

企业简介
Company profile

中研技术有限公司成立于1997年。经十多年来的快速发展，已经成为动力传动制造行业规模化、专业化设计和制造工厂。企业先后获得“高新技术企业”、浙江省工商企业信用AAA级‘守合同重信用’等荣誉称号，连续几年被当地政府评为重点工业企业。“紫光”的各类产品，已在各国各地区、各行业得到了广泛应用。“紫光”产品行销全国各地，出口全球各地区，在美国、欧盟、东南亚等地区，得到了用户广泛的认同，深受用户的好评。

Autofast Technologies Co.,Ltd. was found in 1997.After rapid development for ten years, it has become scalable and specialized manufacturer in transmission industry. The company has obtained the honors of "High and new technology enterprise", "Reliable and credible enterprise" in Zhejiang Province, "AAA Enterprise" and so on. Various product of "ZIK" are widely applied in different industries in different areas in china.ZIK products are very popular all around China, American, European Union and South-East Asia etc.

企业愿景使命

以前瞻意识持续推动优化与创新，缔造机电行业受尊重的和谐企业。

企业核心价值观

承担责任，勇于创新，尊重规则，自我成就。

我们的服务

1. 专业销售工程师为用户提供整体设计方案及时帮助用户咨询和解决用户对减速机的使用；
2. 专职售后服务人员，协助用户搞好产品与主机配套的安装、调试；
3. 向用户宣传产品使用性能及维护保养有关事项；
4. 公司备有充足的备件，保证用户设备可以得到及时的维护与检修；
5. 咨询或走访用户使用情况并做好记录，反馈相关部门；
6. 服务原则为：以最优服务、最快速度和最专业的态度，服务客户。

自动化立体仓库
Automatic Storage

“紫光”品牌专业制造的产品
Specialized product of 'ZIK' brand

通用电机、BMA系列三相异步制动电机、BMD系列三相异步制动电机、UD系列机械无级变速机、UD系列机械无级变速机与减速机组合、KM斜齿轮-准双曲面齿轮减速机、RW系列蜗轮蜗杆减速机、R系列斜齿轮减速机、S系列斜齿轮-蜗轮减速机、F系列平行轴斜齿轮减速机、K系列斜齿轮-锥齿轮减速机等各系列数千种规格的产品。并能为各行各业专业设计、制造各类非标产品、更贴近用户产品实际应用。

General purpose motors, BMA brake motor, BMD brake motor, UD variator combined with reducers, KM Helical-hypoid gear units, RW reducer, S helical-worm reducer, Fworm reducer, R helical geared parallel shaft helical reducer, K helical-spiral reducer, brake motors and numbers of products. Moreover, we can design and produce kinds of non-standard productsfor every walk of life, which is close to practical applicationof product.

多年来存在于很多行业
Exist in many industries for several years

◎石油化工 petrochemical industry
◎矿山 mine
◎冶金 metallurgy
◎陶瓷 pottery
◎橡塑 rubber and plastic
◎木工机械 woodworker machinery
◎啤酒饮料 beverage
◎及其他很多行业 many other industry
◎交通运输 transportation
◎物流设备 logistic equipment
◎环境保护 environment protection
◎粮油食品 oil and foodstuff
◎医疗器械 medical instruments
◎烟草机械 tobacco machinery

“紫光”遍布全球、全国各地。各行各业客户的成功经验，都向我们传递这样的一条信息，“紫光”产品是从研发、生产、销售和服务，完全是全面质量管理的结果。质量永远是“紫光”的中心目标，每个员工都把追求向客户提供产品质量最优的产品作为工作目标。本公司将仍然一如既往地本着“顾客至上，品质第一，不断创新，持续改进”的宗旨，不断生产出质量更优，价格更廉，打造动力传动知名品牌而努力。

“ZIK”products spread all over China and the world. The customer’s successful experience transfers us that from R&D, produce, sale and service, “zik”products are in full quality management. Quality is key aim of “zik” forever. Every employee pursue optimal product as work target. Our company will insist the tenet of “customer supreme, quality first, ceaseless innovation, continual improvement”, and continuously provide products with better quality, cheaper prices. We will struggle to make famous transmission brand.


三坐标测量仪
Three coordinates measure an instrument


加工中心
Machining Center


齿轮测量中心
Gear measuring center


数控磨齿机
Gear grinding machine


数控磨齿机
Gear Grinding Machine

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概述/SUMMARIZE

1. 概述

MRC系列小型斜齿轮减速器是我公司在模块组合体系的基础上设计的新一代减速器产品，可分别与普通IEC、制动、防爆、变频、伺服等电机组合，可在立体空间六个方位任意安装。该产品广泛适用于轻纺、食品、啤酒饮料、化工、自动化仓储设备、烟草、环保、物流等驱动领域。

1.1 产品特点

- 模块化；
- 斜齿轮传动，效率高；
- 精磨齿面，噪音低；
- 结构紧凑，设计精巧；
- 安装方式多样；
- 铝制箱体，重量轻；
- 渗碳硬齿面，经久耐用；
- 可组合多种结构形式，满足各种传动条件的需求。

MRC系列小型斜齿轮减速器共有4种机型号，功率0.12–4kW，速比3.66–54，最大扭矩120–500Nm。可根据用户要求进行任意组合（底脚、法兰）和多种安装位置的选择。

1. SUMMARIZE

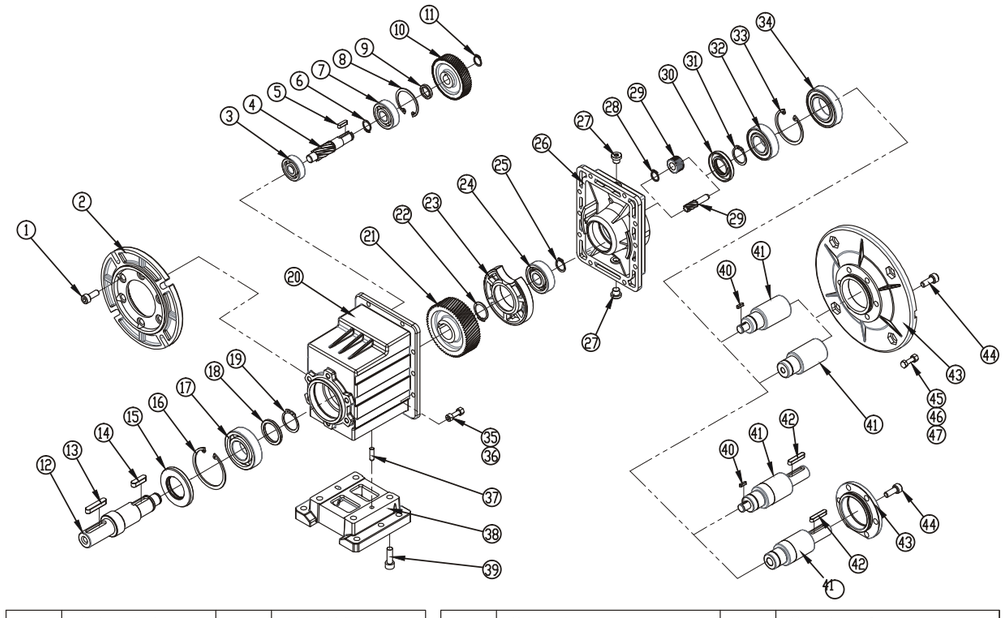
MRC Series helical gear units is a new generation mechanic-electrical integrated product, which designed basing on the modular system. It can be connected respectively with motors such as normal motor, brake motor, explosion-proof motor, frequency conversion motor, servo motor, IEC motor and so on. It can be mounted discretionary six orientation in solid space. This kind of product is widely used in drive fields such as textile, foodstuff, beverage, chemical industry, automatic arm ladder, automatic storage equipment, metallurgy, tobacco, environment0protection, logistics and so on.

1.1 Products characteristics

- Modularity;
- High efficiency;
- Low noise;
- Space effective, refined desigh;
- Universal mounting;
- Aluminium housing, light in weight;
- Gears in carbonize hard, durable;
- Multistructure, can be combined in many forms to meet needs of all kinds of transmission conditions.

MRC Series helical gear units has more than 4 types. Power 0.12-4kW; Ratio 3.66-54; Torque max 120-500Nm. It can be connected (foot, flange) discretionary and use multi-mounting positions according to custom-ers'requirements.

产品构造原理/BASIC STRUCTURE

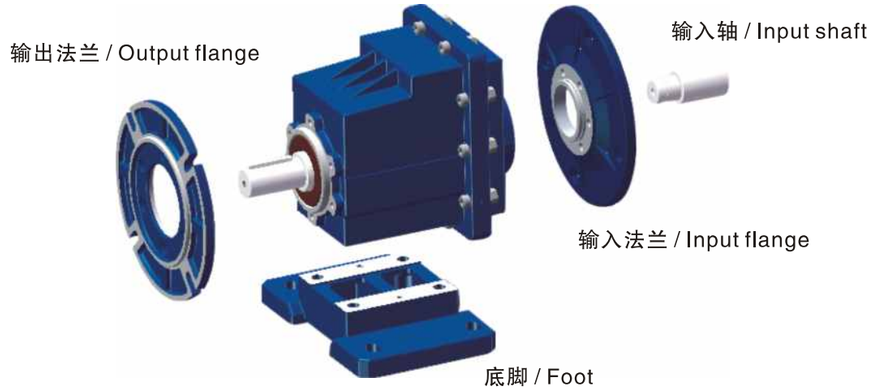


1	内六角螺钉	25	轴用挡圈
2	输出法兰	26	输入盖
3	轴承	27	油塞
4	主动齿轮轴	28	轴用挡圈
5	键	29	主动齿轮
6	挡圈	30	油封
7	轴承	31	轴用挡圈
8	孔用挡圈	32	轴承
9	间隔环	33	孔用挡圈
10	从动齿轮	34	轴承
11	轴用挡圈	35	内六角螺钉
12	输出轴	36	六角螺母
13	键	37	圆柱销
14	键	38	底座
15	油封	39	内六角螺钉
16	孔用挡圈	40	键
17	轴承	41	输入轴
18	垫圈	42	键
19	轴用挡圈	43	输入法兰
20	齿轮箱体	44	内六角螺钉
21	从动齿轮	45	六角螺栓
22	轴用挡圈	46	垫圈
23	支承座	47	六角螺母
24	轴承		

1	Socket head cap screw	25	Shaft circlip
2	Output flange	26	Input cover
3	Bearing	27	Oil plug
4	Pinion shaft	28	Shaft circlip
5	Key	29	Pinion
6	Retaining ring	30	Oil seal
7	Bearing	31	Shaft circlip
8	Hole circlip	32	Bearing
9	Spacer ring	33	Hole circlip
10	Gear	34	Bearing
11	Shaft circlip	35	Socket head cap screw
12	Output shaft	36	Hex nut
13	Key	37	Cylindrical pin
14	Key	38	Foot
15	Oil seal	39	Socket head cap screw
16	Hole circlip	40	Key
17	Bearing	41	Input shaft
18	Washer	42	Key
19	Shaft circlip	43	Input flange
20	Gear box	44	Socket head cap screw
21	Gear	45	Hex head bolt
22	Shaft circlip	46	Washe
23	Support seat	47	Hex nut
24	Bearing		

结构形式/STRUCTURE FORM

1.2 结构特点 / Structure feature



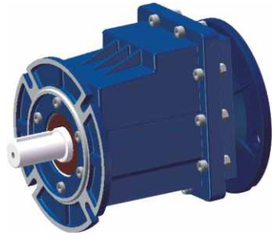
2. 产品结构 / PRODUCT STRUCTURE PICTURE



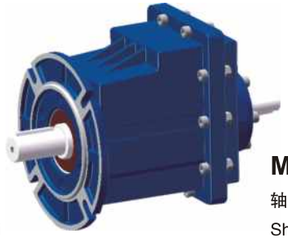
MRC..P(IEC)
底脚安装斜齿轮减速器
Foot–mounted helical gear unit



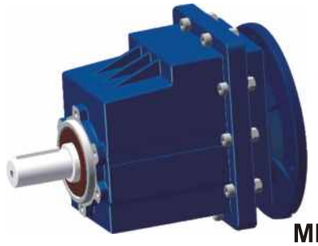
MRC..HS
轴输入底脚安装斜齿轮减速器
Shaft input foot–mounted helical gear unit



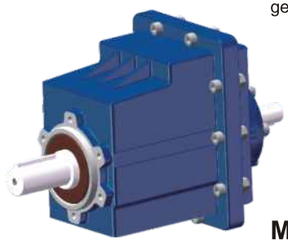
MRCF..P(IEC)
法兰安装斜齿轮减速器
Flange–mounted helical gear uni



MRCF..HS
轴输入法兰安装斜齿轮减速器
Shaft input flange–mounted helical gear unit



MRCZ..P(IEC)
B14形式法兰安装斜齿轮减速器
B14 Flange–mounted helical gear unit



MRCZ..HS
轴输入B14形式法兰安装斜齿轮减速器
Shaft input B14 flange–mounted helical gear uni

3.型号说明 / Model Illuminate

减速机/Gear unit　　电机/Motor

MRC F 02 Ⅱ – P71B5 – 28.88 – M6 / 270° – 7124(或/or0.37–4) – 220/380–50 / X

① ② ③ ④ ⑤ ⑥ ⑦ ⑧ ⑨ ⑩ ⑪

NO	说　明	Comments
1	MRC：减速器系列代号	MRC: code for gear units series
2	1).无代号表示底脚安装 2).F:B5形式法兰安装 3).Z:B14形式法兰安装	1).No code means foot-mounted 2).F:B5 flange mounted 3).Z:B14 flange mounted
3	减速器规格号01、02、03、04	Specification code of gear units 01.02.03.04
4	1).B01、M01……表示底脚代号，无法兰 2).Ⅰ、Ⅱ、Ⅲ:B5形式输出法兰规格，默认1可以不写	1).B01. M01……means foot code, without flange 2).Ⅰ,Ⅱ,Ⅲ:B5 Output flange specification, default Ⅰ not to write out is ok
5	1).IEC输入法兰 2).HS：轴输入	1).IEC input flange 2).HS: Shaft input
6	减速器传动比i	Transmission ratio of gear units i
7	M1：安装方位，默认安装方位M1可以不写	M1: Mounting positio, default mounting position M1 not to write out is ok
8	电机接线盒位置，默认位置0°（R)可以不写	Position diagram for motor terminal box, default position 0°(R) not to write out is ok
9	1).无代号表示不带电机 2).电机型号或功率、极数	1).No mark means without motor 2).Model motos (poles of power)
10	电压–频率	Voltage-frequency
11	电机进线位置，默认位置X可以不写	Coil in pssition for motor, default position X not to write out is ok

示例 Example: MRC01B01–P71B5–28.50
MRCZ03–HS–6.31
MRCF02Ⅲ-P80B14–8.78–7124–220/380–50/2

订单时请说明是否带电机，一般按不带电机供应。
When ordering, you should show whether the reducers are equipped with motores otherwise reducers aren't supplied with motors.

4.选型相关参数/RELEVANT PARAMENTER

4.1 功率P / Power P

$$P_1=\frac{P_2}{\eta}\ [kW]$$

$$P_1>=P_1*K\ [kW]$$

P_1　输入功率 Input power
P_2　输出功率 Output power
P_{1n}　电机额定功率 Rated input motor power
K　服务系数 Service factor
η　传动效率 Transmission efficiency

MRC系列斜齿轮减速器的传动是2级齿轮传动，其效率 η 为96%。
MRC Series helical gear units has 2 stage and the efficiency is about 96%。

4.2 转速 n/Rotation speed n

n_1　减速器输入转速 Gear units input speed
n_2　减速器输出转速 Gear units output speed

若是齿轮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。允许输入较高的输入转速，但在这种情况下，额定扭矩M2会下降。

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. Higher input rotation speed is permitted, but in this situation, the rated torque M2 will be reduced.

4.3 传动比 i / Transmission ratio i

$$i=\frac{n_1}{n_2}$$

传动比通常为小数，在选型表中保留两位小数。
Usually transmission ratio is decimal fraction with 2 radix point tagged in selection tables.

4.4 扭矩 M / Torque M

$$M_2=\frac{9550\cdot P_1\cdot \eta}{n_2}\ [Nm]$$

$$M_{2n}>=M_2*K\ [Nm]$$

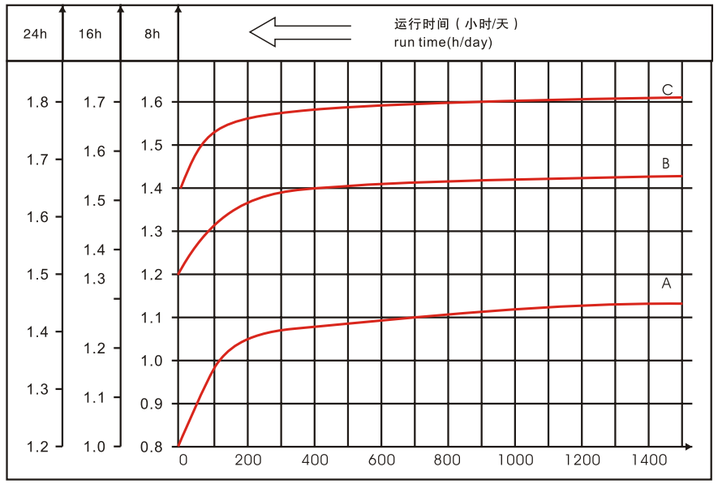
M_2　输入扭矩 Output torque
M_{2n}　额定输出扭矩 Rated output torque
P_1　输入功率 Input power
η　传动统率 Transmission efficiency
K　使用系数 Service factor

4.5 使用系数K

使用减速器时，应考虑一定的使用系数K，它是根据每天的运转时间和启停频率Z确定的。根据惯性加速系数确定三种负载类型，在下图中可以读取实际应用的使用系数，按下图选取的使用系数必须小于或等于从性能参数表中提供的使用系数。

Service Factor K

The effect of the driven machine on the gear unit is taken into account to a sufficient level of accuracy using the service factor K. The service factor is determined according to the daily operating time and the starting frequency Z. Three load classifica-tions are considered depending on the mass accel-eration factor. You can read off the service factor applicable to your application in following figure. The service factor selected using this diagram must be less than or equal to the service factor as given in the performance parameter table.



图：使用系数（k）
Fig: Service factor(k)

启动频率 z（次/小时）#
Start up frequency z (1/h) #

启动频率Z：周期包括所有启动、制动的次数以及变速电机高低速变化时的次数。

starting frequency z: the cycles include all starting and braking procedures as well as change overs from low to high speed.

4.5.1 负载类型

A 均匀冲击负载，允许惯性加速系数≤0.2
B 中等冲击负载，允许惯性加速系数≤3
C 重冲击负载，允许惯性加速系数≤10
负载类型见附录。

4.5.1 Load classifications

A Uniformshock load, permitted mass acceleration factor≤0.2
B Moderate shock load, permitted mass acceleration factor≤3
C Heavy shock load, permitted mass acceleration factor≤10
Load classifications see the addendum.

4.5.2 惯性加速系数

惯性加速系数计算如下：

$$fa=\frac{Jc}{Jm}$$

4.5.2 Mass acceleration factor

The mass acceleration factor is calculated as follows:

$$fa=\frac{Jc}{Jm}$$

fa 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fa>10，请与我们技术部联系。

为了保持减速器的使用寿命，从产品样本中的性能参数表所选择的使用系数K应等于或略高于计算出的使用系数K。

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.

To keep the service-life of gear units, the use factor K selected form the catalogue must be equal or slightly higher than the calculated use factor K.

4.6 径向载荷Fr

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

4.6 Radial loads Fr

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 transmis-sion element factors fz:

传动件 Transmission element	传动附加系数 Fz Transmission element factor Fz	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：

$$Fr=\frac{M\cdot 2000\cdot fz}{(b+x)}\ [N]$$

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

当径向负荷不作用的轴中点时，按以下公式计算有效负荷：

$$FxL\le\frac{Fr2\cdot a}{(b+x)}\ [N]$$

Fr2 依据下面表格给出中底脚安装式齿轮减速器的许可径向载荷(x=L/2)[N]
a,b 减速器径向转化常量[mm]

The overhung loads exerted on the motor or gear shaft is then calculated as follows:

$$Fr=\frac{M\cdot 2000\cdot fz}{(b+x)}\ [N]$$

Fr Resulting radial load[N]
M Torque on the shaft[Nm]
d_0 Mean diameter of the mounted transmis sion element in[mm]
fz Transmission element factor

The overhung loads exerted on the motor or gear shaft is then calculated as follows:

$$FxL\le\frac{Fr2\cdot a}{(b+x)}\ [N]$$

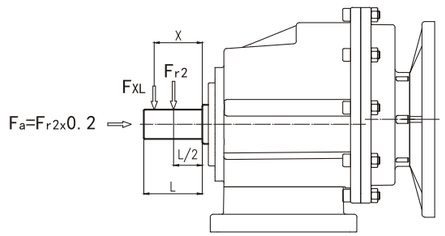
Fr2 Permitted overhung load(x=L/2) for foot-mounted gear units according to the selection tables in [N]
a,b Gear unit constant for overhung load conversion[mm]

x 轴肩到实际作用点的距离[mm]
a,b,Fr2的数值在下面表格给出：

x Distance from the shaft shoulder to the force application point in [mm]
The values of a,b,Fr2 are given in the following tables:

	MRC01	MRC02	MRC03	MRC04
a	103	116.5	130	147
b	83	91.5	100	112

输出轴径向载荷和轴向载荷 Fr2,Fa / Output shafts radial loads & axial loads Fr2,Fa



n2[min−1]		10	40	60	80	100	120	150	180	250	400
Fr2[N]	MRC01	2500	2500	2180	1980	1840	1630	1400	1320	1080	920
	MRC02	5000	5000	4370	3970	3680	3470	2710	2550	2150	1840
	MRC03	6500	6500	5550	5040	4510	3800	3530	3320	2800	2390
	MRC04	8000	8000	6590	5990	5230	4570	4240	3900	3350	2860

4.7 选型表注释 / SELECTION TABLES COMMENTS

P_{1n} [kW]	n_2 [r/min]	m_{2n} [Nm]	i	k		

表示IEC与减速器的组合是可行的
表示IEC与减速器的组合是不可行的

P1n 输入电机额定功率[kW];
n2 输出转速[r/min];
M2n 额定输出扭矩[Nm];
M2 max 最大允许输出扭矩[Nm];
i 减速器传动比；
k 使用系数；
减速器型号；
电机型号

Combination with the IEC in the header row is possible
Combination with the IEC in the header row is not possible

P1n Rated power driving motor[kW];
n2 Output speed[r/min];
M2n Rated output torque[Nm];
M2 max Permissible output torque[Nm];
i Gear unit ratio;
k Service factor;
Gear unit type
Motor type

5 选型举例 / SELECTION EXAMPLE

5.1 减速器

例：被驱动设备所需扭矩为400Nm，工作6小时/天，均匀冲击负载，启动频率400次/小时，输出转速n2=30r/min，要求减速器 ϕ200mm输出法兰安装。

查表，选使用系数K=1.05

$M2n \geqslant M2 \cdot K=400\times1.05=420[Nm]$

$$i=\frac{n1}{n2}=\frac{1400}{30}=46.67$$

查MRC系列选型表可选定减速器为：

MRCF04 II –P90B5–44.18

5.2 减速电机

例：被驱动设备所需功率为1kW，工作8小时/天，中等冲击，连续启动，输出转速n2=95r/min，减速电机要求M6底脚安装。

查表，选使用系数K=1.35

$$i=\frac{n1}{n2}=\frac{1400}{95}=14.74$$

$P1n \geqslant P1\cdot K=P2/n\cdot K=1/0.96\times1.35=1.41[kW]$

查MRC系列选型表可选定减速电机型号为：

MRCF02-P90B5-14.81-1.5-4-M6

5.1 Gear units

Example: The required torque on driven machine is 400Nm, works for 6 hours per day, Uniform shock load, start-up frequency is 400 times per hour, ϕ 200mm output flange-mounted, n2=30r/min.

see tables, K=1.05

$M2n \geqslant M2 \cdot K=400\times1.05=420[Nm]$

$$i=\frac{n1}{n2}=\frac{1400}{30}=46.67$$

Choose type:

MRCF04 II –P90B5–44.18

5.1 Gear motor

Example: The required power on driven machine 1kW, works for 8 hours per day, moderate shock load, start-up cootinnously, M6 foot-mounted, n2=95r/min.

see tables, K=1.35

$$i=\frac{n1}{n2}=\frac{1400}{95}=14.74$$

$P1n \geqslant P1\cdot K=P2/n\cdot K=1/0.96\times1.35=1.41[kW]$

Choose type:

MRCF02-P90B5-14.81-1.5-4-M6

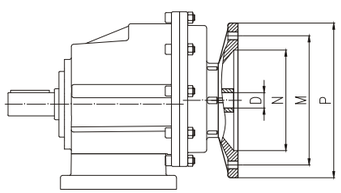
6. 速比与IEC接口 / RATIO AND IEC MOTOR ADAPTERS

MRC..01..P(IEC)				120N·M
i	63B5	71B5 71B14	80B5 80B14	90B5 90B14
53.33	■	■		
45.89	■	■		
40.10	■	■	■	
35.47	■	■	■	
28.50	■	■	■	
23.56	■	■	■	
19.83	■	■	■	■
17.86	■	■	■	■
14.62	■	■	■	■
13.80	■	■	■	■
11.90	■	■	■	■
9.81	■	■	■	■
9.17	■	■	■	■
7.72	■	■	■	■
5.69	■	■	■	■
4.63	■	■	■	■
3.82	■	■	■	■

MRC..02..P(IEC)				200N·M
i	63B5	71B5 71B14	80B5 80B14	90B5 90B14
54.00	■	■	■	
46.46	■	■	■	
40.60	■	■	■	
35.91		■	■	■
28.88		■	■	■
23.85		■	■	■
20.08		■	■	■
17.10		■	■	■
14.81			■	■
13.21			■	■
12.05			■	■
9.93			■	■
8.78			■	■
7.39			■	■
5.45			■	■
4.43				■
3.66				■

MRC..03..P(IEC)					300N·M
i	71B5	80B5 80B14	90B5 90B14	100B5 100B14	112B5 112B14
58.09	■	■	■		
50.02	■	■	■		
43.75	■	■	■		
38.73	■	■	■		
34.62	■	■	■		
28.30		■	■	■	
21.78		■	■	■	
17.33		■	■	■	■
15.06		■	■	■	■
12.37		■	■	■	■
10.28			■	■	■
7.93			■	■	■
6.31			■	■	■
5.48			■	■	■
4.50			■	■	■
3.74			■	■	■

MRC..04..P(IEC)				500N·M
i	80B5 80B14	90B5 90B14	100B5 100B14	112B5 112B14
58.09	■	■		
50.02	■	■		
43.75	■	■		
38.73	■	■		
34.62	■	■	■	■
28.30	■	■	■	■
21.78	■	■	■	■
17.33		■	■	■
15.06		■	■	■
12.37		■	■	■
10.28		■	■	■
7.93		■	■	■
6.31		■	■	■
5.48		■	■	■
4.50			■	■
3.74			■	■



IEC	63B5	71B5	71B14	80B5	80B14	90B5	90B14	100B5	100B14	112B5	112B14
D_{E8}	11	14		19		24		28		28	
P	140	160	105	200	140	200	140	250	160	250	160
M	115	130	85	165	115	165	115	215	130	215	130
N	95	110	70	130	95	130	95	180	110	180	110

7. 减速器选型表 / GEAR UNIT SELECTION TABLES

7.1 MRC..P(IEC)..性能参数 / Performance Papameter

P_{1n} [kW]	n_2 [r/min]	M_{2n} [Nm]	i	k			
0.12	26.3	42	53.33	2.9	MRC01	63B5	6314
	30.5	36	45.89	3.3	MRCF01	63B5	6314
	34.9	32	40.10	3.8	MRCZ01	63B5	6314
	39.5	28	35.47	4.3			
	49.1	22	28.50	5.4			
	59.4	18.5	23.56	6.5			
	70.6	15.6	19.83	7.7			
	78.4	14.0	17.86	7.1			
	95.8	11.5	14.62	10.4			
	101	10.8	13.80	9.2			
	118	9.4	11.90	12.8			
	143	7.7	9.81	13.0			
	153	7.2	9.17	11.1			
	181	6.1	7.72	13.2			
	246	4.5	5.69	13.4			
	302	3.6	4.63	16.5			
	366	3.0	3.82	20.0			
0.18	16.9	98	53.33	1.2	MRC01	71B5	7116
	19.6	84	45.89	1.4	MRCF01	71B5	7116
	22.4	74	40.10	1.6	MRCZ01	71B5	7116
	25.4	65	35.47	1.8			
	31.6	52	28.50	2.3			
	26.3	63	53.33	1.9	MRC01	63B5	6324
	30.5	54	45.89	2.2	MRCF01	63B5	6324
	34.9	47	40.10	2.5	MRCZ01	63B5	6324
	39.5	42	35.47	2.9			
	49.1	34	28.50	3.6			
	59.4	28	23.56	4.3			
	70.6	23	19.83	5.1			
	78.4	21	17.86	4.8			
	95.8	17.2	14.62	7.0			
	101	16.3	13.80	6.1			
	118	14.0	11.90	8.6			
	143	11.6	9.81	8.6			
	153	10.8	9.17	7.4			
	181	9.1	7.72	8.8			
	246	6.7	5.69	8.9			
	302	5.5	4.63	11.0			
	366	4.5	3.82	13.3			
	16.7	99	54.00	2.0	MRC02	71B5	7116
	19.4	85	46.46	2.3	MRCF02	71B5	7116
	22.2	74	40.60	2.7	MRCZ02	71B5	7116
	25.1	66	35.91	3.0			
	31.2	53	28.88	3.8			
	25.9	64	54.00	3.1	MRC02	63B5	6324
	30.1	55	46.46	3.7	MRCF02	63B5	6324
	34.5	48	40.46	4.2	MRCZ02	63B5	6324

P_{1n} [kW]	n_2 [r/min]	M_{2n} [Nm]	i	k			
0.25	16.9	136	53.33	0.88	MRC01	71B5/B14	7126
	19.6	117	45.89	1.0	MRCF01	71B5/B14	7126
	22.4	102	40.10	1.2	MRCZ01	71B5/B14	7126
	25.4	90	35.47	1.3			
	31.6	73	28.50	1.7			
	26.3	87	53.33	1.4	MRC01	71B5/B14	7114
	30.5	75	45.89	1.6	MRCF01	71B5/B14	7114
	34.9	66	40.10	1.8	MRCZ01	71B5/B14	7114
	39.5	58	35.47	2.1			
	49.1	47	28.50	2.6			
	59.4	39	23.56	3.1			
	70.6	32	19.83	3.7			
	78.4	29	17.86	3.4			
	95.8	24	14.62	5.0			
	101	23	13.80	4.4			
	118	19.5	11.90	6.2			
	143	16.1	9.81	6.2			
	153	15.0	9.17	5.3			
	181	12.6	7.72	6.3			
	246	9.3	5.69	6.4			
	302	7.6	4.63	7.9			
	366	6.3	3.82	9.6			
	16.7	138	54.00	1.5	MRC02	71B5/B14	7126
	19.4	118	46.46	1.7	MRCF02	71B5/B14	7126
	22.2	103	40.60	1.9	MRCZ02	71B5/B14	7126
	25.1	91	35.91	2.2			
	31.2	74	28.88	2.7			
	25.9	88	54.00	2.3	MRC02	71B5/B14	7114
	30.1	76	46.46	2.6	MRCF02	71B5/B14	7114
	34.5	66	40.60	3.0	MRCZ02	71B5/B14	7114
	39.0	59	35.91	3.4			
	48.5	47	28.88	4.2			
0.37	22.4	151	40.10	0.79	MRC01	80B5/B14	8016
	25.4	134	35.47	0.90	MRCF01	80B5/B14	8016
	31.6	107	28.50	1.1	MRCZ01	80B5/B14	8016
	38.2	89	23.56	1.4			
	26.3	129	53.33	0.93	MRC01	71B5/B14	7124
	30.5	111	45.89	1.1	MRCF01	71B5/B14	7124
	34.9	97	40.10	1.2	MRCZ01	71B5/B14	7124
	39.5	86	35.47	1.4			
	49.1	69	28.50	1.7			
	59.4	57	23.56	2.1			
	70.6	48	19.83	2.5			
	78.4	43	17.86	2.3			
	95.8	35	14.62	3.4			
	101	33	13.80	3.0			
	118	29	11.90	4.2			
	143	24	9.81	4.2			
	153	22	9.17	3.6			
	181	19	7.72	4.3			
	246	14	5.69	4.4			
	302	11	4.63	5.3			
	366	9	3.82	6.5			

P_{1n} [kW]	n_2 [r/min]	M_{2n} [Nm]	i	k			
0.37	16.7	204	54.00	1.0	MRC02	80B5/B14	8016
	19.4	175	46.46	1.1	MRCF02	80B5/B14	8016
	22.2	153	40.60	1.3	MRCZ02	80B5/B14	8016
	25.1	135	35.91	1.5			
	31.2	109	28.88	1.8			
	25.9	131	54.00	1.5	MRC02	71B5/B14	7124
	30.1	113	46.46	1.8	MRCF02	71B5/B14	7124
	34.5	98	40.60	2.0	MRCZ02	71B5/B14	7124
	39.0	87	35.91	2.3			
	48.5	70	28.88	2.9			
	58.7	58	23.85	3.5			
	81.9	41	17.10	3.9			
	24.1	141	58.09	2.1	MRC03	71B5	7124
	28.0	121	50.02	2.5	MRCF03	71B5	7124
	32.0	106	43.75	2.8	MRCZ03	71B5	7124
	36.1	94	38.73	3.2			
	40.4	84	34.62	3.6			
	15.5	219	58.09	1.4	MRC03	80B5/B14	8016
	18.0	189	50.02	1.6	MRCF03	80B5/B14	8016
	20.5	165	43.75	1.8	MRCZ03	80B5/B14	8016
	23.2	146	38.73	2.1			
	26.0	130	34.62	2.3			
	31.8	107	28.30	2.8			
	41.3	82	21.78	3.4			
0.55	31.6	160	28.50	0.75	MRC01	80B5/B14	8026
	38.2	132	23.56	0.91	MRCF01	80B5/B14	8026
	45.4	111	19.83	1.1	MRCZ01	80B5/B14	8026
	34.9	144	40.10	0.8	MRC01	80B5/B14	8014
	39.5	128	35.47	0.9	MRCF01	80B5/B14	8014
	49.1	103	28.50	1.2	MRCZ01	80B5/B14	8014
	59.4	85	23.56	1.4			
	70.6	71	19.83	1.7			
	78.4	64	17.86	1.6			
	95.8	53	14.62	2.3			
	101	50	13.80	2.0			
	118	43	11.90	2.8			
	143	35	9.81	2.8			
	153	33	9.17	2.4			
	181	28	7.72	2.9			
	246	20	5.69	2.9			
	302	17	4.63	3.6			
	366	14	3.82	4.4			
	19.4	260	46.46	0.77	MRC02	80B5/B14	8026
	22.2	227	40.60	0.88	MRCF02	80B5/B14	8026
	25.1	201	35.91	1.0	MRCZ02	80B5/B14	8026
	31.2	162	28.88	1.2			
	37.7	134	23.85	1.5			
	25.9	194	54.00	1.0	MRC02	80B5/B14	8014
	30.1	167	46.46	1.2	MRCF02	80B5/B14	8014
	34.5	146	40.60	1.4	MRCZ02	80B5/B14	8014
	39.0	129	35.91	1.5			
	48.5	104	28.88	1.9			
	58.7	86	23.85	2.3			

P_{1n} [kW]	n_2 [r/min]	M_{2n} [Nm]	i	k			
0.55	69.7	72	20.08	2.8	MRC02	80B5/B14	8014
	81.9	62	17.10	2.6	MRCF02	80B5/B14	8014
	94.5	53	14.81	3.7	MRCZ02	80B5/B14	8014
	15.5	325	58.09	0.92	MRC03	80B5/B14	8026
	18.0	280	50.02	1.1	MRCF03	80B5/B14	8026
	20.6	245	43.75	1.2	MRCZ03	80B5/B14	8026
	23.2	217	38.73	1.4			
	26.0	194	34.62	1.5			
	31.8	159	28.30	1.9			
	41.3	122	21.78	2.3			
	24.1	209	58.09	1.4	MRC03	80B5/B14	8014
	28.0	180	50.02	1.7	MRCF03	80B5/B14	8014
	32.0	158	43.75	1.9	MRCZ03	80B5/B14	8014
	36.1	139	38.73	2.2			
	40.4	125	34.62	2.4			
	49.5	102	28.30	2.9			
	64.3	78	21.78	3.6			
0.75	49.1	140	28.50	0.86	MRC01	80B5/B14	8024
	59.4	116	23.56	1.0	MRCF01	80B5/B14	8024
	70.6	97	19.83	1.2	MRCZ01	80B5/B14	8024
	78.4	88	17.86	1.1			
	95.8	72	14.62	1.7			
	101	68	13.80	1.5			
	118	58	11.90	2.1			
	143	48	9.81	2.1			
	153	45	9.17	1.8			
	181	38	7.72	2.1			
	246	28	5.69	2.1			
	302	23	4.63	2.6			
	366	19	3.82	3.2			
	31.2	221	28.88	0.91	MRC02	90B5/B14	90S6
	37.7	182	23.85	1.1	MRCF02	90B5/B14	90S6
	44.8	153	20.08	1.3	MRCZ02	90B5/B14	90S6
	30.1	228	46.46	0.88	MRC02	80B5/B14	8024
	43.5	199	40.60	1.0	MRCF02	80B5/B14	8024
	39.0	176	35.91	1.1	MRCZ02	80B5/B14	8024
	48.5	142	28.88	1.4			
	58.7	117	23.85	1.7			
	69.7	99	20.08	2.0			
	81.9	84	17.10	1.9			
	94.5	73	14.81	2.7			
	106	65	13.21	2.5			
	116.2	59	12.05	3.4			
	141	49	9.93	3.3			
	159	43	8.78	2.8			
	189	36	7.39	3.3			
	257	27	5.45	3.7			
	97.0	71	28.88	2.8	MRC02	80B5/B14	8012
	117.4	59	23.85	3.4	MRCF02	80B5/B14	8012
	139.4	49	20.08	4.1	MRCZ02	80B5/B14	8012
	163.7	42	17.10	3.8			

性能参数/PERFORMANCE PAPAMETER

P_{1n} [kW]	n_2 [r/min]	M_{2n} [Nm]	i	k			
0.75	23.2	296	38.73	1.0	MRC03	90B5/B14	90S6
	26.0	264	34.62	1.1	MRCF03	90B5/B14	90S6
	31.8	216	28.3	1.4	MRCZ03	90B5/B14	90S6
	41.3	166	21.78	1.7			
	51.9	132	17.33	2.1			
	59.8	115	15.06	2.3			
	24.1	285	58.09	1.1	MRC03	80B5/B14	8024
	28.0	246	50.02	1.2	MRCF03	80B5/B14	8024
	32.0	215	43.75	1.4	MRCZ03	80B5/B14	8024
	36.1	190	38.73	1.6			
	40.4	170	34.62	1.8			
	49.5	139	28.30	2.2			
	64.3	107	21.78	2.6			
	80.8	85	17.33	3.3			
	93.0	74	15.06	3.5			
	15.5	444	58.09	1.1	MRC04	90B5/B14	90S6
	18.0	382	50.02	1.3	MRCF04	90B5/B14	90S6
	20.6	334	43.75	1.5	MRCZ04	90B5/B14	90S6
	23.3	296	38.73	1.7			
	26.0	264	34.62	1.9			
	31.8	216	28.30	2.3			
	41.3	166	21.78	2.9			
	51.9	132	17.33	3.6			
	24.1	285	58.09	1.8	MRC04	80B5/B14	8024
	28.0	246	50.02	2.0	MRCF04	80B5/B14	8024
	32.0	215	43.75	2.3	MRCZ04	80B5/B14	8024
	36.1	190	38.73	2.6			
	40.4	170	34.62	2.9			
	49.5	139	28.30	3.6			
	64.3	107	21.78	4.5			
1.1	70.6	143	19.83	0.84	MRC01	90B5/B14	90S4
	78.4	129	17.86	0.78	MRCF01	90B5/B14	90S4
	95.8	105	14.62	1.1	MRCZ01	90B5/B14	90S4
	101	99	13.80	1.0			
	118	86	11.90	1.4			
	143	71	9.87	1.4			
	153	66	9.17	1.2			
	181	56	7.72	1.4			
	246	41	5.69	1.5			
	302	33	4.63	1.8			
	366	28	3.82	2.2			
	285	35	9.81	2.8	MRC01	80B5/B14	8022
	305	33	9.17	2.4	MRCF01	80B5/B14	8022
	363	28	7.72	2.9	MRCZ01	80B5/B14	8022
	492	20	5.69	2.9			
	605	17	4.63	3.6			
	733	14	3.82	4.4			
	39.0	259	35.91	0.77	MRC02	90B5/B14	90S4
	48.5	208	28.88	1.0	MRCF02	90B5/B14	90S4
	58.7	172	23.85	1.2	MRCZ02	90B5/B14	90S4
	69.7	145	20.08	1.4			
	81.9	123	17.10	1.3			

P_{1n} [kW]	n_2 [r/min]	M_{2n} [Nm]	i	k			
1.1	94.5	107	14.81	1.9	MRC02	90B5/B14	90S4
	106	95	13.21	1.7	MRCF02	90B5/B14	90S4
	116	87	12.05	2.3	MRCZ02	90B5/B14	90S4
	141	72	9.93	2.2			
	159	63	8.78	1.9			
	189	53	7.39	2.3			
	257	39	5.45	2.5			
	316	32	4.43	3.1			
	383	26	3.66	3.8			
	32.0	315	43.75	0.95	MRC03	90B5/B14	90S4
	36.1	279	38.73	1.1	MRCF03	90B5/B14	90S4
	40.4	249	34.62	1.2	MRCZ03	90B5/B14	90S4
	49.5	204	28.30	1.5			
	64.3	157	21.78	1.8			
	80.8	125	17.33	2.2			
	93.0	108	15.06	2.4			
	113	89	12.37	2.9			
	136	74	10.28	3.2			
	177	57	7.93	3.2			
	222	45	6.31	4.0			
	255	39	5.48	3.8			
	48.2	209	58.09	1.4	MRC03	80B5/B14	8022
	56.0	180	50.02	1.7	MRCF03	80B5/B14	8022
	64.0	158	43.75	1.9	MRCZ03	80B5/B14	8022
	72.3	139	38.73	2.2			
	80.9	125	34.62	2.4			
	99.0	102	28.30	2.9			
	129	78	21.78	3.6			
	24.1	418	58.09	1.2	MRC04	90B5/B14	90S4
	28.0	360	50.02	1.4	MRCF04	90B5/B14	90S4
	32.0	315	43.75	1.6	MRCZ04	90B5/B14	90S4
	36.1	279	38.73	1.8			
	40.4	249	34.62	2.0			
	49.5	204	28.30	2.5			
	64.3	157	21.78	3.1			
	80.8	125	17.33	3.8			
	93.0	108	15.06	4.2			
1.5	118	117	11.90	1.0	MRC01	90B5/B14	90L4
	143	96	9.81	1.0	MRCF01	90B5/B14	90L4
	153	90	9.17	0.9	MRCZ01	90B5/B14	90L4
	181	76	7.72	1.12			
	246	56	5.69	1.1			
	302	45	4.63	1.3			
	366	38	3.82	1.6			
	305	45	9.17	1.8	MRC01	90B5/B14	90S2
	363	38	7.72	2.1	MRCF01	90B5/B14	90S2
	492	28	5.69	2.1	MRCZ01	90B5/B14	90S2
	605	23	4.63	2.6			
	733	19	3.82	3.2			

性能参数/PERFORMANCE PAPAMETER

性能参数

P_{1n} [kW]	n_2 [r/min]	M_{2n} [Nm]	i	k			
1.5	58.7	234	23.85	0.85	MRC02	90B5/B14	90L4
	69.7	197	20.08	1.0	MRCF02	90B5/B14	90L4
	81.9	168	17.10	1.0	MRCZ02	90B5/B14	90L4
	94.5	145	14.81	1.4			
	106	130	13.21	1.2			
	116	118	12.05	1.7			
	141	98	9.93	1.6			
	159	86	8.78	1.4			
	189	73	7.39	1.7			
	257	54	5.45	1.9			
	316	44	4.43	2.3			
	383	36	3.66	2.8			
	212	65	13.21	2.5	MRC02	90B5/B14	90S2
	232	59	12.05	3.4	MRCF02	90B5/B14	90S2
	282	49	9.93	3.3	MRCZ02	90B5/B14	90S2
	319	43	8.78	2.8			
	379	36	7.39	3.3			
	514	27	5.45	3.7			
	40.4	340	34.62	0.88	MRC03	90B5/B14	90L4
	49.5	278	28.3	1.1	MRCF03	90B5/B14	90L4
	64.3	214	21.78	1.3	MRCZ03	90B5/B14	90L4
	80.8	170	17.33	1.6			
	93.0	148	15.06	1.8			
	113	122	12.37	2.1			
	136	101	10.28	2.4			
	177	78	7.93	2.3			
	222	62	6.31	2.9			
	255	54	5.48	2.8			
	311	44	4.50	3.4			
	374	37	3.74	4.1			
	48.2	285	58.09	1.1	MRC03	90B5/B14	90S2
	56.0	246	50.02	1.2	MRCF03	90B5/B14	90S2
	64.0	215	43.75	1.4	MRCZ03	90B5/B14	90S2
	72.3	190	38.73	1.6			
	80.9	170	34.62	1.8			
	99.0	139	28.30	2.2			
	129	107	21.78	2.6			
	162	85	17.33	3.3			
	186	74	15.06	3.5			
	26.0	529	34.62	0.95	MRC04	100B5/B14	100L6
	31.8	432	28.30	1.2	MRCF04	100B5/B14	100L6
	41.3	333	21.78	1.4	MRCZ04	100B5/B14	100L6
	51.9	265	17.33	1.8			
	59.8	230	15.06	2.0			
	24.1	571	58.09	0.88	MRC04	90B5/B14	90L4
	28.0	491	50.02	1.0	MRCF04	90B5/B14	90L4
	32.0	430	43.75	1.2	MRCZ04	90B5/B14	90L4
	36.1	380	38.73	1.3			
	40.4	340	34.62	1.5			
	49.5	278	28.30	1.8			
	64.3	214	21.78	2.2			
	80.8	170	17.33	2.8			
	93.0	148	15.06	3.1			
	113	122	12.37	3.8			
	136	101	10.28	4.4			
	177	78	7.93	3.3			
	222	62	6.31	4.2			
	255	54	5.48	4.3			

性能参数/PERFORMANCE PAPAMETER

P_{1n} [kW]	n_2 [r/min]	M_{2n} [Nm]	i	k			
2.2	64.3	314	21.78	0.89	MRC03	100B5/B14	100L1-4
	80.8	250	17.33	1.1	MRCF03	100B5/B14	100L1-4
	93.0	217	15.06	1.2	MRCZ03	100B5/B14	100L1-4
	113	178	12.37	1.5			
	136	148	10.28	1.6			
	177	114	7.93	1.6			
	222	91	6.31	2.0			
	155	79	5.48	1.9			
	311	65	4.50	2.3			
	374	54	3.74	2.8			
	186	108	15.06	2.4	MRC03	90B5/B14	90L2
	226	89	12.37	2.9	MRCF03	90B5/B14	90L2
	272	74	10.28	3.2	MRCZ03	90B5/B14	90L2
	353	57	7.93	3.2			
	444	45	6.31	4.0			
	511	39	5.48	3.8			
	41.3	488	21.78	1.0	MRC04	112B5/B14	112M6
	51.9	388	17.33	1.2	MRCF04	112B5/B14	112M6
	59.8	338	15.06	1.4	MRCZ04	112B5/B14	112M6
	72.8	277	12.37	1.7			
	40.4	499	34.62	1.0	MRC04	100B5/B14	100L1-4
	49.5	408	28.30	1.2	MRCF04	100B5/B14	100L1-4
	64.3	314	21.78	1.5	MRCZ04	100B5/B14	100L1-4
	80.8	250	17.33	1.9			
	93.0	217	15.06	2.1			
	113	178	12.37	2.6			
	136	148	10.28	3.0			
	177	114	7.93	2.3			
	222	91	6.31	2.9			
	255	79	5.48	2.9			
	311	65	4.50	3.5			
	374	54	3.74	3.7			
3	93.0	296	15.06	0.88	MRC03	100B5/B14	100L2-4
	113	243	12.37	1.1	MRCF03	100B5/B14	100L2-4
	136	202	10.28	1.2	MRCZ03	100B5/B14	100L2-4
	177	156	7.93	1.2			
	222	124	6.31	1.5			
	255	108	5.48	1.4			
	311	88	4.50	1.7			
	374	73	3.74	2.0			
	49.5	556	28.30	0.90			
	64.3	428	21.78	1.1	MRC04	100B5/B14	100L2-4
	80.8	340	17.33	1.4	MRCF04	100B5/B14	100L2-4
	93.0	296	15.06	1.6	MRCZ04	100B5/B14	100L2-4
	113	243	12.37	1.9			
	136	202	10.28	2.2			
	177	156	7.93	1.7			

性能参数/PERFORMANCE PAPAMETER

P_{1n} [kW]	n_2 [r/min]	M_{2n} [Nm]	i	k			
3	222	124	6.31	2.1	MRC04	100B5/B14	100L2-4
	255	108	5.48	2.1	MRCF04	100B5/B14	100L2-4
	311	88	4.50	2.6	MRCZ04	100B5/B14	100L2-4
	374	73	3.74	2.7			
	186	148	15.06	3.1	MRC04	100B5/B14	100L-2
	226	122	12.37	3.8	MRCF04	100B5/B14	100L-2
	272	101	10.28	4.4	MRCZ04	100B5/B14	100L-2
	353	78	7.93	3.3			
	444	62	6.31	4.2			
	136	269	10.28	0.89	MRC03	112B5/B14	112M4
	177	208	7.93	0.87	MRCF03	112B5/B14	112M4
	222	165	6.31	1.1	MRCZ03	112B5/B14	112M4
	255	144	5.48	1.0			
	311	118	4.50	1.3			
	374	98	3.74	1.5			
4	80.8	454	17.33	1.1	MRC04	112B5/B14	112M4
	93.0	394	15.06	1.2	MRCF04	112B5/B14	112M4
	113	324	12.37	1.4	MRCZ04	112B5/B14	112M4
	136	269	10.28	1.6			
	177	208	7.93	1.3			
	222	165	6.31	1.6			
	255	144	5.48	1.6			
	311	118	4.50	2.0			
	374	98	3.74	2.0			
	186	197	15.06	2.3	MRC04	112B5/B14	112M2
	226	162	12.37	2.8	MRCF04	112B5/B14	112M2
	272	135	10.28	3.3	MRCZ04	112B5/B14	112M2
	353	104	7.93	2.5			
	444	83	6.31	3.1			
	511	72	5.48	3.2			
	622	59	4.50	3.9			
	749	49	3.74	4.1			

性能参数/PERFORMANCE PAPAMETER

M_{2n} [Nm]	n_1 [r/min]	i	P_{1n} [kW]	n_2 [r/min]	
120	1400	53.33	0.34	26.3	MRC01-HS
120	1400	45.89	0.40	30.5	MRCF01-HS
120	1400	40.01	0.46	34.9	MRCZ01-HS
120	1400	35.47	0.52	39.5	
120	1400	28.50	0.64	49.1	
120	1400	23.56	0.78	59.4	
120	1400	19.83	0.92	70.6	
100	1400	17.86	0.86	78.4	
120	1400	14.62	1.25	95.7	
100	1400	13.80	1.10	101	
120	1400	11.90	1.54	118	
100	1400	9.81	1.56	143	
80	1400	9.17	1.34	153	
80	1400	7.72	1.58	181	
60	1400	5.69	1.61	246	
60	1400	4.63	1.98	302	
60	1400	3.82	2.40	367	
200	1400	54.00	0.57	25.9	MRC02-HS
200	1400	46.46	0.66	30.1	MRCF02-HS
200	1400	40.60	0.75	34.5	MRCZ02-HS
200	1400	35.91	0.85	39.0	
200	1400	28.88	1.06	48.5	
200	1400	23.85	1.28	58.7	
200	1400	20.08	1.52	69.7	
160	1400	17.10	1.43	81.9	
200	1400	14.81	2.06	94.6	
160	1400	13.21	1.85	106	
200	1400	12.05	2.53	116	
160	1400	9.93	2.46	141	
120	1400	8.78	2.08	159	
120	1400	7.39	2.49	190	
100	1400	5.45	2.80	257	
100	1400	4.43	3.45	316	
100	1400	3.66	4.18	383	

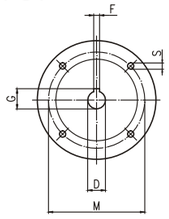
性能参数/PERFORMANCE PAPAMETER

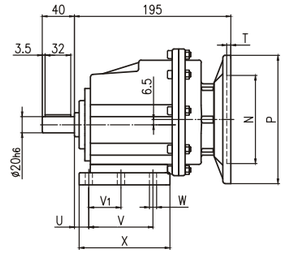
M_{2n} [Nm]	n_1 [r/min]	i	P_{1n} [kW]	n_2 [r/min]	
300	24.1	58.09	0.79	1400	MRC03-HS
300	28.0	50.02	0.92	1400	MRCF03-HS
300	32.0	43.75	1.05	1400	MRCZ03-HS
300	36.1	38.73	1.18	1400	
300	40.4	34.62	1.32	1400	
300	49.5	28.30	1.62	1400	
280	64.3	21.78	1.96	1400	
280	80.8	17.33	2.47	1400	
260	93.0	16.06	2.64	1400	
260	113	12.37	3.21	1400	
240	136	10.28	3.57	1400	
180	177	7.93	3.47	1400	
180	222	6.31	4.36	1400	
150	255	5.48	4.18	1400	
150	311	4.50	5.09	1400	
150	374	3.74	6.12	1400	
500	24.1	58.09	1.31	1400	MRC04-HS
500	28.0	50.02	1.53	1400	MRCF04-HS
500	32.0	43.75	1.75	1400	MRCZ04-HS
500	36.1	38.73	1.97	1400	
500	40.4	34.62	2.21	1400	
500	49.5	28.30	2.70	1400	
480	64.3	21.78	3.37	1400	
480	80.8	17.33	4.23	1400	
460	93.0	16.06	4.66	1400	
460	113	12.37	5.68	1400	
440	136	10.28	6.54	1400	
260	177	7.93	5.01	1400	
260	222	6.31	6.29	1400	
230	255	5.48	6.41	1400	
230	311	4.50	7.80	1400	
200	374	3.74	8.17	1400	

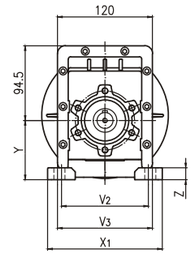
8.外形尺寸图表/OUTLINE DIMENSION SHEET

MRC01..P(IEC)

输入 / INPUT







MRCF01..P(IEC)

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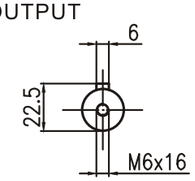
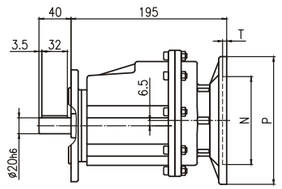


Ⅰ

ϕ120



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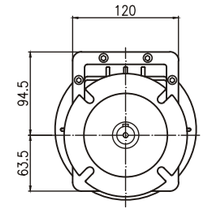
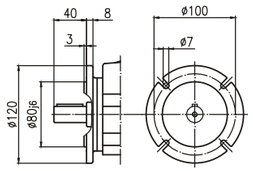
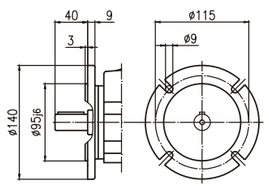
ϕ140

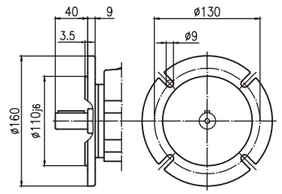


Ⅲ

ϕ160







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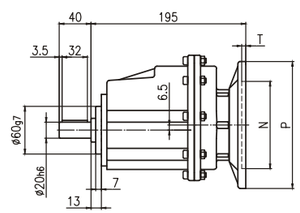
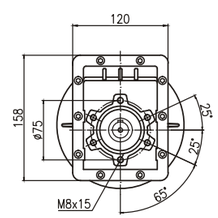


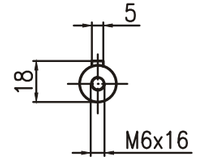


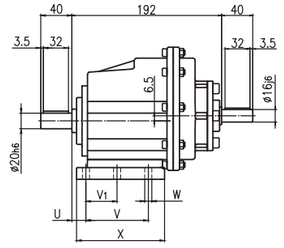
IEC	D	F	G	P	M	N	S	T
63B5	11	4	12.8	140	115	95	9	4
71B5	14	5	16.3	160	130	110	9	4
71B14	14	5	16.3	105	85	70	7	4
80B5	19	6	21.8	200	165	130	11	4
80B14	19	6	21.8	120	100	80	7	4
90B5	24	8	27.3	200	165	130	11	4
90B14	24	8	27.3	140	115	95	9	4

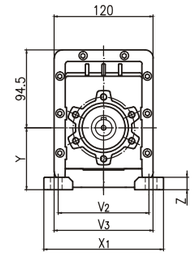
底脚代号 foot code	U	V	V1	V2	V3	W	X	X1	Y	Z
B01	18	87	50	110	—	9	118	130	85	15
M01	18	80	—	110	120	9	113	145	75	15
M02	25	85	—	110	120	9	112	145	75	15
B02	18	107.5	60	—	130	11	136	155	95	17

MRC01..HS

输入 / INPUT

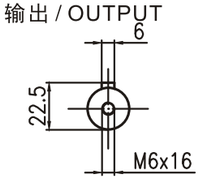






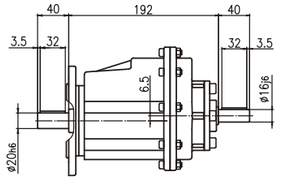
MRCF01..HS

输出 / OUTPUT



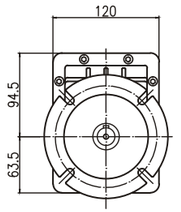
Ⅰ

ϕ120



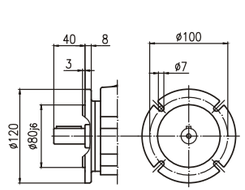
Ⅱ

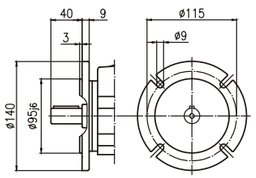
ϕ140

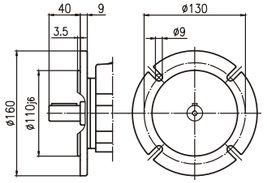


Ⅲ

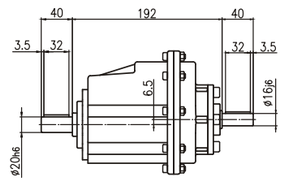
ϕ160

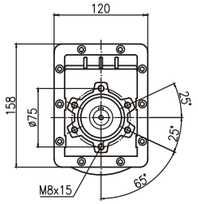






MRCZ01..HS

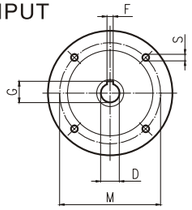


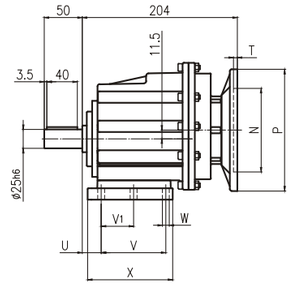


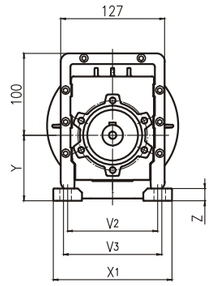
底脚代号 foot code	U	V	V1	V2	V3	W	X	X1	Y	Z
B01	18	87	50	110	—	9	118	130	85	15
M01	18	80	—	110	120	9	113	145	75	15
M02	25	85	—	110	120	9	112	145	75	15
B02	18	107.5	60	—	130	11	136	155	95	17

MRC02..P(IEC)

输入 / INPUT

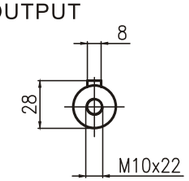






MRCF02..P(IEC)

输出 / OUTPUT



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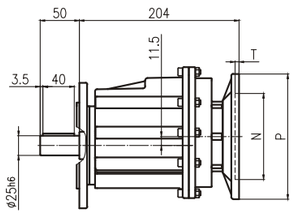
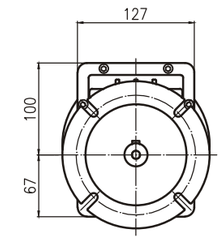
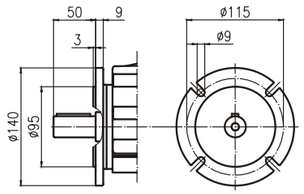


II

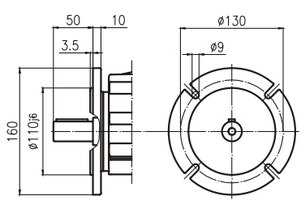


III

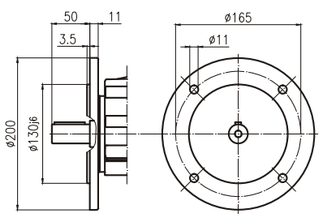
ϕ140



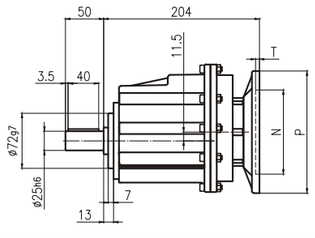
ϕ160

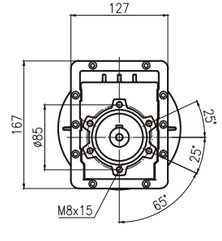


ϕ200



MRCZ02..P(IEC)



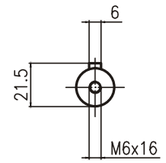


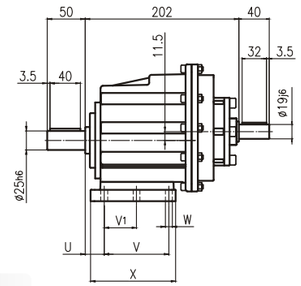
IEC	D	F	G	P	M	N	S	T
63B5	11	4	12.8	140	115	95	9	4
71B5	14	5	16.3	160	130	110	9	4
71B14	14	5	16.3	105	85	70	7	4
80B5	19	6	21.8	200	165	130	11	4
80B14	19	6	21.8	120	100	80	7	4
90B5	24	8	27.3	200	165	130	11	4
90B14	24	8	27.3	140	115	95	9	4

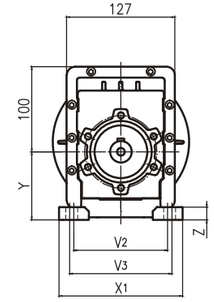
底脚代号 foot code	U	V	V1	V2	V3	W	X	X1	Y	Z
B02	18	107.5	60	—	130	11	136	155	100	17
M02	25	85	—	110	120	9	112	145	80	15
M01	18	80	—	110	120	9	118	145	80	15
B01	18	87	50	110	—	9	118	130	90	15

MRC02..HS

输入 / INPUT

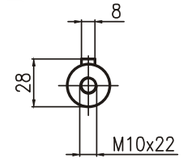






MRCF02..HS

输出 / OUTPUT



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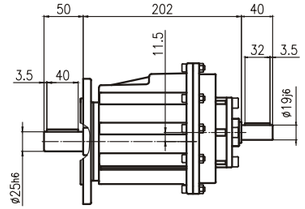
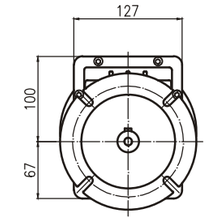
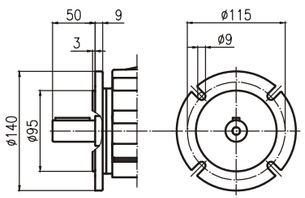


II

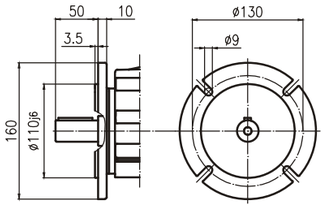


III

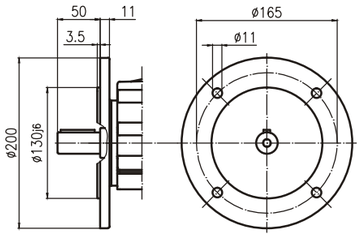
ϕ140



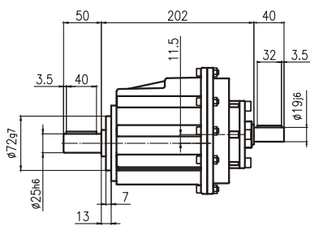
ϕ160

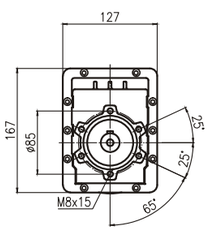


ϕ200



MRCZ02..HS

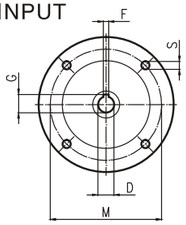


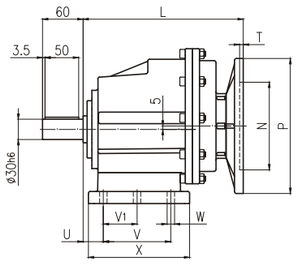


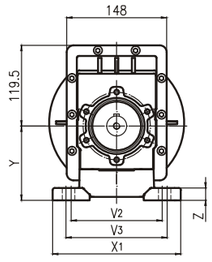
底脚代号 foot code	U	V	V1	V2	V3	W	X	X1	Y	Z
B02	18	107.5	60	—	130	11	136	155	100	17
M02	25	85	—	110	120	9	112	145	80	15
M01	18	80	—	110	120	9	118	145	80	15
B01	18	87	50	110	—	9	118	130	90	15

MRC03..P(IEC)

输入 / INPUT

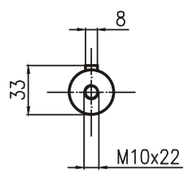






MRCF03..P(IEC)

输出 / OUTPUT



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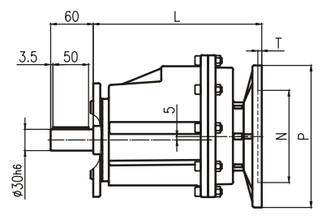

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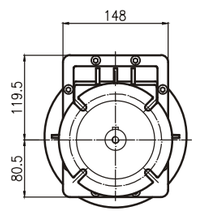
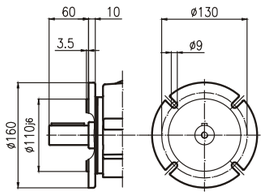
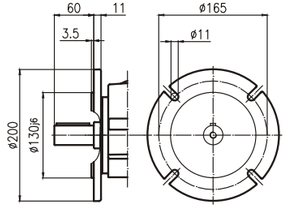


III

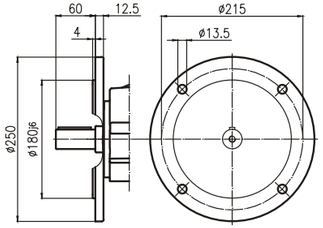
ϕ160



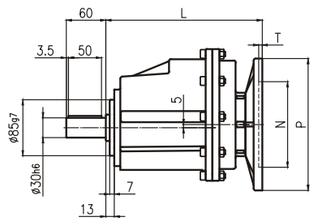
ϕ200

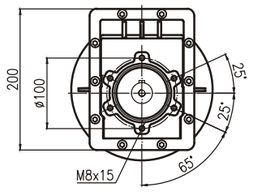


ϕ250



MRCZ03..P(IEC)





IEC	D	F	G	P	M	N	S	T	L
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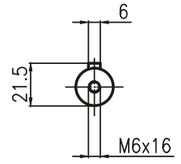
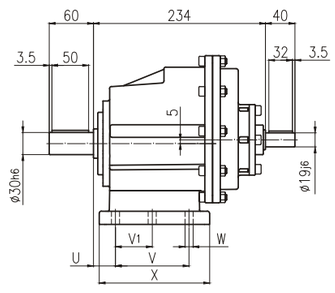
80B5	19	6	21.8	200	165	130	11	4	220
80B14	19	6	21.8	120	100	80	7	4	220
90B5	24	8	27.3	200	165	130	11	4	220
90B14	24	8	27.3	140	115	95	9	4	220
100/112B5	28	8	31.3	250	215	180	13.5	4.5	237.5
100/112B14	28	8	31.3	160	130	110	9	4.5	237.5

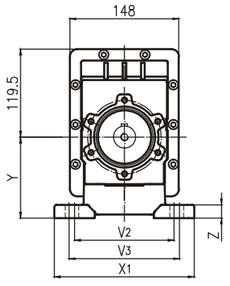
底脚代号 foot code	U	V	V1	V2	V3	W	X	X1	Y	Z
B03	18	130	70	—	160	11	156	190	110	20
M03	30	100	—	135	150	11	150	190	110	18
M04	32	110	—	170	185	14	150	230	110	20
B04	20.5	130	—	170	—	14	168	205	105	20

MRC03..HS

输入 / INPUT

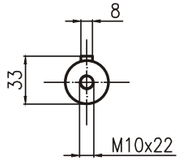




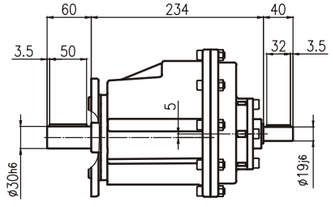


MRCF03..HS

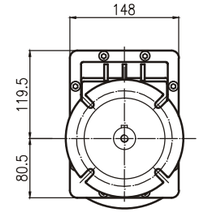
输出 / OUTPUT



I

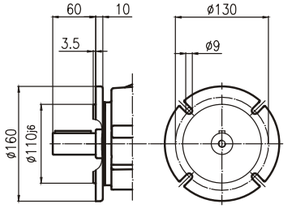


II

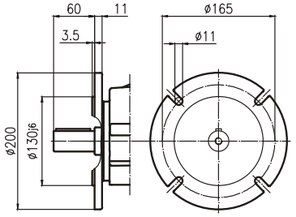


III

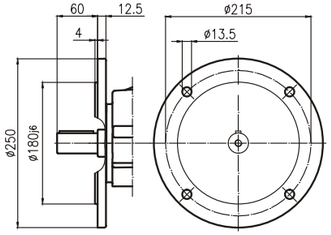
ϕ160



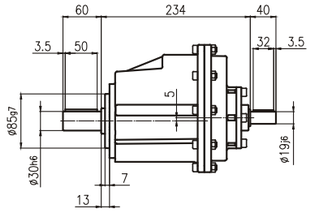
ϕ200

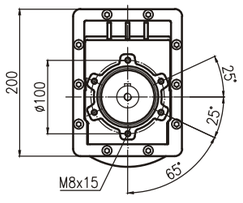


ϕ250



MRCZ03..HS

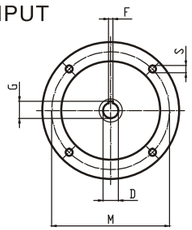


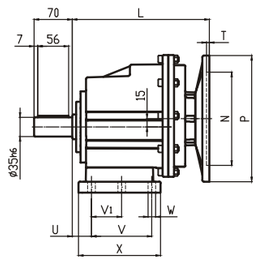


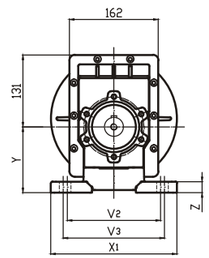
底脚代号 foot code	U	V	V1	V2	V3	W	X	X1	Y	Z
B03	18	130	70	—	160	11	156	190	110	20
M03	30	100	—	135	150	11	150	190	110	18
M04	32	110	—	170	185	14	150	230	110	20
B04	20.5	130	—	170	—	14	168	205	105	20

MRC04..P(IEC)

输入 / INPUT







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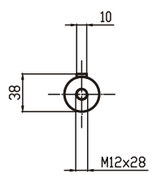

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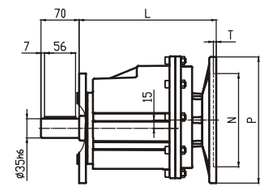

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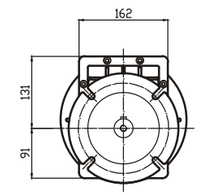
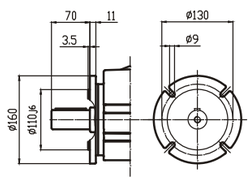
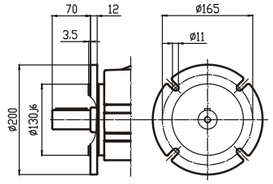


III

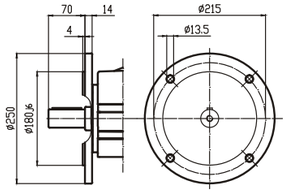
ϕ160



ϕ200



ϕ250



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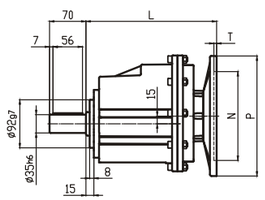

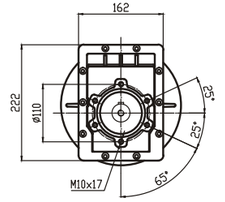

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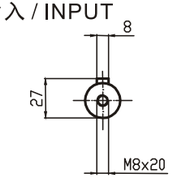
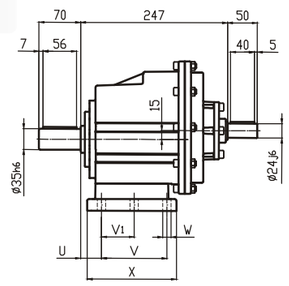
80B14	19	6	21.8	120	100	80	7	4	232.5
90B5	24	8	27.3	200	165	130	11	4	232.5
90B14	24	8	27.3	140	115	95	9	4	232.5
100/112B5	28	8	31.3	250	215	180	13.5	4.5	250
100/112B14	28	8	31.3	160	130	110	9	4.5	250

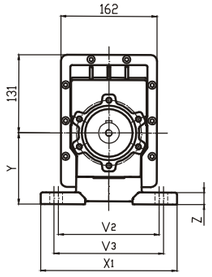
底脚代号 foot code	U	V	V1	V2	V3	W	X	X1	Y	Z
B04	23.5	130	—	170	—	14	168	205	115	20
B05	19.5	149.5	—	180	—	14	185	215	130	20
M04	35	110	—	170	185	14	150	230	120	20
M03	33	100	—	135	150	11	150	190	120	18
B03	21	130	70	—	160	11	156	190	120	20

MRC04..HS

输入 / INPUT







MRCF04..HS

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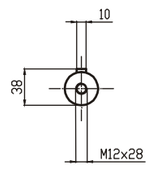

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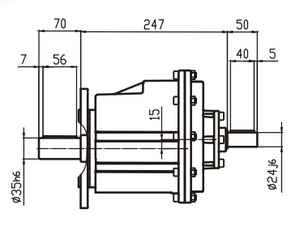

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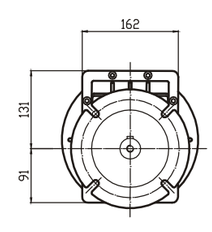
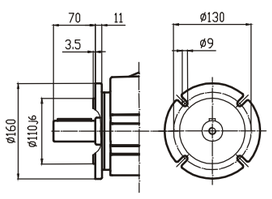
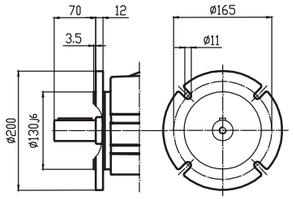


III

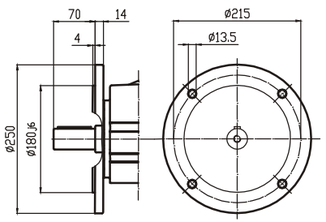
ϕ160



ϕ200



ϕ250



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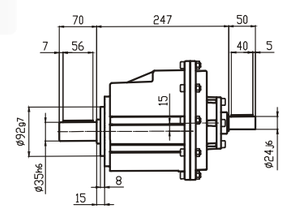
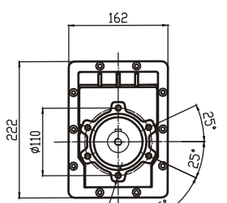
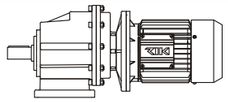
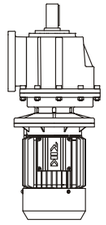
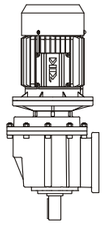
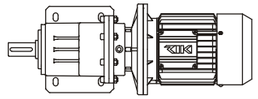
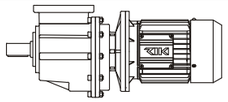
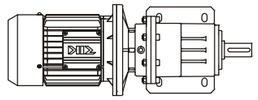
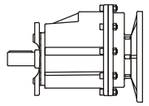
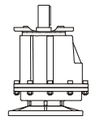
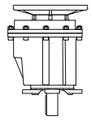


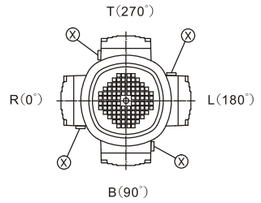


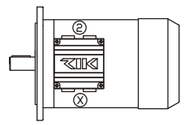
底脚代号 foot code	U	V	V1	V2	V3	W	X	X1	Y	Z
B04	23.5	130	—	170	—	14	168	205	115	20
B05	19.5	149.5	—	180	—	14	185	215	130	20
M04	35	110	—	170	185	14	150	230	120	20
M03	33	100	—	135	150	11	150	190	120	18
B03	21	130	70	—	160	11	156	190	120	20

9.安装方位和接线盒位置 / MOUNTING POSITIONS AND TERMINAL BOX ORIENTAION

MRC.. M1	M2	M4	M5
			
M3			**M6**
			

MRCF.. M1	M2	M4
		





X:标准进线位置
normal position

10.润滑油 / LUBRICATION

10.1 概述

如果没有特殊要求。本公司所提供的减速器均按商定的安装方式的加注了润滑油，所以您在订货时需要指定与安装方式相关的参数（M1~M6.→“安装方式及重要的订货提供参数”章节）。在后期调整安装方式时。您必须根据改变后的安装方式相应的调节注油量（→ 润滑油注入量）。

10.1 General information

Unless a special arrangement is made,TONGYU supplies the drives with a lubricant fill adapted for the specific gear unit and mounting position.The

decisive factor is the mounting position(M1…M6,→ Sec."Mounting Position and Important Order Information")specified when ordering the drive. You must adapt the lubricant fill in case of any subsequent changes made to the mounting position(→Lubricant fill quantities).

10.2滚动轴承润滑脂

减速器和电动机的滚动轴承在出厂时就加注了润滑脂。对于配有润滑油加注装置的滚动轴承，建议在更换机油时也更换润滑脂。下列润滑脂更换时参考：

	环境温度	制造厂家	型　号	润滑油类型
减速器滚动轴承	–20℃~+60℃	Mobil	Mobil EP 2	矿物油
	–40℃~+80℃	Mobil	Mobiltemp SHC100	合成油
电机滚动轴承	–20℃~+80℃	Esso	Unirex EQ3	矿物油
	–20℃~+60℃	Shell	Alvania RL3	矿物油
	–45℃~+25℃	Shell	Aero Shell Grease 16	合成油

10.2 Anti-friction bearing greases

The lubricant table on the following page shows the permitted lubricants for TONGYU gear units.Please note the following to the lubricant table:

需要下列润滑脂加注量：

· 如果是高速运转的轴承（电动机和减速器输入端）：轴承腔中加入三分之一的润滑脂。

· 如果是低速运转的轴承（减速器中和减速器输出端）：轴承腔中加入三分之二的润滑脂。

The following grease quantities are required:

· For fast-running bearings (motor and gear unit input end):Fill cavities between the rolling elements one third full will grease.

· For slow-running bearings(in gear units and gear unit output end):Fill the cavities between the rolling elements two thirds full with grease.

10.3 润滑油型号/Types of lubrication

	环境温度（℃）Ambient Tempreatur（℃）	ISO粘度 ISO Viscosity Class	SHELL	MOBIL	BP	润滑油类型 lubrication type
MRC..	–10 ~ +40	VG220	Shell Omala 220	Mobil gear 630	BP Energol GX–XP 220	矿物油 Mineral oil
	–20 ~ +25	VG150 VG100	Shell Omala 100	Mobil gear 627	BP Energol GX–XP 100	
	–30 ~ +10	VG110–46 VG32	Shell Omala T32	Mobil D.T.E.13M		
	–40 ~ –20	VG22 VG15	Shell Omala T15	Mobil D.T.E.11M	BP Energol HLP–HM 15	
	–40 ~ +80	VG220	Shell Omala HD220	Mobil SHC630		合成油 Synthetic oil
	–40 ~ +40	VG150		Mobil SHC629		
	–40 ~ +10	VG32		Mobil SHC624		

10.4 润滑油加注量/Lubricant fill quantity

减速器型号 Gear units	加注量 Fill quantity in liters					单位 unit：升（L）
	M1	M2	M3	M4	M5	M6
MRC..01..	0.4	0.6	0.4	0.3	0.3	0.3
MRC..02..	0.5	0.7	0.5	0.4	0.4	0.4
MRC..03..	0.8	1.1	0.8	0.6	0.6	0.6
MRC..04..	1.2	1.6	1.0	1.0	0.9	0.9

表格规定的加注量为参考值，准确值的变化与传动比有关。MRC系列减速器在出厂前已加注了润滑油。

The fill quantity in the table is referenced,the exact value velating to the ratio.All MRC Series helical gear units are filled with lubrication before delivery.

11.安装方法 / INSTALLATION METHODS

11.1 安装前准备工作

1）.检查减速电机铭牌上的规定与电源是否一致。

2）.对于标准减速器，环境温度必须与润滑剂表中相应的润滑剂表相一致。

3）.动力安装不允许在油、爆炸气体、水蒸气、酸性腐蚀和放射线环境下进行。

4）.输出轴和法兰表面必须彻底清除掉防锈剂、污染物或者类似脏物。必须使用常用的溶剂。不得让溶剂进入到轴密封环的密封唇上，否则会损坏密封材料!

5）.支承结构必须满足平稳、防震、刚性好，不发生扭曲特征。

11.2 减速器的安装

1).减速器安装时将底脚或法兰交错拧紧，注意其允许承受的横向力和轴向力!

2).输出轴上安装传动件时，传动件如皮带轮，联轴器，小齿轮等绝对不能使用锤子敲击的方法套装到输出轴上，否则有可能损伤轴承，外壳以及轴。

3).启动机器之前，检查放油塞是否利于操作，油镜是否利于观察油位，油位与减速器的安装位置是否一致，透气塞方位是否恰当。

11.1 Preparetion before the installation

1).Check if the data on the nameplates of the gearmotor matches the voltage supply system.

2).For standard gear unit, the ambient temperature must be in accordance with corresponding lubricant table.

3).The drive must not be assembled in conditions such as oil,gas,vapors,acids,radiation and so on.

4).Output shaft and flange surfaces must thoroughly cleaned to ensure they are free of anticorrosion agents,contamination or similar.Use a commercially available solvent.Do not let the solvent come into contact with sealing lip of the oil seals,or will damage the material!

5).The supporting structure must have the following characteristics:level,vibration damping and torsionally rigid.

11.2 The installation of the gear ubits

1).Do not tighten the housing legs and mounting flages against one another and ensure that you comply with the permittde radial load and axial load.

2).Never drive belt pulleys, couplings, pinions, etc.onto the shaft end by hitting them with a hammer. This will damage the bearing.housing and the shaft.

3).Prior to startup,check that if the oil level is as specified for the mounting position.if the oil checking and drain screw and the breather valves are free accessible.

12.故障排除 / CORRECT THE MALFUNCTION

故障	可能的原因	解决办法
异常、均匀的运转噪声。	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.检测润滑油，更换轴承。 B.请向客户服务部咨询。
异常、不均匀的运转噪声。	机油中有异物。	・检测润滑。 ・停止运转传动装置，向客户服务部咨询。
机油泄漏1）。 ・在减速器盖上。 ・在电机凸缘上。 ・在电机轴密封圈上。 ・在减速器凸缘上。 ・在输出端轴密封圈上。	A.减速器底座上的橡胶密封发生渗漏。 B.密封圈损坏。 C.减速器没有排气。	A.拧紧各个外盖上的螺钉并且观察减速器。如果机油继续泄露，请向客户服务部咨询。 B.请向客户服务部咨询 C.给减速器排气（参见“安装方式”）。
机油从排气阀帝渗出。	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.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”）。
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。	减速器中的轴轮毂联接断裂。	将减速器或减速电机送修。

1）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。

Problem	Possible cause	Remedy
Unusual, regular running noise	A. Meshing/grinding noise: Bearing damage. B. Knocking noise: Lrregularity in the gearing.	A. Check the oil, change bearings B. Contact customer service
Unusual, irregular running noise	Foreign bodies in the oil	・Check the oil ・Stop the drive, contact customer service
Oil leaking 1) ·From the gear cover plate ·From the motor flange ·From the motor oil seal ·From the gear unit flange ·From the output end oil seal	A. Rubber seal on the gear cover plate leaking B. Seal defective C. Gear unit not vented	A. Tighten the bolts on the gearcover plate and observe the gear unit. Oil still leaking: Contact customer service B. Contact customer service C. Vent the gear unit(see "Mounting Positions")
Oil leaking from breaking valve	A. Too much oil B. Drive operated in incorrect mounting position C. Frequent cold starts(oil foams) and/or high oillevel	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")
Output shaft does not turn although the motor is running or the input shaft is rotated	Connection between shaft and hub in gear unit interrupted	Send in the gear unit / gearmotor for repair

1) Short-term oil / grease leakage at the oil seal is possible in the run-in phase (24 hours running time).

13.减速器负载物征表（参考件）/ CHARGE CHARACTERISTIC CHART(FOR REFERENCE)

风机类 AIR BLOWERS	
风机（轴向和径向） Air blower（axial or radial）	A
冷却塔风扇 Fan of cooling tower	B
引风机 Induced draught fan	B
螺旋活塞式风机 Rotary piston type fan	B
蜗轮式风机 Turbo–fan	A
建筑机械类 CONSTRUCTION MACHINERY	
混凝土搅拌机 Concrete mixer	B
卷扬机 Hoist	B
路面建筑机械 Road building machinery	B
钻孔机 Boring mill	B
化工机械类 CHEMICAL MACHINERY	
搅拌机（液体） Mixer（liquid）	A
搅拌机（半液体） Mixer（half liquid）	B
离心机（重型） Centrifuge（heavy）	B
离心机（轻型） Centrifuge（light）	A
冷却滚筒** Cooling rolling drum	B
干燥滚筒** Dry rolling drum	B
搅拌机 Mixer	B
压缩机类 COMPRESSOR	
活塞式压缩机 Piston type compressor	C
蜗轮式压缩机 Turbo–compressor	B
传送运输机类 TRANSMISSION FREIGHTER	
平板传送机 Pan conveyer	B
平衡块升降机 Balance lifter	B
槽式传送机Trough conveyer	B
带式传送机（大件） Ribbon conveyer（large piece）	C
带式传送机（碎料） Ribbon conveyer（small piece）	B
筒式面粉传送机 Drum–type flour conveyer	A
链式传送机 Chain conveyer	B
环式传送机 Ring type conveyer	B
货物升降机 Lifter	B
卷扬机 Hoist	B
连杆式传送机 Crank–connecting conveyer	B
载入升降机 Lifter	B
螺旋式传送机 Worm conveyer	B
钢带式传送机 Steel–band conveyer	B
链式槽型传送机 Chain reed–type conveyer	B
绞车运输机 Crab freighter	B
起重机类 HOIST	
卷扬机齿轮传动装置 Hoist gear assembly	A
转臂式起重传动齿轮装置 Bracket swing gear assembly	B
吊杆起落齿轮传动装置 Derrick gear assembly	B
转向齿轮传动装置 Steering gear assembly	B
行走齿轮传动装置 Moving gear assembly	C
挖泥机类 LAND DREDGER	
筒式传送机 Drum–type conveyer	C
筒式转动机 Drum–type rotation wheel	C
挖泥头 Dredger head	C
机动绞车 Powered crab	B
泵 Pump	B
泵转向齿轮传动装置 Pump turning gear assembly	B
行走齿轮传动装置（履带）Moving gear assembly（apron wheel）	C
行走齿轮传动装置（铁轨）Moving gear assembly（track）	B
食品工业机械类 FOODSTUFF PROCESSING MACHINERY	
灌注及装箱机器 Placer or box filler	A
甘蔗压榨机 Cane crusher	A
甘蔗切断机 Cane cutter	B
甘蔗粉碎机 Cane crasher	C
搅拌机 Mixer	B
酱状物吊筒 Paste bucket	B
装包机 Packager	A
糖甜菜切断机 Beet slicer	B
糖和甜菜清洗机 Beet washing machine	B
发动机及转换器类 MOTOR AND CONVERSION EQUIPMENTS	
频率转换器 Frequency converter	C
发动机 Motor	C
焊接发动机 Welding motor	C
洗衣机类 WASHING MACHINE	
滚筒 Rolling drum	B
洗衣机 Washing machine	B
金属滚轧机类 METAL ROLLER MACHINE	
钢坯剪断机** Steel cutter	C
链式输送机** Chain converter	B
冷轧机** Cold mill	C
连铸成套设备 Continuous casting equipments	B
冷床** Cold bed	B
剪料机头** Cropper	C
交叉转弯输送机** Cross steering transmitter	B
除锈机** Druster	C
重型和中型板轧机** Heavy and medium steel mill	C
捧坯切轧机** Bar mill	C

捧坯转运机类 BAR TRANSMISSION EQUIPMENTS	B
捧坯推料机 Bar pusher	B
推床 Push bed	B
剪板机** Shears	C
板材摆升降台**Lumber elevator platform	B
轧辊调整装置 ROLL ADJUSTING EQUIPMENTS	B
辊式矫直机 Roller leveling machine	B
轧钢机辊道（重型）**Mill rolling way(heavy)	C
轧钢机辊道（轻型）**Mill rolling way(light)	B
薄板轧机** Sheet rolling mill	C
修整剪切机** Trimming shears	B
焊管机 Pipe welder	C
焊管机(带材和线材） Soldering machine(belt material and wire rod)	B
线材拉拔机 Wire drawbench	B
金属加工机床类 METAL PROCESSING MACHINE TOOLS	
动力轴 Power shaft	A
锻造机** Forging machine	C
锻锤 Drop hammer	C
机床及附助装置 Machine tool and necessary	A
机床及主要传动装置 Machine tool and main driving equipment	B
金属刨床 Metal facing machine	C
板材矫直机床 Plate–leveling machine tool	C
冲床 Backing–out punch	C
冲压机床 Press machine tool	C
剪床 Cutting machine	B
薄板弯曲机床 Sheet bending machine tool	B
石油工业机械类 PETROLEUM PROCESSING MACHINERY	
输油管油泵** Pump of oil pipe line	B
转子钻井设备 Rotary drilling equipment	C
制纸机类 PAPERING MACHINE	
压光机** Glazing press	C
多层纸板机** Multilayer paper board machine	C
干燥滚筒** Drying cylinder	C
上光滚筒** Glazing cylinder	C
搅浆机** Masher	C
搅浆擦碎机** Mashing and breaking machine	C
吸水滚** Suction roll	C
潮纸滚压机** Wet paper roller machine	C
吸水滚压机木** Water absorbing roller machine	C
威罗机 Welon machine	C
泵类 PUMPS	
离心泵（稀液体）Centrifugal pump (thin liquid)	A
离心泵（半液体）Centrifugal pump (half liquid)	B
活塞泵 Displacement pump	C
柱塞泵 Plunger pump	C
压力泵 Force pump	C
塑料机械类 PLASTIC EQUIPMENTS	
压光机** Glazing press	B
挤压机** Ejecting press	B
螺旋压出机** Spiral extruding machine	B
混合机** Mixing machine	B
橡胶机械类 RUBBER EQUIPMENT	
压光机** Glazing press	B
挤压机** Ejecting press	C
混合搅拌机** Mixing stir machine	B
捏合机 Kneading machine	B
滚压机** Roller machine	C
石料、瓷土料加工机械类 STONE PORCELAIN CLAY PROCESSING EQUIPMENTS	
球磨机 Ball crusher	B
挤压料碎机** Ejecting press and breaker	C
破碎机 Breaker	C
压砖机 Brick press	C
锤料碎机** Beating crusher	C
转炉** Converter	C
筒型磨机** Cylinder mill	C
纺织机械类 TEXTILE MACHINERY	
送料机 Feeding machine	B
织布机 Loom machine	B
印染机 Dyeing machine	B
精制筒 Purified drum	B
威罗机 Welon machine	B
水处理设备类 WASTER TERATMENT EQUIPMENTS	
鼓风机** Air blast	B
螺杆泵 Screw pump	B
木料加工机床 WOOD PROCESSING MACHINE TOOL	
剥皮机 Barker	C
刨床 Facing machine	B
锯床 Saw bench	C
木材加工机床 Wood processing machine tool	A

注：A—均匀冲击负载；B—中等冲击负载；C—重冲击负载；**—用于24小时工作制。
Note:A - Uniform load; B - Moderate shock load; C - heavy shock load; ** - for 24hour system.