	20	25	30	40	50	60	80	100
025	56B14	-	50	-	65	-	80	9	9	9	9	-	9	9	9	9	-	-
030	56B5/B14	80	50	100	65	120	80	9	9	9	9	9	9	9	9	9	9	-
	63B5/B14	95	60	115	75	140	90	11	11	11	11	11	11	11	11	-	-	-
040	56B5/B14	80	50	100	65	120	80	-	-	-	-	-	-	-	9	9	9	9
	63B5/B14	95	60	115	75	140	90	11	11	11	11	11	11	11	11	11	11	11
	71B5/B14	110	70	130	85	160	105	14	14	14	14	14	14	14	-	-	-	-
050	63B5/B14	95	60	115	75	140	90	-	-	-	-	-	-	11	11	11	11	11
	71B5/B14	110	70	130	85	160	105	14	14	14	14	14	14	14	14	14	14	
	80B5/B14	130	80	165	100	200	120	19	19	19	19	19	19	19	-	-	-	-
063	71B5/B14	110	70	130	85	160	105	-	-	-	-	-	-	14	14	14	14	14
	80B5/B14	130	80	165	100	200	120	19	19	19	19	19	19	19	19	19	19	19
	90B5/B14	130	95	165	115	200	140	24	24	24	24	24	24	-	-	-	-	-
075	71B5	110	-	130	-	160	-	-	-	-	-	-	-	-	14	14	14	14
	80B5/B14	130	80	165	100	200	120	-	-	-	-	-	-	19	19	19	19	19
	90B5/B14	130	95	165	115	200	140	24	24	24	24	24	24	24	-	-	-	-
	100B5/B14	180	110	215	130	250	160	28	28	28	-	-	-	-	-	-	-	-
	112B5/B14	180	110	215	130	250	160	28	-	-	-	-	-	-	-	-	-	-
090	80B5/B14	130	80	165	100	200	120	-	-	-	-	-	-	-	19	19	19	19
	90B5/B14	130	95	165	115	200	140	-	-	-	-	24	24	24	24	24	-	-
	100B5/B14	180	110	215	130	250	160	28	28	28	28	28	28	-	-	-	-	-
	112B5/B14	180	110	215	130	250	160	28	28	28	28	-	-	-	-	-	-	-
110	80B5	130	-	165	-	200	-	-	-	-	-	-	-	-	-	-	19	19
	90B5	130	-	165	-	200	-	-	-	-	-	24	24	24	24	24	24	24
	100B5	180	-	215	-	250	-	28	28	28	28	28	28	28	28	28	-	-
	112B5	180	-	215	-	250	-	28	28	28	28	28	-	-	-	-	-	-
	132B5	230	-	265	-	300	-	38	38	38	38	-	-	-	-	-	-	-
130	90B5	130	-	165	-	200	-	38	38	38	38	-	-	-	-	-	-	-
	100B5	180	-	215	*-	250	-	38	38	38	38	-	-	-	-	-	-	-
	112B5	180	-	215	-	250	-	38	38	38	38	-	-	-	-	-	-	-
	132B5	230	-	265	-	300	-	38	38	38	38	38	38	38	-	-	-	-

备注：WNMRV型号的尺寸同上。

WNMRW外形尺寸图表/OUTLINE DIMENSION SHEET

WNMRW外形尺寸/Outline Dimension
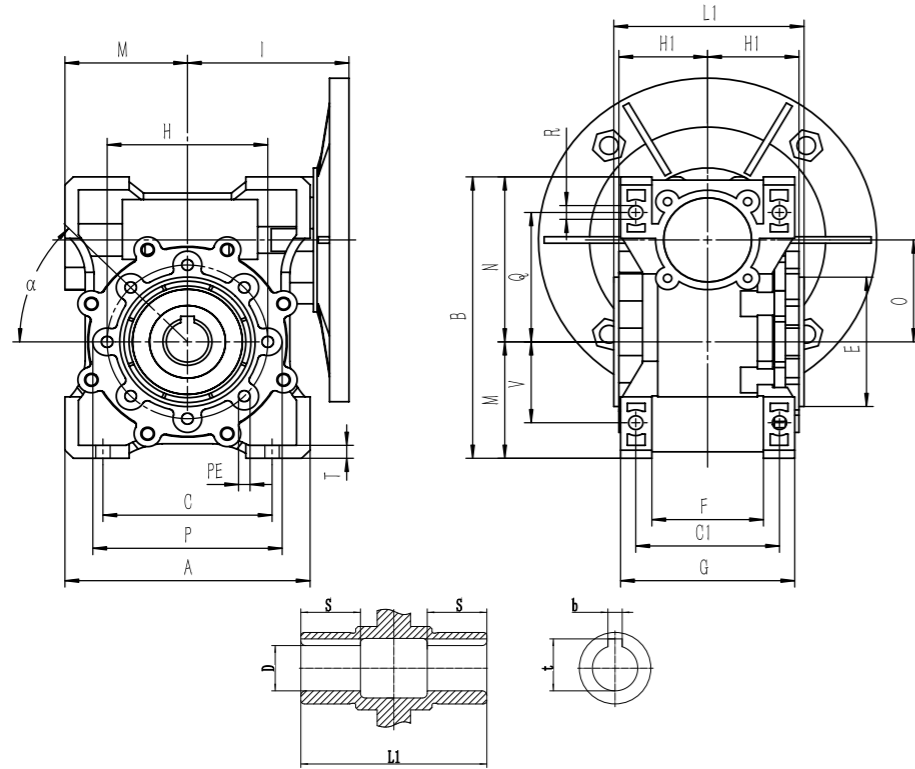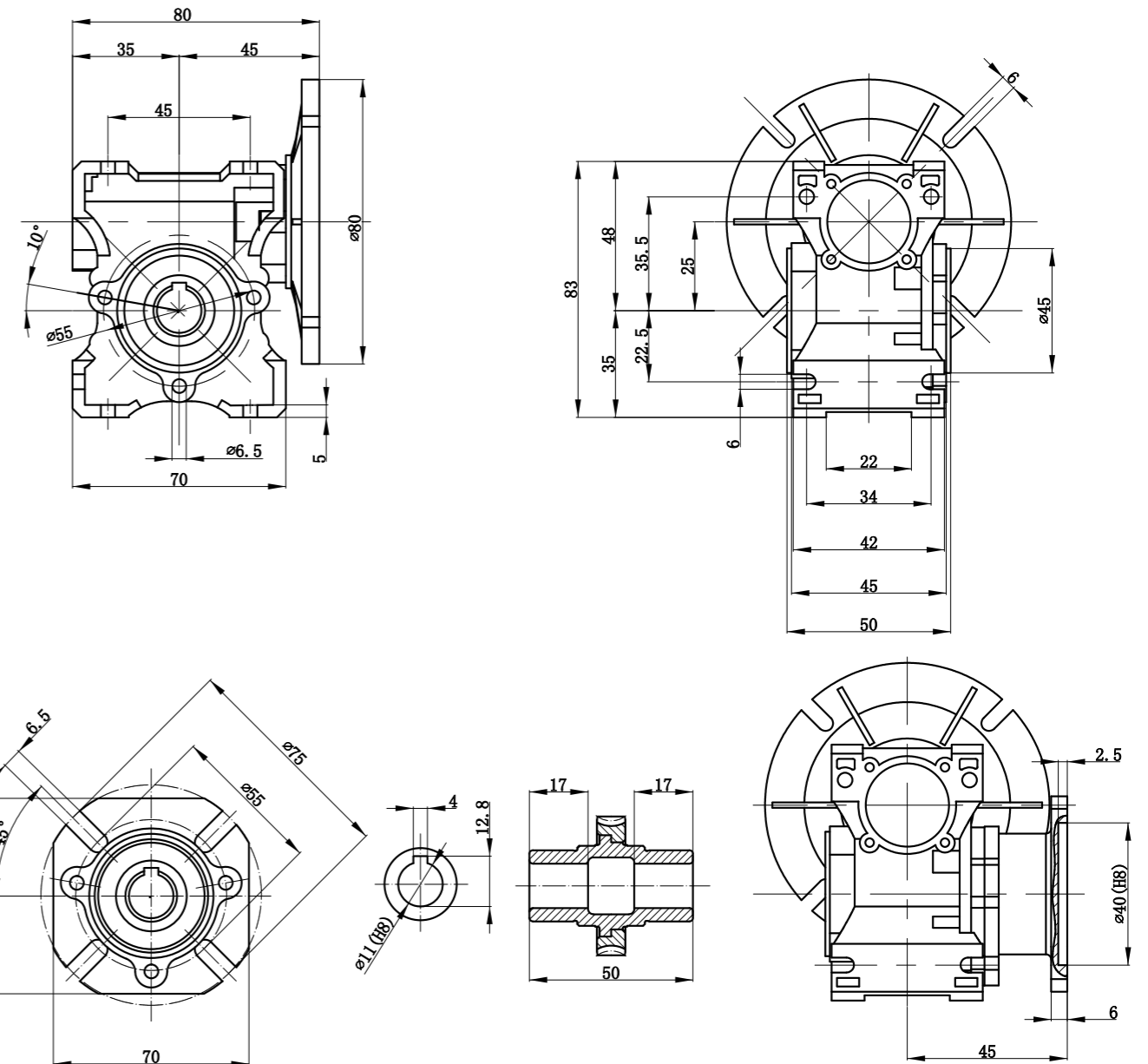
WNMRW	A	B	C	C1	D(H8)	E(h8)	F	G	H	H1	I	L1	M	N	O
030	80	97	54	44	14	55	32	56	65	29	55	63	40	57	30
040	100	121.5	70	60	18(19)	60	43	71	75	36.5	70	78	50	71.5	40
050	120	144	80	70	25(24)	70	49	85	85	43.5	80	92	60	84	50
063	144	174	100	85	25(28)	80	67	103	95	53	95	112	72	102	63
075	172	205	120	90	28(35)	95	72	112	115	57	112.5	120	86	119	75
090	206	238	140	100	35(38)	110	74	130	130	67	129.5	140	103	135	90
110	255	295	170	115	42	130	-	144	165	74	160	155	127.5	167.5	110
130	293	335	200	120	45	180	-	155	215	81	179	170	146.5	187.5	130

WNMRW	P	Q	R	S	T	V	PE	b	t	α	Kg
030	75	44	6.5	21	5.5	27	M6X11(n=4)	5	16.3	0°	1.2
040	87	55	6.5	26	6.5	35	M6X8(n=4)	6	20.8(21.8)	45°	2.3
050	100	64	8.5	30	7	40	M8X10(n=4)	8	28.3(27.3)	45°	3.8
063	110	80	8.5	36	8	50	M8X14(n=8)	8	28.3(31.3)	45°	6.2
075	140	93	11	40	10	60	M8X14(n=8)	8(10)	31.3(41.3)	45°	9
090	160	102	13	45	11	70	M10X18(n=8)	10	45.3	45°	13
110	200	125	14	50	14	85	M10X18(n=8)	12	45.3	45°	42.5
130	250	140	16	60	15	100	M12X20(n=8)	14	48.8	45°	59

*重量（Kg）不包含电机的重量。WNMRV尺寸同上. NOTE:Weight(Kg) without the weight of motor.

WNMRW025尺寸图

WNMRV025尺寸同上

## WNRW外形尺寸图表/OUTLINE DIMENSION SHEET

WNRW外形尺寸/Outline Dimension

输出端

蜗轮出力孔
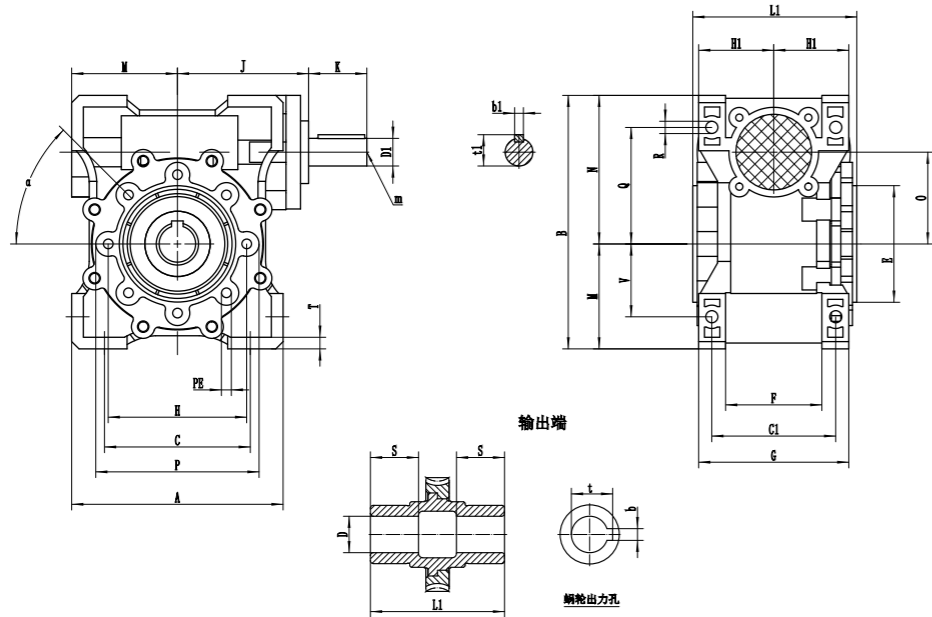
WNRW	A	B	C	C1	D(H8)	D1(j6)	E(h8)	F	G	H	H1	J	K	L1	M	N	O
030	80	97	54	44	14	9	55	32	56	65	29	51	20	63	40	57	30
040	100	121.5	70	60	18(19)	11	60	43	71	75	36.5	60	23	78	50	71.5	40
050	120	144	80	70	25(24)	14	70	49	85	85	43.5	74	30	92	60	84	50
063	144	174	100	85	25(28)	19	80	67	103	95	53	90	40	112	72	102	63
075	172	205	120	90	28(35)	24	95	72	112	115	57	105	50	120	86	119	75
090	206	238	140	100	35(38)	24	110	74	130	130	67	125	50	140	103	135	90
110	255	295	170	115	42	28	130	-	144	165	74	142	60	155	127.5	167.5	110
130	293	335	200	120	45	30	180	-	155	215	81	162	80	170	146.5	187.5	130

WNRW	P	Q	R	S	T	V	PE	b	b1	t	t1	m	α	Kg
030	75	44	6.5	21	5.5	27	M6×11(n=4)	5	3	16.3	10.2	-	0°	1.2
040	87	55	6.5	26	6.5	35	M6×8(n=4)	6	4	20.8(21.8)	12.5	-	45°	2.3
050	100	64	8.5	30	7	40	M8×10(n=4)	8	5	28.3(27.3)	16	M6	45°	3.8
063	110	80	8.5	36	8	50	M8×14(n=8)	8	6	28.3(31.3)	21.5	M6	45°	6.2
075	140	93	11	40	10	60	M8×14(n=8)	8(10)	8	31.3(38.3)	27	M8	45°	9
090	160	102	13	45	11	70	M10×18(n=8)	10	8	38.3(41.3)	27	M8	45°	13
110	200	125	14	50	14	85	M10×18(n=8)	12	8	45.3	31	M10	45°	42.5
130	250	140	16	60	15	100	M12×21(n=8)	14	8	48.8	33	M10	45°	59

*重量（Kg）不包含电机的重量。WNRV尺寸同上./NOTE:Weight(Kg) without the weight of motor.

Worm Reducer连接尺寸图表/CONNECTING DIMENSION SHEET

Worm Reducer输出法兰尺寸图/Worm Reducer Output Flange Dimension
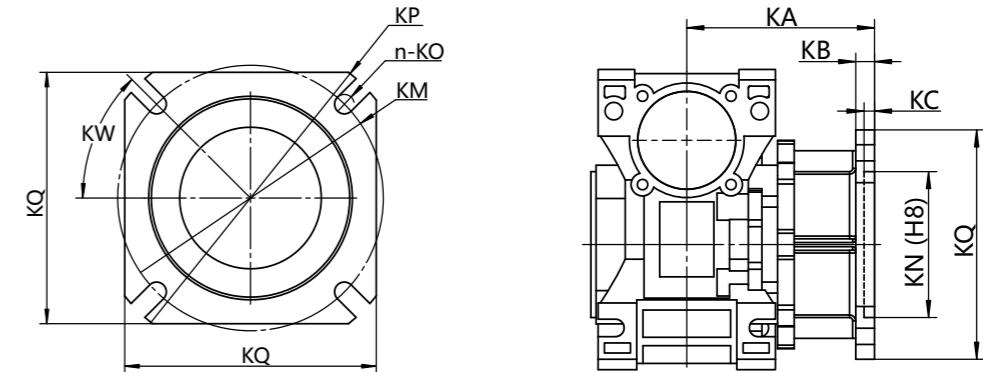
Worm Reducer	FA								
	a1	KA	KB	KC	KM	KN$_{H8}$	KO	KP	KQ
030	45°	54.4	6	4	68	50	6.5(n=4)	80	70
040	45°	67	7	4	75	60	9(n=4)	110	95
050	45°	90	9	5	85	70	11(n=4)	125	110
063	45°	82	10	6	150	115	11(n=4)	180	142
075	45°	111	13	6	165	130	14(n=4)	200	170
090	45°	111	13	6	175	152	14(n=4)	210	200
110	45°	139	15	6	230	170	14(n=8)	280	260
130	45°	140	15	6	255	180	16(n=8)	320	290

Worm Reducer	FB								
	a1	KA	KB	KC	KM	KN$_{H8}$	KO	KP	KQ
030	-	-	-	-	-	-	-	-	-
040	45°	97	7	4	75	60	9(n=4)	110	95
050	45°	120	9	5	85	70	9(n=4)	125	110
063	45°	112	10	6	150	115	11(n=4)	180	142
075	45°	90	13	6	130	110	11(n=4)	160	-
090	45°	122	18	6	215	180	14(n=4)	250	-
110	-	-	-	-	-	-	-	-	-

Worm Reducer	FC								
	a1	KA	KB	KC	KM	KN$_{H8}$	KO	KP	KQ
040	45°	80	9	5	115	95	9.5(n=4)	140	-
050	45°	89	10	5	130	110	9.5(n=4)	160	-
063	45°	98	10	5	165	130	11(n=4)	200	-
090	45°	110	17	6	165	130	11(n=4)	200	-

Worm Reducer 尺寸/Dimensions

蜗轮输出轴尺寸表：
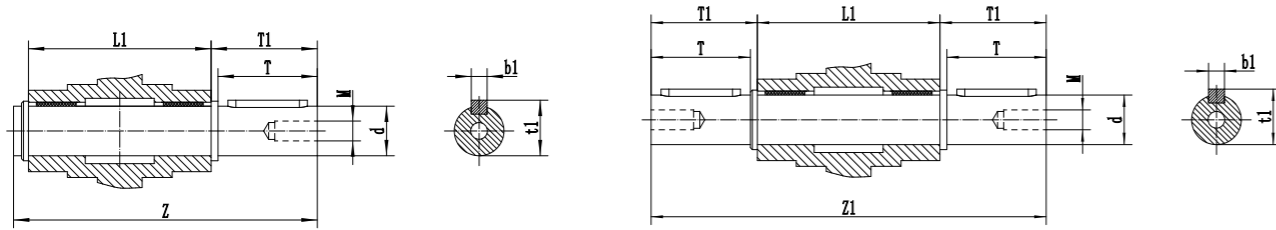
Reducer	d（h6)	T	T1	L1	Z	Z1	M	b1	t1
025	11	23	25.5	50	81	101	-	4	12.5
030	14	30	32.5	63	102	128	M6	5	16
040	18	40	43	78	128	164	M6	6	20.5
050	25	50	53.5	92	153	199	M10	8	28
063	25	50	53.5	112	173	218	M10	8	28
075	28	60	63.5	120	192	247	M10	8	31
090	35	80	84.5	140	234	308	M12	10	38
110	42	80	84.5	155	249	324	M16	12	45
130	45	80	85	170	265	340	M16	14	48.5

蜗杆尾出轴尺寸表：

Reducer	J	d(j6)	K	m	b1	t1
025	37	9	20	-	3	10.2
030	45	9	20	-	3	10.2
040	53	11	23	-	4	12.5
050	64	14	30	M6	5	16
063	75	19	40	M6	6	21.5
075	90	24	50	M8	8	27
090	108	24	50	M8	8	27
110	135	28	60	M10	8	31
130	155	30	80	M10	8	33
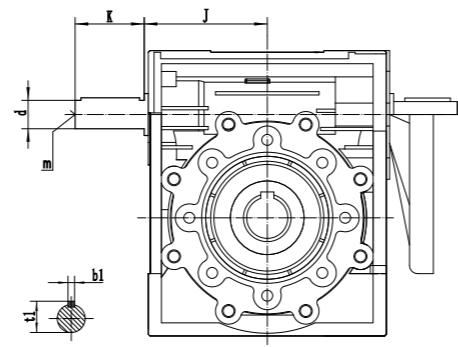
扭力臂尺寸表：

Reducer	L	H	K	D	R	B
025	70	14	17.5	8	15	4
030	85	14	24	8	15	4
040	100	14	31.5	10	18	4
050	100	14	38.5	10	18	4
063	150	14	49	10	18	6
075	200	25	47.5	20	30	6
090	200	25	57.5	20	30	6
110	250	30	62	25	35	6
130	250	30	69	25	35	6
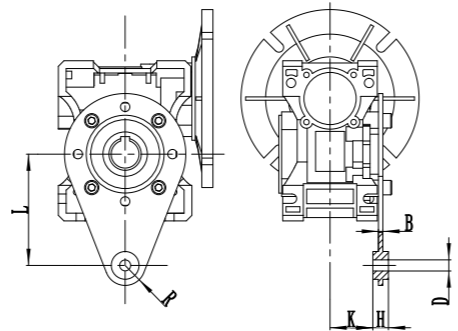
安装位置图/Installation Plan

输出法兰位置图：

F1

F2

蜗轮输出轴位置图：

SS1，左

SS2，右

DS

扭力臂位置图：

A1

A2
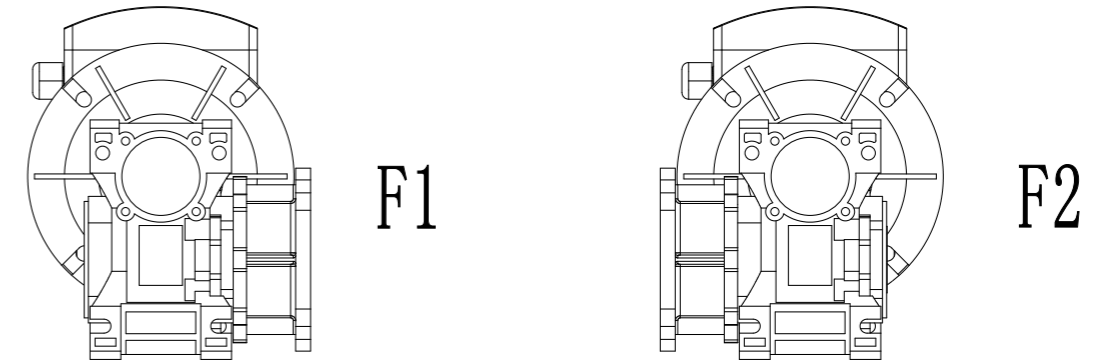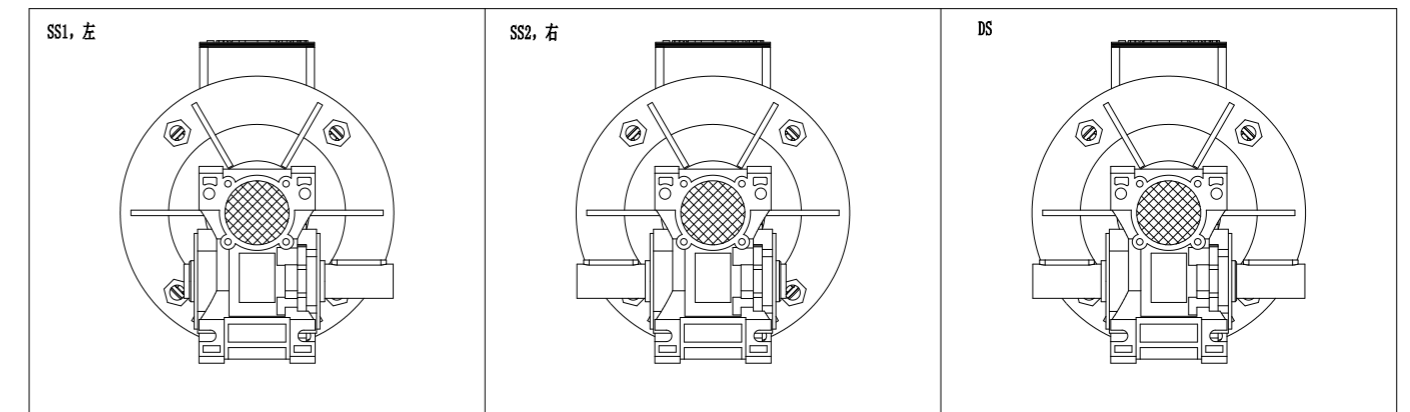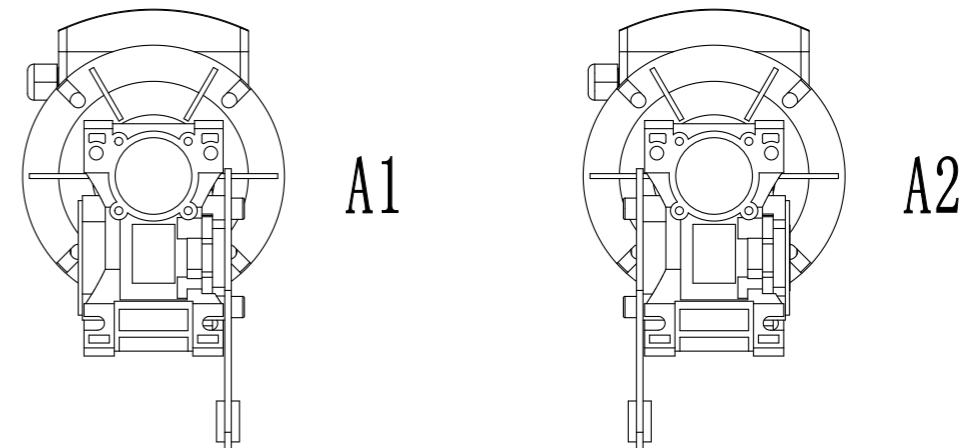
通用电机/ GENERAL PURPOSE MOTORS

三相异步电机型式 /Type Of Three-phase Asynchronous Motor
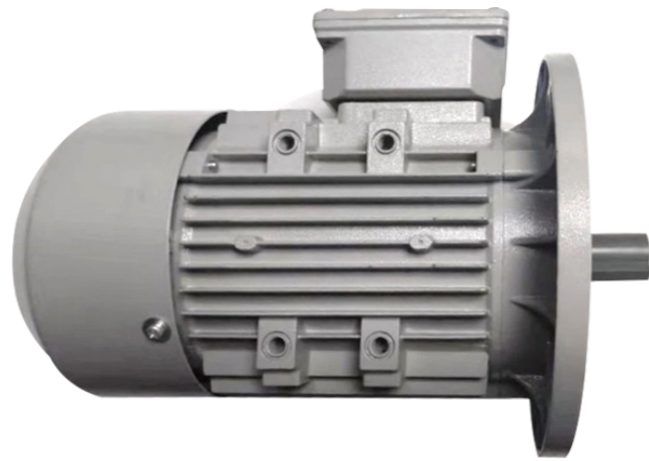
电机示意图

产品标注 /Product Code

电机产品命名按国标机方式命名：系列代号+中心高(机座号)+叠长代号+电机极数+电机功率+电机法兰+外观颜色。

例： Y2-80M2-4-750W-B5-清灰色

Y2:标准国标三相电机系列　　　80：中心高(机座号)80mm　　　M2：定转子铁芯叠长代号

4：4极电机　　　750W：电机额定输出功率　　　B5：电机法兰类型

清灰色：电机整体外观颜色

Motor products are named according to the National Standard: Series Code + Center high base number + stack length code + Motor Pole number + motor power + motor flange + appearance color.

EXAMPLE: Y2-80M2-4-750W-B5-Clear Gray

Y2: Standard three-phase Motor Series　　　80: Center high frame 80mm

M2: stator rotor iron core stack length code　　　4:4 pole

750W: rated output power

B5: Motor Flange Type

Clear Gray: Overall appearance color

部件分解图 /EXPLODED VIEW DRAWING
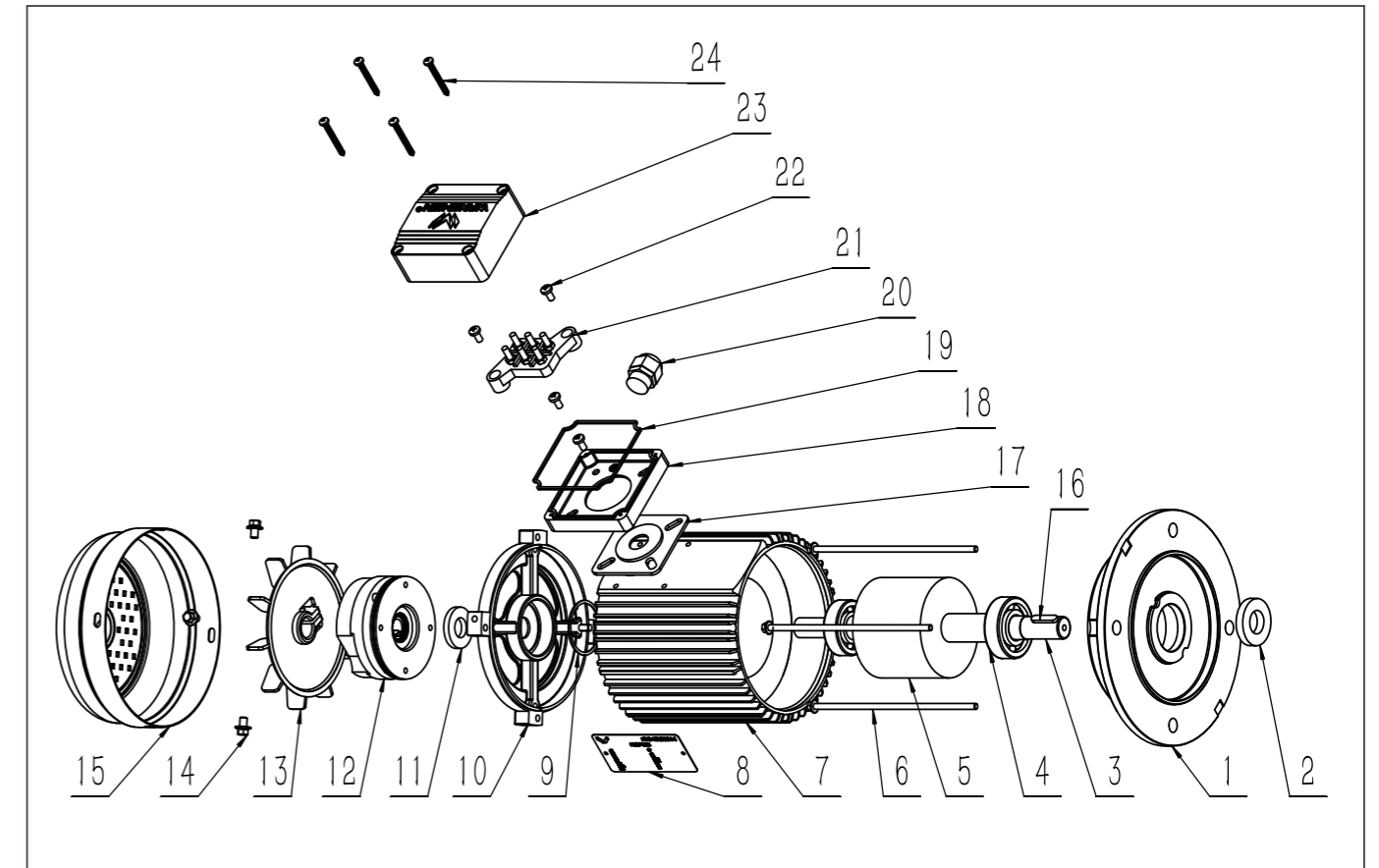
◆ 部件分解图标注 /Product Code

1	电机法兰/Motor flange	13	风叶/Blades
2	油封(法兰密封)/Oil seal (flange seal)	14	风罩紧固螺钉/Fastening screw for Fan hood
3	电机轴/Motor shaft	15	风罩/Fan cover
4	轴承/Bearing	16	键/Key
5	转子/Rotor	17	接线盒下盖密封垫/Gasket of bottom cover on terminal box
6	电机装配螺钉/Assembly screw	18	接线盒下盖/Bottom cover on terminal box
7	定子线圈组件/Stator coil	19	接线盒上盖密封垫/Top cover on terminal box
8	铭牌/Nameplate	20	电缆锁头/Cable lock head
9	波形垫圈/Wave washer	21	接线板/Terminal plate
10	后端盖/Rear end cover	22	接线板装配螺钉/Assembly screws of terminal plate
11	油封(后盖密封)/Oil seal (back cover seal)	23	接线盒上盖/Upper cover of terminal box
12	刹车(按客户要求增加)/Brake (according to customer requirements)	24	接线盒上盖装配螺钉/Assembly screws of top cover on terminal boxCC

设计特征/DESIGN FEATURES

总体简介/General Introduction

◆ 结构特点/Structure and features

一电机输出功率覆盖范围0.06KW-7.5KW。

一接线座与机体整体铝合金压铸结构,密封性好。

一机体散热性能良好，在恶劣的工作环境下维持电机良好的运行性能。

一精确的动平衡校正及专用的低噪声轴承,使电机运行更加平稳、静音。

一提供F级绝缘等级制造。

一预设置的出轴密封装置,与变速机、减速机配套联接时,密封更可靠安全。

一符合IEC尺寸标准及IM国际安装结式,具备优良的互换性。

-Motor output power coverage range 0.06 kw-7.5 kw
-The Aluminum alloy casting whole structure, good sealing performance.
- Good heat dissipation performance of the machine body, maintain good operation performance of the motor in bad working environment
- Accurate dynamic balance correction and special low noise bearing make the motor run more smoothly and quietly
-With F insulation classes.
- The pre-set shaft sealing device is more reliable and safe when connected with gearbox and reducer
-There is the superior interchangeability between the IEC size standard and the IM mounted form.

◆ 主要材料/Main Material

一外壳：铝合金

一轴：高频淬火处理

一漆包线：聚酯QZ-2

一硅钢片：DW470-600

一轴承：C&U；NSK；NTN；SKF

-Outside shell: Aluminum alloy
-Shaft: High frequency quenching processing
-Electromagnetic wire: Poly-qz-2; Polymide QY-2
-Si steel plate: DW470-600
-Bearing: C&U;NSK;NTN: SKF

◆ 涂漆/Painting

一外观颜色有二种可供选择：烤漆RAL9002清灰色，或者烤漆RAL5010蓝色。

◆ 统一标准/Consolidated Standard

电机统一执行标准如下：

----电机产品符合：3C标准(CCC)；GB14711电机国家标准;EN60034-1；

----电气规范： GB755-2008；IEC60034-1；

----结构及安装型式：3C标准(CCC)；

----外壳防护等级：GB4942.1；IEC60034-5；

----冷切方式： GB/T1993；IEC60034-6.

　All general-purpose motors perform the following manufacture standard.
-Motor product standard:3C(CCC),GB14711,EN60034-1
-Electric criterion: GB755-2008; IEC60034-1
-Structure and mounting position: 3C(CCC)
-Outside shell protection grade: GB4942.1; IEC60034-5
-Cooling mode: GB/T1993; IEC60034-6

电机的工作过程/Operation Course Of Motor

◆ 工作原理/Operation Principle

交流异步电机是将电能转换为旋转机械能的部件单元。当电机接通电源时,电机定子绕组即产生以固定转速n_0旋转的磁场。n_0即为电机的同步转速，它的值仅与电源的频率(f)及电机绕组的构造极数(P)有关，即：

AC asynchronous motor is a unit that transfers electric energy into mechanical energy. When we supply the power to it, electric motor's stator winding will create a rotational magnetic with fixed speed rotary speed n_0. The speed n_0 is same as the synchronous speed of the electric motor, and its value is related with the frequency of power and the structure poles of motor winding, that is:

$$n_0 = \frac{60 \times f}{p} \quad （转/分钟）（r/min）$$

旋转的磁场使电机转子产生感应电流，从而使电机转子受到电磁力矩的牵引而带动负载旋转。只要转子转速与磁场转速存在差异，电机转子上就保持有电磁转矩的作用，并且差异越大转子上产生的电磁转矩也越大。电机输出转速n与同步转速(n_0)的差异程度将以转差率S表示：

Rotational magnetic make electric motor rotor create faradism torque, which rotate the load. As long as the speed difference existed between the rotor rotation speed and magnetic field rotation speed, the rotor of electric motor will keep the magnetic torque and more difference will create more magnetic torque. The difference degree of the electric motor's output rotate speed n and the synchronous rotate speed n_0 will be shown as rotation difference rate S:

设计特征/DESIGN FEATURES

$$S = \frac{n_0 - n}{n_0}$$

下图中曲线(M)表明电机转子的输出转矩与转速的关系，表征电机的输出机械特性。它与负载曲线 (M_L) 相交于一点，该点即为电机带动负载稳定运行时的工作点,在工作点时电机上的输出转矩与负载转矩相等。

The curve (M) in the figure below shows the relationship between output torque and rotation speed of the motor rotor, representing the mechanical characteristics of the motor output.It intersects with the load curve (ML) at a point, which is the working point when the motor drives the load to run stably. At the working point, the output torque of the motor is equal to the load torque.

◆ 主要转矩指示 /MAIN TORQUE INDEX

由图示曲线(M)可知,在电机力矩特性曲线中对实际应用有影响的力矩指标有:
From the curve (M) shown in the figure, it can be seen that the torque indexes in the motor torque characteristic curve that have influence on practical application are:

M_{st}:启动转矩。电机在通电启动瞬间（转速为零）时的输出转矩，表示电机带负载启动的能力。
M_{st}: Start torque. Output torque is generated when electrical motor start up(rotational speed is zero) shows the start load capacity of electric motor.

M_{max}:最大转矩。电机转矩特性曲线中从高速到低速方向的第一个峰点最大值。表示电机在稳定工作后,抵抗负载变化的过载能力。
M_{max}: The max torque. It is the first peak from high speed to low speed direction in the torque characteristic curve of electric motor that shows the electric motor ability resists the overload capacity for load change in steadily operation.

M_{min}:最小转矩。在电机转矩曲线中,从零转速开始到最大转矩处的最小值。它与启动转矩M_s一起表示电机带动负载进入稳定工作点的能力。以下电机性能参数表中给出本公司制造的各型电机启动转矩与额定转矩的比值(M_{st}/M_n)、最大转矩与额定转矩的比值(M_{max}/M_n)。
M_{min}: Minimum torque. Minimum torque is the minimum value among electrical motor torque curve from start to the maximum torque. Together with start torque M_s, it indicate the ability of electrical motor drives load steadily.

◆ 工作点 /Operation Point

电机带负载工作到稳定状态后，电机的输出转矩与负载转矩保持动态的平衡，电机的工作转速也相应保持在该点的转速值n_L上负载发生加大或减轻波动时，转速n_L也相应降低或增加而使电机的输出力矩加大或减小使之与负载的变化得以平衡。
Electric motor operates with load steadily the output torque and load torque of the electric motor keepin dynamic balance, the operation rotational speed of the electric

motor keeps on the rotational speed value n_L, correspondingly, When the Load become bigger or smaller, the rotational speed n_L, corresponding reduce or increase and make output torque of electric motor increase or decrease in order to make it change accordingly.

理论上,电机的工作点只能位于特性曲线中最大转矩(M_{max})右侧(n'—n_0之间)的曲线段。因为只有在这一段电机才有自动与负载波动平衡的能力。
Theoretically, the working point of the motor can only be located in the curve segment (between n' and n0) to the right of the maximum torque (Mmax) in the characteristic curve.Because only in this section of the motor has the ability to automatically balance with the load fluctuations

每型电机规定了一具体的额定输出功率(P_N)及额定输出力矩(M_N),在使用时电机工作点不应超过该型电机规定的额定点(M_N),否则电机有损坏的可能。
A specific rated output power (PN) and rated output torque (MN) are specified for each type of motor. The working point of the motor should not exceed the rated point (MN) specified for this type of motor, otherwise the motor may be damaged.

◆ 电机的启动时间 /Motor Start Time

电机带动负载从零转速到达稳定的工作点转速n_L的过程即为电机的启动过程电机的启动时间与旋转系统的总转动惯量(J_{tot})、电机输出电磁转矩(M)、负载阻力矩(M_L)有关。
The process in which the motor drives the load from zero speed to the stable working point speed nL is the starting process of the motor. The starting time of the motor is related to the total moment of inertia (Jtot) of the rotating system, the output electromagnetic torque (M) of the motor, and the load resistance moment (ML)

M和M_L的差值即为推动系统的加速转矩(M_a):
The difference of M and M_L, equal to the accelerating torque(M_a)of drive system:

$$M_a = M - M_L = f_1(n) - f_2(n) = \Psi(n)$$

电机的启动时间(t_{st})可以以如下公式表示:
The start time(t_{st})of electric motor shows as following formula:

$$t_{st} = \frac{\pi}{30} \times J_{tot} \times \int_0^{n_L} \frac{1}{\Psi(n)} \times d(n)$$

t_{st}--电机启动时间，秒；/Start time of electric motor, second.
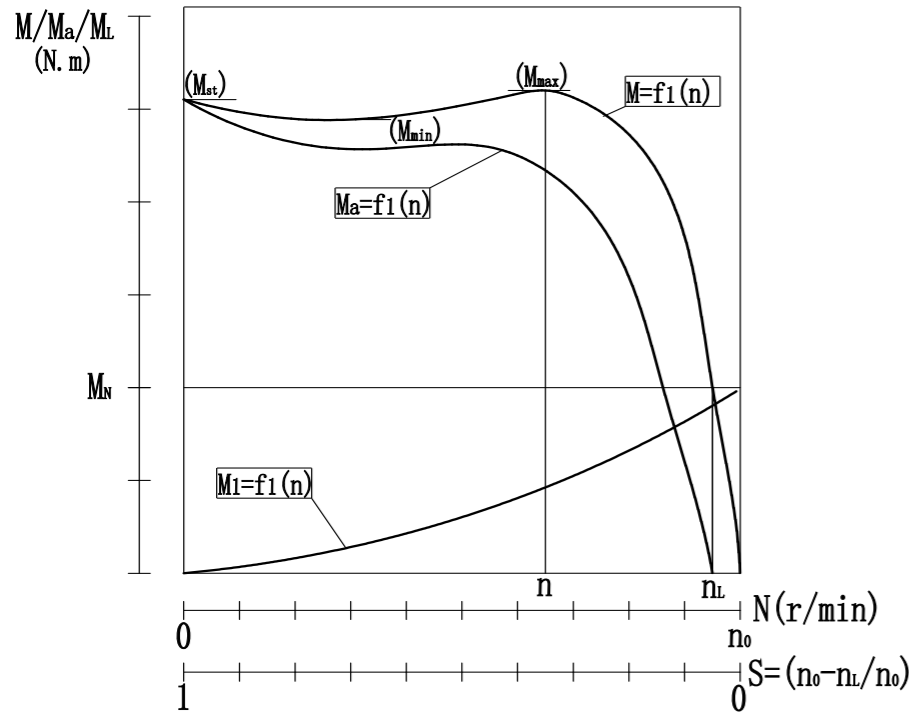J_{tot}--机组的总转动惯量，kg·m²；/Total rotational inertia
n_L--电机的负载速度，转/分钟，/The speed of electric motor with load, rpm
M:电机输出转矩转速曲线 /M: motor output rotatory torque rotatory speed curve
M_a:电机加速力矩曲线 /Ma: motors accelerated torque curve
M_L:负载力矩曲线 /Ml: load torque curve

设计特征/DESIGN FEATURES

◆ 电机的运行特征 / Operation Characteristic Of The Electric Motor

在带负载工作运行时，电机的实际输出功率（P_{out}）的大小恒等于实际负载的需求功率。负载的加重或减轻相应是电机输出功率增加或减少。电机在不同工作点时的工作转速（n_L）、转矩（M）、输出功率（P_{out}）、功率因数（cosΦ）、效率（η）、电流（I）等将随着负载的变化而变化（如下图所示），这种变化是由电机的运行特殊性所决定的。

When running with load, the ctual output power (P_{out})of electric motor equal to demanded power of actual load identically. Increase or decrease of load will make the output power of the electric motor increase or decrease correspondingly. Operation rotational speed in different operating points of the electric motor(n_L), torque(M), output power(P_{out}), power factor(COSΦ), efficiency(η)electric current (I), etc. will change with load change, this kind of change is determined by operation characteristic of the electric motor.

n--P_{out}特性:从空载到加载,随着电机输出功率的增大,电机转速(n)稍有下降。一般电机在额定点($n=n_N$,$P_{out}=P_N$)时的转差率(S)约为:0.06左右。

n --Pout characteristics: from no load to load, the motor speed (n) decreases slightly with the increase of motor output power.Generally, the slip (S) of the motor at the rated point ($n=n_N$,Pout=PN) is about :0.06.

M、I--P_{out}特性:电机的转矩随负载的增大而增大。

M,I--P_{out} characteristic: The torque of the motor increases with the increase of the load

n、COSΦ--P_{out}特性:轻载时电机的效率(η)及功率因数(COSΦ)很低,当负载增大到50%额定值以上时，n值和COSΦ值迅速增大并保持基本稳定。

n、COSΦ--P_{out} characteristic: Efficiency (η) and power factor(COSΦ)of electric motor are very low with light load; when the load increase to over 50% of the rated load, n value and cos o value will increase rapidly and become steady.

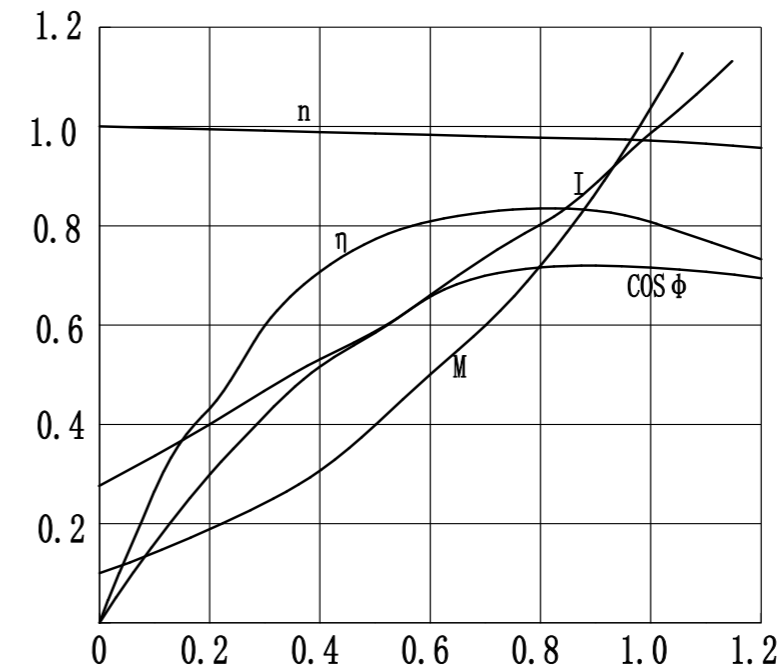n--P_{out}： 转速特性 /Np_{out}： Rotate speed characteristic
I-- P_{out}： 电流特性 /Ip_{out}： Electrical current characteristic
η-- P_{out}： 效率特性 /ηP_{out}： Efficiency characteristic
COSΦ-- P_{out}： 功率因数特性 / COSΦP_{out}： Power factor characteristic
M--P_{out}： 转矩特性 /MP_{out}： Torque characteristic

应用规范/Application Criterion

◆ 定额工作制/Rated Work System

工作制是电机承受负载情况的说明，是电机设计和使用选择的基础。一般用途的电机，其定额应为最大连续定额，并能按S1工作制运行。本公司制造的电机均为按S1工作制运行的最大连续定额提供技术性能参数。

设计特征/DESIGN FEATURES

Working system is the description of the motor under load and the basis of the motor design and use. For general purpose motor, its quota shall be the maximum continuous quota and can operate according to S1 duty system. The motors manufactured by the company are provided with technical performance parameters according to the maximum continuous quota of S1 duty system operation.

连续工作制(S1)：
电机在恒定负载下的运行,运行时间足以达到热稳定。
Continuous work system (S1):
The running time of the motor under constant load is enough to achieve thermal stability。

短时工作制(S2)：
电机在恒定负载下按给定的时间运行，该时间不足以达到热稳定，随之即断能停转足够时间，使电机再度冷却到环境温度。
Short-time work (S2):
The motor runs at a given time under a constant load, which is not enough to achieve thermal stability, and then the energy break and stop for enough time to cool the motor to the ambient temperature again.

断续周期工作制(S3)：
电机按一系列相同的工作周期运行，每一周期包括一段恒定负载运行时间和一段断能停转时间。通常以负载持续率=N/(N+R)*100%加以表征。
Intermittent cycle system (S3):
The motor operates in a series of identical working cycles, each consisting of a period of constant load running time and a period of break-energy stopping time.It is usually

S1   S2   S3
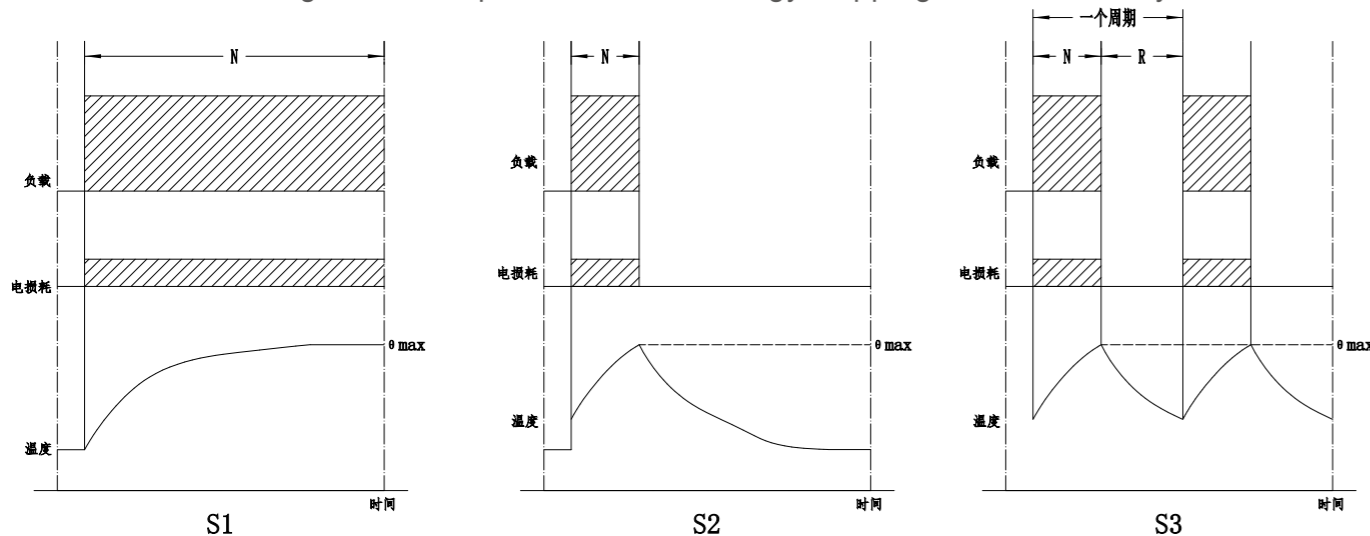
设计特征/DESIGN FEATURES

-当电机按S2或S3定额工作制运行时，可按如下图表的修正系数K适当递增电机的许可使用功率：
-When the motor operates in the S2 or S3 fixed duty system, the permissible power of the motor can be increased appropriately according to the correction factor K in the following chart:

◆ 额定电压和频率/Rated Voltage And Frequency

过程时间（min）   负载持续率（%）
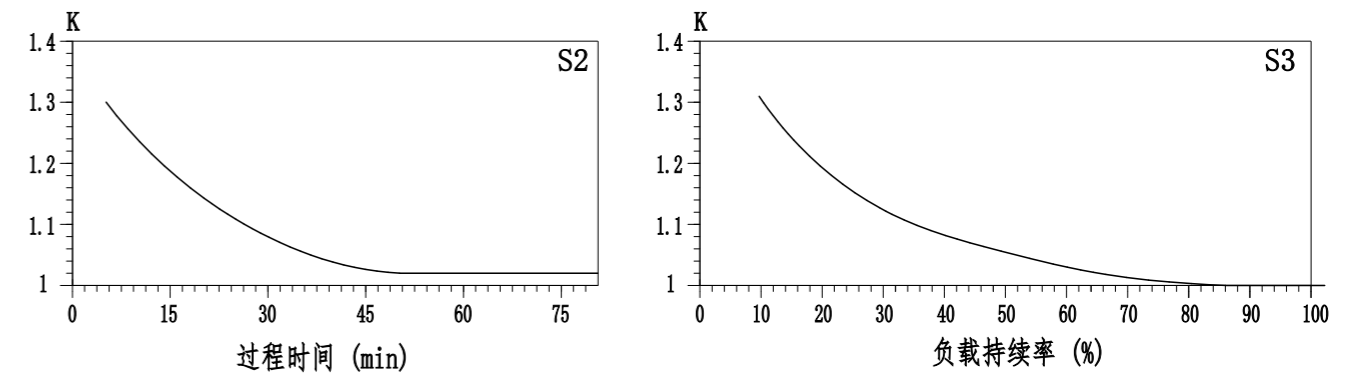
每型电机都规定了其额定的工作电压及频率，并在电机铭牌上标示。在使用电机时,必须保证电源电压、频率与电机规定的额定值相符合。否则电机的性能指标将得不到有效的保障甚至损坏电机造成危害。在本册技术性能表中列出的电机主要性能指标都是在额定电压及额定频率下的正常运行条件下获得的。
The rated working voltage and frequency of each type of motor are specified and marked on the motor nameplate.When using a motor, it is necessary to ensure that the voltage and frequency of the power supply are in accordance with the specified ratings of the motor.Otherwise, the performance index of the motor will not be effectively guaranteed or even damage the motor and cause harm.The main performance indexes of the motor listed in the technical performance table of this book are obtained under normal operating conditions of rated voltage and rated frequency.

所有电机在电源实际电压偏离额定电压不超过+/-5%；实际频率偏离不超过额定频率+/-1%的时候，将能保证正常的功率输出。
The actual voltage deviation of all motors from the rated voltage should not exceed +/- 5%;Normal power output will be guaranteed when the actual frequency deviation does not exceed the rated frequency +/-1%.

三相电机在额定频率下，可按△形接线及Y形接线同时提供两档额定电压值。电机在该两种接法的额定值下运行将保持完全相同的运行性能。理论上Y形接法的额定电压值是△形接法额定电压值的3倍。
Three-phase motor at rated frequency, can be delta wiring and Y wiring at the same time to provide two rated voltage value. The motor will maintain exactly the same operating performance under the rating of the two connection methods. Theoretically the rated voltage value of Y connection method is three times of the rated voltage value of delta connection method.

如未特别说明，我们将按中国电源标准提供电机：按Y形接线380V/50HZ(△形接线220V/50HZ)提

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设计特征/DESIGN FEATURES

供；如用户需要其他额定电压及额定频率的电机产品，须向我公司作特别订货。

If not specified, we will provide the motor according to the Chinese power supply standard: y-wiring 380V/50HZ(delta wiring 220V/50HZ);If you need other motor products with rated voltage and rated frequency, please place special order with us

一对于三相电机，同时按相同倍数提高或降低电机的额定电压和额定频率是允许的。50Hz的电机将电压提高1.2倍后，可在60Hz的频率下运行，而保持该电机效率(η)、功率因数(COSΦ)、转矩(M_N、M_{ST}/M_N、M_{max}/M_N)、绝对转差(n_s-n)等指标的基本不变，而转速及输出功率将相应提高为原来的1.2倍。

-For three-phase motors, it is permissible to increase or decrease the rated voltage and frequency of the motor by the same factor.50 hz motor voltage increased by 1.2 times, can run under the frequency of 60 hz, and keep the motor efficiency (eta), power factor (COS Φ), torque (MN, MST/MN, Mmax/MN), absolute slip (ns - n), and other indicators of basically remain unchanged, and rotational speed and output power will increase 1.2 times accordingly.

以下表格中第一栏中列出50Hz的额定工作电压，第二栏中列出该额定电压下许可使用的工作电压范围。

The rated operating voltage of 50Hz is listed in the first column of the following table, and the permissible operating voltage range under this rated voltage is listed in the second column.

标称额定电压/ Nominal rated voltage	许可使用电压/ Permissible voltage
220/380 50	(209~231)/(360~400) 50HZ

-电机的工作电压偏离额定值时，电机的启动转矩(M_{st})、最小转矩(M_{min})、最大转矩(M_{max})等将受到影响。如果电机重载工作时，必须注意这种工作电压与输出力矩(M)的变化关系。

-When the working voltage of the motor deviates from the rated value, the starting torque (Mst), minimum torque (Mmin) and maximum torque (Mmax) of the motor will be affected. If the motor is overloaded, attention must be paid to the relationship between the working voltage and output torque (M).

设计特征/DESIGN FEATURES
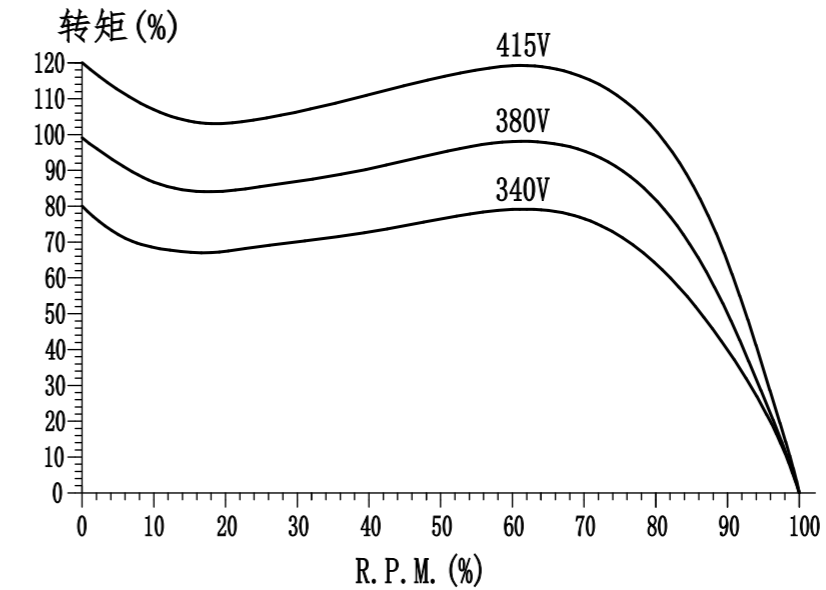
◆ 运行环境/Operation Environment

电机的标准电气规范是按S1定额工作制；在额定电压、额定频率下；使用环境空气温度不超过40℃、海拔高度不超过1000m的运行条件下给出的。如电机需在超过40℃或海拔高于100m的工作环境中工作，需按专业经验修正电机的许可使用功率。

The standard electrical code of motor is S1 duty system.At rated voltage and rated frequency;It is given under the operating condition that the ambient air temperature does not exceed 40℃ and the altitude does not exceed 1000m.If the motor needs to work in the working environment of more than 40℃ or more than 100m above sea level, the licensed power of the motor shall be modified according to professional experience.

-如环境温度高于40℃时，应按如下表格中的修正系数修正电机的许可使用功率：

-If the ambient temperature is higher than 40℃, the permissible power of the motor shall be modified according to the correction factor in the following table:

环境温度 （℃）/Ambient Temperature(℃)	40	45	50	55	60
修正系数 （%）/Modified Coefficient(%)	100	96	92	88	83

-如工作环境海拔高度超过1000m,应按如下表格中的修正系数修正电机的许可使用功率：

-If the working environment altitude exceeds 1000m, the permissible power of the motor shall

设计特征/DESIGN FEATURES

海拔高度（M）/ALTITUDE(M)	1000	1500	2000	2500	3000
修正系数（%）/MOOIFIED COEFFICIENT(%)	100	96	92	88	83

◆ 噪声等级/Noise Grade

电机工作噪声主要由电磁场、轴承和风冷系统产生。而最大的噪声主要由风冷系统的风扇产生。
The noise during the operation of electric motors is created by the magnetic field, the bearings, and the wind cooling system. However mainly the cooling fan of wind cooling system creates the noise.

技术数据表中的噪声数据dB(A)与ISO1680相一致。当电机工作于60Hz时，以上数据约增加3/4dB(A)
The noise data dB(A) in the technical data table is consistent with IS01680.When the motor works at 60Hz, the above data will increase by 3/4db (A).

◆ 温升及绝缘等级/Temperature Rise And Isolation Grade

电机工作时，一方面由于绕组电流及轴旋转摩擦将使电机产生发热而使电机各部分的温度升高；另一方面电机通过外表向环境冷却介质散发热量。电机温度越高向外散热功能越强，而电机在稳定运行时的发热量是相对恒定的，因此当发热与散热达到平衡后电机各部分的温度将保持恒定。它们与冷却介质的温度差即为该部分的温升。
When the motor is working, on the one hand, the temperature of each part of the motor will rise due to the winding current and axis rotating friction, which will generate heat.On the other hand, the motor emits heat to the ambient cooling medium through the exterior.The higher the temperature of the motor, the stronger the heat dissipation function, while the heat generated by the motor in stable operation is relatively constant, so when the heat and heat dissipation reach a balance, the temperature of each part of the motor will remain constant.The temperature difference between them and the cooling medium is the temperature rise of this part.

对于电机来说，过高的温度将主要对电机的绕组及轴承造成损害。因此对电机的绕组温升及轴承处的最高温度作出了规定。同时绝缘等级作为表征电机绕组的耐热程度指标,也作出了相应的规定。
For the motor, excessive temperature will mainly damage the winding and bearing of the motor. Therefore, the winding temperature rise of the motor and the maximum temperature of the bearing have been stipulated. At the same time, the insulation grade is used as the index of heat resistance degree of motor winding.

本公司的电机绕组按F级绝缘等级制作并且由于采用了增强散热筋的铝合金外壳,使电机绕组温升大为降低(大部分电机的绕组温升在40--60K之间)。从而确保电机的安全运行。
Our electric motor windings are made in accordance with F isolation grade. We adopt the aluminum alloy cases with heat sink design which decrease greatly the temperature rise of electric motor windings (temperature rise of most electric motor windings is between 40-60k, thereby it will ensure the safe running of electric motors.

设计特征/DESIGN FEATURES

◆ 外壳防护等级/Housing Protection Level

电机的外壳防护等级表示电机在以下两个方面的防护能力:
The housing protection level of electric motor indicates 2 protection abilities as following:
(1)防止人体接触电机内部带电或转动部分和防止固体异物进入电机内部的能力
(2)防止水进入电机内部的能力
1. The ability to prevent human contact with live or rotating parts of a motor and to prevent solid foreign matter from entering the motor.
2. Prevent water from entering into the interior of the electric motor

本公司制造的电机采用接线盒与机体一体压铸，并在外壳所有出轴及接合处均设有密封装置可以达到IP54、IP55的防护等级。(如无特别说明,默认按IP54供货)
The motor manufactured by the company is die-cast with junction box and body, and all the shaft and joint of the shell are equipped with sealing device, which can reach the protection grade of IP54 and IP55.(if not specified, supply by default as IP54)

IP54:防尘并完全防止人体触及或异物进入电机内部、防任何方向的溅水
IP54: Dustproof and avoid body touching and eyewinker entering into the interior of electric motors, as well as to prevent the spattered water from any direction.

IP55:防尘并完全防止人体触及或异物进入电机内部、防任何方向的喷水
Ip55: Dustproof and avoid body touching and eyewinker entering into the interior of electric motors, as well as to prevent the spattered water from any direction.

三相电机的变频调速/FREQUENCY INVERTER OF THREE PHASE ELECTRIC MOTOR

通过配置变频器改变三相异步电机的电压及频率，可使三相电机获得一定范围的无级速度调速。理论上电压与频率的变化必须保持一定的关系:
Through inverter, we can change the electric voltage and frequency for three phase asynchronous electric motors, which will adjust electric motors speed stepless.

当 $f<f_N$ 时电机工作于低速区，能获得低于额定转速的各种转速。为保持电机的输出转矩恒定不变，电压必须与频率作同步线性变化，即 $U/f=U_N/f_N=$ 常数。
When $f<f_N$ the electric motor operate in lowspeed area, and get the various speed will be lower than the rotate speed. To keep the output torqueinvariable, electric voltage should have synchronous and linear alteration with frequency, that is $U/f=U_N/f_N=$ constant.

当 $f>f_N$ 时：电机工作于高速区，能获得高于额定转速的各种转速。在高速区电机将作恒功率驱动，且为保持电机过载能力不变，电压与频率须保持 $U/f^{1/2}=U_N/f_N^{1/2}=$ 常数的变化规律。
When $f>f_N$ electric motor works in high-speed area, the various speed will be faster than the rotate speed. It drives with constant power in the high-speed area, and the change of electric voltage frequency should obey the rules of $U/f^{1/2}=U_N/f_N^{1/2}=$ constant.

电机在低频段 $(f<f_N)$ 工作时，由于工作电压较低，电机定子绕组本身的电压降落将大大影响电机的输

设计特征/DESIGN FEATURES

出力矩，有时甚至不能带动负载，因此实际应用中往往根据电机定转子漏阻抗(X)与定子电阻(R_S)的比值($Q=X/R_S$)提升电机的输入电压以作补偿。必须指出，电机空载时R_S上负载电流产生的压降较少，过深的电压补偿有可能导致磁路饱和，使励磁电流达到不允许的数值。

When electric motor work with low frequency($f<f_N$), due to the lower voltage, the decreased voltage of rotor winding will reducer the output torque largely. Sometimes it even cannot drive the load. Therefore in practical use, we sometimes raise the input voltage according to the ratio(($Q=X/R_S$)of motor stator rotor leaking impedance (X) and the stator resistance(R_S)as compensation. We must indicate that the voltage of electric motors without load will decrease slightly. Too much increase of voltage compensation will make magnetism route saturated. And the current may be over the allowed value.

电机在高频段($f>f_N$)工作时，由于电机的工作电压超过额定电压是不允许的,因此在实际使用中,随着频率的升高，电机电压往往不会升高，而维持额定电压U_N不变。一下图表示电机在变频调速时实际的电压与频率关系。

When electric motor work in high frequency($f>f_N$), the work voltage of electric motor is not allowed to over the rated voltage, therefore, in the practical usage, the voltage of electric motor won't rise up with the frequency rising up but keep the rated voltage U_N The following picture shows the relationship of practical voltage and frequency of electric motor when we adjust the speed by inverter:
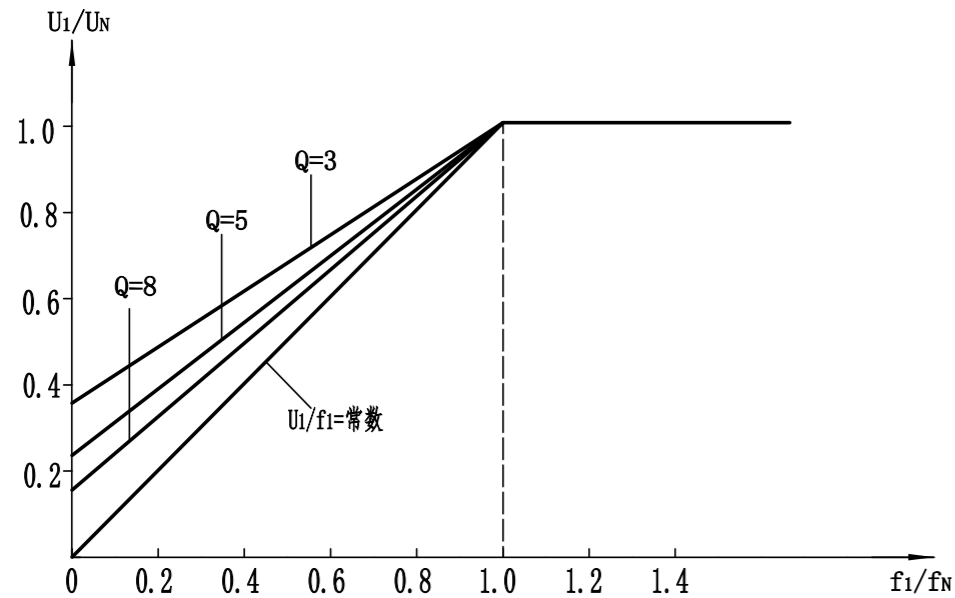
下图曲线表示额定频率为50Hz的电机在进行变频调速时的输出转矩转速特性

. The following diagram describes the performance of output toque speed when a electric motor(with rated frequency 50Hz)adjust the speed by inverter
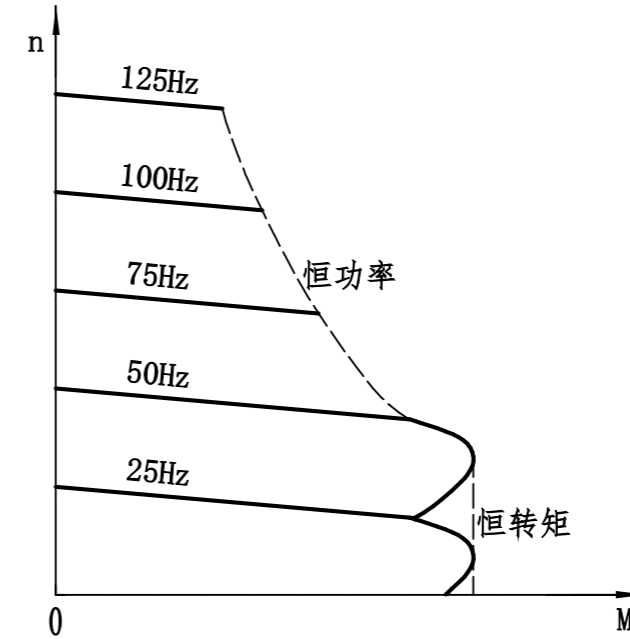
本公司的通用三相电机能够配置变频器进行变频调速操作。在低频工作区工作时，由于电机转速的降低而使电机原有设计的风冷系统的冷却作用降低，电机温升将会上升在高频区操作时，过高的转速将使冷却风扇消耗更多的功率，并且大大增加电机的运行噪声。另外,由于变频电源的输出电压为高频脉冲，高次谐波成份较多，并会对电机的工作噪声及绕组带来有害的影响。因此我们建议：在进行变频操作时电机最好采用较高的绝缘等级，最好加装独立的冷却风扇。

The company's general three-phase motor can be configured with frequency converter frequency control operation .In the low-frequency working area, the cooling effect of the original air cooling system designed by the motor will be reduced due to the reduction of the motor speed, and the temperature rise of the motor will rise. When operating in the high-frequency area, the excessive speed will make the cooling fan consume more power and greatly increase the motor operating noise .In addition, the output voltage of frequency conversion power supply is high-frequency pulse, high order harmonic components are more, and will bring harmful influence to the motor's working noise and winding. Therefore, we suggest that the motor should adopt a higher insulation grade and install an independent cooling fan when carrying out frequency conversion operation.

特别引起注意的是，过高的频率将使电机铁芯涡流损耗加大，电机在10~100Hz内运行时是可靠的。

Please note it specially: too high frequency may enlarge whirlpool wastage of electric rotor core. When the voltage is over 120HZ, it is better to adopt special frequency conversion motors, Special use frequency conversion motors have a better performance in timing scope etc.

轴负荷及旋转精度 /Axle load and rotational precision

◆ 输出轴许可径向加载力

设计特征/DESIGN FEATURES

电机输出轴中点的许可径向加载力F_r(N)与电机的轴承寿命及工作转速有关。以下表格分别列出轴承使用寿命按20000小时及40000小时计算时的各型电机输出轴的最大许可径向加载力：

◆ **Allowed radial load force on output shaft**

Allowed radial load force F_r(N)at the mid-point of motor output shaft is related with the bearing life and the rotational speed of motor. The Max, allowed radial load force on each size motor output shaft has been listed in following table calculated in accordance with different bearing life of 20000 hours and 40000 hours.
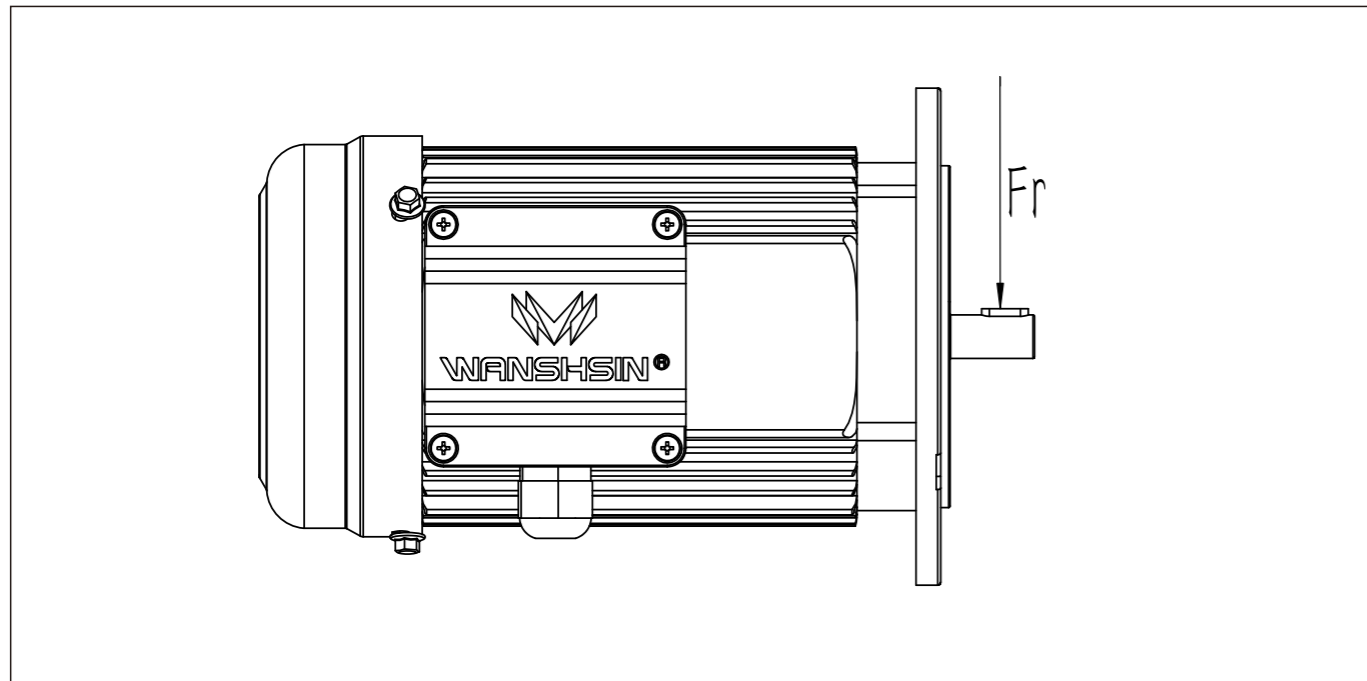
电机规格 MOTOR SIZE	20000h	40000h
	4p	4p
250/400	520	410
550/750	840	660
1100/1500	900	720
2200/3000	1250	1000

-Fr值在各个方向均相同；
-当径向力与轴向力同时施加时，许可的轴向力为径向的1/5；
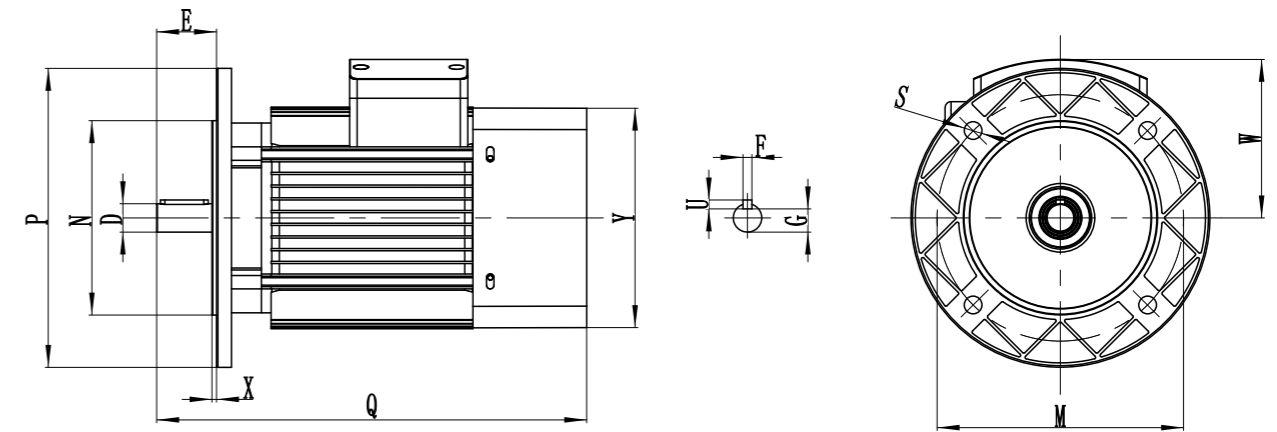-Fr value is the same in every direction.
-Allowed axial force is 1/5 of radial force when they load together.
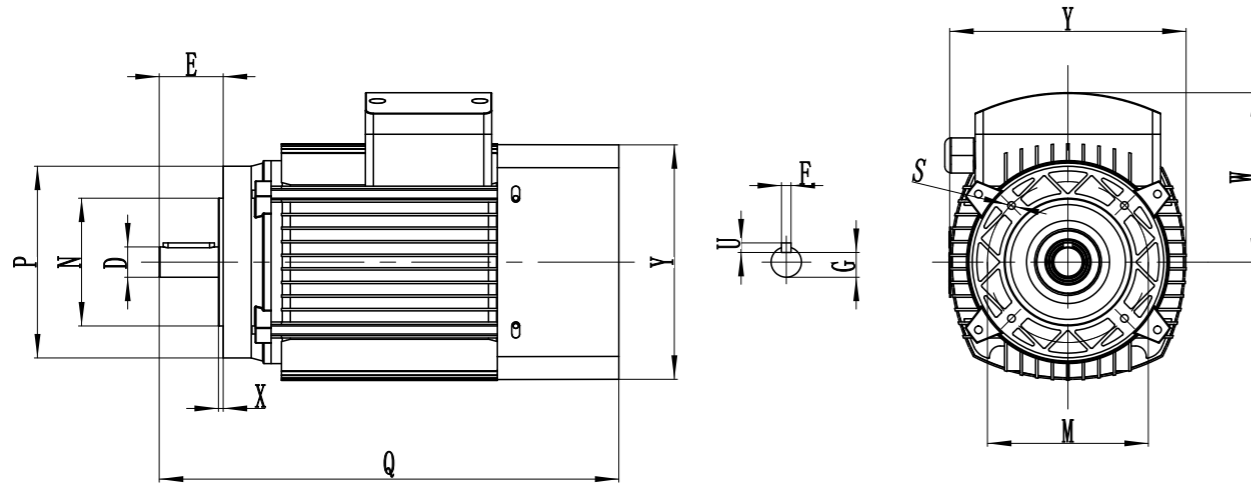

电机尺寸图表 /MOTOR SIZE DIAGRAM

B5电机尺寸图表/B5 Motor Size Diagram

电机型号B5 Motor model No.B5	输出功率 Power	外形尺寸/Drawing Size				安装尺寸/Installation Size				轴伸尺寸/Shaft Extension Size				
		Y	W	Q	P	N	X	M	S	E	F	D	G	U
YS5614-B5	60W	117	93	197	120	80	2.5	100	7	20	3	9	7.2	3
YS5624-B5	90W													
Y2-63M1-4-B5	120W	125	95	215	140	95	3	115	10	23	4	11	8.5	4
Y2-63M2-4-B5	180W													
Y2-71M1-4-B5	250W	140	108	245	160	110	3.5	130	10	30	5	14	11	5
Y2-71M2-4-B5	370W													
Y2-80M1-4-85	550W	156	118	280	200	130	3.5	165	12	40	6	19	15.5	6
Y2-80M2-4-85	750W													
Y2-90S-4-B5	1100W	174	125	312	200	130	3.5	165	12	50	8	24	20	7
Y2-90L-4-B5	1500W	174	125	336	200	130	3.5	165	12	50	8	24	20	7
Y2-100L1-4-B5	2200W	194	145	390	250	180	4	215	15	60	8	28	24	7
Y2-100L2-4-B5	3000W													
Y2-112M-4-B5	4000W	218	153	400	250	180	4	215	15	60	8	28	24	7
Y2-132S-4-B5	5500W	256	188	463	300	230	4	265	15	80	10	38	33	8
Y2-132M-4-B5	7500W	256	188	500	300	230	4	265	15	80	10	38	33	8

电机尺寸图表 /MOTOR SIZE DIAGRAM

B14电机尺寸图表/B14 Motor Size Diagram

电机型号B14 Motor model No.B14	输出功率 Power	外形尺寸/Drawing Size				安装尺寸/Installation Size				轴伸尺寸/Shaft Extension Size				
		Y	W	Q	P	N	X	M	S	E	F	D	G	U
YS5614-B14	60W	117	93	197	80	50	2.5	65	5	20	3	9	7.2	3
YS5624-B14	90W													
Y2-63M1-B14	120W	125	95	215	90	60	2.5	75	5	23	4	11	8.5	4
Y2-63M2-B14	180W													
Y2-71M1-B14	250W	140	108	245	105	70	2.5	85	6	30	5	14	11	5
Y2-71M2-B14	370W													
Y2-80M1-B14	550W	156	118	280	120	80	3	100	6	40	6	19	15.5	6
Y2-80M2-B14	750W													
Y2-90S-B14	1100W	174	125	312	138	95	3	115	8	50	8	24	20	7
Y2-90L-B14	1500W	174	125	336	138	95	3	115	8	50	8	24	20	7
Y2-100L1-B14	2200W	194	145	390	160	110	3.5	130	8	60	8	28	24	7
Y2-100L2-B14	3000W													

电机性能/PERFORMANCE

性能参数/Performance Parameter

型号 TYPE	功率 POWER (KW)	转速 N_N (R/MIN)	电流 $I_N(A)$	功率因数 COSΦ	额定转矩 M_N (N.M)	启动转矩倍数 M_{ST}/M_N	最大转矩倍数 M_{MAX}/M_N	启动电流倍数 I_S/I_N	效率 η (%)
4P									n_0=1500r/min
Ys5614	0.06	1400	0.28	0.58	0.41	2.4	2.4	6	56
Ys5624	0.09	1450	0.39	0.61	0.614	2.4	2.4	6	58
Y2-63M1-4	0.12	1400	0.43	0.72	0.819	2.1	2.2	4.4	57
Y2-63M2-4	0.18	1400	0.61	0.73	1.23	2.1	2.2	4.4	60
Y2-71M1-4	0.25	1400	0.76	0.74	1.71	2.1	2.2	5.2	65
Y2-71M2-4	0.37	1400	1.07	0.75	2.53	2.1	2.2	5.2	67
Y2-80M1-4	0.55	1400	1.54	0.75	3.75	2.4	2.3	5.2	71
Y2-80M2-4	0.75	1400	1.99	0.76	5.12	2.3	2.3	5.2	73
Y2-90S-4	1.1	1420	2.80	0.77	7.40	2.3	2.3	6	75
Y2-90L-4	1.5	1420	3.65	0.79	10.1	2.3	2.3	6	78
Y2-100L1-4	2.2	1420	5.05	0.81	14.8	2.3	2.3	7	80
Y2-100L2-4	3	1420	6.64	0.82	20.2	2.3	2.3	7	82
Y2-112M-4	4	1440	8.62	0.82	26.5	2.3	2.3	7	84
Y2-132S-4	5.5	1400	11.5	0.83	36.2	2.3	2.3	7	85
Y2-132M-4	7.5	1450	15.3	0.84	49.4	2.3	2.3	7	87

接线盒位置/TERMINAL BOX DIRECTION
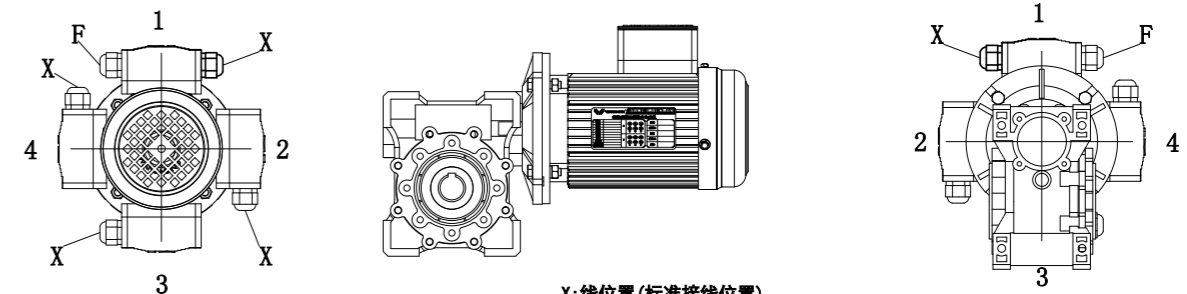
X:线位置(标准接线位置)
F:反向出线
X:Wire inlet direction(standard wire inlet direction)
F:Reverse wire inlet

安装方位/INSTALLATION AZIMUTH

B3

V5

V6

B6

B8

B7
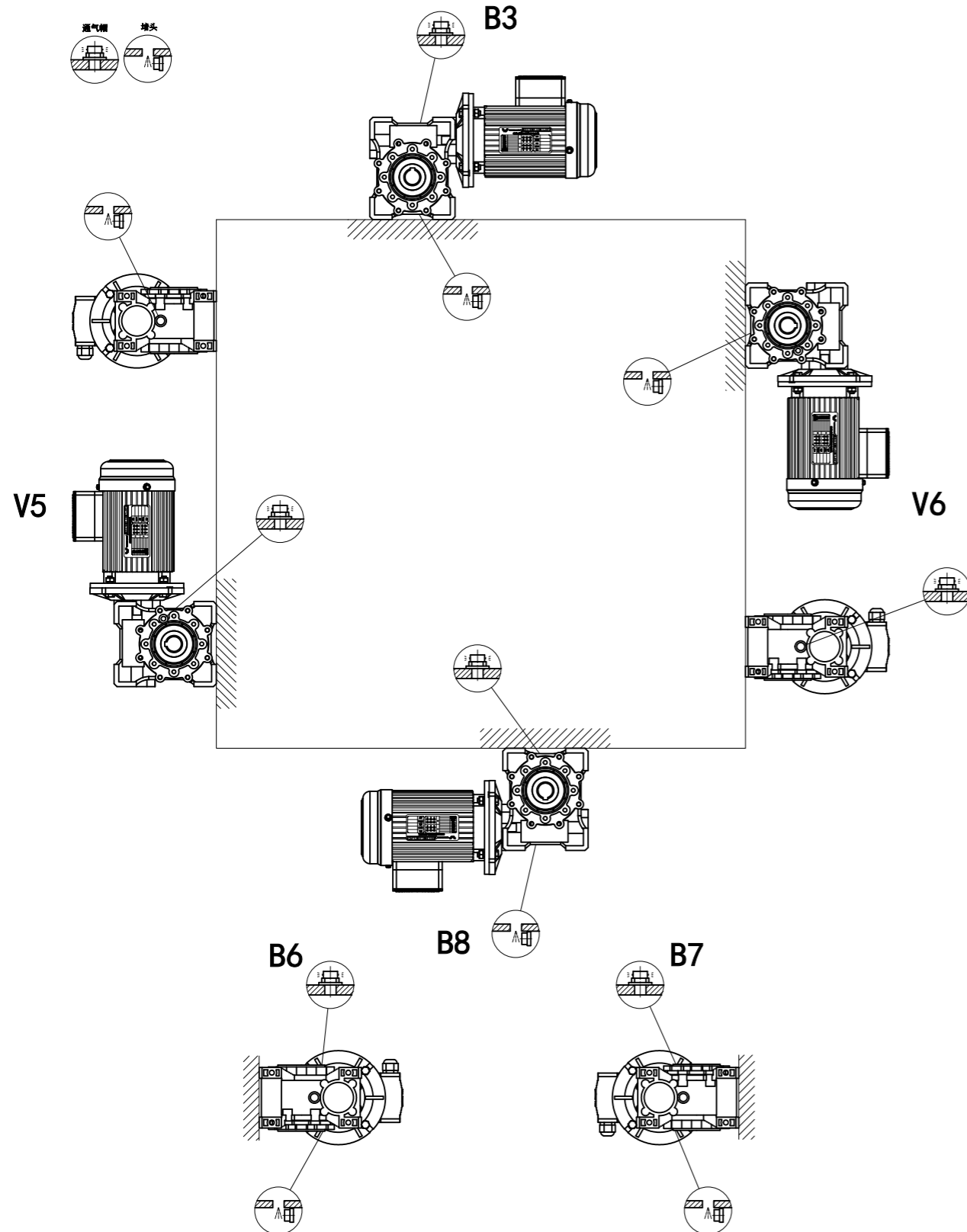
安装方法/INSTALLATION METHODS

使用限制/Service Restriction

这本样本给出的参数基本上是按B3安装方位来编的。对于其他安装方位和输入转速，请参考下面表格中相应参数。当遇到下列应用情况时，如有必要请与我们技术服务人员联系。

Parameters given in this brochure were basically according to B3 mouting direction, for other mouting directions, please refer to the corresponding parameters listed in below table.
During the actual application, when encountering the following situations, please contact our technical service if necessary.

1.在原有上提高转速时，

2.应用在惯性特别大的设备上时；

3.应用在如升降机(需要自锁考虑)时；

4.当减速机出现故障有可能会对操作者造成危害时；

5.应用在减速机过度疲劳状态时；

6.工作环境温度低于-5℃或高于40℃时；

7.在化学腐蚀环境中使用时；

8.在盐性环境中使用时；

9.在辐射性高的环境中使用时；

10.在环境气压不在正常大气压力下使用时；

11.安装方位在这样本中没有被提到。

1. When speed is increasing;
2. Applied to equipment with particularly large inertia;
3. Applied in lift when needs self-locking:
4. When the gear motor fails, it may cause harm to the operator.
5. Gear motor is over use.
6. Working environment temperature is lower than - 5 ° C or higher than 40 ° C.
7. Used in a chemically corrosive environment.
8. Used in a salty environment.
9. Used in radioactive environments.
10.Use in an abnormal ambient pressure.
11.Mounting positions not envisaged in the catalogue.

避免把减速机部分或整台浸入水中或其他液体中。

Avoid immersing part or whole of gear motor in water or other liquids.

减速机承受的最大负载扭矩不能超过两倍于性能参数表中规定的正常扭矩(当服务系数fs=1时);这里最大负载扭矩是指承受瞬间短暂的过载,他出现在过载启动、刹车、振动或其他动态操作环境中。

The maximum torque of the gear motor must not exceed twice the normal torque specified in the performance parameter table (when the service factor fs = 1); The maximum load torque here is to withstand transient overload, which appears in overload start, brake, vibration or other dynamic operating environment.

Worm Reducer	025	030	040	050	063	075	090	110	130
V5:1500<n1<3000	–	–	–	–	–	B	B	B	B
n1>3000	B	B	B	B	B	A	A	A	A
v6	B	B	B	B	B	B	B	B	B

A.不被推荐的使用方式

B.需要确定应用情况合适性或与我们技术服务人员联系

A. Application not recommended

B. Check the application suitability with/or call our technical service

安装使用与保养/INSTALLATION USAGE MAINTENANCE

Worm Reducer 系列安装使用与保养/ WRW Installation Usage Maintenance

安装减速机时要注意以下一些事项:

(1) 减速机与机械设备装配之前,要检查减速机输出端的旋转方向是否正确;

(2) 减速机与原动机、设备装配之前,应检查各轴径、孔径、键和键槽的偏差尺寸,避免装配过紧、过松影响减速机性能;

(3) 减速机必须牢固地安装在机械设备上,避免有松动或振动;

(4) 尽可能地避免减速机暴露在烈日阳光下和恶劣环境中;

(5) 如果减速机存放时间长达4-6个月,应检查油封是否浸润在润滑油中,可能油封唇口会粘在轴上,甚至失去了弹性,由于适合的弹性是油封必须的工作条件,所以推荐更换油封;

(6) 所有橡胶件和透气孔不能沾有油漆;

(7) 与减速机的空心轴或实心轴配合连接时,应在轴上配合部分涂上润滑油,以免卡死或氧化;

(8) 使用时必须检查油位(如油位镜孔或打开油塞,小型号是没有的);

(9) 使用新减速机时,不能满负载起动,应该逐步增大负载;

(10) 使用各类电机直连型减速机时,若电机重量偏大,应设支撑装置;

(11) 确保电机风扇附近有良好的通风环境,以免影响散热效果;

(12) 减速机的标准工作环境温度是-5℃至40℃,如果不在这范围时,请与我们技术服务人员联系。

Installation Precaution:

(1) Check whether the rotation direction of the output shaft is correct before assembling the reducer and the mechanical equipment.

(2) Before assembling the gear motor and prime mover and equipment, check the deviation dimensions of each shaft diameter, hole diameter, key and key way to avoid over-tightening and looseness affecting the performance of the gear motor

(3) The gear motor must be firmly installed on the mechanical equipment to avoid loosening or vibration.

(4) Avoid being exposed to the hot sun and harsh environment.

(5) If the gear motor is stored for 4-6 months, check whether the oil seal is wetted in the grease. The grease seal lip may stick to the shaft or even lose its elasticity. Since the suitable elasticity is the working condition necessary for the oil seal, It is recommended to replace the oil seal.

(6) When connected with the hollow shaft or the solid shaft, please grease the joint to avoid jamming or oxidation.

(7) Check oil level during use (such as indicator or open oil plugs, small models are not available).

(8) The gear motor should be start at gradually increasing load instead of full load.

(9) When using direct-connected gear motor, support devices should be provided if the motor is heavy.

(10) Ensure that there is a good ventilation environment to avoid affecting the heat dissipation effect.

(11) Ensure the motor cools correctly by assuring good passage of air form the fan side.

(12) In the case of ambient temperatures <-5'C >+40'c, please call the Technical Service.

使用须知/INSTRUCTIONS

使用须知/Instruction

工作环境温度不在表中范围内,请与我们技术服务人员联系。

(1)当工作环境温度低于-30℃或高于60℃时,必须使用特殊材质的油封。

(2)当工作环境温度低于0℃时,必须考虑下列情况:

● 选用的电机必须在低温下能正常工作;

● 电机的功率必须满足在低温下有较大启动力矩要求;

● 如果减速机箱体的材质是铸铁,在温度-15℃以下时,箱体会变得很脆,要注意尽量避免撞击;

● 在开始使用阶段时,由于润滑油的粘度很高,可能会产生一些问题,所以刚开始启动时最好让它空载运转几分钟。减速机运转大约10000小时后,应更换润滑,换油频率按减速机实际运行情况和工作环境条件而定。

(3) 所有规格减速机在出厂时已加注了润滑油。

(4)WRW系列的减速机,在特定的工作环境,需配排气阀(可选配件)。

(5)对于齿轮箱,首次换油必须在工作大约300小时(齿轮磨合期)后进行,在换油时应使用合适的清洗剂小心地冲洗齿轮箱,不得将矿物油和合成油混合。

(6)每3000工作小时,最低程度每半年,应检测油以及油位,油封密封不严引起滴漏的常规检测,若是IEC输入的减速机,则检测检查弹性体,必要时进行更换。

(7)根据不同的工作条件(见下图)而定,最长每三年检测一次,更换矿物油,更换轴承润滑油脂。

(8)根据不同的工作条件而定,更换输出轴上的油封。

(9)产品出现故障时,不要拆卸部件,与本公司售后服务部门联系(需提供减速机规格、出厂日期、编号、已使用时间、主机名称、主机生产单位和故障类型)后,再采取合理的措施。

In cases of ambient temperature not envisaged in the table, please call our Technical Service.

1 When the working environment temperature is below -30 ℃ or above 60 ℃, use a special material oil seal.

2 When the working environment temperature is lower than 0 °C, the following must be considered:

● Motor must work properly at low temperature.

● Motor must meet the requirements of large starting torque at low temperature.

● If gear motor material is cast iron, the case will become very brittle when the temperature is below -15 °C, so be careful to avoid impact.

● In initial use stage, there may be some problems due to the high viscosity of the lubricating oil, so it is best to let it run for a few minutes at no load. The grease change frequency depends on the actual operation and the working environment after working 10,000 hours.

3 The reducer of all specifications has been filled with lubricating oil when leaving the factory.

4 WRW series worm gearbox should mount breather plug(optional parts)under special working condition.

5 For gearboxes, the first oil change must be after approximately 30 hours of operation (gear running-in period). Clean the gearbox with a suitable lotion and do not mix mineral oil with synthetic oil.

6 Every 3000 working hours or at least 6 months, you need check the oil,oil level and routine check if there is lubricant leak which caused by oil seal not tight.

7 Depending on the operating conditions (as chart below), every 3 years at the latest for inspection is needed. Replace mineral grease and replace the bearing grease.

8 Replace the output shaft oil seal depending on the working conditions.

9 Once the malfunctions appear, stop disassembling the parts, and firstly please contact the customer service(the information about specification, delivery date, series number, usage time, machine name, machine manufacturer, malfunction problems is required), then take the reasonable measures.

润滑油/LUBRICATION

润滑油加注量/Lubricant Filling Amount

减速机型号/Gear Unit	加注量 Fill Quantity Liters	单位：升（L）
025	0.02	
030	0.042	
040	0.081	
050	0.153	
063	0.30	
075	0.58	
090	1.02	
110	3.02	
130	4.55	

蜗轮蜗杆减速机所加润滑油一般采用--蜗轮蜗杆减速机专用320#润滑油，上图所规定的加注量为参考值。精确值的变化与级数和传动比有关。请您在加注润滑油时一定要注意油位螺栓所指示的精确油量后根据安装方式相应调整加注润滑剂。
The lubricating oil added to the reducer of WRW is generally used -- 320# lubricating oil specially used for the reducer of worm gear and worm shaft. The filling amount specified in the figure above is the reference value. The exact value varies with the series and the transmission ratio. Please pay attention to the exact amount of oil indicated by the oil level bolt when filling lubricating oil. When adjusting the installation mode later, you must adjust the filling lubricant according to the changed installation mode.

订货须知 /ORDERING NOTICE

存放/Storage

(1)有顶棚,防雨雪,无振动。
(2)在设备和地面之间垫放木块或其他材料。
(3)开箱后暂不使用的减速机在其加工表面涂上防锈油,并应及时放回包装箱内。
(4)在定期检查的情况下,两年以及更长时间。在进行检查时,应检查清洁度和机械损伤,检查防锈层是否完好。
(1)Under roof, protected against rain and snow, no vibration.
(2)Underlay the block and other material between the ground and equipment.
(3)The gear motor that is not used after unpacking should be coated with anti-rust oil on its processing surface, or put back into the package in time.
(4)Two years or more given regular inspections. Check for cleanliness, mechanical damage and anti-rust layer.

订货须知/ Notice for order

●订货时请根据使用需要的转速范围,输出转矩,结构形式,对照性能参数、尺寸表、安装和操作方位图,合理选择机型,写明型号标记(下单时是否带电机请说明,一般按不带电机供应)。订货时选择的安装方位应与安装方法一致,不然容易造成漏油,影响使用寿命,若安装方位特殊请另加说明。
●订货时请尽量选择本目录内的标准产品,如有特殊要求或配用特殊电机请附加说明。
●Please refer to the sheet of performance parameter, WRW series dimensions, Mounting and operation positions diagram, make reasonable choice of model, and write down model mark to your required revolution scope, output torque and structural from on ordering(when ordering, you should show whether the reducers are equipped with motors, otherwise reducers aren't with motors).Make sure the install direction is same as the instruction, otherwise it will cause oil leakage and shorten the lifespan of motor, any special installation should be clarified.
●Please make the best choice of standard products in this catalogue and give an additional explanation for your special requirement and motors.

运转故障 / MALFUNCTIONS

减速机运转故障 / Gear Operation Malfunctions

故障 Malfunctions	可能的原因 Possible cause	解决方法 Solution
异常、均匀的运转噪声 Unusual,regular running noise	A. 滚动/碾压噪声:轴承损坏 B. 冲击型噪声齿轮啮合不均匀 A. Meshing/grinding noise: Bearing damage. B. Knocking noise: Irregularity in the gearing	A. 检测润滑油,更换轴承 B. 请向客户服务部咨询 A. Check the oil, change bearings B. Contact customer service
异常、均匀的运转噪声 Unusual,regular running noise	机油中有异物 Foreign bodies in the oil	A. 检测润滑 B. 停止运转传动装置,向客户服务部咨询 异常、不均匀的运转噪声 A. Check the oil B. Stop the drive, contact customer service
机油泄漏 A. 在减速机盖上 B. 在电机凸缘上 C. 在电机轴密封圈上 D. 在减速机凸缘上 F. 在输出端轴密封圈上 Oil leaking A. From the gear cover plate B. From the motor flange C. From the motor oil seal D. From the gear unit flange F. From the output end oil sea	A. 减速机底座上的橡胶密封发生渗漏 B. 密封圈损坏 C. 减速机没有排气 A. Rubber seal on the gear cover plate leaking B. Seal defective C. Gear unit not vented	A. 拧紧各个外盖上的螺钉并且观察减速机。如果机油继续泄露,请向客服服务部咨询 B. 请向客户服务部咨询 C. 给减速机排气参见安装方式) A. Tighten the bolts on the gear cover plate and observe the gear unit. Oil still leaking: Contact customer service B. Contact customer service C. Vent the gear unit (see "Mounting Positions")
机油从排气阀门旁渗出 Oil leaking from breaking valve	A. 机油太多 B. 传动装置安装方式错误 C. 频繁冷起动(机油起泡沫)和/或者较高的油位 A. Too much oil B. Drive operated in incorrect mounting position C. Frequent cold starts(oil foams) and/or high oil lever	A. 修正油量(参见"润滑油) B. 正确安装排气阀并且矫正油位(参见安装方式) A. Correct the oil level("see Sec. Inspection and Maintenance") B. Mount the breather valve correctly (see Sec. "Mounting Positions") and correct the oil level (see"Lubricants")
尽管电机在运转或者传动轴已经被驱动,但是传动轴不转动 Although the motor is running or the shaft has been driven, the shaft does not rotate	减速机中的轴轮毂联接断裂 Connection between shaft and hub in gear unit interrupted	将减速机或减速电机送修 Send in the gear unit/gearmotor for repair

● 在磨合试运转阶段(24小时的运转时间内,轴密封圈有可能出现短期内的漏油油脂的现象
Short-term oil/grease leakage at the oil seal is possible in the run-in phase (24 hours running time)

运转故障 / MALFUNCTIONS

电机运转故障 / Motor Malfunctions

前提：1.发生故障时，先对照如下目录的故障排除表进行处理，不能自行处理的，请联系当地经销商。

解决：2.电机保修12个月，如因客户拆装或所带负载原因损坏，我司将收取维修成本费用。

Premise: 1. In case of failure, first deal with it according to the troubleshooting table in the following catalogue. If you cannot deal with it by yourself, please contact the local dealer.

Remedy: 2. The motor is guaranteed for 12 months. If the motor is damaged due to customer disassembly or load, our company will charge the maintenance cost

故障 Malfunctions	可能的原因 / Possible reasons	解决方法/Remedy
异音 Abnormal noise	风叶擦风罩 / The blades wipe the hood	将风叶/风罩扳正，或更换变型零部件 Straighten the blade/hood or replace the modified parts
	轴承坏/Bearing broken	更换轴承/ Replace shaft
	电机缺相运行：电源接触不良 Motor out of phase operation: poor power contact	电工修复触点及电源线路/ Electrician repairs contacts and power lines
	电机缺相运行：线圈断路 Motor out of phase operation: coil circuit broken	更换定子线圈/ Replace stator coil
	定转子擦 / Rotor rub	更换电机/ Replace motor
	转子断条 / Rotor bar breaking	更换转子/ Replace rotor
	线圈内有一个线苞嵌反/Inside the coil, a wire bract is inverted	更换定子线圈/ Replace stator coil
温度高 High temperature	负载过大/频繁启停 Excessive load/frequent start-stop	选择大容量电机或减轻负载/ Choose large capacity motor or reduce load
	风道阻塞/ Air duct obstruction	清除风道油垢/ Remove grease from duct
	环境温度增高：太阳下暴晒/附近有其它高温热源 Ambient temperature increase: sun exposure/ Has other hot reservoirs nearby	应采用遮阳或降温措施/ Shading or cooling measures should be used
	电机缺相运行：电源接触不良 Motor out of phase operation: poor power contact	电工修复触点及电源线路/ Electrician repairs contacts and power lines
	电机缺相运行：线圈断路 Motor out of phase operation: coil circuit broken	更换定子线圈/ Replace stator coil
	绕组匝间或相间短路：电流猛增 Winding turns or interphase short circuit: surge of current	更换定子线圈/ Replace stator coil
	电源电压波动超10%：电流超标 Power supply voltage fluctuation of more than 10%:excess current	电工采用稳压措施，或选用大容量电机 Electricians use voltage stabilizing measures, or choose large - capacity motor
	接法错误，Y接法与△接法用反/Connect method error, should be △ connect method wrong use for Y connect	接法更正/ Correct connection
	定转子擦 /Rotor rub	更换电机/Replace motor
	转子断条 /Rotor bar breaking	更换转子/Replace rotor
电机外壳带电 Motor housing charged	电源线碰机壳，且绝缘皮破损/The power cord touches the casing, and the insulation is damaged	电工排查维修/ Electrician inspection and maintenance
	绕组受潮、绝缘老化、接地装置坏 Winding damp, insulation aging, grounding device is bad	换定子线圈，重装接地线/ Replace stator coil, Reinstall the ground wire
三相电流 不平衡 Imbalance three-phase current	三相电压不平衡/Imbalance three-phase current	电工维修电源电压/ The electrician maintains the power supply voltage
	线圈部分线圈短路/ Part of coil short circuit	更换定子线圈/ Replace stator coil
	线圈内有一个线苞嵌反 Inside the coil, a wire bract is inverted	更换定子线圈/Replace stator coil

运转故障 / MALFUNCTIONS

电机运转故障 / Motor Malfunctions

故障 Malfunctions	可能的原因 / Possible reasons	解决方法/Remedy
电流过大 Excessive current	电源电压偏差大/ Large power supply voltage deviation	电工维修电源电压/ The electrician maintains the power supply voltage
	接法错误，应是Y接法错用为△接/Connect method error, should be △ connect method wrong use for Y connect	接法更正/ Correct connection
	定转子擦/Rotor rub	更换电机/Replace motor
	负载过大/The load is too large	选用大容量电机或减小负载/ Choose large capacity motor or reduce load
电机不转 Motor not working	电源未接通或接触不良或电源电压过低 The power supply is not connected or in poor contact or the power supply voltage is too low	电工人员排查维修/ Electrician checks and repairs
	负载过大/Too many connections	选择大容量电机或减轻负载/ Choose large capacity motor or reduce load
	减速箱卡死/Gearbox stuck	更换减速箱/Replace the gearbox
	电机卡死/Motor stuck	更换电机/Replace the motor
	接法错误，应是△接法错用为Y接 / Connect method error, should be △ connect method wrong use for Y connect	接法更正/ Method of correction
	定子绕组断路 Short-circuit between stator windings	用万用表欧姆档检查，若有相无电阻，则是此原因，确认后换线圈绕组 Check with the ohm of multimeter. If there is any phase and no resistance, it is the reason. Change the coil winding after confirmation
	定子绕组匝间短路 Electronic winding turns short circuit	用万用表欧姆档检查，若有相电阻与标准值偏差大于10%，则是此原因，确认后换线圈绕组/Check with the ohm of the multimeter. If there is a deviation between the phase resistance and the standard value greater than 10%, it is the reason. After confirmation, change the coil winding
	定子绕组对地短路 Stator winding shorted to ground	用万用表欧姆档检查，若线圈与机壳间有电阻小于1000欧，则是此原因，确认后换线圈绕组/Check with the ohm of the multimeter. If the resistance between the coil and the housing is less than 1000 ohm, this is the reason. Change the coil winding after confirmation
	定子绕组接线错误/ Wrong connection of stator winding	拆开电机找出错误，重新接线 Disassemble the motor to find errors and rewire it
	定子线圈的6引线接错 6 leads of stator coil are connected incorrectly	换定子线圈/ Stator exchange coil
转速远低 于额定值 Revs well below rating	电压过低/ Voltage below level	用万用表测电动机输入电压，电工人员排查维 Use a multimeter to measure the input voltage of the motor
	负荷过大/Supercharge	若电流大于额定值10%，则是此原因，选用大容量电机 If the current is more than 10% of the rated value, this is the reason, choose large capacity motor
	转子断条/ Rotor bar breaking	更换转子/ Replacement of the rotor
震动 Shake	电机装配螺钉松动/ Motor assembly screw loosens	拧紧螺钉/ Tighten screw
	转子不平衡量大/ The rotor is uneven	更换转子/ Replacement of the rotor
	线圈内有一个线苞嵌反/ Inside the coil, a wire bract is inverted	更换定子线圈/ Stator coil replacement

使用需知：

1.使用中电源电压变动超过10%时，有可能烧毁电机，同时伴有出力扭力降低或异常；

2.电机超负荷运行时有可能烧毁，请在运行初次测试电机电流是否在额定电流值内。

Instructions for use

1.When the voltage of the power supply changes more than 10%, the motor may be burnt out, and the torque force is reduced or abnormal

2.The motor may burn out if it is overloaded. Please test whether the motor current is within the rated current value in the first run