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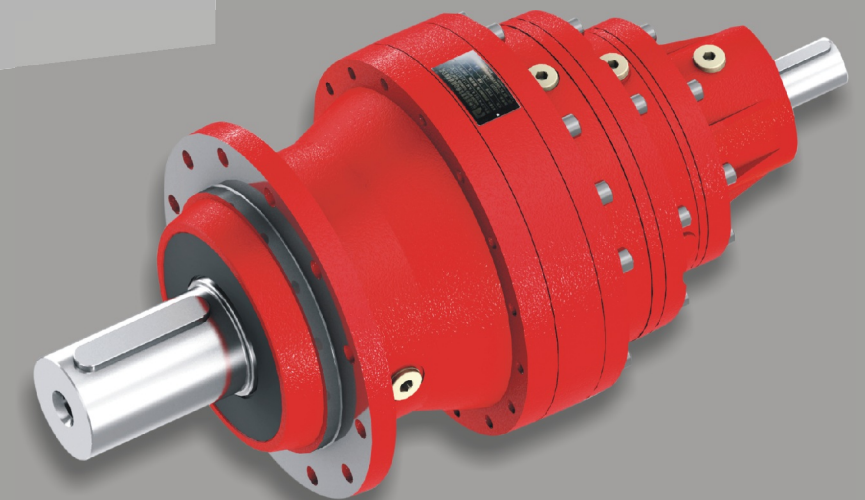
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SPN 行星减速机系列
SPN Planetary Gearbox Series



企业荣誉
十二年

第四代产品 - SPN行星减速机系列



通过意大利ECM中心认证
认证号：EC1282.DD140722.HSTDW84
通过ISO9001:2008 质量管理体系
国家级高新技术企业
浙江省科技型中小企业
杭州市技术中心
杭州市著名商标
杭州市重点技改项目
杭州市重点培育成长型企业

Through Italy CE Certification
Certificate No.: EC1282.DD140722.HSTDW84
Through ISO9001:2008 Quality Management System
National High-tech Enterprise
Technology Oriented Small and Medium-sized Enterprises in Zhejiang Province
Hangzhou Technology Center
Hangzhou Famous Brand
Hangzhou Municipal Key Technological Transformation Project
Hangzhou Key Fostering and Developing Enterprise



浙江速博机械科技有限公司—第1期于2014年投入使用
Zhejiang Supror Machinery Technology Co., Ltd - The first phase was put into use in the year of 2014.

齿轮减速机生产研发基地

RFKS 齿轮减速机系列

HB 齿轮箱系列

SPN 行星减速机系列

Helical Gear Reducer R&D Production Base

RFKS Helical Gear Reducer Series

HB Industrial Gear Unit Series

SPN Planetary Gearbox Series

品牌远景

打造传动设备领域的代表性企业

通过12年不断的研究与开发，速博雷尔骄傲地证明了，她以崭新的面貌成功地面对市场的挑战。我们新建的厂房面积达170.000M2，同时我们还生产出全新的H/B齿轮箱和SPN系列行星减速机。

速博雷尔将继续秉承“变革创新、诚信经营创造价值”的企业精神和“同谋共赢”的经营理念，不断提升企业的核心竞争力，为客户和合作伙伴创造价值，并以卓越的产品和服务致力于我们共同的未来！

SUPROR BRAND VISION

Create a representative enterprise in the field of transmission equipment

With 12 years experience continuously enriched by research and development, Supror is proud to present itself completely renewed to successfully meet the challenges of the market.our new facility Of 170.000 m2, our new series for H/B gearboxes and SPN Series planetary gearboxes.

Finally, SUPROR will uphold the corporate spirit - “Transformation and Innovation, High Level of Integrity as we do business, as well as Value Creation for customers.” also its business philosophy “Accomplice in Winning”, for constantly strengthening the core competitiveness of the company and creating more value for our customers and partners, While sustaining excellence in product and services dedicated to our unified future!



速博雷尔创建于2003年。经过近十二年的艰苦创业和市场开拓，速博雷尔已发展成为一家具有自主知识产权和品牌，并集研发、生产制造各类减速传动设备为一体的制造商和传动解决方案提供商，公司在2013年获得了国家级“高新技术企业”的荣誉称号。

速博雷尔旗下共有两家企业 - “杭州速博雷尔传动机械有限公司”和“浙江速博机械科技有限公司”。分别坐落于中国经济发展的前沿地区 - 杭州空港开发区，毗邻杭州国际机场；以及国家级开发区—浙北工业园区。速博雷尔公司总占地面积已达到十五万平方米，总注册资本壹亿伍仟叁佰万元人民币，目前各类减速机平均年生产能力已达三十五万台以上，并将持续增长。

自公司创建以来，速博雷尔的销售额以年均30%以上的增长而高速发展，被誉为行业内综合竞争力提升最快的减速机械制造商和提供商。产品品质被市场广泛认可，运用于如：能源环保、建筑建材、起重输送、矿山冶金、石油化工、玻璃陶瓷、轻工纺织、农业、食品、塑料橡胶、木工造纸等各个工业制造领域。以速博雷尔（SUPROR）品牌制造的各类减速机产品已远销欧洲、美洲、亚洲、非洲等几十个国家。

速博雷尔一贯尊重产品品质。在当今激烈的市场竞争环境下，我们认为研发、技术、工艺和不断改进是企业可持续发展和达成经营目标的重要因素。为此，人才的培养和造就的挑战将成为速博雷尔高速发展的引擎和未来取得成功的关键。

速博雷尔将继续秉承“变革创新、诚信经营，创造价值”的企业精神和“同谋共赢”的经营理念，不断提升企业的核心竞争力，为客户和合作伙伴创造价值，并以卓越的产品和服务致力于我们共同的未来！

SUPROR was founded in 2003, after nearly twelve years of hard work and market development, it has developed into a fast growing company with independent intellectual property rights and own brands, as well as R&D, manufacturing various types of gear transmission equipment as one of the manufacturers and drive solutions provider. The company was awarded the "High-tech Enterprises" by the National Authority, an honorary title, in 2013.

There are two entire entities - "Hangzhou Supror Transmission Machinery Co., Ltd" and "Zhejiang Supror Machinery Technology Co., Ltd." which are located respectively in the forefront of China's economic development regions - Hangzhou Airport Development Zone, adjacent to the Hangzhou International Airport; and National Development Zones - Northern Zhejiang Industrial Park. The company occupied about one hundred and fifty thousand square meters land, with a total registered capital of one hundred and fifty three hundred million RMB. Average gear and all types of reducer production capacity has reached more than three hundred and fifty thousand units a year and the company will invest more money continues to grow.

Since the company was founded, Supror business began rapidly growing YAGR (yearly average grow rate) to more than 30%. It is known within the industry to enhance the competitiveness of the fastest deceleration transmission machinery manufacturers and driver solution providers. Product quality has been widely recognized by customers nationally and worldwide, which applied to a variety of industries, such as energy and environmental protection, building materials, lifting machine, mining and metallurgy fields, petrochemical, glass, ceramics, textiles, agriculture, food industries, plastics, rubber, wood and paper manufacturing, etc. The various types of gear products with the SUPROR brand name have been well received by oversea customers in Europe, America, Africa and Asia market place.

SUPROR always respected quality and we believe that in the face of the current market environmental and competition today, R&D, technology, processes and continuous improvement would be important factors for sustainable growth of the company. So cultivating talent and bringing it all together to achieve predetermined goals, which will become critical challenges and a growth engine to SUPROR in the year ahead.

Finally, SUPROR will uphold the corporate spirit - "Transformation and Innovation, High Level of Integrity as we do business, as well as Value Creation for customers," also its business philosophy "Accomplish in Winning", for constantly strengthening the core competitiveness of the company and creating more value for our customers and partners, while sustaining excellence in product and services dedicated to our unified future!

杭州速博雷尔传动有限公司—2009年投入使用
Hangzhou Supror Transmission Machinery Co., Ltd - It was put into use in the year of 2009.

蜗轮蜗杆全系列产品生产基地

- WP 铸铁蜗轮蜗杆减速机
- RV/VF 铝合金减速机
- SPS 丝杆升降机

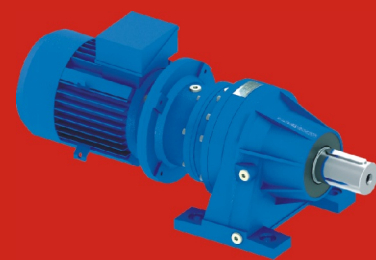
All Series of Worm Gearbox Production Base

- WP Cast Iron Reducer
- RV/VF Aluminum Worm Gearbox
- SPS Screw Jack

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SPN..L..PC..D..E



SPN..L..HC..FAD..O



SPN..P..FP..AD..B..GO



SPN..L..VK..D..T

SPN..行星齿轮减速机 Planetary Gear Units

2 规格

SPN系列主要特点:

- 18种机座号:
 - 输出扭矩达到500, 000 Nm
 - 输出功率达到450 kw
 - 速比 3.5:1 ~ 3000:1
- 型式:
 - 同轴式包括1至4级减速型式
 - 直角轴式包括2至4级减速型式 (第一级为螺旋伞齿轮)
- 法兰、底脚和轴装方式
- 带平键输出轴、花键输出轴、花键空心轴、带收缩盘空心输出轴
- 输入联接方式:
 - IEC 标准电机
 - 输入轴
 - 伺服电机
 - 液压马达
- 安装的附件:
 - 法兰
 - 小齿轮
 - 花键轴
 - 收缩盘
- 更多特点:
 - 可选扭矩种类繁多
 - H型使用了重型圆锥滚子轴承, 能承受很高的悬臂载荷与径向载荷
 - 高效率
 - 零件间使用花键连接, 比使用平键连接更好
 - 行星轮安装在自动定心装置上, 确保每个齿轮承受相同负载
 - 球墨铸铁箱体

3 结构形式

- A
- 01 IEC电机/电机接头
 - 02 实心输入轴
 - 03 带风扇的实心输入轴
 - 04 伺服电机
 - 05 液压马达
- B
- 06 直角减速机
 - 07 单级行星减速机
 - 08 二级行星减速机
 - 09 三级行星减速机
- C
- 10 MC/MZ-带平键或花键实心轴输出 (SPN00-SPN07)
 - 11 HC/HZ-带平键或花键加强型实心轴输出 (SPN00-SPN07)
 - 12 PC-底座支撑带平键实心轴输出
 - 13 PZ-底座支撑带花键实心轴输出
 - 14 HC-带平键实心轴输出 (SPN09-SPN21)
 - 15 HZ-带花键实心轴输出 (SPN09-SPN21)
 - 16 FP-配收缩盘空心轴输出
 - 17 FZ-带花键空心轴输出
 - 18 VK-搅拌机用加强型平行实心轴输出
- D
- 19 法兰
 - 20 齿轮
 - 21 连接套管
 - 22 端盖
 - 23 花键轴
 - 24 收缩盘

2 SPECIFICATIONS

SPN series basic features are:

- **18 size:**
 - output torque up to 500, 000 Nm
 - output power up to 450 kw
 - ratios from 3.5:1 to 3000:1
- **Modular design :**
 - in-line with 1 to 4 reductions
 - right angle (spiral bevel gear set into first stage)with 2 to 4 reduction.
- **Flange-mounted, foot-mounted and shaft-mounted output**
- **Output shafts with keyway, splined, splined hollow shafts, hollow shafts for shaft-mounting with shrink disc**
- **Input adaptors for :**
 - electric motors to IEC standards design B5
 - input shafts
 - servomotors
 - hydraulic motor setting
- **Installation accessories:**
 - flanges
 - pinions
 - splined bars
 - shrink discs
- **More design features:**
 - high ratio of transmissible torque to overall dimensions
 - high radial and axial load capacity of output shafts thanks to tapered roller bearings fitted on the H versions
 - high efficiency
 - inner parts are connected using grooved sections instead of tabs
 - planetary gears of reduction stages mounted to floating holders to ensure maximum load distribution among planetary gears
 - housing from ductile cast iron

3 VERSIONS

- A
- 01 Electric motors IEC / Electric motor setting
 - 02 Solid input shaft
 - 03 Solid input shaft with fan
 - 04 Servomotors
 - 05 Hydraulic motor setting
- B
- 06 Right angle reduction stage
 - 07 Single reduction stage
 - 08 Two reduction stages
 - 09 Three reduction stages
- C
- 10 Keyed or splined solid shaft output (SPN00-SPN07)
 - 11 Keyed or splined heavy solid shaft output (SPN00-SPN07)
 - 12 Output with support bracket and keyed solid shaft
 - 13 Output with support bracket and splined solid shaft
 - 14 Keyed solid shaft output (SPN09-SPN21)
 - 15 Splined solid shaft output (SPN09-SPN21)
 - 16 Hollow shaft output for shrink disc
 - 17 Splined hollow shaft output
 - 18 Reinforced output with parallelshaft for stirres and mixers
- D
- 19 Flange
 - 20 Pinion
 - 21 Sleeve coupling
 - 22 Stop bottom plate
 - 23 Splined bar
 - 24 Shrink disc

4 输出扭矩

4.1 减速机传递的扭矩 M2 [Nm]

基于减速机输入功率的额定输出扭矩（转矩值已考虑到齿轮箱的效率）

4.2 额定输出扭矩 Mn2 [Nm]

指齿轮箱的能安全传递的扭矩，条件为：
-均匀负载，安全系数为1
-理论寿命为10000小时

4.3 最大扭矩 M2max [Nm]

指齿轮箱在静态条件或高启停运转条件下所能承受的输出扭矩。通常是指峰值负载或启动负载。

4.4 实际所需扭矩 Mr2 [Nm]

所需转矩取决于应用场合的实际工况。
拟选齿轮箱的额定转矩Mn2必须大于这个扭矩。

4.5 计算用扭矩 Mc2 [Nm]

计算用扭矩会在选择齿轮箱时被用到，可由实际所需扭矩Mr2和使用系数fs，按以下公式得出。

$$M_{c2} = M_{r2} \cdot f_s < M_{n2} \quad (1)$$

5 符号及计量单位

符号	单位	说明
Ac1	N	输入轴计算用轴向力
Ac2	N	输出轴计算用轴向力
An1	N	输入轴所允许的轴向力
An2	N	输出轴所允许的轴向力
Fh	-	齿轮箱计算寿命系数
Fh1,Fh2	-	轴计算寿命系数
fh1,fh2	-	轴载修正系数
fm	-	调节系数
fs	-	服务系数
ft	-	热功率系数
ftp	-	温度系数
fv	-	速度系数
h	h	寿命小时
i	-	速比
ka	-	轴向载荷系数
kr	-	径向载荷系数
l	-	循环周期系数
M2	Nm	传递到输出轴的扭矩
Mb	Nm	额定制动扭矩
Mc2	Nm	计算用输出扭矩
M2max	Nm	最大输出扭矩
Mr1	Nm	输入轴所需扭矩
Mr2	Nm	输出轴所需扭矩
n1	rpm	输入转速
n2	rpm	输出转速
P1	kW	最大输入功率
P2	kW	输出功率
Pn	kW	电机额定功率
Pr1	kW	所需输入功率
Pr2	kW	最大输出转速时的输出功率
Ps	kW	损耗功率
Pt	kW	齿轮箱热功率
Rc1	N	输入轴计算用径向力
Rc2	N	输出轴计算用径向力
Rn1,Rn2	N	输入和输出轴中点的额定径向载荷
ta	°C	环境温度
X	mm	悬臂载荷的作用距离
ηd	-	动态效率
Z	-	每小时启动次数

4 OUTPUT TORQUE

4.1 Reference torque M2 [Nm]

Indicative output torque to easily establish the performance class for each gearbox basic size.

4.2 Norminal torque Mn2 [Nm]

The condition is that the torque of the gearbox can be transmitted safely:
- Uniform load, the safety factor is 1
- Theoretical life is 10000 hours

4.3 Maximum torque M2max [Nm]

It is the output torque that the reduction unit can withstand instatic or highly intermittent conditions.

It is considered as instantaneous load peak torque or stanting torque under load.

4.4 Required torque Mr2 [Nm]

This is the torque corresponding to application requirement.
It must always be equal to or less than rated output torque Mn2 of the selected gearbox.

4.5 Calculated torque Mr2 [Nm]

Torque value to be used for selecting the gearbox, considering required torque Mr2 and service factor fs, and is obtained by formula.

5 SYMBOLS AND UNITS OF MEASURE

Description
Calculated thrust load at gearbox input shaft
Calculated thrust load at gearbox output shaft
Rated thrust load at gearbox input shaft
Rated thrust load at gearbox output shaft
Lifetime factor for gearbox calculation
lifetime factor for bearing shafts calculation
load corrective factor on shafts
Increase factor
Service factor
Thermal factor
Temperature factor
Speed factor
Lifetime in hours
Reduction ratio
Axial load factor
Radial load factor
Intermittence fator
Reference torque
Rated brake torque
Calculated torque at gearbox output shaft
Gearbox max.output torque
Required torque at gearbox input shaft
Required torque at gearbox output shaft
Angular speed at gearbox input
Angular speed at gearbox output
Max transmissible power at gearbox input
Transmitted power at gearbox output
Motor rated power
Required input power
Maximun output speed
Excess power
Gearbox thermal capacity
Calculated radial load of gearbox input shaft
Calculated radial load of gearbox output shaft
Radial load at the midpoint of the input and output shaft
Ambient temperature
Action distance of cantilever load
Dynamic efficiency
Start times per hour

6 功率

6.1 额定输入功率 P1 [kW]

P1是指齿轮箱安全的最大输入功率：

- 输入转速为n1
- 安全系数S=1
- 理论寿命为10000小时

请检查下面的公式：

$$P_1 \cdot f_s \leq P_1 \quad (2)$$

6.2 输出功率 P2 [kW]

输出功率是指传动到输出轴的有效功率，可按以下公式得出：

$$P_2 = P_1 \cdot \eta_d \quad (3)$$

$$P_2 = \frac{m_{r2} \cdot n_2}{9550} \quad (4)$$

7 热功率 Pt [kW]

热功率值与齿轮箱的发热限值相关。具体数值在齿轮箱额定值表中列出。

该参数表示在输入转速n1、环境温度为20°C、润滑油温度不超过85~90°C，减速机温度不超过75~80°C且不带附加冷却系统的条件下，齿轮箱能持续传递的功率。在短工作时间和长时间停止的工况中，如果定制时间较长，齿轮箱的温度能冷却，则热功率就不再有意义，在计算时可以忽略。

在工作环境不同于20°C、间歇工作制、或输入转速n1不是额定值时，Pt值应由表(A1)中的热功率系数ft和/或速度系数fv进行调整。

确保满足以下条件：

$$P_{rt} \leq P_t \cdot f_t \cdot f_v \quad (5)$$

n1	fv
750	1.5
950	1.2
1500	1.0
2000	0.7

循环持续时间系数是指处于负荷下的工作时间tf与周期时间（tf+tr，tr代表停止时间）的比，并以百分数表示。

$$l = \frac{t_f}{t_f + t_r} \cdot 100 \quad (6)$$

如果常规配置中减速机热功率不足且不能满足（5）中的条件，建议使用带冷却风扇的输入轴FAD。相关的热容量见下面列出的图表（A2）。

8 效率

动态效率 [ηd]

动态效率可以由以下公式计算得出：

$$\eta_d = \frac{P_2}{P_1} \quad (7)$$

它的值是一个传递功率的函数，其值与油的温度和粘度有关。具体效率值如下表(A3)所示：

A3

级数 / N°			
L1	L2、R2	L3、R3	L4、R4
0.97	0.94	0.91	0.88

6 POWER

6.1 Input rated power P1 [kW]

P1 refers to the maximum input power gear box security:

- input speed n1
- theoretical duration 10000 h
- service factor fs=1

Check that the formula here below is always satisfied:

$$P_1 \cdot f_s \leq P_1 \quad (2)$$

6.2 Output rated power P2 [kW]

This value is the power transmitted at gearbox output.It can be calculated with the following formulas.

$$P_2 = P_1 \cdot \eta_d \quad (3)$$

$$P_2 = \frac{m_{r2} \cdot n_2}{9550} \quad (4)$$

7 THERMAL POWER Pt [kW]

This parameter is linked to the gearbox thermal limit.Values for the thermal capacity are listed within the rating charts of gearboxes and gearmotors and represent the mechanical power that can be transmitted continuously at an input speed n1 and at an ambient temperature of 20°C, without the lubricant exceeding The temperature of 85~90°C and the gear case the temperature of 75~80°C,withtout the use a supplementary cooling system.When the duty cycle is formed by short operating periods and rest time is long enough for the unit to cool down,the thermal capacity is hardly significant and it may be omitted from calculation .

For ambient temperatures other than 20°C, intermittent duty and drive speed n1 other than the reference speed listed in the rating charts,Pt is to be adjusted through thermal factor f1 and/or speed factor fv as listed in table (A1).

Finally, make sure that the following condition is always satisfied:

		Ft			
Ta max [°C]	连续工作制 Continuous duty	间歇工作制 / Intermittent duty			
		负载持续率 % / Cyclic duration factor %			
10	1.2	1.3	1.6	1.8	2
20	1	1.1	1.3	1.5	1.7
30	0.9	1	1.2	1.3	1.5
40	0.7	0.8	0.9	1	1.2
50	0.5	0.6	0.7	0.8	0.9

The intermittence factor (l)%is obtained form the ratio between operating time under load tf and total time (tf+tr), where rest time tr, expressed as percentage:

Should the gear unit in the conventional configuration fall short of thermal capacity and not verify the condition(5) above, it is recommended that the fan cooled input shaft-ordering code FAD_ is specified instead. The relevant thermal capacity is listed in the charts here after.

8 EFFICIENCY

Dynamic efficiency [ηd]

Dynamic efficiency can be calculated by the following formula:

$$\eta_d = \frac{P_2}{P_1} \quad (7)$$

Its value is a function of the transmitted power, the reduction ratio and oil temperature and viscosity.

The maximum efficiency values are shoun in table (A3) below:

A3

Stages			
L1	L2、R2	L3、R3	L4、R4
0.97	0.94	0.91	0.88

A2

		热容量 / Thermal capacity Pt [kW]						n1=1450 rpm			
		FAD3	FAD4	FAD5	FAD6	FAD7	FAD8	FAD3	FAD4		
SPN03	L1	29	-	-	-	-	-	SPN07	R2	52	-
SPN04	L1	30	-	-	-	-	-	SPN09	R2	52	-
SPN05	L1	31	-	-	-	-	-	SPN10	R2(B)	-	82
SPN06	L1	-	45	-	-	-	-		R2(C)	-	82
	L2	31	-	-	-	-	-	R2(B)	-	102	
SPN07	L1	-	-	49	-	-	-	SPN11	R2(C)	-	117
	L2	36	-	-	-	-	-		R3	58	-
SPN09	L1	-	-	52	-	-	-	SPN13	R2(B)	-	102
	L2	36	-	-	-	-	-		R2(C)	-	117
SPN10	L1	-	-	-	-	62	-	SPN14	R3	58	-
	L2	-	49	-	-	-	-		R3(B)	-	82
	L3	36	-	-	-	-	-	R3(C)	-	82	
SPN11	L1	-	-	-	-	-	62	SPN15	R4	38	-
	L2	-	-	-	-	-	-		R3(B)	-	102
	L3	36	-	-	-	-	-	R3(C)	-	117	
SPN13	L1	-	-	-	-	-	-	SPN16	R4	58	-
	L2	-	-	57	57	-	-		R3(B)	-	102
	L3	36	-	-	-	-	-	R3(C)	-	117	
SPN14	L2	-	-	-	-	67	-	SPN17	R4	63	-
	L3	-	52	-	-	-	-		R3(B)	-	117
	L4	33	-	-	-	-	-	R3(C)	-	127	
SPN15	L2	-	-	-	-	-	72	SPN18	R4	68	-
	L3	-	-	57	57	-	-		R4(B)	-	108
	L4	36	-	-	-	-	-	R4(C)	-	137	
SPN16	L2	-	-	-	-	-	72	SPN19	R4(B)	-	122
	L3	-	-	57	57	-	-		R4(C)	-	142
	L4	36	-	-	-	-	-	R4(B)	-	132	
SPN17	L2	-	-	-	-	-	77	SPN21	R4(C)	-	152
	L3	-	-	62	62	-	-				
	L4	36	-	-	-	-	-				
SPN18	L3	-	-	-	-	-	62				
	L4	-	-	45	45	-	-				
SPN19	L3	-	-	-	-	-	77				
	L4	-	-	57	57	-	-				
SPN21	L3	-	-	-	-	-	87				
	L4	-	-	62	62	-	-				

9 传动比 [i]

传动比等于输入转速与输出转速的比值:

$$i = \frac{n_1}{n_2} \quad (8)$$

10 工作转速

10.1 输入转速 n1 [min-1]

减速机的驱动速度，如减速机与电机直接相连，则转速值与电机转速相同。

如果减速机有外部传动装置驱动，在间接驱动的情况下，这个值是由电机的转速除以间接驱动附件（皮带、链条等）的传动比。输入转速不得超过减速机额定值表中规定的值。

在工业应用中的连续操作，我们建议速度不超过1750 min-1。

10.2 输出转速 n2 [min-1]

输出转速按照下列公式通过输入转速n1和传动比i计算出来的:

$$n_2 = \frac{n_1}{i} \quad (9)$$

11 使用系数 [fs]

使用系数表现减速机的应用特性。它考虑到减速机的负载类型和每日工作时间。

可以参照表（A4）所列的值选取合适使用系数。

9 REDUCTION RATIO [i]

This is the ratio of gearbox input speed to output speed:

$$i = \frac{n_1}{n_2} \quad (8)$$

10 ANGULAR SPEED

10.1 Input speed n1 [min-1]

The driving speed of the gear box, if gear box and motor directly connect, then the speed value and motor speed are the same.

In the case of an indirect drive, this value is the speed of the motor divided by the transmission ratio of the indirect drive accessory (belt, chain, etc.).

Input speed shall not exceed the value specified in the gear box.

As for continuous operation in industrial applications, We recommend that speed of 1750 min-1 be never exceeded.

10.2 output speed n2 [min-1]

Calculated from input speed n1 and transmission ratio i according to the following equation:

$$n_2 = \frac{n_1}{i} \quad (9)$$

11 SERVICE FACTOR [fs]

Factor depending on the application type. This factor takes into consideration (with sufficient approximation) load variations which the gearbox may undergo for a specific type of duty.

Table (A4) gives indications for the service factor to be selected according to the application and operation type.

A4

		使用系数 / Service factors				
		Number of starts/hour		运行总时间(h)		
		≤ 5000	10000	15000	20000	50000
负载类型 Type of load	每小时启动次数 Type of drive unit	每日运行时间 (h)				
		h < 4	4 < h < 8	8 < h < 12	12 < h < 16	16 < h < 24
均匀负载 Uniform load	Z < 10	0.9	1.0	1.15	1.3	1.6
	10 < Z < 30	0.95	1.15	1.30	1.5	1.8
	30 < Z < 100	1.0	1.25	1.45	1.6	2.0
中等负载 Moderate shock load	Z < 10	1.0	1.25	1.45	1.6	2.0
	10 < Z < 30	1.1	1.4	1.6	1.8	2.2
	30 < Z < 100	1.2	1.5	1.7	2.0	2.4
重负载 Heavy shock load	Z < 10	1.2	1.5	1.7	2.0	2.4
	10 < Z < 30	1.3	1.6	1.8	2.1	2.6
	30 < Z < 100	1.4	1.75	2.0	2.3	2.8

12 寿命系数 [Fh1,Fh2]

输入转速n1或输出转速乘以实际工作时间（休息时间除外）所得出为寿命系数。

寿命系数与齿轮箱的转速成正比。

$$Fh1 = (n1 * h)$$

$$Fh2 = (n2 * h)$$

12 LIFE FACTOR [Fh1,Fh2]

Factor resulting by multiplying angular speed at input (n1) or output(n2) by actual operating working hours h, break times excluded.

Life factor is directly proportional to gearbox rpms during the whole duty time.

$$Fh1 = (n1 * h)$$

$$Fh2 = (n2 * h)$$

13 选型

减速机选型

a) 根据应用所需的确定以下数据:

- 使用系数 fs (表A4)

- 减速机要求

- 工作寿命, (小时)

b) 根据所需输出转矩Mr2按照以下公式得出计算用转矩Mc2:

c) 根据工作寿命、输出转速n2, 得出寿命系数

$$F_{n2} = (n_2 * h) \quad (13)$$

d) 计算需要的速比:

$$i = \frac{n_1}{n_2} \quad (14)$$

e) 选择最接近的传动比以及满足以下条件的减速机机座号:

$$M_{c2} \leq M_{n2} \quad (15)$$

$$Fh_2 \leq (n_2 * h) \quad (16)$$

13 SELECTION

Gearbox selection

a) Determine the following according to the required application:

- Service factor fs (tab.A4)

- Required gearbox

- Working life h

b) Define the calculated torque with the required output torque Mr2

c) Calculate the life factor with required working life H and output speed n2:

$$F_{n2} = (n_2 * h) \quad (13)$$

d) Calculate the required reduction ratio:

$$i = \frac{n_1}{n_2} \quad (14)$$

e) Select gearbox featuring the ratio I nearest to calculated ratio that also satisfies the condition.

$$M_{c2} \leq M_{n2} \quad (15)$$

$$Fh_2 \leq (n_2 * h) \quad (16)$$

14 校核

完成减速机选型后，执行以下校核工作:

a)热功率

确保减速机热功率大于或等于应用的机械功率，见公式（5）.如果不能满足，应选择较大的减速机或增加一个辅助冷却系统。

B)最大转矩

确保瞬时峰值转矩和带载启动转矩不超过减速机的额定最大转矩M2max(见表A5)

A5

减速机 Gearbox	SPN00	SPN01	SPN03	SPN04	SPN05	SPN06	SPN07	SPN09	SPN10
Mn2 [Nm]	1000	1750	2500	3600	5000	8500	12500	18000	25000
M2max [Nm]	1200	2100	3500	4800	7000	12000	18000	27000	36000
减速机 Gearbox	SPN11	SPN13	SPN14	SPN15	SPN16	SPN17	SPN18	SPN19	SPN21
Mn2 [Nm]	40000	55000	80000	100000	135000	170000	250000	350000	500000
M2max [Nm]	54000	66000	100000	126000	162000	216000	300000	420000	650000

14 VRTIFICATION

After selecting the drive units, please check the following:

a) Thermal capacity

Make sure that the thermal power of the gearbox is equal to or greater than the mechanical power required by the application, as per equation (5).

If this is not the case provide a supplementary cooling system (see chap.29) or select a larger gearbox.

B) Maximum torque

Make sure that either the momentary peak torque nor the starting torque under load ever exceed the M2max value that the gearbox is rated for (see tab.A5)

C) 悬臂载荷

检查所选配置并确定：
输入轴和/或输出轴上的悬臂载荷可通过下列公式求出：

$$R_{c1-2} = \frac{2000 \cdot M_{c1-2} \cdot K_2}{d} \quad (17)$$

R_{c1-2} 悬臂载荷 (N)
1 = 表示输入轴
2 = 表示输出轴
 M_{c1-2} 轴上的转矩 (Nm)
d P,C,D(mm)传动部件分度圆直径
(链轮, 齿轮, 带轮等)
Kr = 1 链条传动
Kr = 1.25 齿轮传动
Kr = 1.5~2.5 V形带传动

定义可靠载荷位置x轴。用图表示减速机Rx1和Rx2承受载荷值。
检查以下是否满足要求：

$$R_{c1-2} \leq R_{x1-2} \cdot fh \quad (18)$$

径向和轴向负荷修正系数fh1-2取决于所要求的寿命系数Fh1和Fh2。

d) 轴向力

当施加到输出轴上的径向载荷为指定时，请检查轴向力。满足以下要求：

$$\pm A_{c2} \leq \pm A_{n2} \cdot fh_2 \quad (19)$$

Ac2 输出轴计算用轴向力 [N]
An2 输出轴所允许的轴向力 [N]

15 选择电机

根据以下公式计算减速机所需的输入功率。
须提前确定以下参数：

- 所需扭矩Mr2
- 输出转速n2
- 效率 η_d

$$P_{r1} = \frac{M_{r2} \cdot n_2}{9550 \cdot \eta_d} \quad (20)$$

表 (A3) 列出了不同型号减速机的效率 η_d ；

根据以下条件，在电机选型标准选择合适的电机：

$$P_{r1} \leq P_n \quad (21)$$

对于非连续工作制S1条件下使用的电机，电机额定值可使用系数fm进行调整。见表 (A6)
优先选择四级电机或较低转速的电机。

$$\frac{P_{r1}}{f_m} \leq P_n \quad (22)$$

A6

	工作制 / DUTY					
	S2		S3		S4-S8	
	循环周期 / Cycle time		循环周期系数 / Cyclic duration rate		请与我们联系！ Please contact us	
	10	30	25%	40%	60%	
fm	1.3	1.15	1.05	1.25	1.15	1.1

16 安装

为保证减速机正确可靠运行，需要遵守几条安装准则。

C) Overhung load

Examine the application and establish:
overhung load applying to input and/or output shaft through the following formula:

$$R_{c1-2} = \frac{2000 \cdot M_{c1-2} \cdot K_2}{d} \quad (17)$$

R_{c1-2} Overhung load (N)
1 = for input shaft
2 = for output shaft
 M_{c1-2} Torque at the shaft (Nm)
d P,C,D(mm) of transmission element
(sprlcket,gear,pulley,etc)
Kr = 1 chain transmission
Kr = 1.25 gear transmission
Kr = 1.5~2.5 V-belt transmission

Define the trust load position X onto shaft .Check this value with the chart indicating the load Rx1 and Rx2 bearable by the gearbox.Check that the following is satisfied:

$$R_{c1-2} \leq R_{x1-2} \cdot fh \quad (18)$$

Where fh1-2 the radial and thrust load corrective factor depending on the required life factor Fh1 and Fh2.

d) Thrust loads

Check the thrust load,when exerted onto the output shaft,as specified for the radial load. The following should be satisfied:

$$\pm A_{c2} \leq \pm A_{n2} \cdot fh_2 \quad (19)$$

Ac2 Calculated thrust load at gearbox output shaft [N]
An2 Rated thrust load at gearbox output shaft [N]

15 MOTOR SELECTION

Through the formula here after calculate the power required to gearbox input shaft.

The following paramenters must be determined on beforehand:

- required torque Mr2
- output speed n2
- efficiency η_d

$$P_{r1} = \frac{M_{r2} \cdot n_2}{9550 \cdot \eta_d} \quad (20)$$

Table (A3) lists the efficiency value η_d for the vsrious types of gearboxes.
In the electric motor section select a motor that is sufficiently rated,as per the following condition:

$$P_{r1} \leq P_n \quad (21)$$

For duties other than continuous S1 the motor rating can be upgraded through the factor fm listed in table (A6)
4-pole motors or over should be preferred.

$$\frac{P_{r1}}{f_m} \leq P_n \quad (22)$$

此处所列准则可用作减速机选型指南。

遵循我们公司提供的减速机安装、使用和维护手册，就能正确、有效地进行安装。
以下是安装准则的简要描述：

a) 固定

- 将减速机安放在一个足够坚硬的表面上，结合面应经过机加工且保持平坦。
- 对法兰安装的带花键空心输出轴的减速机尤其重要。
- 在输出端有较大径向载荷的应用中，建议使用法兰安装，因为这种安装方式能在减速机上实现双导径。
- 确保减速机适合于所需的安装位置。
- 使用8.8或更高等级的螺栓固定减速机，拧紧螺栓至相应图表中规定的额定值。

当传送的扭矩大于或等于给定的M2max值70%并频繁换向时，使用等级高于10.9的螺栓。

部分减速机可以使用螺栓和销进行固定。如果使用了销，插入减速机的长度至少为直径的1.5倍。

b) 连接

装配传动装置零件至减速机上时，禁止使用铁锤或类似工具进行敲打压入零件时，可使用维护螺钉和轴端螺纹。装配前务必清除轴上的油脂或防锈剂。

c) 油漆

使用和减速机底漆一致的油漆，
请参照：供货条件。
在油漆之前，保护好装在轴上的密封件。
与溶剂接触会损坏密封件并导致漏油。

d) 润滑

调试前，在减速机中装入指定型号和数量的润滑油（参照：润滑）。
可通过合适的油位塞或观察孔检测油位，每个减速机都装有观察孔，位置与安装方式相关。

17 维护

初次运行50小时后需要检查安装螺栓是否松动，运行100-150小时后必须进行首次换油。随后每运行2000-3000小时更换一次润滑油，具体取决于应用情况。也可以选择一年更换一次油。

然而，必须每隔一段时期检查油面并按规定注油。
间歇工作制条件下应每月检查设备，连续工作制条件下需经常检查。

18 存放

遵循以下说明正确存放产品。

- 不要存放在户外露天或过于潮湿的地方。
- 始终在设备和地板之间垫有木板、木材或其它材料，减速机不得与地板直接接触。
- 对于存放时间超过60天的减速机，所有加工面如法兰、轴和联轴器必须涂刷防锈产品。
- 当减速机存放时间可能超过6个月时，必须采取以下额外措施：
- 所以加工部件需涂上油脂防止生锈。

The rules set out here are intended as a preliminary guide to selecting gearbox.

For effective and proper installation, following the instructions given in the Installation, use and maintenance manual available from us.
Following is a rief outline of installation rules:

a) Fastening

- Please the gearbox on a surface providing adequate rigidity. Mating surfaces should be machined and flat.
- This applies especially to flange-mounted gearboxes with splined hollow output shafts.
- In applications that involve high radial loads at the output end, flange mounting is recommended for some gearboxes as. This mounting pattern benefits from the double pilot diameters provided on these gearboxes.
- Make sure the gearbox is suitable for the reuired mounting position.
- Use bolts of grade 8.8 or greater to secure the gearbox. tighten the bolts to the rated values specified in the relevant charts.

With transmitted worque greater than or equal to 70% of the given M2max and with frequent reversals, use bolts with minimum grade 10.9.

Some gearboxes can be fastened using both blots and pins. If a pin is used, the portion of the pin inserted into the structure the gearbox is being installed to should be least 1.5 times its diameter.

b) Connections

When fitting transmission elements onto the gearbox do not tap them with hammers or similar tools. To slide these parts in ,use the service screws and taps provided at the shaft ends. Be sure to clean off any grease or rust preventative from the shafts before fitting any parts.

c) Paint coating

Use paints compatible with the primer applied to the gearbox, see :Supply comditions. Before painting ,protect the seal rings installed on the shafts.
Contact with paint may deteriorate the seals with su bsequent oil leakage.

d) Lubrication

Before start-up ,fill the gearbox with the recommended lube oil(see lubrication)up to correct level.
level is checked through the suitable plug or sight glass provided on each gearbox depending on designated mounting position.

17 MAINTNEANCE

Check the tightness of mounting bolts after the initial 50 hours of operation. Change the oil first after 100-150 hours operation. Subsequently, change the oil every 2000-3000 hours operation depending on the application. Alternatively change oil once a year.

However ,oil lever should be checked at regular intervals and topped up as required. Check monthly if unit operates under intermittent duty, more frequently if duty is continuous.

18 STORAGE

Observe the following instructions to ensure correct storage of the products.

- Do not store outdoors, in areas exposed to weather or with excessive humidity.
- Always place boards, wood, or other material between the products and the floor. The gearbox should not have direct contact with the floor.
- For storage periods of over 60 days ,oil machined surfaces such as flanges, shafts and couplings must be protected with a suitable anti-oxidation product.
- The following meastres must be taken in respect of products for which the expected storage period exceeds 6 months:
- Cover outer machined parts and mating parts with grease to avoid.

- 放置减速机时必须使透气塞处于顶部并注满润滑油（不适用于终身润滑减速机）。减速机投入运转前，重新注入适当数量和型号的润滑油。

19 供货条件

减速机通常按以下标准进行供货：

- 安装方式符合订单要求；
- 无润滑油的内部零件受到测试时用的润滑油膜的保护。
- 安装表面不涂漆。
- 根据出厂规范进行测试
- 适当包装
- 提供IEC电机安装配件
- 需终身润滑的减速机在制造厂内加注润滑油。

20 润滑

减速机采用润滑油润滑作为标准方式。

对于竖直安装的减速机，鉴于润滑油可能不能保证最高处的轴承的可靠润滑，因此需采用其他润滑措施。

减速机可以在环境温度 -20°C ~ $+40^{\circ}\text{C}$ 之间运行。当温度为 -20°C 和 -10°C 之间时，减速机启动前必须充分且均匀预热，或者空载启动。

当减速机温度达到 -10°C 或更高温度时，方可加载。

运行之前，在减速机中注入适量的润滑油，润滑油的粘性根据列表（A7）进行选择。

A7

在 40°C 时粘度 (ISO-VG) Viscosity ISO-VG at 40°C mm ² /S (CST)	浸油润滑容许的最低临界温度 $^{\circ}\text{C}$ Permissible temperature limit in $^{\circ}\text{C}$ for dip lubrication		在泵速为1500 min ⁻¹ 时强制润滑容许的 最低临界温度 $^{\circ}\text{C}$ Permissible temperature limit in $^{\circ}\text{C}$ for forced feed lubrication at a pump speed of 1500 min ⁻¹	
	矿物油/MINERAL OIL	合成油/SYNTHETIC OIL	矿物油/MINERAL OIL	合成油/SYNTHETIC OIL
VG320	-12	-25	+5	-5

减速机通常备有注油孔、油位塞和放油塞，因此在订购减速机时必须指定安装位置。

表（A7）列出了常规应用中做推荐的润滑油品牌和型号。

- 注意：对于非常规工作条件下的应用，应征询制造商的意见。
- 工作油温不得超过 $85-90^{\circ}\text{C}$ 。
- 除非另有说明，减速机供货时通常是不带润滑油的。
- 不同型号减速机所列的油量只是估计值，根据订货时指定的安装位置设置油位塞的位置，从而确保正确注油。
- 如果传递功率超过减速机的热容量，需提供辅助冷却装置。
- 减速机最高温度不超过 $80-85^{\circ}\text{C}$ 。

- Position the gearboxes with the breather plug up and fill them with oil. Before use, the gearboxes should be filled with the proper amount of lubricant of the recommended type.

19 SUPPLY CONDITIONS

Gearboxes are generally supplied as follows:

- Ready for installation in the mounting position specified in the purchase order.
- Dry; inner parts are protected by a film of the oil used for final testing;
- Mating surfaces are not painted.
- Tested to in-house specifications;
- Suitably packed;
- Complete with mounting hardware for IEC electric Motors;
- Gearboxes oubticated "for life" are factory filled with oil.

20 LUBRICATION

Gear units are provided with dip lubrication as a standard feature.

For gearboxes specified for vertical installation, whereas the oil coverage may not be sufficient to ensure proper lubrication of the uppermost bearings, extra lubrication provisions are used.

Operation of gear units is permitted at ambient temperatures between -20°C and $+40^{\circ}\text{C}$. However, for temperatures between -20°C and -10°C unit may only start up after it has been progressively and evenly pre-heated, or otherwise initially operated unloaded.

Load may then be connected to the output shaft when the gear unit has reached the temperature of -10°C , or higher.

Prior to start-up, fill the gearbox with the appropriate quantity of oil, selecting the viscosity as per table(A7).

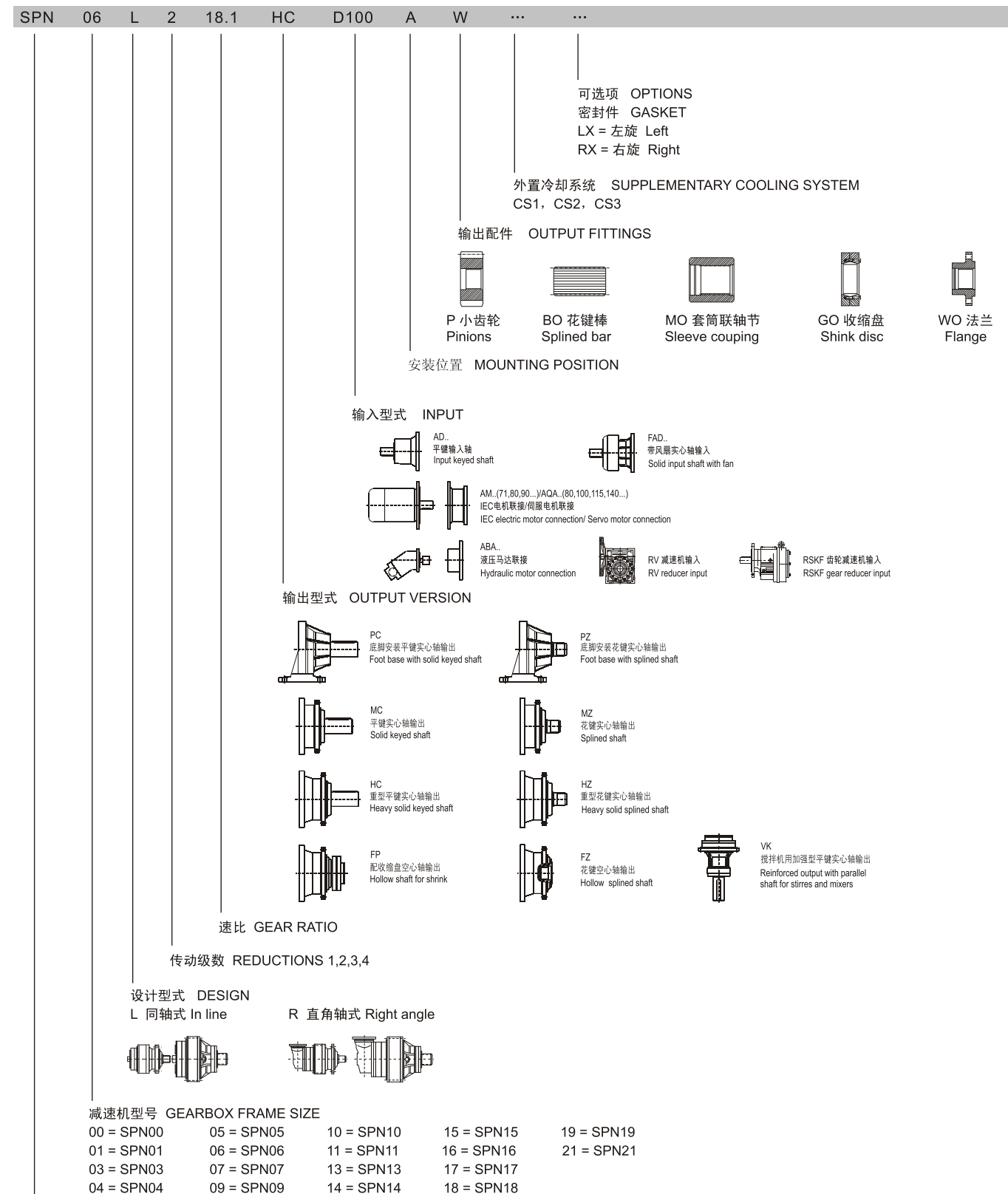
Gearboxes are generally provided with oil fill, leved and drain plugs. as such, the mounting position needs always to be specified when ordering the gearbox.

The table (A7) lists the most common brands of lubricant and the types recommended for normal applications.

- Note :For applications with non-routinge operating conditions, consult factory with complete information.
- Oil temperature must not exceed $85-90^{\circ}\text{C}$ in operation.
- Unless otherwise specified, gear units are supplied unlub-ricated
- The oil capacities listed for the various types of unit are indicative only, fill the gearbox up to the level plug located as per the mounting position specified when ordering to ensure the gearbox is properly filled.
- Should transmitted power exceed the thermal capacity of the unit a supplementary cooling unit must be provided.
- The temperature of the gear case should never exceed $80-85^{\circ}\text{C}$ at the hottest point.

21 SPN...系列减速机命名说明

21 SPN...GEARBOX DESIGNATION



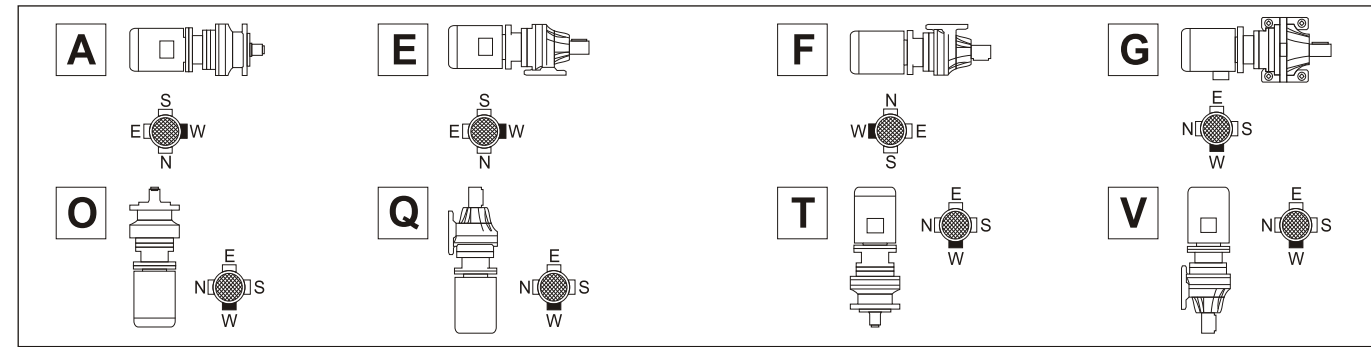
减速机系列 SERIES

22 安装位置

一个产品完整的型号必须包含安装位置，同轴式减速机请参阅表 (A8)，直角轴式减速机请参阅表 (A9)

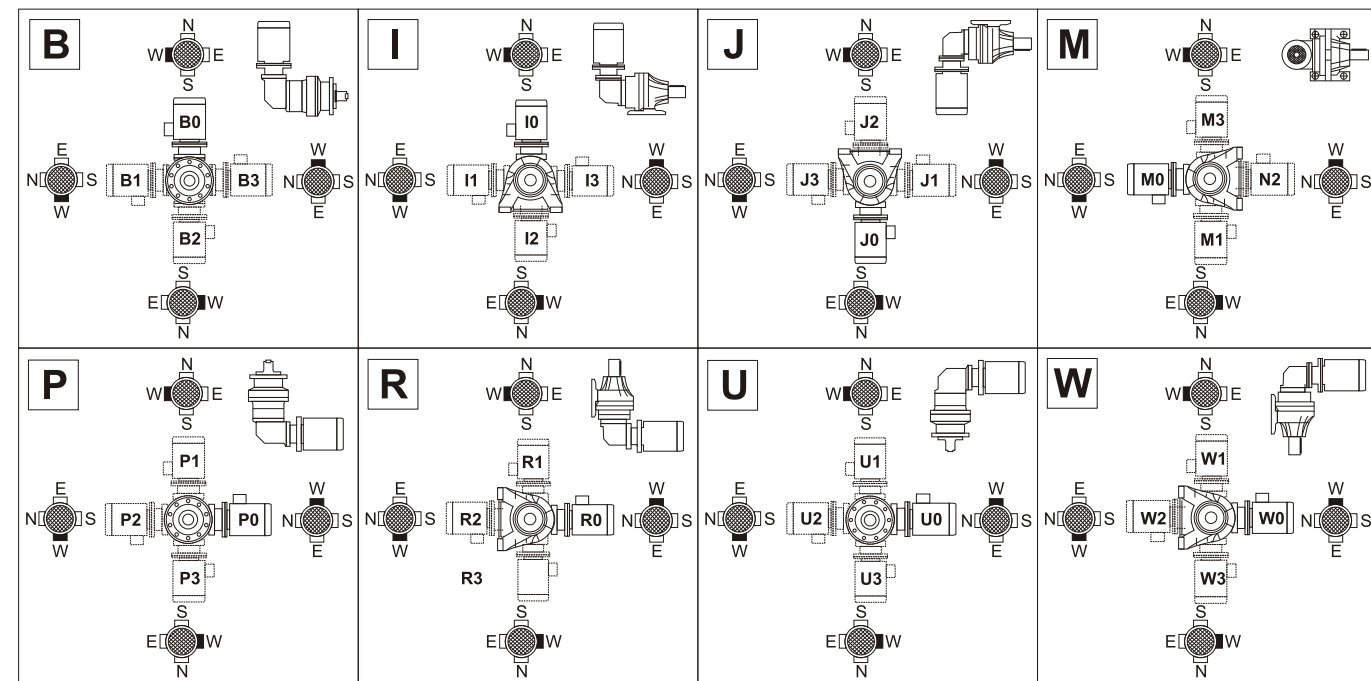
22.1 同轴式减速机

A8



22.2 直角轴式减速机

A9



23 SPN 系列减速机油堵位置

所有减速机

- 1 注油塞/透气塞
- 2 油位塞
- 3 放油塞
- 2A 透明油位管
- 5 连续工况中的附加油罐

1 级同轴式行星减速机 (表A10)

- 1A 注油塞/透气塞
- 3A 放油塞

2 级直角轴式行星减速机 (表A11)

- 1B 注油塞/透气塞
- 3B 放油塞

22 MOUNTING POSITION

The product designation is only complete when the mounting position is also specified. Please refer to table (A8) for in-line gear units and to (A9) for right angle drives.

22.1 In-line units

22.2 Right angle units

23 SPN SERIES OIL PLUG POSITIONS

ALL UNITS

- 1 Filler/breather oil plug
- 2 Oil level plug
- 3 Oil draining plug
- 2A Transparent oil level pipe
- 4 Expansion tank for continuous duty

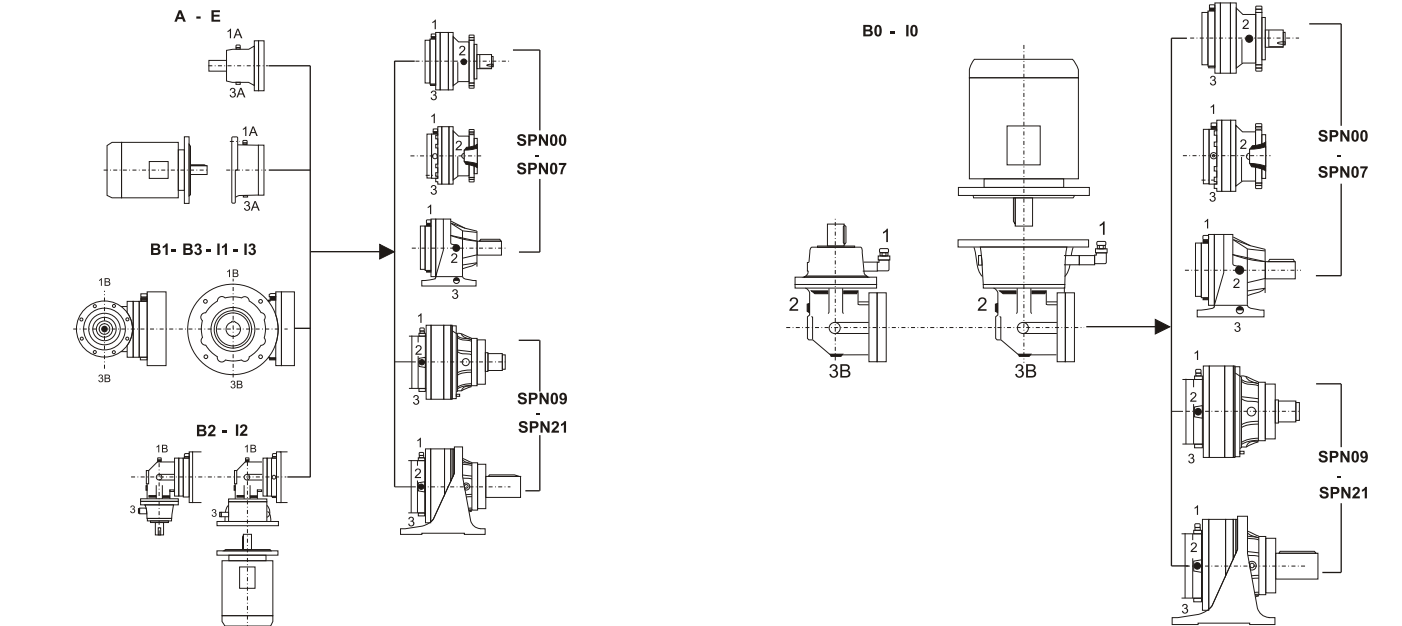
1 STAGE IN-LINE GEAR UNITS (Table A10)

- 1A Filler/breather oil plug
- 3A Oil draining plug

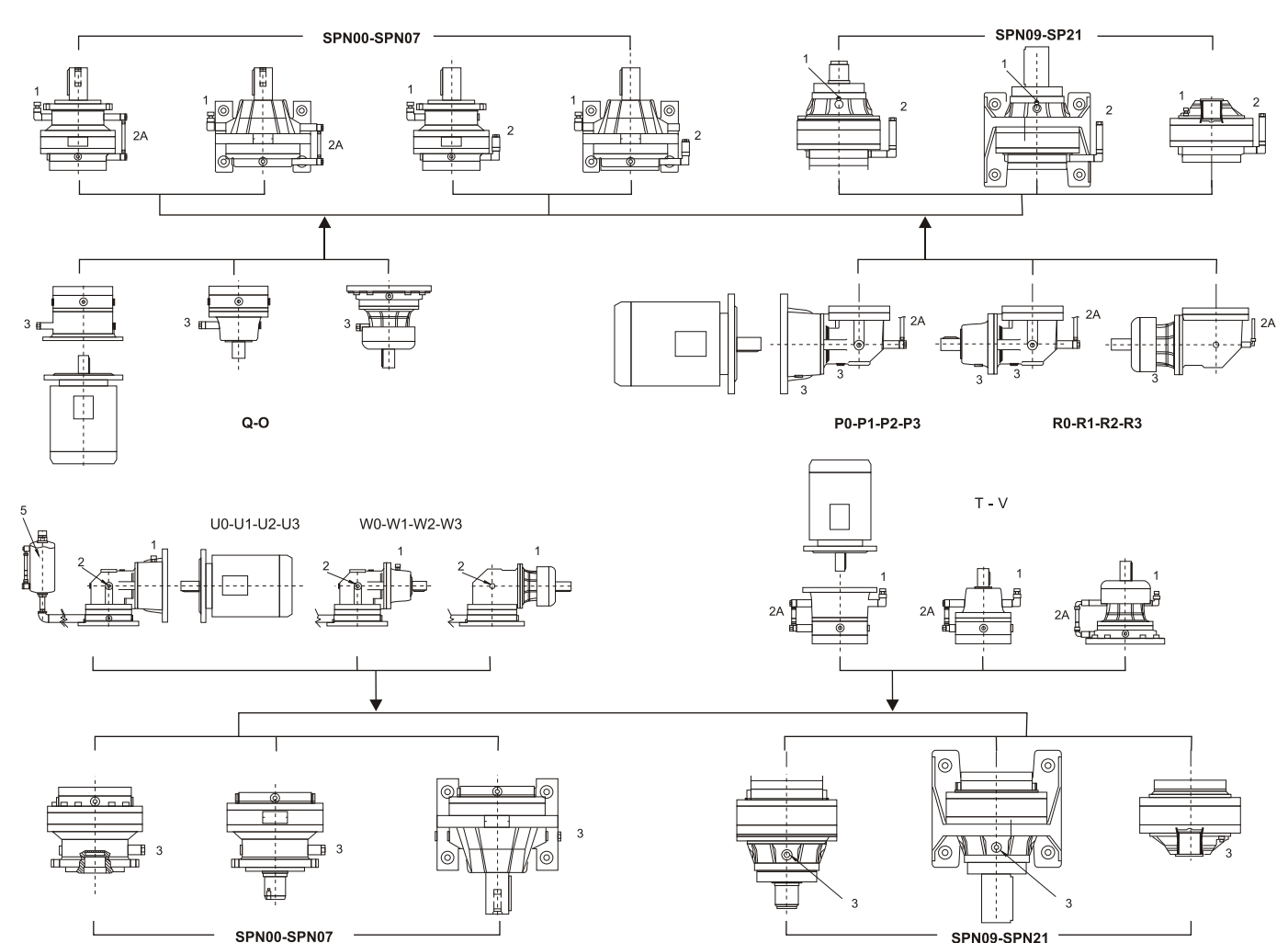
2 STAGE RIGHT ANGLE UNITS (Table A11)

- 1B Filler/breather oil plug
- 3B Oil draining plug

A10



A11



24 系列润滑油量 (L)

A12 L同轴式

SPN00	L1	安装位置 Mounting position		
		A	T	O
SPN00	L1	0.6	1.0	0.9
	L2	0.9	1.3	1.2
	L3	1.2	1.6	1.5
	L4	1.5	1.9	1.8
SPN01	L1	0.8	1.2	1.1
	L2	1.1	1.5	1.4
	L3	1.4	1.8	1.7
	L4	1.7	2.1	2.0
SPN03	L1	1.3	2.3	2.0
	L2	1.6	2.6	2.3
	L3	1.9	2.9	2.6
	L4	2.2	3.2	2.9
SPN04	L1	1.4	2.4	2.2
	L2	1.9	2.9	2.7
	L3	2.2	3.2	3.0
	L4	2.5	3.5	3.3
SPN05	L1	1.6	2.6	2.4
	L2	2.1	3.1	2.9
	L3	2.4	3.4	3.2
	L4	2.7	3.7	3.5
SPN06	L1	2.5	3.5	3.2
	L2	3.3	4.3	4.0
	L3	3.6	4.6	4.3
	L4	3.9	4.9	4.6
SPN07	L1	3.5	5.0	4.5
	L2	4.5	6.0	5.5
	L3	5.0	6.5	6.0
	L4	5.3	6.8	6.3
SPN09	L1	4.0	5.5	5.0
	L2	5.0	6.5	6.0
	L3	5.5	7.0	6.5
	L4	5.8	7.3	6.8

24 SERIES OIL QUANTITY (L)

L In-line

SPN10	L1	安装位置 Mounting position		
		A	T	O
SPN10	L1	5.0	6.5	6.0
	L2	6.3	7.8	7.3
	L3	7.1	8.6	8.1
	L4	7.4	8.9	8.4
SPN11	L1	7.0	12	10
	L2	9.0	14	12
	L3	10	15	13
	L4	11	16	14
SPN13	L1	9.0	14	12
	L2	12	17	15
	L3	13	18	16
	L4	13	18	16
SPN14	L2	17	25	21
	L3	19	27	23
	L4	20	28	24
	L1	15	23	29
SPN15	L2	19	27	23
	L3	21	29	25
	L4	22	30	26
	L2	22	30	26
SPN16	L3	24	32	28
	L4	25	33	29
	L2	26	41	36
	L3	29	44	39
SPN17	L4	30	45	40
	L2	35	50	45
	L3	40	55	50
	L4	43	58	53
SPN18	L2	45	65	55
	L3	50	70	60
	L4	53	73	63
	L3	56	76	66
SPN21	L4	60	80	70

A13 R 直角轴式

SPN00	R2	安装位置 Mounting position		
		BO	U_	P_
SPN00	R2	1.2	1.7	1.5
	R3	1.5	2.0	1.8
	R4	1.8	2.3	2.1
SPN01	R2	1.6	2.1	1.9
	R3	1.9	2.4	2.2
	R4	2.2	2.7	2.5
SPN03	R2	2.2	2.8	2.6
	R3	2.5	3.1	2.9
	R4	2.8	3.4	3.2
SPN04	R2	2.3	2.9	2.7
	R3	2.8	3.4	3.2
	R4	3.1	3.7	3.5
SPN05	R2	2.5	3.1	2.9
	R3	3.0	3.6	3.4
	R4	3.3	3.9	3.7
SPN06	R2	4.0	5.0	4.8
	R3	4.8	5.8	5.6
	R4	5.1	6.1	5.9
SPN07	R2	6.0	8.0	7.0
	R3	7.0	9.0	8.0
	R4	7.5	9.5	8.5

R Right angle

SPN09	R2	安装位置 Mounting position		
		BO	U_	P_
SPN09	R2	6.5	8.5	7.5
	R3	7.5	9.5	8.5
	R4	8.0	10	9.0
SPN10	R2	13	15	14
	R3	11	13	12
	R4	12	14	13
SPN11	R2	14	19	17
	R3	16	21	19
	R4	17	22	20
SPN13	R2	16	21	19
	R3	19	24	22
	R4	20	25	23
SPN14	R3	25	33	29
	R4	28	36	32
	R3	27	35	31
SPN15	R4	30	38	34
	R3	30	38	34
	R4	33	41	37
SPN17	R3	38	52	48
	R4	42	56	52
	R4	48	63	58

注：所有润滑油量为估计值，注油后专门的油堵检查实际油位。

N.b.oil quantities are indicative. Check actual level after filling through the appropriate plug.

25 减速机额定值表

25.1 SPN...L同轴式减速机额定值表

SPN00	i	Mn2 [Nm]	P1 [kW]	Pt [kW]	Rn2 [N]				
					MC/PC	MZ/PZ	HC	HZ	FZ
					L1	3.48	470	20	7.5
L1	4.26	490	18.8	7.5	1720	5280	6070	1130	
	5.77	470	13.3	7.5	1910	5790	6650	1250	
	7.2	410	9.2	7.5	2050	6180	7100	1350	
	9	320	5.7	7.5	2210	6610	7600	1450	
	L2	12.1	680	9.4	7.5	2440	7230	8300	1600
L2	14.8	720	8.1	7.5	2610	7680	8820	1720	
	18.2	750	6.9	7.5	2790	8160	9380	1840	
	20.1	640	5.3	7.5	2890	8410	9660	1900	
	24.6	800	5.5	7.5	3090	8940	10300	2030	
	30.7	840	4.6	7.5	3330	9550	11000	2190	
	33.3	650	3.3	7.5	3420	9790	11200	2250	
	38.4	840	3.7	7.5	3590	10200	11700	2360	
	41.5	650	2.6	7.5	3680	10500	12000	2420	
	51.9	650	2.1	7.5	3970	11200	12900	2610	
	64.8	550	1.4	7.5	4270	12000	13700	2810	
L3	51.6	850	2.8	7.5	3960	11200	12800	2600	
	63.2	850	2.3	7.5	4240	11900	13600	2780	
	69.9	650	1.6	7.5	4380	12200	14000	28800	
	77.5	850	1.9	7.5	4530	12600	14500	29800	
	85.6	850	1.7	7.5	4680	13000	14900	3080	
	105	860	1.4	7.5	5010	13800	15900	3300	
	116	650	0.97	7.5	5180	14200	16300	3410	
	131	860	1.1	7.5	5400	14800	17000	3550	
	142	860	1	7.5	5540	15100	17400	3650	
	177	880	0.86	7.5	5970	16200	18600	3920	
	192	650	0.58	7.5	6130	16600	19000	4030	
	221	910	0.71	7.5	6430	17300	19800	4230	
	240	650	0.47	7.5	6600	17700	20300	4340	
	299	650	0.37	7.5	7110	18900	21700	4670	
	374	670	0.31	7.5	7660	20200	23200	5030	
L4	330	970	0.52	6	7350	19500	22400	4830	
	403	680	0.3	6	7850	20700	23800	5160	
	447	1020	0.4	6	8130	21300	24500	5340	
	494	1030	0.37	6	8400	22000	25300	5520	
	558	1060	0.34	6	8750	22800	26200	5750	
	616	1070	0.31	6	9050	23500	27000	5950	
	755	1110	0.26	6	9680	25000	28700	6360	
	819	1130	0.24	6	9940	25600	29400	6540	
	942	1160	0.22	6	10400	26700	30700	6850	
	1022	1170	0.2	6	10700	27300	31400	7040	
	1108	810	0.13	6	11000	28000	32200	7230	
	1275	1220	0.17	6	11500	29200	33600	7580	
	1383	850	0.11	6	11800	29900	34000	7790	
	1591	1250	0.14	6	12000	31000	34000	8000	
	1725	860	0.09	6	12000	31000	34000	8000	
2153	860	0.07	6	12000	31000	34000	8000		
2692	1000	0.07	6	12000	31000	34000	8000		

i -实际速比，输入转速n1=1500 min-1

Mn2 -减速机额定输出扭矩，

P1 -电机额定功率

Pt -减速机热功率

Rn2 -输出轴上允许的悬臂载荷，根据：

-安全系数S=1，

-10000小时使用寿命。

当作用力没有应用在轴中点时，按照具体减速机的尺寸查看相应图表。

25 GEARMOTOR RATING CHARTS

25.1 Rating charts for in-line units SPN...L

SPN01	i	Mn2 [Nm]	P1 [kW]	Pt [kW]	Rn2 [N]			
					MC/MZ	HC/PC	HZ/PZ	FZ
					L1	3.48	840	30
L1	4.26	880	30	7.5	1720	5280	6070	1130
	5.77	930	26	7.5	1910	5790	6650	1250
	7.2	750	17	7.5	2050	6180	7100	1350
	9	630	11.3	7.5	2210	6610	7600	1450
	L2	12.1	1220	16.8	7.5	2440	7230	8300
L2	14.8	1280	14.4	7.5	2610	7680	8820	1720
	18.2	1360	12.5	7.5	2790	8160	9380	1840
	20.1	1260	10.5	7.5	2890	8410	9660	1900
	24.6	1490	10.1	7.5	3090	8940	10300	2030
	30.7	1580	8.6	7.5	3330	9550	11000	2190
	33.3	1300	6.5	7.5	3420	9790	11200	2250
	38.4	1540	6.7	7.5	3590	10200	11700	2360
	41.5	1300	5.2	7.5	3680	10500	12000	2420
	51.9	1300	4.2	7.5	3970	11200	12900	2610
	64.8	1150	3	7.5	4270	12000	13700	2810
L3	51.6	1630	5.4	7.5	3960	11200	12800	2600
	63.2	1650	4.5	7.5	4240	11900	13600	2780
	69.9	1300	3.2	7.5	4380	12200	14000	28800
	77.5	1670	3.7	7.5	4530	12600	14500	29800
	85.6	1680	3.4	7.5	4680	13000	14900	3080
	105	1700	2.8	7.5	5010	13800	15900	3300
	116	1300	1.9	7.5	5180	14200	16300	3410
	131	1720	2.3	7.5	5400	14800	17000	3550
	142	1720	2.1	7.5	5540	15100	17400	3650
	177	1770	1.7	7.5	5970	16200	18600	3920
	192	1300	1.2	7.5	6130	16600	19000	4030
	221	1790	1.4	7.5	6430	17300	19800	4230
	240	1300	0.93	7.5	6600	17700	20300	4340
	299	1300	0.75	7.5	7110	18900	21700	4670
	374	1350	0.62	7.5	7660	20200	23200	5030
L4	330	1920	1	6	7350	19500	22400	4830
	403	1370	0.6	6	7850	20700	23800	5160
	447	2030	0.81	6	8130	21300	24500	5340
	494	2070	0.74	6	8400	22000	25300	5520
	558	2110	0.67	6	8750	22800	26200	5750
	616	2150	0.62	6	9050	23500	27000	5950

SPN03										
i	Mn2 [Nm]	P1 [kW]	Pt [kW]	Rn2 [N]						
				MC	MZ	HC/PC	HZ/PZ	FZ		
L1	3.6	1380	40	11	5010	5780	10300	12300	3210	
	4.25	1430	40	11	5290	6110	10800	13000	3400	
	5.33	1490	40	11	5710	6590	11500	13900	3660	
	6.2	1400	36	11	6000	6930	12100	14500	3850	
	7.5	1220	26	11	6400	7390	12800	15400	4100	
	9.67	750	12.6	11	6960	8040	13800	16600	4470	
L2	12.5	1640	20	9	7590	8760	14900	17900	4870	
	15.3	1710	18.6	9	8120	9380	15800	19100	5210	
	18.1	2020	18.6	9	8580	9910	16600	20000	5510	
	20.8	1820	14.6	9	8980	10400	17300	20900	5760	
	22.7	2100	15.4	9	9260	10700	17800	21400	5940	
	24.5	2150	14.6	9	9490	11000	18200	21900	6090	
	26.4	1820	11.5	9	9740	11200	18600	22400	6250	
	30.8	2140	11.6	9	10200	11800	19500	23500	6570	
	35.8	1820	8.5	9	10800	12400	20400	24600	6910	
	38.4	2150	9.3	9	11000	12700	20900	25100	7070	
	44.6	1820	6.8	9	11600	13400	21800	26300	7440	
	55.8	1820	5.4	9	12500	14400	23300	28100	8010	
	L3	53.4	2170	7	7.5	12300	14200	23000	27700	7900
		63.1	2510	6.8	7.5	13000	15000	24200	29100	8340
72.3		2230	5.3	7.5	13600	15700	25200	30300	8730	
77.2		2520	5.6	7.5	13900	16100	25700	30900	8930	
90.2		2250	4.3	7.5	14700	16900	26900	32400	9400	
105		2580	4.2	7.5	15400	17300	28200	33900	9880	
113		1820	2.8	7.5	15800	18200	28800	34700	10100	
124		1820	2.5	7.5	16300	18800	29700	35700	10500	
141		2610	3.2	7.5	17000	19700	30800	37100	10900	
152		1820	2.1	7.5	17500	20200	31500	37900	11200	
164		2200	2.3	7.5	17900	20600	32200	38800	11500	
178		2210	2.1	7.5	18400	21200	33000	39700	11800	
190		1830	1.7	7.5	18800	21700	33700	40600	12100	
220		2250	1.8	7.5	19700	22800	35200	42400	12700	
258		1840	1.2	7.5	20800	24000	36900	44400	13300	
276		2230	1.4	7.5	21300	24600	37700	45400	13700	
321		1860	1	7.5	22400	25800	39400	47500	14400	
389		1690	0.75	7.5	23900	27500	41800	50300	15300	
402	1940	0.85	7.5	24100	27800	42200	50700	15500		
L4	413	2360	1	6	24300	28100	42500	51200	15600	
	446	2810	1.1	6	25000	28800	43500	52400	16000	
	492	2690	0.97	6	25800	29800	44800	53900	16600	
	556	2810	0.9	6	26900	31000	46500	55900	17200	
	649	2320	0.63	6	28300	32700	48700	58600	18200	
	718	2150		6	29300	33800	50200	60400	18800	
	816	2720	0.53	6	30500	35300	52200	62800	19600	
	896	2230	0.59	6	31500	36400	53700	64600	20200	
	1018	2740	0.44	6	32900	38000	55800	67100	21100	
	1098	2310	0.48	6	33700	38900	57000	68600	21600	
	1278	2790	0.37	6	35500	40900	59700	71800	22800	
	1370	2400	0.39	6	36000	41900	60900	73300	23300	
	1586	2250	0.31	6	36000	42000	63700	74000	24000	
	1854	2440	0.25	6	36000	42000	64000	74000	24000	
	1991	2850	0.23	6	36000	42000	64000	74000	24000	
	2243	2000	0.25	6	36000	42000	64000	74000	24000	
	2799	2000	0.16	6	36000	42000	64000	74000	24000	

SPN04									
i	Mn2 [Nm]	P1 [kW]	Pt [kW]	Rn2 [N]					
				MC	MZ	HC/PC	HZ/PZ	FZ	
3.6	1840	50	12	5010	5780	10300	12300	3210	
4.25	1900	50	12	5290	6110	10800	13000	3400	
5.33	1990	50	12	5710	6590	11500	13900	3660	
6.57	1870	46	12	6120	7070	12300	14800	3930	
12.5	2680	30	9	7590	8760	14800	17900	4870	
15.3	2840	30	9	8120	9380	15800	19100	5210	
18.1	2940	27	9	8580	9910	16600	20000	5510	
20.8	2960	24	9	8980	10400	17300	20900	5760	
22.7	2790	21	9	9260	10700	17800	21400	5940	
24.5	3230	22	9	9490	11000	18200	21900	6090	
30.8	2850	15.5	9	10200	11800	19500	23500	6570	
38.4	2850	12.4	9	11000	12700	20900	25100	7070	
47.3	2390	8.4	9	11800	13600	22200	26700	7580	
59.1	2390	6.7	9	12700	14700	23700	28600	8170	
43.6	3190	12.6	7.5	11500	13300	21700	26100	7380	
53.4	3230	10.4	7.5	12300	14200	23000	27700	7900	
63.1	3480	9.5	7.5	13000	15000	24200	29100	8340	
72.3	3290	7.8	7.5	13600	15700	25200	30300	8730	
77.2	3490	7.8	7.5	13900	16100	25700	30900	8930	
90.2	3320	6.3	7.5	14700	16900	26900	32400	9400	
105	3520	5.8	7.5	15400	17800	28200	33900	9880	
111	3380	5.3	7.5	15700	18100	28600	34500	10100	
130	3530	4.7	7.5	16600	19100	30100	36200	10600	
141	3540	4.3	7.5	17000	19700	30800	37100	10900	
150	3440	4	7.5	17300	20000	31400	37700	11100	
165	2390	2.5	7.5	17900	20700	32300	38800	11500	
178	2850	2.8	7.5	18400	21200	33000	39700	11800	
202	2390	2	7.5	19200	22100	34300	41300	12300	
220	3610	2.8	7.5	19700	22800	35200	42400	12700	
273	2390	1.5	7.5	21200	24500	37600	45200	13600	
341	2420	1.2	7.5	22800	26400	40200	48300	14700	
426	2470	1	7.5	24600	28400	42900	51600	15800	
413	3000	1.3	6	24300	28100	42500	51200	15600	
446	3720	1.5	6	25000	28800	43500	52400	16000	
492	3730	1.3	6	25800	29800	44800	53900	16600	
556	3740	1.2	6	26900	31000	46500	55900	17200	
649	3540	0.97	6	28300	32700	48700	58600	18200	
702	2630	0.66	6	29000	33500	49900	60000	18600	
816	3820	0.83	6	30500	38000	52200	62800	19600	
1018	3870	0.67	6	32900	39700	55800	67100	21100	
1164	2870	0.44	6	34400	40900	58000	69800	22100	
1271	3920	0.55	6	35400	41600	59600	71700	22700	
1344	3690	0.49	6	36000	42000	60600	72900	23100	
1586	3960	0.44	6	36000	42000	63700	74000	24000	
1815	3000	0.29	6	36000	42000	64000	74000	24000	
1991	3740	0.33	6	36000	42000	64000	74000	24000	
2269	3000	0.23	6	36000	42000	64000	74000	24000	
2453	3000	0.22	6	36000	42000	64000	74000	24000	

SPN05									
i	Mn2 [Nm]	P1 [kW]	Pt [kW]	Rn2 [N]					
				MC	MZ	HC/PC	HZ/PZ	FZ	
L1	3.6	2370	60	13	5010	5780	10300	12300	3210
	4.25	2450	60	13	5290	6110	10800	13000	3400
	5.33	2560	60	13	5710	6590	11500	13900	3660
	6.2	2650	60	13	6000	6930	12100	14500	3850
	7.5	2270	49	13	6400	7390	12800	15400	4100
	12.5	2930	30	9	7590	8760	14900	17900	4870
L2	15.3	3060	30	9	8120	9380	15800	19100	5210
	18.1	3620	30	9	8580	9910	16600	20000	5510
	20.8	3250	26	9	8980	10400	17300	20900	5760
	22.7	3940	29	9	9260	10700	17800	21400	5940
	24.5	3830	26	9	9490	11000	18200	21900	6090
	26.4	3530	22	9	9740	11200	18600	22400	6250
	30.8	4280	23	9	10200	11800	19500	23500	6570
	35.8	3560	16.6	9	10800	12400	20400	24600	6910
	38.4	4300	18.7	9	11000	12700	20900	25100	7070
	44.6	3560	13.3	9	11600	13400	21800	26300	7440
	55.8	3540	10.6	9	12500	14400	23300	28100	8010
	53.4	4000	12.9	7.5	12300	14200	23000	27700	7900
	63.1	4720	12.9	7.5	13000	15000	24200	29100	8340
	72.3	4160	9.9	7.5	13600	15700	25200	30300	8730
77.2	4820	10.7	7.5	13900	16100	25700	30900	8930	
90.2	4260	8.1	7.5	14700	16900	26900	32400	9400	
105	5030	8.3	7.5	15400	17800	28200	33900	9880	
113	3590	5.5	7.5	15800	18200	28800	34700	10100	
124	3590	5	7.5	16300	18800	29700	35700	10500	
141	5180	6.3	7.5	17000	19700	30800	37100	10900	
152	3600	4.1	7.5	17500	20200	31500	37900	11200	
164	4410	4.6	7.5	17900	20600	32200	38800	11500	
178	4420	4.3	7.5	18400	21200	33000	39700	11800	
190	3600	3.3	7.5	18800	21700	33700	40600	12100	
220	4750	3.7	7.5	19700	22800	35200	42400	12700	
258	3600	2.4	7.5	20800	24000	36900	44400	13300	
276	4460	2.8	7.5	21300	24600	37700	45400	1	

SPN07										SPN09							
i	Mn2 [Nm]	P1 [kW]	Pt [kW]	Rn2 [N]													
				MC	MZ	HC/PC	HZ/PZ	FZ									
L1	3.43	5110	115	22	6820	8560	17800	23300	5930	3.43	7010	150	25	18100	23300	4740	
	4.09	5260	115	22	7230	9070	18700	24600	6290	4.09	7220	150	25	19000	24600	5030	
	5.25	5540	115	22	7860	9860	20200	26500	6830	5.25	7600	150	25	20500	26500	5470	
	6.23	5750	115	22	8320	10400	21300	27900	7230	6.23	7900	150	25	21600	27900	5790	
L2	12.3	7510	60	18	10500	13100	26100	34200	9080	12.3	7890	60	18	26500	34200	7270	
	14.7	7730	60	18	11100	13900	27500	36100	9640	14.7	9410	60	18	28000	36100	7710	
	17.4	8120	60	18	11700	14700	28900	37900	10200	17.4	9730	60	18	29400	37900	8150	
	21.8	8690	60	18	12600	15900	31000	40600	11000	21.8	10100	60	18	31500	40600	8790	
	25.4	9090	60	18	13300	16700	32400	42500	11600	25.4	10500	60	18	32900	42500	9240	
	28	9150	55	18	13700	17200	33400	43700	11900	28	12500	60	18	33900	43700	9550	
	30.7	9590	52	18	14200	17800	34300	45000	12300	32.6	13000	60	18	35500	45800	10000	
	32.6	9410	48	18	14400	18100	34900	45800	12600	38.6	12500	54	18	37400	48200	10600	
	38.6	8310	36	18	15300	19200	36800	48200	13300	46.7	12500	45	18	39600	51000	11300	
	46.7	8360	30	18	16300	20400	38900	51000	14200								
	L3	51.3	10700	30	11	16800	21100	40000	52400	14600	51.3	13400	30	11	40700	52400	11700
		60.5	11100	30	11	17800	22300	42100	55100	15400	60.5	14100	30	11	42700	55100	12300
74.1		11600	27	11	19000	23800	44700	58600	16500	74.1	15000	30	11	45400	58600	13200	
80.6		10200	22	11	19500	24500	45800	60100	17000	80.6	14800	30	11	46600	60100	13600	
93		12200	23	11	20500	25700	47900	62700	17800	93	15100	28	11	48600	62700	14200	
100		12400	21	11	21000	26400	49000	64100	18300	100	16500	28	11	49700	64100	14600	
113		10500	16	11	21900	27500	50800	66500	19000	113	15500	24	11	51600	66500	15200	
126		13000	17.8	11	22700	28400	52400	68700	19700	126	16400	22	11	53200	68700	15800	
139		10700	13.3	11	23400	29400	54000	70700	20400	139	16000	19.9	11	54800	70700	16300	
146		13400	15.8	11	23800	29900	54800	71800	20700	162	16300	17.3	11	57400	74000	17100	
162		10800	11.6	11	24600	30900	56500	74000	21400	183	14300	13.5	11	59500	76800	17800	
177		12300	12	11	25400	31900	58000	76100	22100	202	16500	14.1	11	61300	79100	18400	
202		11000	9.4	11	26500	33300	60400	79100	23100	223	13000	10	11	63200	81500	19100	
221		12700	9.9	11	27300	34300	62000	81300	23800	239	13000	9.4	11	64600	83300	19500	
239		8700	6.3	11	28100	35200	63500	83300	24400	284	15700	9.6	11	67900	87600	20700	
284		11300	6.8	11	29700	37300	66900	87600	25800	336	13200	6.8	11	71500	92200	21900	
336	8840	4.5	11	31500	39500	70400	92200	27300									
L4	349	14900	7.6	7.5	31800	40000	71200	93300	27700	349	21300	10.8	7.5	72300	93300	22100	
	406	11900	5.2	7.5	33500	42000	74400	97500	29100	406	17800	7.8	7.5	75600	97500	23300	
	465	12200	4.6	7.5	35000	44000	77500	101600	30500	465	18300	7	7.5	78800	101600	24400	
	509	14000	4.9	7.5	36100	45300	79700	104400	31400	509	14300	5	7.5	81000	104400	25100	
	579	14900	4.6	7.5	37700	47300	82800	108500	32800	579	21300	6.5	7.5	84100	108500	26200	
	654	12900	3.5	7.5	39200	49200	85900	112600	34100	654	18100	4.9	7.5	87300	112600	27300	
	722	15000	3.7	7.5	40600	50900	88500	116000	35300	722	21300	5.2	7.5	89900	116000	28200	
	801	13300	3	7.5	42000	52700	91300	119600	36500	801	18200	4	7.5	92800	119600	29200	
	906	15200	3	7.5	43800	54900	94700	124200	38000	906	17900	3.5	7.5	96300	124200	30400	
	999	13800	2.5	7.5	45200	56700	97600	127800	39300	999	18200	3.2	7.5	103400	127800	31400	
	1157	14200	2.2	7.5	47500	59600	101900	133600	41300	1149	16200	2.5	7.5	106900	133300	32900	
	1274	12300	1.7	7.5	49000	61500	104900	137500	42600	1286	16500	2.3	7.5	109200	137900	34200	
	1408	15600	2	7.5	50700	63600	108100	141700	44100	1380	16700	2.2	7.5	110000	140900	35000	
	1591	15000	1.7	7.5	52000	65000	10900	145000	45000	1605	17000	1.9	7.5	110000	145000	36000	
	1767	15700	1.6	7.5	52000	65000	10900	145000	45000	1723	17000	1.8	7.5	110000	145000	36000	
	2041	14300	1.2	7.5	52000	65000	10900	145000	45000	2003	17000	1.5	7.5	110000	145000	36000	
	2423	11000	0.81	7.5	52000	65000	10900	145000	45000	2423	17000	1.2	7.5	110000	145000	36000	

i -实际速比, 输入转速n1=1500 min-1
Mn2 -减速机额定输出扭矩,
P1 -电机额定功率
Pt -减速机热功率
Rn2 -输出轴上允许的悬臂载荷, 根据:
-安全系数S=1,
-10000小时使用寿命.
当作用力没有应用在轴中点时, 按照具体减速机的尺寸查看相应图表。

i - Gear ratio, gearbox drive-speed is 1500 min-1
Mn2 - Reference torque
P1 - Reference power
Pt - Thermal Power
Rn2 - Permitted overhung loading on output shaft, based on:
- safety factor S=1
- 10000 hrs theoretical lifetime
For forces not applying at shaft midpoint, see diagrams provided in the pages following dimensions of the specific gearbox .

SPN10							SPN11							
i	Mn2 [Nm]	P1 [kW]	Pt [kW]	Rn2 [N]										
				HC/PC	HZ/PZ	FZ								
L1	4.09	7330	175	35	22600	28400	9080	4.09	10600	200	35	26700	33200	9080
	5.25	7710	175	35	24300	30600	9870	5.25	11700	200	35	28700	35800	9870
	6.23	8020	175	35	25600	32200	10400	6.23	11600	200	35	30300	37700	10400
L2	14.7	10800	75	22	33100	41700	13900	14	15300	115	26	38600	48100	13700
	17.4	11300	75	22	34800	43800	14700	16.7	16100	115	26	40700	50700	14500
	21.8	12100	75	22	37300	46900	15900	18	16900	115	26	41600	51800	14900
	25.4	12700	75	22	39000	49100	16700	21.5	17400	115	26	43900	54600	15800
	28	12800	75	22	40200	50500	17200	25.5	18300	115	26	46200	57500	16700
	30.7	13400	73	22	41300	51900	17800	27.6	19200	115	26	47300	58900	17200
	32.6	13300	68	22	42000	52900	18100	32.7	20200	103	26	49800	62000	18200
	38.6	13600	59	22	44300	55700	19200	38.8	19700	85	26	52400	65300	19200
	46.7	14200	51	22	46900	58900	20500							
L3	53	15800	40	18	48700	61200	21300	50.5	22400	60	18	56700	70600	21000
	62.6	16600	40	18	51200	64300	22500	60.2	23700	60	18	59800	74500	22300
	73.9	17500	40	18	53800	67600	23800	71.1	24900	60	18	62800	78300	23500
	80.3	17500	37	18	55100	69300	24500	77.3	25500	57	18	64400	80200	24200
	91.3	18600	35	18	57300	72100	25600	89.3	26600	51	18	67300	83800	25400
	101	18700	32	18	59000	74200	26400	104	27800	46	18	70400	87600	26700
	110	19700	31	18	60700	76300	27200	115	28700	43	18	72500	90300	27600
	119	19700	28	18	62000	78000	27900	126	29500	40	18	74500	92800	28400
	130	20700	27	18	63800	80200	28800	133	30000	39	18	75800	94500	29000
	142	20700	25	18	65400	82200	29600	147	31800	37	18	78100	97300	30000
	164	22200	23	18	68300	85800	31100	161	31800	34	18	80300	100000	30900
	177	18300	17.7	18	69900	87900	31900	171	32600	33	18	81700	101800	31500
	202	22000	18.8	18	72700	91400	33300	191	32200	29	18	84500	105300	32700
	230	21200	15.8	18	75600	95100	34800	203	33400	28	18	86000	107200	33400
	249	18400	12.7	18	77400	97400	35700	245	34300	24	18	91100	113500	35500
	295	23300	13.6	18	81500	102500	37800	291	27000	16	18	95900	119400	37600
350	19000	9.3	18	85800	107900	40000								
L4	392	19400	8.8	11	88700	111500	41500	348	39800	20	11	101100	126000	39900
	451	29800	11.7	11	92500	116300	43500	410	41500	18	11	106300	132400	42200
	507	25500	8.9	11	95800	120500	45300	512	44000	15.2	11	113600	141500	45400
	556	31600</												

SPN13								SPN14							
i	Mn2 [Nm]	P1 [kW]	Pt [kW]	Rn2 [N]			i	Mn2 [Nm]	P1 [kW]	Pt [kW]	Rn2 [N]				
				HC/PC	HZ/PZ	FZ					HC/PC	HZ/PZ	FZ		
L2	14.2	22600	150	30	47900	56700	16900	17.4	33100	175	40	54300	63800	20400	
	16.9	23500	150	30	50500	59700	18000	22.3	37400	175	40	58500	68700	22100	
	18.5	24100	150	30	51800	61400	18500	26.5	37300	175	40	61600	72300	23400	
	21.8	25500	150	30	54400	64400	19500	28	38200	175	40	62700	73600	23900	
	25.8	26700	150	30	57300	67800	20700	33.2	40200	175	40	66000	77400	25300	
	28.4	27300	150	30	58900	69700	21300	38.6	35300	152	40	69000	81000	26600	
	33.6	28800	143	30	62000	73400	22600								
	40.5	29500	122	30	65600	77600	24000								
L3	51.1	32700	60	18	70300	83200	25900	62.6	48600	75	25	79800	93600	31200	
	61	34500	60	18	74100	87700	27500	73.9	51100	75	25	83800	98400	33000	
	72	36300	60	18	77900	92200	29100	92.7	54700	75	25	89700	105400	35600	
	78.3	37300	60	18	79900	94600	29900	108	57200	75	25	93900	110200	37400	
	92.4	39300	60	18	84000	99400	31600	138	64800	75	25	101200	118800	40700	
	110	41200	60	18	88400	104600	33500	164	64200	67	25	106500	125100	43100	
	120	42100	60	18	90900	107600	34500	174	63000	62	25	108300	127200	43900	
	135	44000	56	18	94100	111300	35800	206	63800	53	25	114000	133900	46400	
	143	44400	53	18	95700	113300	36500	240	52000	37	25	119300	140100	48800	
	151	45000	51	18	97300	115200	37200								
	163	46000	49	18	99600	117800	38200								
	176	45000	44	18	101800	120500	39100								
	182	39000	37	18	102900	121800	39600								
	194	47600	42	18	104800	124100	40400								
	209	45000	37	18	107200	126900	41400								
	252	45000	31	18	113500	134300	44200								
	304	39100	22	18	120000	142000	47000								
L4	352	52500	26	11	125400	148400	49300	314	77800	40	15	129400	151900	53400	
	394	55000	25	11	129700	153500	51200	388	78500	36	15	137900	161900	57300	
	452	54000	21	11	135200	160000	53600	458	79100	31	15	144900	170100	60600	
	514	48600	16.8	11	140500	166300	56000	495	79300	28	15	148300	174100	62200	
	564	54800	17.2	11	144500	171000	57700	554	79700	26	15	153400	180100	64600	
	633	52000	14.6	11	149600	177000	60000	588	79900	24	15	156200	183400	65900	
	695	51000	13	11	153800	182100	61900	668	80500	21	15	162300	190600	68700	
	790	52200	11.7	11	159800	189200	64600	738	80900	19.5	15	167200	196300	71000	
	889	53100	10.6	11	165600	196000	67200	858	81500	16.9	15	174900	205400	74700	
	1014	54300	9.5	11	172300	203900	70200	926	74000	14.2	15	179000	210100	76600	
	1117	52500	8.3	11	177300	209900	72500	1038	82400	14.1	15	185200	217400	79600	
	1266	56300	7.9	11	184100	217900	75600	1099	75800	12.2	15	188400	221200	81100	
	1394	52700	6.7	11	189500	224300	78100	1277	77400	10.8	15	197100	231400	85300	
	1502	58000	6.8	11	192000	229400	80000	1485	66700	8	15	206000	242100	89700	
	1817	58000	5.7	11	192000	231000	80000	1796	66800	6.6	15	206000	243000	90000	
	2187	49000	4	11	192000	231000	80000								

SPN17								SPN18							
i	Mn2 [Nm]	P1 [kW]	Pt [kW]	Rn2 [N]			i	Mn2 [Nm]	P1 [kW]	Pt [kW]	Rn2 [N]				
				HC/PC	HZ/PZ	FZ					HC/PC	HZ/PZ	FZ		
L3	58.1	90300	150	35	166800	177500	50800	76.5	144900	200	40	227200	231900	74200	
	69.3	93300	150	35	175800	187200	53800	98.2	156100	200	40	244900	249900	80600	
	89	101000	150	35	189500	201800	58500	117	164400	200	40	257800	263100	85300	
	106	105800	150	35	199500	212400	61900	123	167200	200	40	262100	267500	86900	
	116	108300	150	35	205200	218400	63900	146	176000	200	40	275900	281600	92000	
	138	114000	143	35	216000	230000	67700	170	184100	186	40	288700	294600	96800	
	166	120500	125	35	228300	243100	72000								
	179	136600	131	35	233800	248900	73900								
	213	142200	115	35	246100	262000	78200								
	252	119700	82	35	259100	275800	82800								
L4	310	146200	60	18	275500	293400	88700	262	209700	115	22	328800	335600	111800	
	360	152900	60	18	288300	306900	93200	313	220800	115	22	346700	353800	118600	
	449	163300	60	18	307900	327800	100300	337	225200	115	22	354400	361600	121500	
	493	166900	60	18	316700	337200	103500	402	236100	104	22	373600	381300	128900	
	552	174500	56	18	327600	348800	107500	422	239300	101	22	379300	387100	131100	
	619	177200	51	18	339000	361000	111600	477	247200	92	22	393300	401400	136500	
	719	178400	44	18	354700	377600	117400	515	252500	87	22	402700	410900	140100	
	792	186500	42	18	365100	388700	121200	612	263300	76	22	423900	432600	148300	
	904	166600	33	18	379800	404400	126700	647	264400	73	22	431100	439900	151100	
	1032	181300	31	18	395300	420900	132400	726	266600	65	22	446300	455400	157000	
	1134	168100	26	18	406600	432900	136600	768	267600	62	22	453800	463100	160000	
	1318	169100	23	18	425400	452900	143700	911	270900	53	22	477700	487500	169400	
	1595	170000	18.9	18	442000	470000	150000	1059	273800	46	22	499800	510000	178100	
	1893	156200	14.6	18	442000	470000	150000								

SPN15								SPN16							
i	Mn2 [Nm]	P1 [kW]	Pt [kW]	Rn2 [N]			i	Mn2 [Nm]	P1 [kW]	Pt [kW]	Rn2 [N]				
				HC/PC	HZ/PZ	FZ					HC/PC	HZ/PZ	FZ		
L2	17.4	41400	200	45	54300	63800	20400	17.4	43900	200	50	90300	100400	33900	
	22.3	46800	200	45	58500	68700	22100	22.3	48500	200	50	97300	108200	36900	
	26.5	46600	200	45	61600	72300	23400	26.5	47700	200	50	102500	113900	39100	
	28	47800	200	45	62700	73600	23900								
	33.2	50300	200	45	66000	77400	25300								
	38.6	44100	190	45	69000	81000	26600								
L3	59.6	59900	115	30	78600	92300	30700	59.6	63400	115	35	130700	145300	51200	
	71.1	63100	115	30	82900	97300	32600	71.1	66900	115	35	137800	153300	54300	
	91.3	68000	115	30	89300	104900	35400	76.5	70100	115	35	140800	156600	55600	
	108	71600	114	30	94000	110400	37500	91.3	72100	115	35	148500	165200	59000	
	139	81100	100	30	101300	119000	40700	108	75900	115	35	156300	173900	62500	
	165	80400	84	30	106700	125200	43100	117	79400	115	35	160000	178000	64100	
	174	78800	78	30	108500	127400	43900	139	81800	101	35	168500	187400	67900	
	207	79800	66	30	114200	134100	46500	165	82500	86	35	177400	197300	71900	
	241	65000	46	30	119500	140300	48900								
L4	302	97000	57	18	127900	150200	52800	215	93200	60	18	191900	213500	78500	
	370	97900	47	18	135900	159500	56400	256	98200	60	18	202400	225100	83200	
	441	98700	40	18	143300	168200	59800	302	103200	60	18	212700	236600	87900	
	487	99100	36	18	147600	173300	61800	329	105800	57	18	218100	242600	90400	
	533	99500	33	18	151700	178100	63800	370	109400	53	18	225900	251300	94000	
	591	99900	30	18	156400	183600	66000	441	115200	46	18	238200	264900	99700	
	672	100600	27	18	162500	190800	68900	487	118600	43	18	245400	272900	103100	
	741	101100	24	18	167400	196600	71200	533	121800	40	18	252200	2		

25.2 SPN...R 直角轴式减速机额定值表

i	SPN00								
	Mn2 [Nm]	P1 [kW]	Pt [kW]	Rn2 [N]					
				MC/PC	MZ/PZ	HC	HZ	FZ	
7.13	580	13.7	12	2050	2050	6170	7080	1350	
8.74	610	11.7	12	2190	2190	6550	7530	1440	
11.8	590	8.3	12	2420	2420	7180	8240	1590	
14.8	510	5.7	12	2610	2610	7670	8810	1710	
18.5	370	3.3	12	2810	2810	8200	9420	1850	
24.8	730	5.1	12	3100	3100	8960	10300	2040	
30.4	840	4.8	12	3320	3320	9530	10900	2180	
37.3	840	3.9	12	3550	3550	10100	11600	2330	
41.2	650	2.7	12	3670	3670	10400	12000	2410	
50.4	850	2.9	12	3930	3930	11100	12700	2580	
62.9	850	2.3	12	4230	4230	11800	13600	2780	
68.2	650	1.6	12	4340	4340	12100	13900	2860	
78.7	850	1.9	12	4550	4550	12700	14600	2990	
85.2	650	1.3	12	4680	4680	13000	14900	3070	
106	650	1.1	12	5040	5040	13900	15900	3310	
133	550	0.71	12	5420	5420	14800	17000	3570	
106	860	1.4	10	5030	5030	13800	15900	3310	
130	860	1.2	10	5380	5380	14700	16900	3540	
143	650	0.81	10	5560	5560	15200	17400	3660	
159	870	0.97	10	5760	5760	15600	18000	3780	
175	880	0.89	10	5950	5950	16100	18500	3910	
215	910	0.75	10	6370	6370	17100	19700	4190	
237	650	0.49	10	6580	6580	17600	20300	4330	
268	930	0.62	10	6860	6860	18300	21000	4510	
291	950	0.58	10	7040	7040	18800	21500	4630	
363	980	0.48	10	7580	7580	20000	23000	4990	
394	680	0.31	10	7790	7790	20500	23600	5120	
453	1020	0.4	10	8160	8160	2140	24600	5370	
491	710	0.25	10	8390	8390	21900	25200	5510	
613	730	0.21	10	9030	9030	23500	27000	5940	
766	760	0.18	10	9730	9730	25100	28800	6400	

25.2 Rating charts for right-angle units SPN...R

i	SPN01								
	Mn2 [Nm]	P1 [kW]	Pt [kW]	Rn2 [N]					
				MC	MZ	HC/PC	HZ/PZ	FZ	
7.13	1040	15	12	2050	2050	6170	7080	1350	
8.74	1090	15	12	2190	2190	6550	7530	1440	
11.8	1150	15	12	2420	2420	7180	8240	1590	
14.8	940	10.6	12	2610	2610	7670	8810	1710	
18.5	740	6.7	12	2810	2810	8200	9420	1850	
24.8	1390	9.7	12	3100	3100	8960	10300	2040	
30.4	1580	8.9	12	3320	3320	9530	10900	2180	
37.3	1600	7.4	12	3550	3550	10100	11600	2330	
41.2	1300	5.4	12	3670	3670	10400	12000	2410	
50.4	1630	5.6	12	3930	3930	11100	12700	2580	
62.9	1650	4.5	12	4230	4230	11800	13600	2780	
68.2	1300	3.3	12	4340	4340	12100	13900	2860	
78.7	1570	3.4	12	4550	4550	12700	14600	2990	
85.2	1300	2.6	12	4680	4680	13000	14900	3070	
106	1300	2.1	12	5040	5040	13900	15900	3310	
133	1150	1.5	12	5420	5420	14800	17000	3570	
106	1700	2.8	10	5030	5030	13800	15900	3310	
130	1720	2.3	10	5380	5380	14700	16900	3540	
143	1300	1.6	10	5560	5560	15200	17400	3660	
159	1740	1.9	10	5760	5760	15600	18000	3780	
175	1770	1.8	10	5950	5950	16100	18500	3910	
215	1820	1.5	10	6370	6370	17100	19700	4190	
237	1300	0.97	10	6580	6580	17600	20300	4330	
268	1870	1.2	10	6860	6860	18300	21000	4510	
291	1890	1.2	10	7040	7040	18800	21500	4630	
363	1960	0.96	10	7580	7580	20000	23000	4990	
394	1360	0.61	10	7790	7790	20500	23600	5120	
453	1930	0.76	10	8160	8160	2140	24600	5370	
491	1410	0.51	10	8390	8390	21900	25200	5510	
613	1470	0.42	10	9030	9030	23500	27000	5940	
766	1530	0.35	10	9730	9730	25100	28800	6400	

i	SPN03								
	Mn2 [Nm]	P1 [kW]	Pt [kW]	Rn2 [N]					
				MC/PC	MZ/PZ	HC	HZ	FZ	
9.23	1680	30	18	6850	7910	13600	16400	4400	
10.9	1900	29	18	7240	8360	14300	17200	4650	
13.7	1970	24	18	7810	9020	15300	18400	5010	
15.9	1820	19.1	18	8220	9480	16000	19300	5270	
19.2	1550	13.5	18	8750	10100	16900	20400	5620	
24.8	860	5.8	18	9530	11000	18300	22000	6110	
25.7	2030	13.6	14	9640	11100	18500	22200	6190	
31.5	2110	11.5	14	10300	11900	19600	23600	6620	
37.1	2390	11.1	14	10900	12600	20600	24800	7000	
42.6	2070	8.4	14	11400	13200	21500	25900	7320	
46.6	2160	8	14	11800	13600	22100	26600	7550	
50.3	2380	8.2	14	12100	13900	22600	27200	7740	
54.2	1820	5.8	14	12400	14300	23100	27800	7930	
63.1	2170	5.9	14	13000	15000	24200	29100	8350	
73.3	1820	4.3	14	13700	15800	25300	30500	8780	
78.7	2180	4.8	14	14000	16200	25900	31100	8990	
91.5	1820	3.4	14	14700	17000	27100	32600	9450	
114	1820	2.7	14	15900	18300	28900	34800	10200	
129	2620	3.6	12	16500	19100	30000	36100	10600	
148	2310	2.8	12	17300	20000	31300	37600	11100	
158	2660	3	12	17700	20400	31900	38400	11300	
185	2310	2.2	12	18600	21500	33400	40200	11900	
214	2730	2.3	12	19600	22600	34900	42000	12500	
231	1830	1.4	12	20100	23100	35700	43000	12900	
255	1840	1.3	12	20700	23900	36800	44300	13300	
290	2650	1.6	12	21600	25000	38300	46000	13900	
313	1850	1.1	12	22200	25600	39100	47100	14200	
336	2270	1.2	12	22700	26200	40000	48100	14600	
364	2310	1.1	12	23300	26900	40900	49300	15000	
390	1930	0.88	12	23900	27600	41800	50300	15300	
452	2250	0.88	12	25100	28900	43700	52600	16100	
528	2030	0.68	12	26400	30500	45800	55100	16900	
567	2430	0.76	12	27000	31200	46800	56300	17400	
659	2110	0.57	12	28400	32800	48900	58900	18200	
797	1820	0.41	12	30300	35000	51800	62300	19400	
824	2200	0.47	12	30600	35400	52300	62900	19700	

i	SPN04								
	Mn2 [Nm]	P1 [kW]	Pt [kW]	Rn2 [N]					
				MC	MZ	HC/PC	HZ/PZ	FZ	
9.23	1680	30	18	6850	7910	13600	16400	4400	
10.9	1980	30	18	7240	8360	14300	17200	4650	
13.7	2490	30	18	7810	9020	15300	18400	5010	
16.8	2390	24	18	8380	9670	16300	19600	5370	
25.7	3020	15	14	9640	11100	18500	22200	6190	
31.5	3090	15	14	10300	11900	19600	23600	6620	
37.1	3440	15	14	10900	12600	20600	24800	7000	
42.6	3190	12.9	14	11400	13200	21500	25900	7320	
46.6	2850	10.5	14	11800	13600	22100	26600	7550	
50.3	3460	11.9	14	12100	13900	22600	27200	7740	
63.1	2850	7.8	14	13000	15000	24200	29100	8350	
78.7	2850	6.2	14	14000	16200	25900	31100	8990	
97	2390	4.2	14	15000	17300	27500	33100	9630	
121	2390	3.4	14	16200	18700	29400	35400	10400	
89.4	3330	6.6	12	14600	16900	26900	32300	9370	
109	3370	5.5	12	15600	18000	28600	34400	10000	
129	3530	4.8	12	16500	19100	30000	36100	10600	
148	3440	4.1	12	17300	20000	31300	37600	11100	
158	3550	4	12	17700	20400	31900	38400	11300	
185	3460	3.3	12	18600	21500	33400	40200	11900	
214	3620	3	12	19600	22600	34900	42000	12500	
227	3480	2.7	12	19900	23000	35500	42700	12800	
267	3660	2.4	12	21100	24300	37300	44900	13500	
290	3680	2.3	12	21600	25000	38300	46000	13900	
307	3500	2	12	22000	25400	38900	46800	14100	
338	2420	1.3	12	22800	26300	40000	48200	14600	
364	2940	1.4	12	23300	26900	40900	49300	15000	
414	2470	1.1	12	24300	28100	42500	51200	15600	
452	3690	1.4	12	25100	28900	43700	52600	16100	
560	2540	0.81	12	26900	31100	46600	56100	17300	
699	2630	0.67	12	29000	33500	49800	59900	18600	

i	SPN05								
	Mn2 [Nm]	P1 [kW]	Pt [kW]	Rn2 [N]					
				MC/PC	MZ/PZ	HC	HZ	FZ	
9.23	1680	30	18	6850	7910	13600	16400	4400	
10.9	1980	30	18	7240	8360	14300	17200	4650	
13.7	2490	30	18	7810	9020	15300	18400	5010	

SPN10								SPN11							
i	Mn2 [Nm]	P1 [kW]	Pt [kW]	Rn2 [N]			i	Mn2 [Nm]	P1 [kW]	Pt [kW]	Rn2 [N]				
				HC/PC	HZ/PZ	FZ					HC/PC	HZ/PZ	FZ		
R2(B)	12	10100	130	55	31200	39200	13000	12	11900	150	75	36900	45900	13000	
	15.4	10700	115	55	33600	42300	14100	15.4	15400	150	75	39700	49500	14100	
	18.3	11100	101	55	35400	44500	15000	18.3	16000	146	75	41800	52100	15000	
R2(C)	16.6	11200	112	55	34400	43200	14500	16.6	14400	144	90	40600	50600	14500	
	21.3	11800	92	55	37100	46600	15800	21.3	16900	132	90	43800	54500	15800	
	25.3	12200	81	55	39000	49000	16700	25.3	17600	116	90	46100	57400	16700	
R3	37.7	6650	30	22	44000	55300	19000	53	20300	66	40	57500	71600	21300	
	44.6	7860	30	22	46200	58100	20100	63.2	24000	65	40	60600	75500	22600	
	55.9	9860	30	22	49500	62200	21700	68	24000	61	40	62000	77200	23200	
	65	11500	30	22	51700	65100	22800	81.1	25900	55	40	65400	81400	24600	
	71.8	12700	30	22	53300	67000	23600	96.3	27200	49	40	68800	85700	26000	
	78.6	13900	30	22	54800	68900	24300	104	28700	47	40	70400	87700	26700	
	83.4	14700	30	22	55800	70100	24800	124	30200	42	40	74100	92400	28300	
	99	16400	29	22	58700	73800	26300	147	26900	32	40	78100	97200	29900	
	120	17400	25	22	62200	78200	28000								
R4	136	21000	27	15	64600	81200	29200	154	26400	30	22	79300	98700	30500	
	160	22000	24	15	67800	85300	30900	182	31200	30	22	83300	103800	32200	
	189	23200	22	15	71300	89700	32600	198	33800	30	22	85400	106400	33100	
	206	22100	19	15	73100	91900	33500	229	35300	27	22	89200	111100	34700	
	234	24700	18.7	15	76000	95600	35000	266	36900	25	22	93300	116200	36500	
	258	22800	15.7	15	78300	98400	36200	294	38000	23	22	96100	119700	37700	
	283	26100	16.4	15	80500	101200	37300	322	39000	22	22	98800	123100	38900	
	305	23400	13.6	15	82300	103500	38200	341	39200	20	22	100600	125300	39700	
	334	27400	14.6	15	84600	106300	39400	413	40600	17.4	22	106500	132600	42300	
	363	24100	11.8	15	86700	109000	40500	438	37500	15.2	22	108400	135000	43100	
	419	29000	12.3	15	90500	113800	42500	490	34500	12.5	22	112100	139600	44800	
	454	20000	7.8	15	92700	116600	43600	520	38600	13.2	22	114100	142100	45700	
	517	25600	8.8	15	96400	121200	45600	629	39700	11.2	22	120800	150500	48600	
	590	21800	6.6	15	100300	126100	47600	746	30500	7.3	22	127200	158400	51500	
	639	21500	6	15	102700	129100	48900								
	757	26400	6.2	15	108100	135900	51700								
	898	23200	4.6	15	113800	143100	54800								

SPN15								SPN16							
i	Mn2 [Nm]	P1 [kW]	Pt [kW]	Rn2 [N]			i	Mn2 [Nm]	P1 [kW]	Pt [kW]	Rn2 [N]				
				HC/PC	HZ/PZ	FZ					HC/PC	HZ/PZ	FZ		
R3(B)	51.1	48100	150	75	75000	88100	29200	51.1	50000	150	75	124800	138800	48600	
	65.5	62100	150	75	80900	94900	31700	65.5	63800	150	75	134500	149500	52800	
	77.8	64400	143	75	85100	100000	33600	77.8	65800	146	75	141600	157400	55900	
	82.3	65500	137	75	86600	101600	34200								
	97.6	68800	121	75	91100	107000	36200								
	113	64000	91	75	95300	111900	38100								
R3(C)	70.7	54900	134	90	82700	97100	32500	70.7	59300	144	90	137600	153000	54200	
	90.7	59200	112	90	89200	104700	35300	90.7	69800	132	90	148200	164900	58900	
	108	62300	100	90	93900	110200	37400	108	72500	116	90	156100	173600	62300	
	114	64700	98	90	95400	112100	38100								
	135	75700	96	90	100500	118000	40300								
	157	65000	71	90	105100	123400	42400								
R4	225	77700	61	40	117100	137500	47800	225	94500	74	45	194700	216600	79700	
	269	82000	54	40	123500	145000	50700	269	99700	66	45	205300	228300	84600	
	345	96000	49	40	133100	156200	55100	289	105700	65	45	209900	233400	86600	
	409	98300	43	40	140100	164500	58400	345	107300	55	45	221300	246100	91900	
	525	99400	34	40	151000	177300	63400	409	112700	49	45	232900	259100	97300	
	623	100200	29	40	158900	186600	67200	443	117300	47	45	238500	265200	99900	
	659	88200	24	40	161600	189800	68400	525	118900	40	45	251000	279200	105700	
	782	90300	20	40	170200	199800	72400	623	115400	33	45	264300	293900	111900	
	909	76900	15	40	178000	209000	76200								

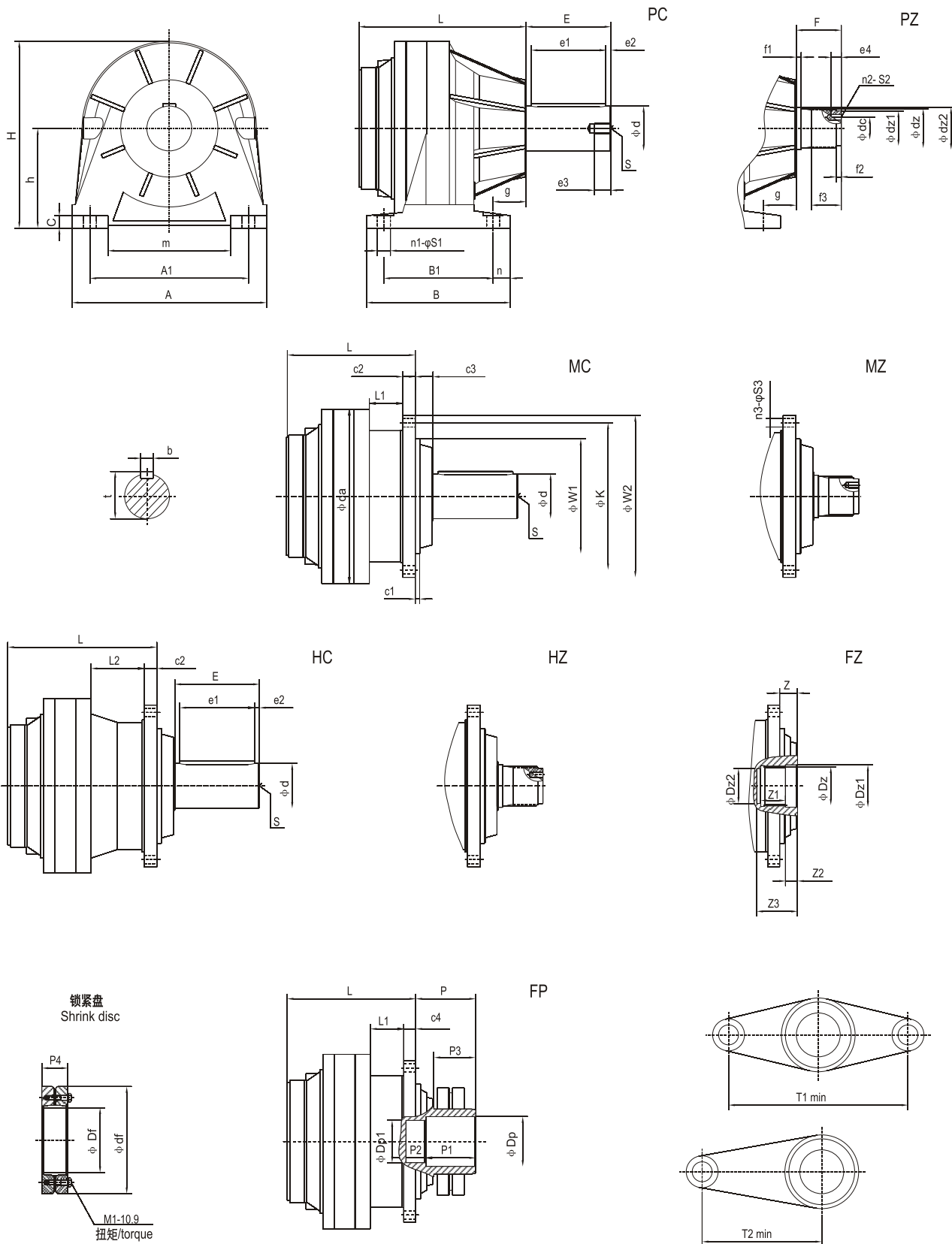
SPN13								SPN14							
i	Mn2 [Nm]	P1 [kW]	Pt [kW]	Rn2 [N]			i	Mn2 [Nm]	P1 [kW]	Pt [kW]	Rn2 [N]				
				HC/PC	HZ/PZ	FZ					HC/PC	HZ/PZ	FZ		
R2(B)	12.2	12100	150	75	45700	54100	16100	51.1	38500	130	55	75000	88100	29200	
	15.9	15700	150	75	49500	58600	17600	65.5	49700	130	55	80900	94900	31700	
	19.1	19100	150	75	52300	61900	18700	77.8	52400	114	55	85100	100000	33600	
R2(C)	16.8	14600	144	90	50400	59600	17900	82.3	55100	110	55	86600	101600	34200	
	22	19000	144	90	54600	64600	19600	97.6	43900	97	55	91100	107000	36200	
	26.4	22800	144	90	57700	68300	20800	113	49800	93	55	95300	111900	38100	
R3	53.7	20500	20500	66	71300	84400	26400	70.7	51500	107	55	82700	97100	32500	
	64	24500	24500	66	75200	89000	28000	90.7	48000	90	55	89200	104700	35300	
	69.9	26700	26700	66	77200	91400	28800	108	47300	80	55	93900	110200	37400	
	82.2	31400	31400	66	81100	95900	30400	114	51700	78	55	95400	112100	38100	
	97.5	37300	37300	66	85300	101000	32200	135	60500	77	55	100500	118000	40300	
	107	38800	38800	62	87800	103900	33200	157	52000	57	55	105100	123400	42400	
	127	40700	40700	55	92400	109400	35100								
	153	39000	39000	44	97700	115600	37400								
R4	185	31600	31600	30	103300	122300	39800	160	56200	35	22	105800	124200	42700	
	201	34300	34300	30	106000	125400	40900	189	59300	35	22	111200	130500	45100	
	237	40500	40500	30	111400	131800	43200	238	71100	35	22	119000	139700	48700	
	281	48100	48100	30	117200	138800	45800	276	75700	35	22	124500	146200	51200	
	309	44500	44500	26	120600	142700	47200	354	78200	35	22	134200	157500	55600	
	346	53000	53000	27	124700	147600	49000	421	78800	33	22	141300	165900	58900	
	387	46700	46700	21	129100	152800	50900	445	67800	27	22	143600	168700	60000	
	450	47700	47700	18.8	136100	159800	53600	528	68800	23	22	151200	177500	63500	
	496	52100	52100	18.6	139000	164500	55300	614	57600	16.7	22	158200	185800	66800	
	535	48900	48900	16.2	142200	168300	56700								
	647	50400	50400	13.8	150500	178100	60400								
778	44200	44200	10.1	159100	188300	64300									

SPN17								SPN18							
i	Mn2 [Nm]	P1 [kW]	Pt [kW]	Rn2 [N]			i	Mn2 [Nm]	P1 [kW]	Pt [kW]	Rn2 [N]				
				HC/PC	HZ/PZ	FZ					HC/PC	HZ/PZ	FZ		
R3(B)	49.8	46900	150	90	159200	169500	48200	225	200200	150	90	313900	320300	106200	
	64.9	61200	150	90	172400	183500	52700	288	215700	133	90	338300	345200	115400	
	78.1	75100	150	90	182200	194000	56000	342	226200	117	90	356100	363400	122200	
	83.3	80200	150	90	185800	197800	57200	362	229600	113	90	362100	369600	124500	
	100	96200	150	90	196400	209100	60900	430	240400	99	90	381200	389100		

26 尺寸

SPN00 L... ~ SPN07 L...

26 DIMENSIONS



SPN00 L... ~ SPN07 L...

型号 size	级数 Stage	L			Kg				底脚尺寸 foot dimension				MZ,PZ 花键尺寸 splined shaft dimension (DIN5482)				
		PC PZ	MZ/MC FP/FZ	HC HZ	MZ MC	FZ FP	HZ HC	PC PZ	h H	A B C	A1 B1	m n	n1 φ S1 g	dc n2 S2	dz1 dz2 e4	f1 f2 f3	F dz
SPN00	L1	86	80	115	19	17	21	24	100	205	165	125	4	24	35 f7	7	55 B40*36
	L2	139	133	168	23	21	25	28	195	160	120	φ 11	3	42 f7	5		
	L3	192	186	221	27	25	29	33	13	120	20	16	M6	13	35		
	L4	245	239	274	32	29	33	37									
SPN01	L1	132	92	126	22	20	24	27	132	260	216	172	4	24	35 f7	7	55 B40*36
	L2	185	145	176	26	24	28	32	227	180	138	φ 17	3	42 f7	5		
	L3	238	198	232	30	28	33	36	15	138	21	24	M6	13	35		
	L4	291	251	285	35	33	37	40									
SPN03	L1	165	125	150	33	33	37	42	160	310	254	198	4	32	50 f7	10	68 B58*53
	L2	218	178	203	37	37	41	46	282	235	169	φ 18	3	60 f7	8		
	L3	271	231	256	41	41	45	50	22	169	33	39	M10	20	46		
	L4	324	284	309	45	45	49	54									
SPN04	L1	165	125	150	33	33	37	42	160	310	254	198	4	32	50 f7	10	68 B58*53
	L2	230	190	215	37	37	41	46	282	235	169	φ 18	3	60 f7	8		
	L3	283	243	268	41	41	45	50	22	169	33	39	M10	20	46		
	L4	336	296	321	45	45	49	54									
SPN05	L1	183	143	168	38	38	42	47	160	310	254	198	4	32	50 f7	10	68 B58*53
	L2	248	208	233	45	45	49	54	282	235	169	φ 18	3	60 f7	8		
	L3	301	261	286	49	49	53	58	22	169	33	39	M10	20	46		
	L4	354	314	339	53	53	57	62									
SPN06	L1	235	160	195	68	68	73	84	180	350	279	200	4	45	62 f7	10	90 B70*64
	L2	300	225	260	77	77	83	93	327	281	201	φ 22	3	72 f7	10		
	L3	353	278	313	81	81	87	97	25	201	40	65	M10	20	61.5		
	L4	406	331	366	86	86	91	101									
SPN07	L1	246	165	210	99	89	110	125	200	390	318	246	4	45	70 f7	10	90 B80*74
	L2	335	254	299	112	101	122	138	375	289	219	φ 26	3	85 f7	10		
	L3	400	319	364	119	109	129	145	25	219	35	66	M12	20	60		
	L4	453	372	417	123	113	133	149									

型号 size	da L1 L2	轴伸尺寸 * shaft dimension			法兰尺寸 flange dimension			FP 锁紧盘空心轴尺寸 hollow shaft for shrink disc dimension			FZ 内花键空心轴尺寸 hollow splined shaft dimension			
		d E S	e1 e2	b t e3	c1 c2 c3	W1 K W2	n3 s3 c4	DP DP1 P	P1 P2 P3	φ Df * φ df * P4 M1 扭矩/torque	T1 T2	Dz1 Dz2	z1 z2 z3	Z Dz(DIN5482)
SPN00	190	38/50 h6	50/70	8/14	5	110 f7	8	42 H7	42	φ 50x φ 90x26	450	42 H7	22	14 A40*36 H10
	36	58/82	4/6	41/53.5	12	165	10.5	35 H7	18	M6-10.9	300	35 H8	12.5	
	71	M12	28/36	6	185	12	50	44	12 Nm			42.5		
SPN01	190	38/50 h6	50/70	8/14	5	110 f7	8	52 H7	42	φ 62x φ 110x30	450	42 H7	22	14 A40*36 H10
	36	58/82	4/6	41/53.5	12	165	10.5	35 H7	18	M6-10.9	300	35 H8	12.5	
	71	M12	28/36	6	185	12	50	44	12 Nm			42.5		
SPN03	245	60 h6	90	11	13	150 f7	10	75 H7	70	φ 100x φ 170x44	500	60 H7	29	15 A58*53 H10
	70	105	64	20	195	12.5	65 H7	30	M8-10.9	350	50 H8	15		
	91	M20	7.5	50	15	222	20	85	70	30 Nm		54		
SPN04	245	60 h6	90	11	13	150 f7	10	75 H7	70	φ 100x φ 170x44	500	60 H7	29	15 A58*53 H10
	70	105	64	20	195	12.5	65 H7	30	M8-10.9	350	50 H8	15		
	91	M20	7.5	50	15	222	20	85	70	30 Nm		54		
SPN05	245	60 h6	90	11	13	150 f7	10	75 H7	70	φ 100x φ 170x44	500	60 H7	29	15 A58*53 H10
	70	105	64	20	195	12.5	65 H7	30	M8-10.9	350	50 H8	15		
	91	M20	7.5	50	15	222	20	85	70	30 Nm		54		
SPN06	294	80 h6	110	14	12	200 f7	12	90 H7	90	φ 110x φ 185x44	600	72 H7	45	40 A70*64 H10
	72	130	85	20	250	15	75 H7	55	M10-10.9	400	62 H8	22		
	107	M20	10	50	40	280	20	115	75	58 Nm		79		
SPN07	350	90 h6	150	14	10	230 f7	10	100 H7	100	φ 130x φ 215x52	700	85 H7	50	36 A80*74 H10
	67	170	95	25	295	16.5	85 H7	40	M10-10.9	450	70 H8	24		
	107	M20	10	50	36	325	24	120	80	58 Nm		87		

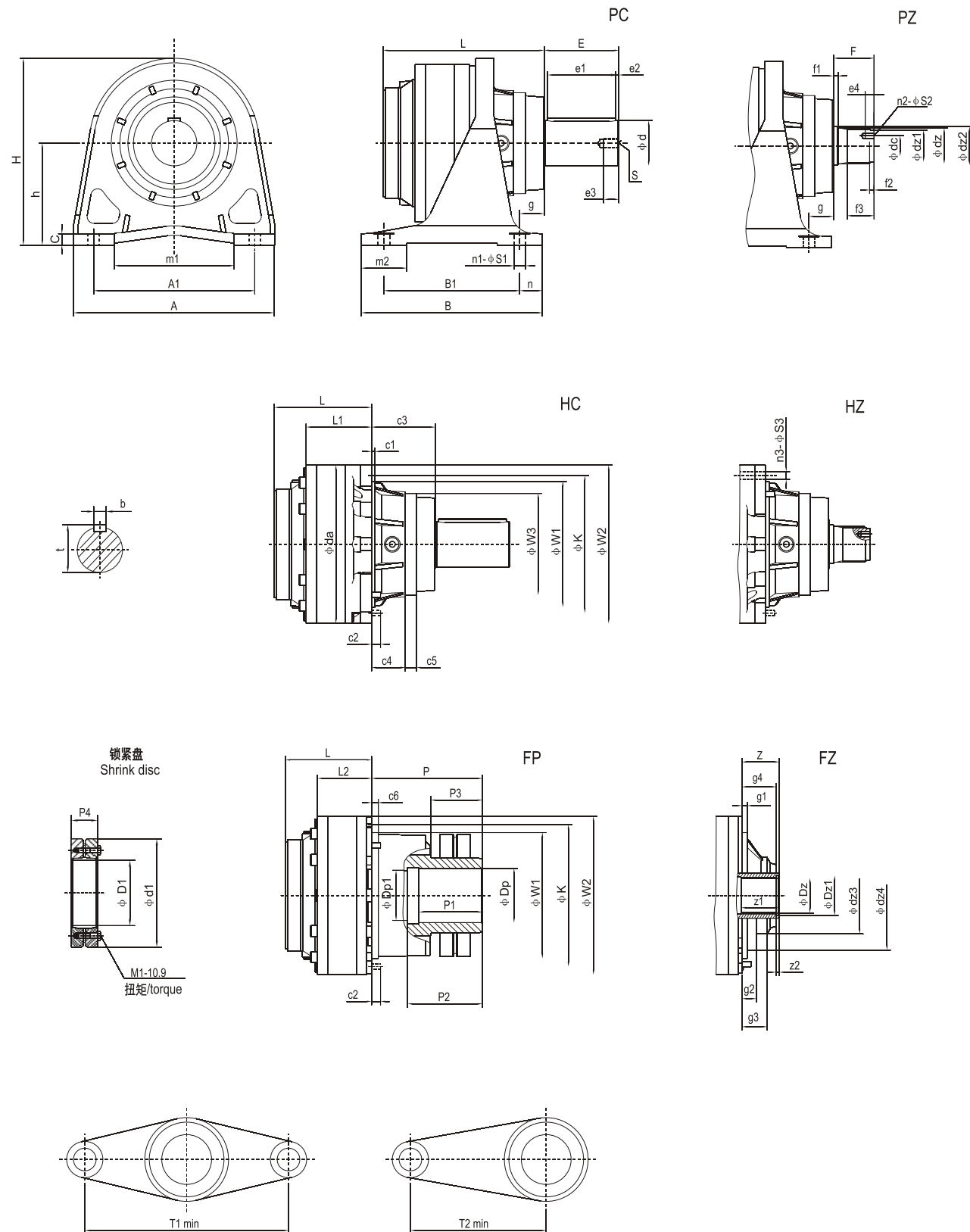
轴伸尺寸 * / shaft dimension *

SPN00 ,SPN01

PC MC时, d=38 E=58 e1=50 e2=4 b=8 t=41 e3=28

HC时, d=50 E=82 e1=70 e2=6 b=14 t=53.5 e3=36

SPN09 L... ~ SPN17 L...



SPN09 L... ~ SPN17 L...

型号 size	级数 Stage	L							da L1 L2	底脚尺寸 foot dimension					MZ,PZ 花键尺寸 splined shaft dimension (DIN5482)				
		PC PZ	HC HZ	FP FZ	HZ HC	PC PZ	FZ FP	FP		h H	A B C	A1 B1	m1 m2 n	n1 S1 g	dc n2 S2	dz1 dz2 e4	f1 f2 f3	F dz	
		Kg																	
SPN09	L1	267	126	101	120	136	99	105	350										
	L2	356	215	190	133	148	112	117	144	225	445	356	265	4	45	70 f7	10	90	
	L3	421	280	255	140	155	119	124	119	414	400	100	26	3	85 f7	9	B80*74*36*9e		
	L4	474	333	308	144	159	123	128	119	24	300	50	54	M12	20	60	(DIN5482)		
SPN10	L1	288	108	88	141	162	115	120	400										
	L2	424	244	224	173	194	146	152	130	250	500	300	4	65	85 f7	12	110		
	L3	489	309	289	182	203	155	161	130	469	420	100	26	3	105 f7	12	B100*94		
	L4	542	362	342	186	207	158	166	110	26	320	50	90	M12	20	78	(DIN5482)		
SPN11	L1	325	115	115	187	260	166	176	428										
	L2	458	248	248	234	306	213	223	134	280	550	330	4	65	85 f7	12	110		
	L3	547	337	337	246	319	225	236	134	516	430	120	33	3	105 f7	12	B100*94		
	L4	612	402	402	253	326	232	243	134	30	334	48	110	M12	20	78	(DIN5482)		
SPN13	L2	531	304	304	301	395	270	291	445										
	L3	620	393	393	317	407	283	301	169	280	550	120	33	3	122 f7	10	130		
	L4	685	458	458	321	415	290	311	169	523	520	60	111	M16	30	98	W120*3		
										30	400	280	8	70	100 f7	14	(DIN5480)		
SPN14	L2	641	362	362	415	545	325	375	542										
	L3	777	498	498	460	590	370	420	192	315	620	140	33	3	125 f6	14	150		
	L4	842	563	563	470	600	380	430	192	613	556	72	169	M16	30	119	W150*5		
										35	412	280	8	70	151 f6	12	(DIN5480)		
SPN15	L2	665	386	386	473	608	379	431	542										
	L3	798	519	519	520	655	426	478	192	315	620	140	33	3	125 f6	14	150		
	L4	887	608	608	532	667	439	491	192	613	556	72	169	M16	30	119	W150*5		
										35	412	280	8	70	151 f6	12	(DIN5480)		
SPN17	L2	624	475	475	960	1120	910	960	695	详见附图					140	170 f7	30	200	
	L3	774	622	622	1030	1180	970	1030	200						6	200 f7	20	W200*5	
	L4	862	710	710	1040	1200	990	1040	200						M16	30	150	(DIN5480)	

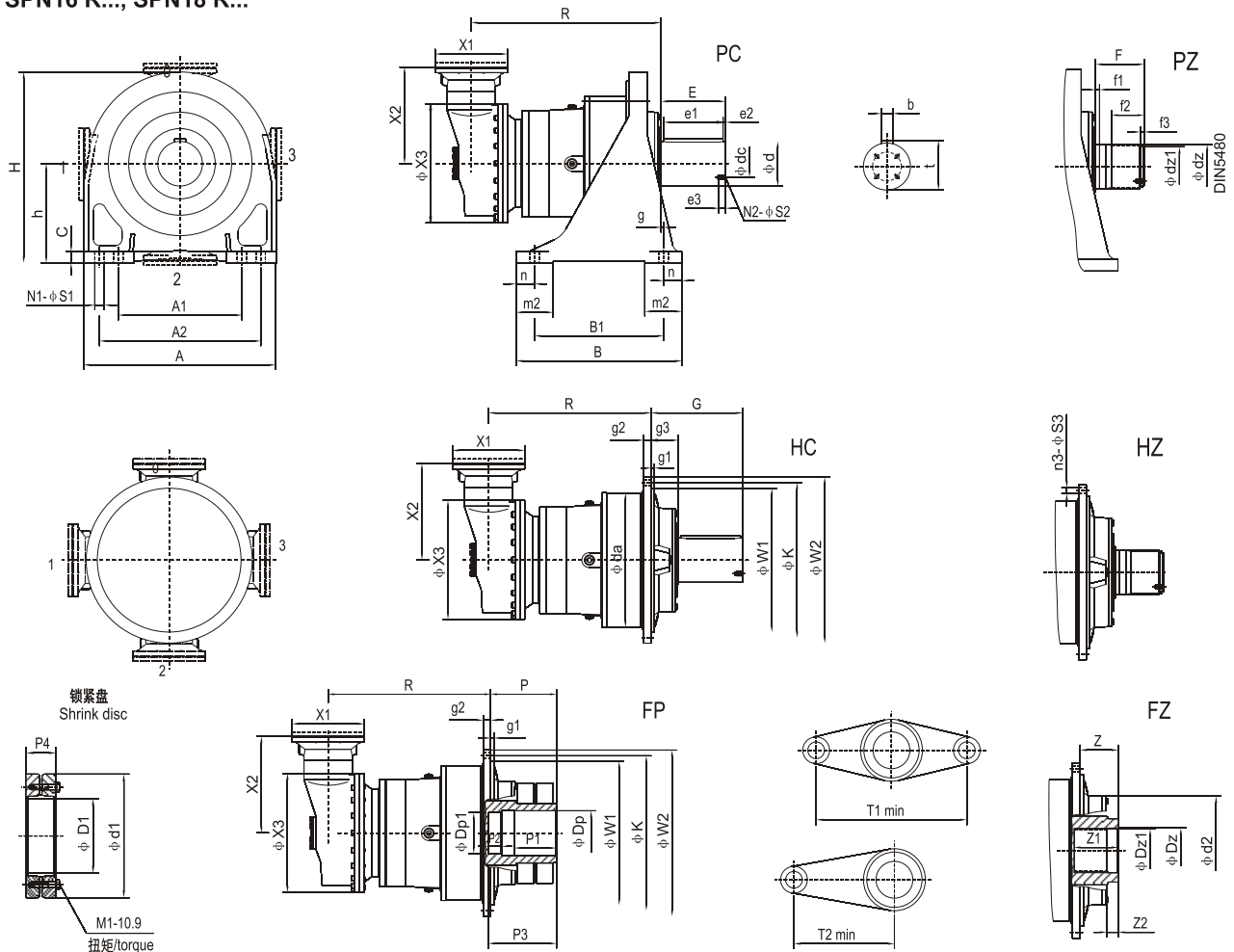
型号 size	轴伸尺寸 * shaft dimension			法兰尺寸 flange dimension					FP 锁紧盘空心轴尺寸 hollow shaft for shrink disc dimension				FZ 内花键空心轴尺寸 hollow splined shaft dimension				
	d E S	e1 e2 e3	b t	c1 c2 c3	c4 c5 c6	n3 S3 W3	W1 K W2	DP DP1 P	P1 P2 P3	φ Df * φ df * P4 M1 扭矩/torque	T1 T2	Z Z1 Z2	g1 g2 g3	g4 dz3 dz4	Dz (DIN.) Dz1		
SPN09	100 m6	150	28	7	74	12	278 f7	120 H7	140	φ 165x φ 290x68	900	82	11	76	A80*74*36*10H		
	165	7.5	106.4	20	25	17	314	-	165	M16-10.9	600	84	32	170 ± 2	(DIN5482)		
	M24	50	141	14/11	225 f7	350	245	114	114	250 Nm		7	56	241 ± 2	88 H8		
SPN10	110 m6	200	28	15	115	15	340 f7	130 H7	155	φ 175x φ 300x71	1000	95	14	92	A100*94		
	210	5	116	20	26	17	370	-	175	M16-10.9	700	91	66	222 ± 3	(DIN5482)		
	M24	50	180	14	245 f7	400	290	120	120	250 Nm		15	80	293 ± 3	102 H8		
SPN11	120 m6	180	32	12	140	24	358 f7	135 H7	150	φ 185x φ 330x86	1100	88	13	87	B120*3		
	210	15	127	-	35	17	390	-	180	M16-10.9	800	92	50	242 ± 3	(DIN5480)		
	M24	50	210	12	230 f7	428	190	100	100	250 Nm		15	74	316 ± 3	102 H8		
SPN13	140 m6	180	36	11	152	30	385 f7	140 H7	135	φ 185x φ 330x112	1200	81	13	76	N140*5		
	200	10	148	-	40	17	415	130 H7	225	M16-10.9	900	100	35	294 ± 3	(DIN5480)		
	M24	50	227	12	260 f7	445	235	140	140	250 Nm		30	62	361 ± 3	142 H7		
SPN14	160 m6	220	40	12	223	20	460 f7	180 H7	210	φ 240x φ 405x109	1400	98	12	96	N150*5		
	240	10	169.4	-	34	21	503	160 H7	260	M20-10.9	1100	120	65	224 ± 3	(DIN5480)		
	M24	50	279	12	300 f7	542	260	150	150	490 Nm		20	87	350 ± 3	152 H7		
SPN15	160 m6	220	40	12	223	20	460 f7	180 H7	210	φ 240x φ 405x109	1400	98	12	96	N150*5		
	240	10	169.4	-	34	21	503	160 H7	260	M20-10.9	1100	120	65	224 ± 3	(DIN5480)		
	M24	50	279	12	300 f7	542	260	150	150	490 Nm		20	87	350 ± 3	152 H7		
SPN17	200 r6	250	-	20	-	24	560 f7	200 H7	307	φ 260x φ 430x160	1600	152	20	140	N200*5		
	260	5	-	25	-	32	635	-	307	M20-10.9	1300	150	90	455 ± 3	(DIN5480)		
	6-M16	30	-	152	20	-	695	318	175	490 Nm		17	-	544 ± 3	210 H8		

法兰尺寸 / flange dimension

SPN09..., FP, c6 = 14 FZ, L2=117

* SPN14, SPN15..., FP, K=600 W2=640 法兰厚度 30/ flange width is 30

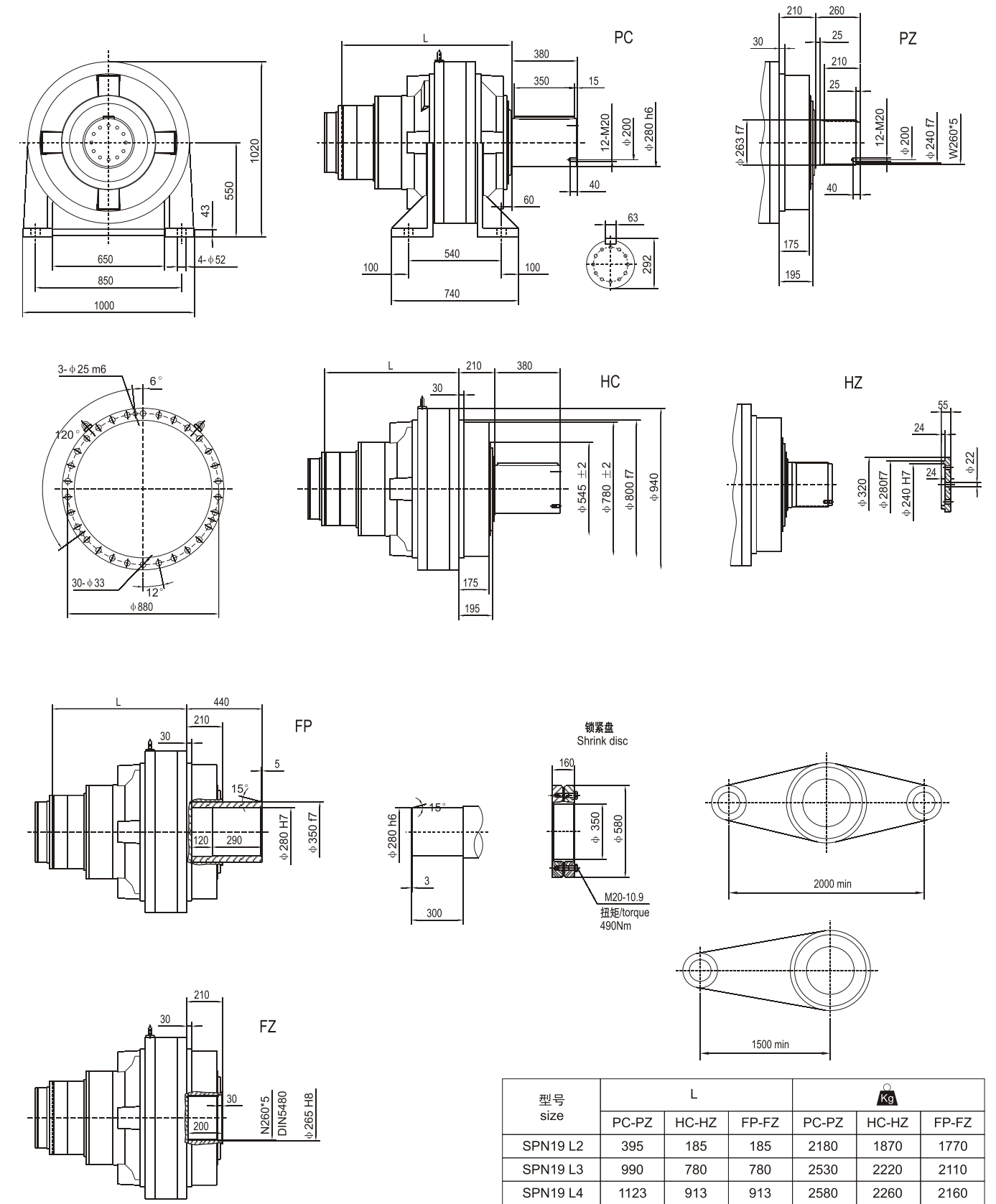
SPN16 R..., SPN18 R...



型号 size	级数 Stage	R			底脚尺寸 foot dimension							PZ, HZ 花键尺寸 splined shaft dimension		
		PC PZ	HC/HZ FP FZ	HZ HC	h	A B C	A1 A2 B1	m1 m2 n	n1 S1 g	f1 f2 f3	Dz(DIN5480) dz1 F			
SPN 16	R3(B)	766	656	740	400	780	500	370	8	15	W170*5*32			
	R3(C)	766	656	750	770	670	650	150	38	125	150 f6			
	R4	793	683	720	45	520	75	10	15	165				
SPN 18	R4(B)	1115	985	1470	500	900	610	460	8	15	W220*5*42			
	R4 c	1115	985	1485	935	800	760	190	38	160	200 f6			
						50	650	75	30	20	210			

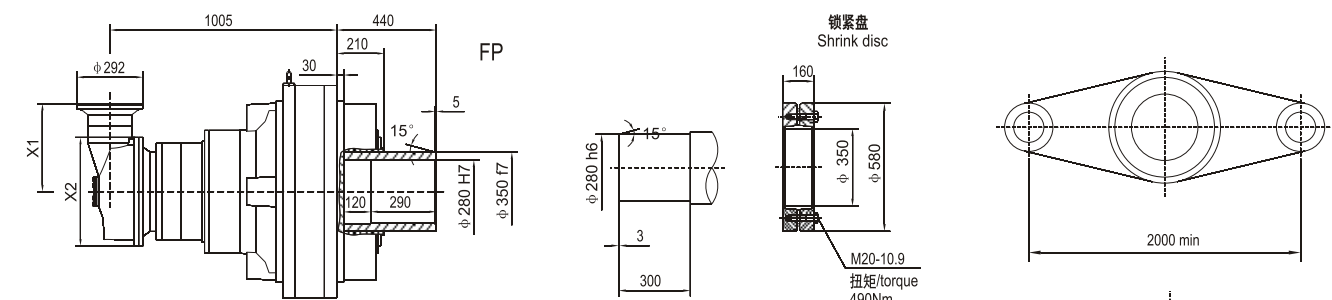
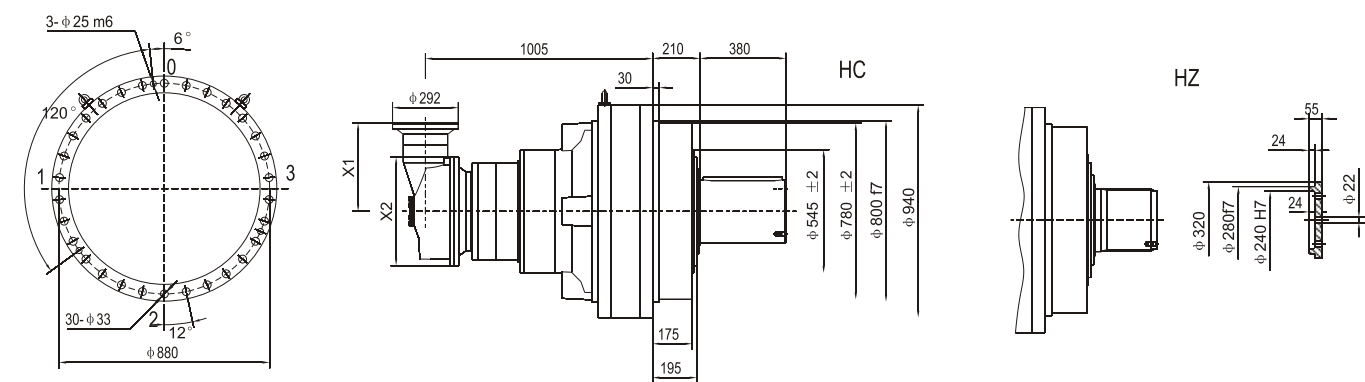
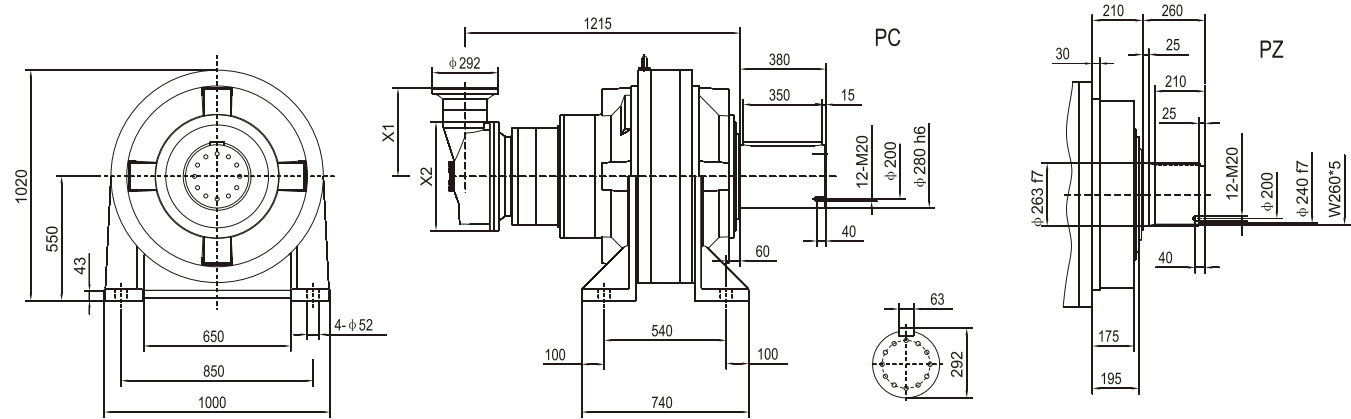
型号 size	PC/HC 轴伸尺寸 shaft dimension			法兰尺寸 flange dimension			FP 锁紧盘空心轴尺寸 hollow shaft for shrink disc dimension					FZ 内花键空心轴尺寸 hollow splined shaft dimension	
	d dc	n2 S2	E e1 e2	b t e3	g1 g2 g3	W1 K W2	G n3 S3	P1 P2 P3	DP DP1 P	T1 T2	φD1 * φd1 * P4 M2 扭矩/torque	Z Z1 Z2	Dz-H9 (DIN5480) Dz1 d2
SPN 16	180	4	260	45	13	580 f7	370	170	182 H7	1500	φ240* φ405*144	145	N170*5*32
	110	M16	240	190	30	625	30	45	165 H7	1200	M20	169	172 H7
			10	26	110	670	22	275	265		490	44	415
SPN 18	250	4	330	56	15	700 f7	460	170	220 H7	1800	φ280* φ460*172	155	N220*5*42
	150	M24	310	262	35	750	32	30	200 H7	1400	M20	187	222 H7
			10	41	130	800	26	315	305		490	45	480

SPN19 L...



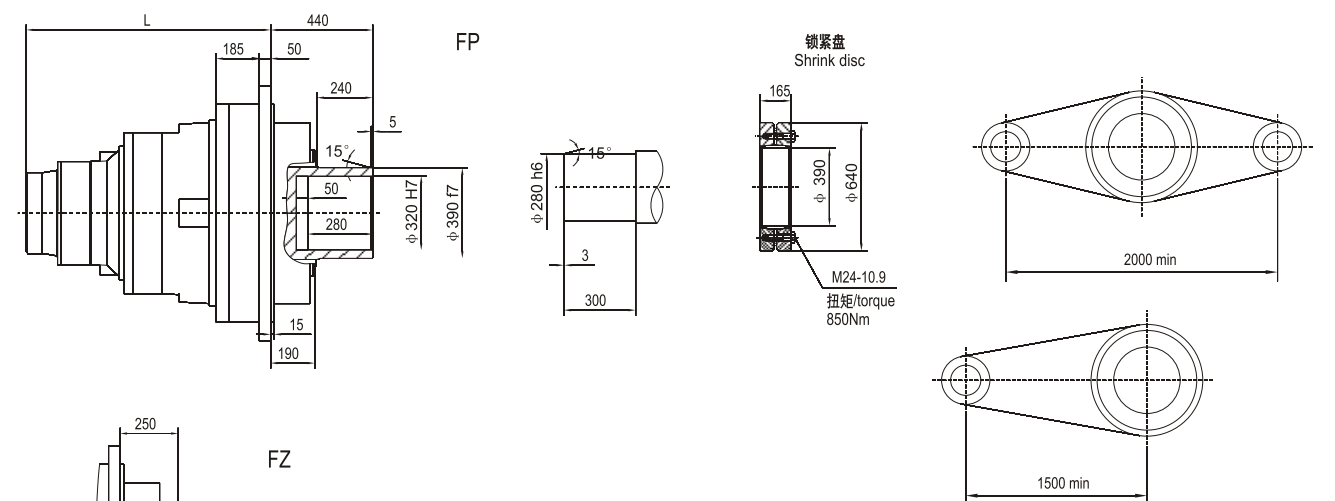
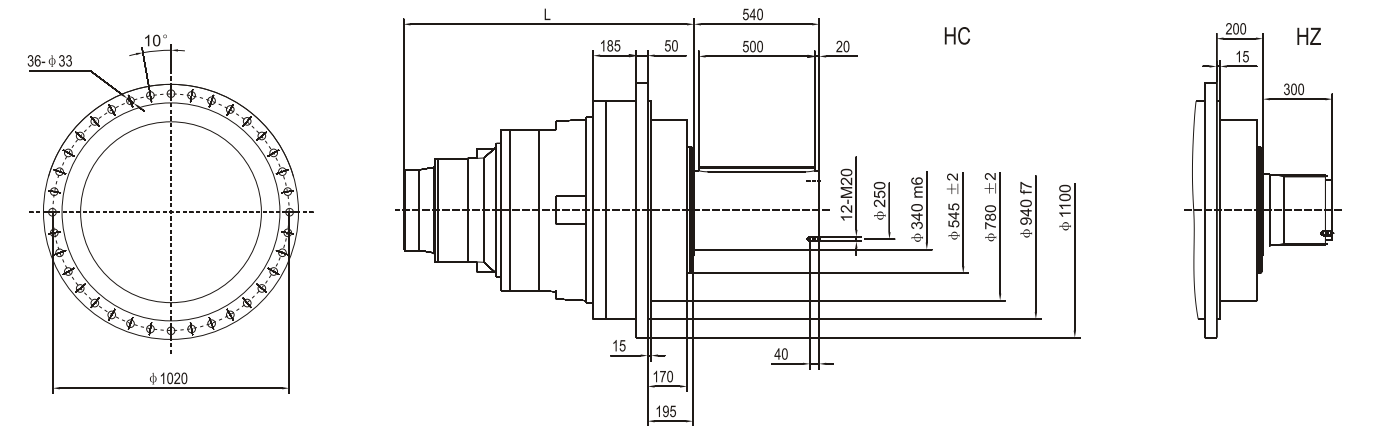
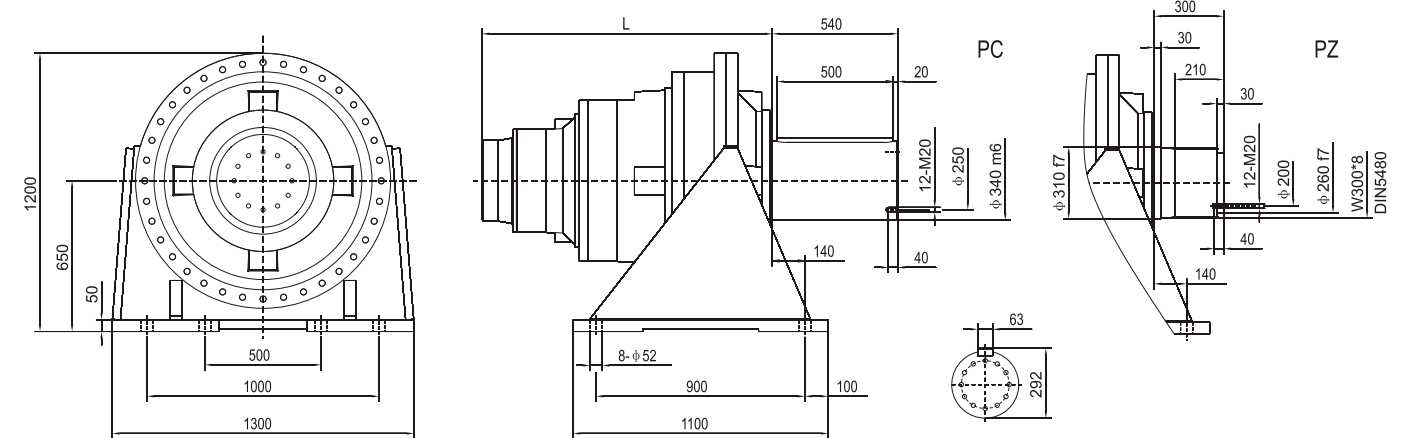
型号 size	L			Kg		
	PC-PZ	HC-HZ	FP-FZ	PC-PZ	HC-HZ	FP-FZ
SPN19 L2	395	185	185	2180	1870	1770
SPN19 L3	990	780	780	2530	2220	2110
SPN19 L4	1123	913	913	2580	2260	2160

SPN19 R...



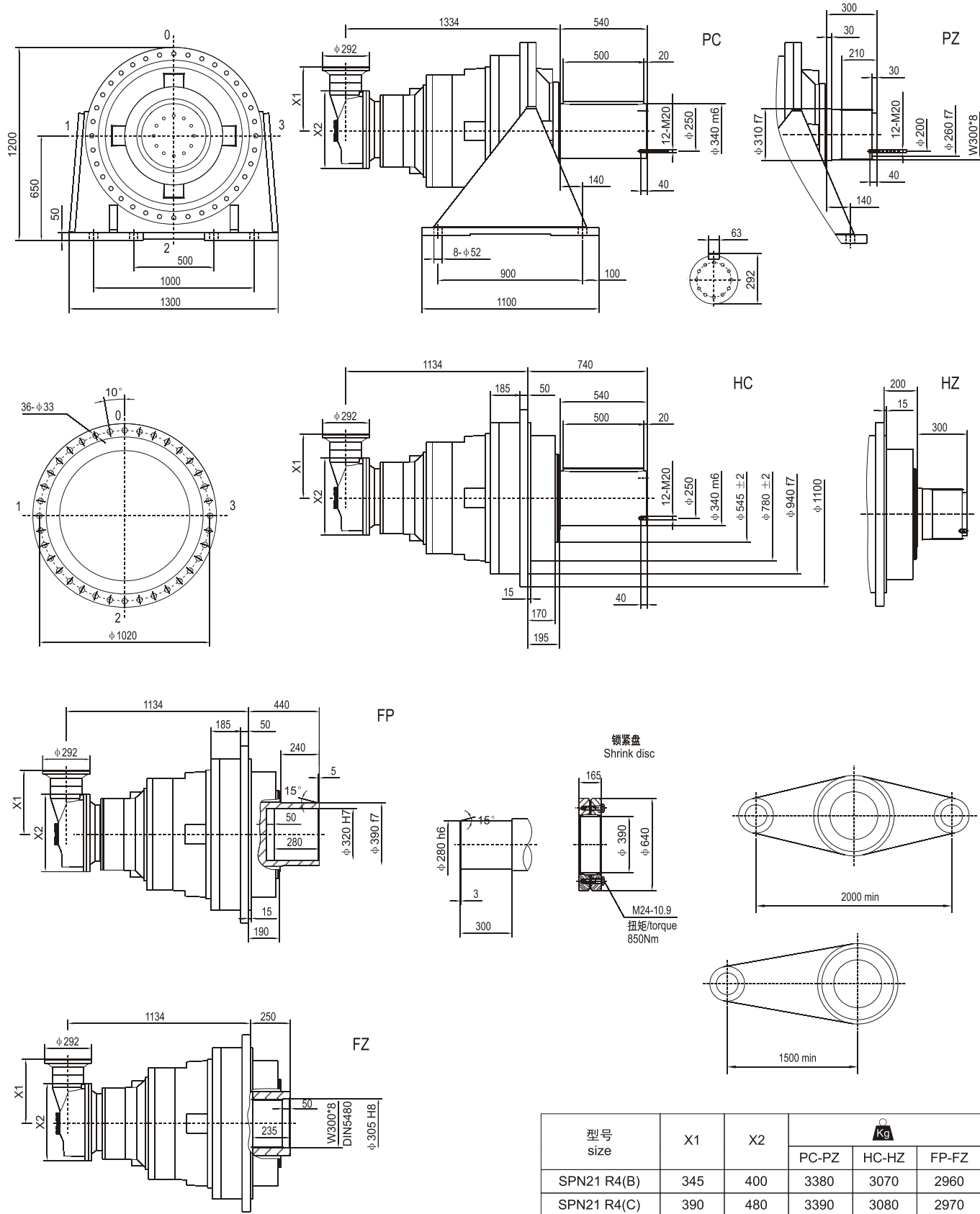
型号 size	X1	X2	Kg		
			PC-PZ	HC-HZ	FP-FZ
SPN19 R4(B)	345	400	2660	2350	2250
SPN19 R4(C)	390	480	2680	2370	2270

SPN21 L...



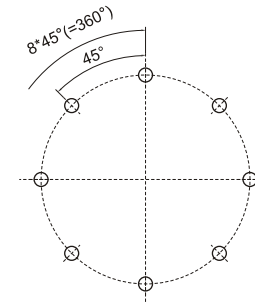
型号 size	L			Kg		
	PC-PZ	HC-HZ	FP-FZ	PC-PZ	HC-HZ	FP-FZ
SPN21 L3	1104	904	904	3240	2930	2830
SPN21 L4	1253	1053	1053	3390	2990	2890

SPN21 R...

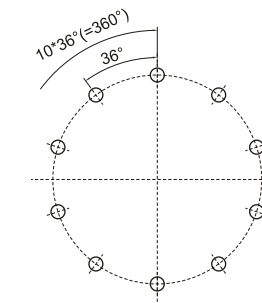


型号 size	X1	X2	kg		
			PC-PZ	HC-HZ	FP-FZ
SPN21 R4(B)	345	400	3380	3070	2960
SPN21 R4(C)	390	480	3390	3080	2970

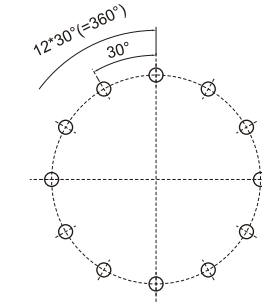
输出法兰联接孔型式
从输出轴侧观察



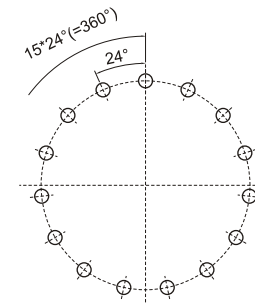
规格/Size SPN00, SPN01



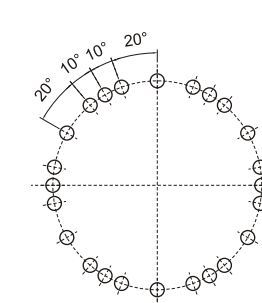
规格/Size SPN03, SPN04
SPN05, SPN07



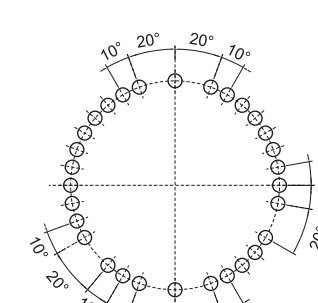
规格/Size SPN06, SPN09



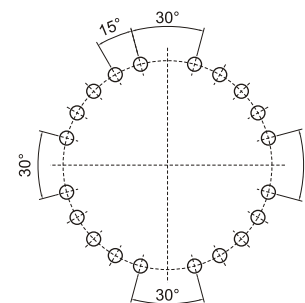
规格/Size SPN10



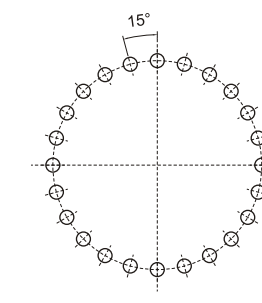
规格/Size SPN11



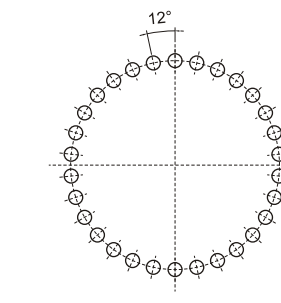
规格/Size SPN13



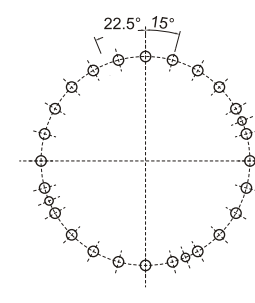
规格/Size SPN14, SPN15
(HC, HZ, FZ)



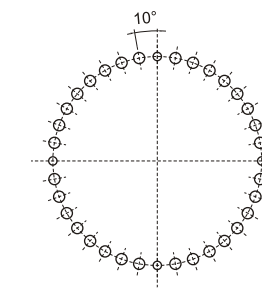
规格/Size SPN14, SPN15
(FP)



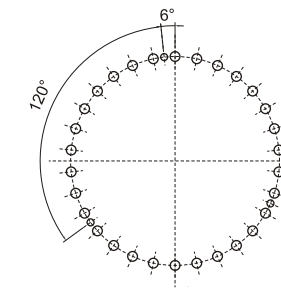
规格/Size SPN16



规格/Size SPN17



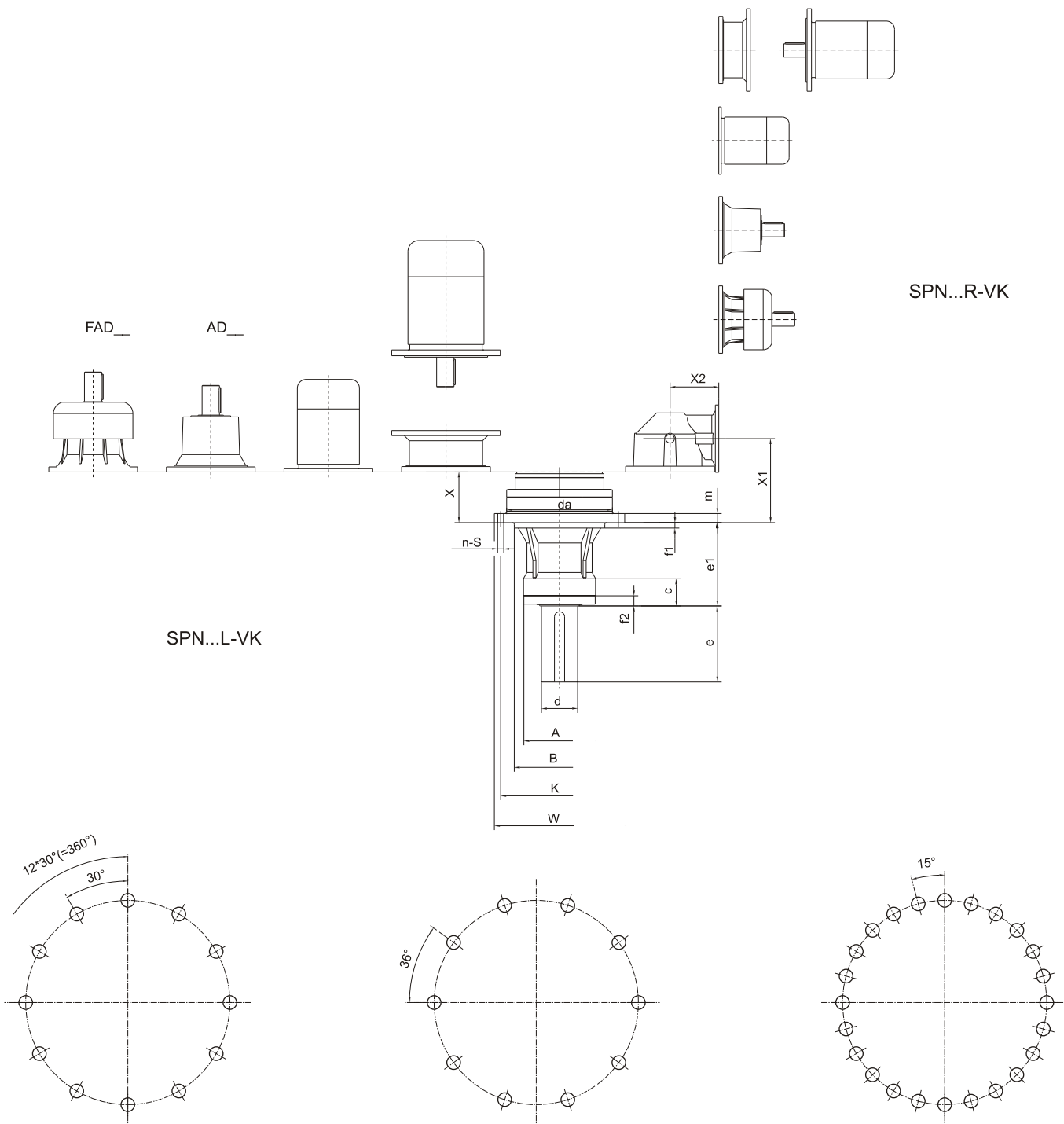
规格/Size SPN18



规格/Size SPN19

VK - 搅拌机用加强型平行实心轴输出

VK Reinforced output with parallel shaft for stirres and mixers



SPN...R-VK

SPN...L-VK

规格/Size SPN03...VK
SPN04...VK
SPN05...VK
SPN07...VK
SPN09...VK
SPN10...VK
SPN11...VK

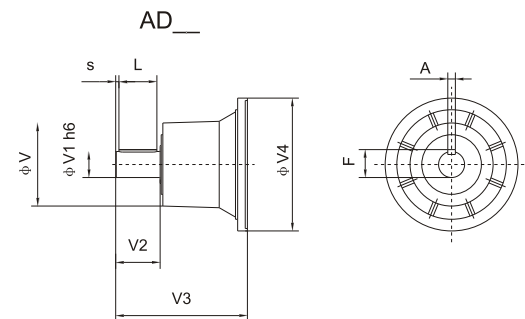
规格/Size SPN06...VK

规格/Size SPN13...VK
SPN14...VK
SPN15...VK

型号 size	级数 Stage	X	kg	级数 Stage	X1	X2	kg	φ da φ W m	φ d e e1	C f1 f2	φ A φ B φ K	n φ S
SPN03	L1	51	65	R2	143	140	85	φ 245	φ 80 m6	75	φ 180 h7	12 φ 13
	L2	104	70	R3	196	122	83	φ 290	170	20	φ 195 h7	
	L3	157	73	R4	249	122	87	21	200	29	φ 265	
	L4	210	77									
SPN04	L1	51	65	R2	143	140	85	φ 245	φ 80 m6	75	φ 180 h7	12 φ 13
	L2	116	73	R3	208	122	86	φ 290	170	20	φ 195 h7	
	L3	169	76	R4	261	122	90	21	200	29	φ 265	
	L4	222	80									
SPN05	L1	69	70	R2	161	140	90	φ 245	φ 80 m6	75	φ 180 h7	12 φ 13
	L2	134	77	R3	226	122	92	φ 290	170	20	φ 195 h7	
	L3	187	81	R4	279	122	95	21	200	29	φ 265	
	L4	240	85									
SPN06	L1	75	110	R2	212	140	130	φ 294	φ 100 m6	75	φ 200 h7	10 φ 17
	L2	140	120	R3	232	140	125	φ 360	210	15	φ 250 h7	
	L3	193	125	R4	285	122	120	25	230	28	φ 325	
	L4	246	130									
SPN07	L1	80	145	R2	199	225	180	φ 350	φ 120 m6	95	φ 250 h7	12 φ 17
	L2	169	160	R3	261	140	170	φ 420	210	25	φ 280 h7	
	L3	234	170	R4	326	122	175	30	305	30	φ 380	
	L4	287	175									
SPN09	L1	102	165	R2	221	225	200	φ 350	φ 120 m6	95	φ 250 h7	12 φ 17
	L2	191	180	R3	283	140	190	φ 420	210	25	φ 280 h7	
	L3	256	190	R4	348	122	195	30	305	30	φ 380	
	L4	309	195									
SPN10	L1	107	200	R2(B)	315	345	320	φ 400	φ 130 m6	105	φ 300 h8	12 φ 22
	L2	243	230	R2(C)	333	390	340	φ 500	250	20	φ 425 h8	
	L3	308	240	R3	380	140	250	40	360	42	φ 460	
	L4	361	245	R4	400	140	260					
SPN11	L1	129	295	R2(B)	354	345	420	φ 428	φ 130 m6	105	φ 300 h8	12 φ 22
	L2	262	340	R2(C)	354	390	430	φ 500	250	20	φ 425 h8	
	L3	351	350	R3	381	225	385	40	360	42	φ 460	
	L4	416	360	R4	443	140	360					
SPN13	L1	158	380	R2	388	345	510	φ 455	φ 150 m6	130	φ 340 h8	24 φ 22
	L2	308	440	R3	388	390	520	φ 560	250	18	φ 400 h8	
	L3	397	450	R4	427	225	490	30	425	40	φ 510	
	L4	462	460									
SPN14	L2	386	650	R3(B)	611	345	720	φ 542	φ 180 m6	130	φ 370 h8	24 φ 22
	L3	519	700	R3(C)	611	390	730	φ 640	300	30	φ 470 h8	
	L4	608	710	R4	638	225	690	36	480	30	φ 600	
SPN15	L2	386	650	R3(B)	611	345	720	φ 542	φ 180 m6	130	φ 370 h8	24 φ 22
	L3	519	700	R3(C)	611	390	730	φ 640	300	30	φ 470 h8	
	L4	608	710	R4	638	225	690	36	480	30	φ 600	

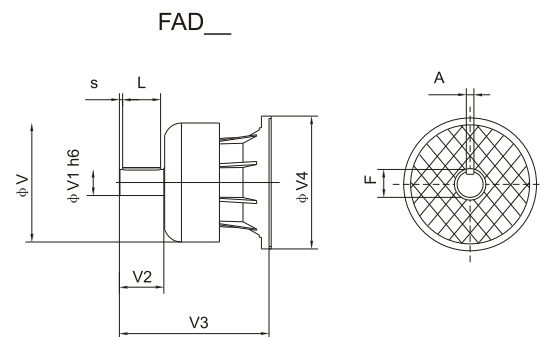
尺寸 AD_ & FAD_

输入轴 / Input shaft



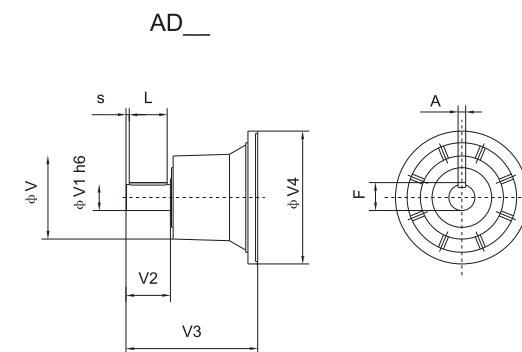
Dimensions for AD_ & FAD_

带风扇的输入轴 / Solid input shaft with fan

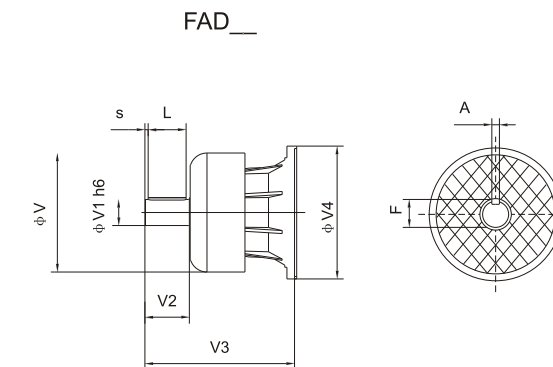


型号 size	级数 Stage	规格 code	V	V1	V2	V3	V4	A	F	L	S
SPN00 SPN01	L1	AD1	120	24	36	137.5	190	8	27	30	3
		AD2	120	38	58	158	190	10	41	50	4
	L2	AD1	120	24	36	137.5	190	8	27	30	3
		AD2	120	38	58	158	190	10	41	50	4
	L3	AD1	120	24	36	137.5	190	8	27	30	3
		AD2	120	38	58	158	190	10	41	50	4
L4	AD1	120	24	36	137.5	190	8	27	30	3	
	AD2	120	38	58	158	190	10	41	50	4	
SPN03 SPN04 SPN05	R2/R3/R4	AD1	120	24	36	137.5	190	8	27	30	3
		AD2	120	38	58	158	190	10	41	50	4
	L1	AD3	155	48	82	239	245	14	51.5	70	6
		FAD3	219.5	48	82	276	245	14	51.5	70	6
	L2	AD1	120	24	36	137.5	190	8	27	30	3
		AD2	120	38	58	158	190	10	41	50	4
L3	AD1	120	24	36	137.5	190	8	27	30	3	
	AD2	120	38	58	158	190	10	41	50	4	
L4	AD1	120	24	36	137.5	190	8	27	30	3	
	AD2	120	38	58	158	190	10	41	50	4	
SPN06	R2/R3/R4	AD1	120	24	36	137.5	190	8	27	30	3
		AD2	120	38	58	158	190	10	41	50	4
	L1	AD4	155	60	105	307	294	18	64	90	7.5
		FAD4	309	60	105	357	294	18	64	90	7.5
	L2	AD3	155	48	82	239	245	14	51.5	70	6
		FAD3	219.5	48	82	276	245	14	51.5	70	6
L3	AD1	120	24	36	137.5	190	8	27	30	3	
	AD2	120	38	58	158	190	10	41	50	4	
L4	AD1	120	24	36	137.5	190	8	27	30	3	
	AD2	120	38	58	158	190	10	41	50	4	
SPN07 SPN09	L1	AD6	200	80	130	315	350	22	85	110	10
		FAD6	347.5	80	130	375	350	22	85	110	10
		AD5	155	60	105	313	350	18	64	90	7.5
		FAD5	309	60	105	363	350	18	64	90	7.5
	L2	AD3	155	48	82	239	245	14	51.5	70	6
		FAD3	219.5	48	82	276	245	14	51.5	70	6
	L3	AD1	120	24	36	137.5	190	8	27	30	3
		AD2	120	38	58	158	190	10	41	50	4
	L4	AD1	120	24	36	137.5	190	8	27	30	3
		AD2	120	38	58	158	190	10	41	50	4
	R2	AD3	155	48	82	239	245	14	51.5	70	6
		FAD3	219.5	48	82	276	245	14	51.5	70	6
R3/R4	AD1	120	24	36	137.5	190	8	27	30	3	
	AD2	120	38	58	158	190	10	41	50	4	

输入轴/Input shaft



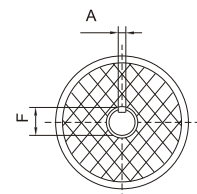
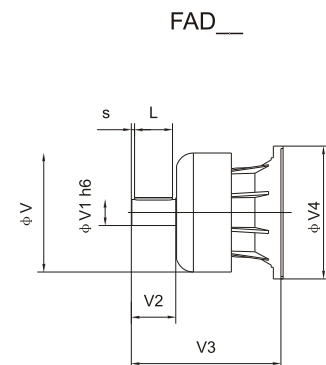
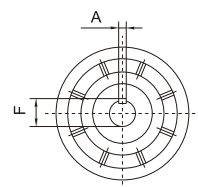
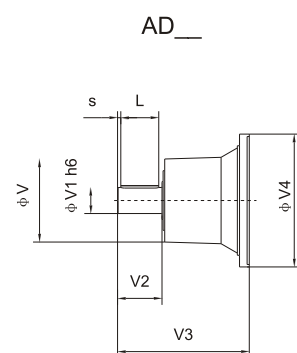
带风扇的输入轴/Solid input shaft with fan



型号 size	级数 Stage	规格 code	V	V1	V2	V3	V4	A	F	L	S
SPN10	L1	AD7	200	80	130	377	400	22	85	110	10
		FAD7	347.5	80	130	457	400	22	85	110	10
	L2	AD4	155	60	105	307	294	18	64	90	7.5
		FAD4	309	60	105	357	294	18	64	90	7.5
	L3	AD3	155	48	82	239	245	14	51.5	70	6
		FAD3	219.5	48	82	276	245	14	51.5	70	6
L4	AD1	120	24	36	137.5	190	8	27	30	3	
	AD2	120	38	58	158	190	10	41	50	4	
SPN11	R2	AD4	155	60	105	307	294	18	64	90	7.5
		FAD4	309	60	105	357	294	18	64	90	7.5
	R3/R4	AD1	120	24	36	137.5	190	8	27	30	3
		AD2	120	38	58	158	190	10	41	50	4
	L1	AD8	200	80	130	348	428	22	85	110	10
		FAD8	347.5	80	130	456	428	22	85	110	10
L2	AD6	200	80	130	313	350	22	85	110	10	
	FAD6	347.5	80	130	363	350	22	85	110	10	
L3	AD5	155	60	105	307	350	18	64	90	7.5	
	FAD5	309	60	105	357	350	18	64	90	7.5	
L4	AD3	155	48	82	239	245	14	51.5	70	6	
	FAD3	219.5	48	82	276	245	14	51.5	70	6	
SPN13	R2(B) R2(C)	AD4	155	60	105	307	294	18	64	90	7.5
		FAD4	309	60	105	357	294	18	64	90	7.5
	R3	AD3	155	48	82	239	245	14	51.5	70	6
		FAD3	219.5	48	82	276	245	14	51.5	70	6
	R4	AD1	120	24	36	137.5	190	8	27	30	3
		AD2	120	38	58	158	190	10	41	50	4
SPN14	L1	AD8	200	80	130	343	445	22	85	110	10
		FAD8	347.5	80	130	451	445	22	85	110	10
	L2	AD6	200	80	130	315	350	22	85	110	10
		FAD6	347.5	80	130	375	350	22	85	110	10
	L3	AD5	155	60	105	313	350	18	64	90	7.5
		FAD5	309	60	105	363	350	18	64	90	7.5
L4	AD3	155	48	82	239	245	14	51.5	70	6	
	FAD3	219.5	48	82	276	245	14	51.5	70	6	
SPN14	R2	AD1	120	24	36	137.5	190	8	27	30	3
		AD2	120	38	58	158	190	10	41	50	4
	L2	AD7	200	80	130	377	400	22	85	110	10
		FAD7	347.5	80	130	457	400	22	85	110	10
	L3	AD4	155	60	105	307	294	18	64	90	7.5
		FAD4	309	60	105	357	294	18	64	90	7.5
L4	AD3	155	48	82	239	245	14	51.5	70	6	
	FAD3	219.5	48	82	276	245	14	51.5	70	6	
R3(B) R3(C)	AD4	155	60	105	307	294	18	64	90	7.5	
	FAD4	309	60	105	357	294	18	64	90	7.5	
R4	AD1	120	24	36	137.5	190	8	27	30	3	
	AD2	120	38	58	158	190	10	41	50	4	

输入轴 / Input shaft

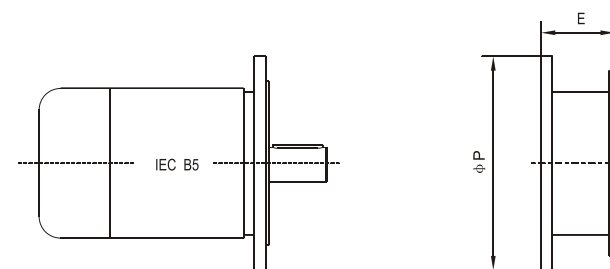
带风扇的输入轴 / Solid input shaft with fan



型号 size	级数 Stage	规格 code	V	V1	V2	V3	V4	A	F	L	S
SPN15	L1	AD9	320	120	210	523	542	32	127	180	15
		AD8	200	80	130	348	428	22	85	110	10
SPN15 SPN16	L2	FAD8	347.5	80	130	456	428	22	85	110	10
		AD6	200	80	130	315	350	22	85	110	10
	L3	FAD6	347.5	80	130	375	350	22	85	110	10
		AD5	155	60	105	313	350	18	64	90	7.5
	L4	FAD5	309	60	105	363	350	18	64	90	7.5
		AD3	155	48	82	239	245	14	51.5	70	6
	R3(B) R3(C)	FAD3	219.5	48	82	276	245	14	51.5	70	6
		AD4	155	60	105	307	294	18	64	90	7.5
	R4	FAD4	309	60	105	357	294	18	64	90	7.5
		AD3	155	48	82	239	245	14	51.5	70	6
SPN17	L2	FAD3	219.5	48	82	276	245	14	51.5	70	6
		AD8	200	80	130	343	445	22	85	110	10
	L3	FAD8	347.5	80	130	451	445	22	85	110	10
		AD6	200	80	130	315	350	22	85	110	10
	L4	FAD6	347.5	80	130	375	350	22	85	110	10
		AD5	155	60	105	313	350	18	64	90	7.5
	R3(B) R3(C)	FAD5	309	60	105	363	350	18	64	90	7.5
		AD3	155	48	82	239	245	14	51.5	70	6
	R4	FAD3	219.5	48	82	276	245	14	51.5	70	6
		AD4	155	60	105	307	294	18	64	90	7.5
SPN18	L2	FAD4	309	60	105	357	294	18	64	90	7.5
		AD9	320	120	210	523	542	32	127	180	15
	L3	AD8	200	80	130	348	428	22	85	110	10
		FAD8	347.5	80	130	456	428	22	85	110	10
	L4	AD6	200	80	130	315	350	22	85	110	10
		FAD6	347.5	80	130	375	350	22	85	110	10
	R4(B) R4(C)	AD5	155	60	105	313	350	18	64	90	7.5
		FAD5	309	60	105	363	350	18	64	90	7.5
	R4(B) R4(C)	AD4	155	60	105	307	294	18	64	90	7.5
		FAD4	309	60	105	357	294	18	64	90	7.5
SPN19	L2	AD9	320	120	210	524	542	32	127	180	15
		AD8	200	80	130	348	428	22	85	110	10
	L3	FAD8	347.5	80	130	456	428	22	85	110	10
		AD6	200	80	130	315	350	22	85	110	10
	L4	FAD6	347.5	80	130	375	350	22	85	110	10
		AD5	155	60	105	313	350	18	64	90	7.5
	R4(B) R4(C)	FAD5	309	60	105	363	350	18	64	90	7.5
		AD4	155	60	105	307	294	18	64	90	7.5
	R4(B) R4(C)	FAD4	309	60	105	357	294	18	64	90	7.5
		AD8	200	80	130	343	445	22	85	110	10
SPN21	L3	FAD8	347.5	80	130	451	445	22	85	110	10
		AD6	200	80	130	315	350	22	85	110	10
	L4	FAD6	347.5	80	130	375	350	22	85	110	10
		AD5	155	60	105	313	350	18	64	90	7.5
	R4(B) R4(C)	FAD5	309	60	105	363	350	18	64	90	7.5
		AD4	155	60	105	307	294	18	64	90	7.5
R4(B) R4(C)	FAD4	309	60	105	357	294	18	64	90	7.5	

电机适配器

Electric motor setting



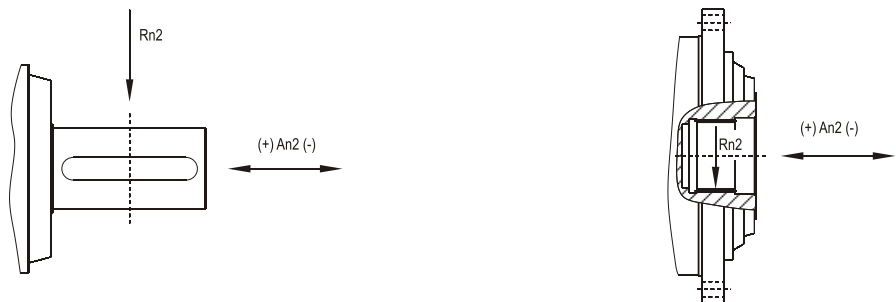
型号 size	级数 Stage	AM71		AM80/AM90		AM100/AM112		AM132		AM160		AM180		AM200		AM225		AM250			
		E	P	E	P	E	P	E	P	E	P	E	P	E	P	E	P	E	P		
SPN00	L1/L2/L3/L4	65	160	84	200	94	250	114	300												
SPN01	R2/R3/R4	65	160	84	200	94	250	114	300												
SPN03	L1									114	300	144	350	144	350	174	400				
	L2/L3/L4	65	160	84	200	94	250	114	300	144	350										
SPN04	R2/R3/R4	65	160	84	200	94	250	114	300												
	L1									114	300	144	350	144	350	174	400				
SPN05	L2/L3/L4	65	160	84	200	94	250	114	300	144	350										
	R2/R3/R4	65	160	84	200	94	250	114	300												
SPN06	L1											144	350	153	350	183	400	212	450	193	550
	L2									114	300	144	350	144	350	174	400				
	L3/L4	65	160	84	200	94	250	114	300	144	350										
	R2/R3/R4	65	160	84	200	94	250	114	300	144	350										
SPN07	L1													195	350	186	400	216	450	216	550
	L2									114	300	144	350	144	350	174	400				
	L3/L4	65	160	84	200	94	250	114	300	144	350										
	R2									114	300	144	350	144	350	174	400				
SPN09	R3/R4	65	160	84	200	94	250	114	300	144	350										
	L1													271	400	301	450	281	550		
SPN10	L2											144	350	153	350	183	400	212	450	193	550
	L3									114	300	144	350	144	350	174	400				
	L4	65	160	84	200	94	250	114	300	144	350										
	R2(B)													153	350	183	400	212	450		
	R2(C)									114	300	144	350	153	350	183	400	212	450		
	R3/R4	65	160	84	200	94	250	114	300	144	350										
SPN11	L2													195	350	186	400	216	450	216	550
	L3									114	300	144	350	144	350	174	400				
	L4	65	160	84	200	94	250	114	300	144	350										
	R2(B)/R3(C)													153	350	183	400	212	450	193	550
SPN13	R3									114	300	144	350	144	350	174	400				
	R4	65	160	84	200	94	250	114	300	144	350										
	L2													271	400	301	450	281	550		
	L3											144	350	153	350	183	400	212	450	193	550
SPN14	L4									114	300	144	350	144	350	174	400				
	R3(B)/R3(C)													153	350	183	400	212	450	193	550
	R4	65	160	84	200	94	200	114	300	144	350										
SPN15	L3													195	350	186	400	216	450	216	550
	L4									114	300	144	350	144	350	174	400				
SPN16	R3(B)/R3(C)													153	350	183	400	212	450	193	550
	R4									114	300	144	350	144	350	174	400				
SPN18	L4													195	350	186	400	216	450	216	550
	R4(B)													153	350	183	400	212	450	193	550
SPN19	L4													195	350	186	400	216	450	216	550
	R4(B)													153	350	183	400	212	450	193	550
SPN21	L4													195	350	186	400	216	450	216	550
	R4(B)													153	350	183	400	212	450	193	550

* 伺服电机联接AQA... 液压马达联接ABA... 请联系我们

* Servo motor connection AQA... hydraulic motor connection ABA... ,please refer to us.

输出轴上载荷

Permissible radial and axial loads on output shaft with $Fh2=n2 \cdot h=10000$



型号 size	An2(+)(N)				An2(-)(N)			
	MZ-MC	PC-PZ	HZ-HC	FZ	MZ-MC	PC-PZ	HZ-HC	FZ
SPN00	20000	20000	40000	8000	15000	15000	40000	8000
SPN01	20000	40000	40000	8000	15000	40000	40000	8000
SPN03	55000	55000	55000	24000	44000	44000	44000	25000
SPN04	55000	55000	55000	24000	44000	44000	44000	25000
SPN05	55000	55000	55000	24000	44000	44000	44000	25000
SPN06	70000	120000	120000	35000	44000	60000	60000	35000
SPN07	90000	160000	160000	45000	50000	80000	80000	45000
SPN09	-	160000	160000	36000	-	80000	80000	37000
SPN10	-	170000	170000	65000	-	100000	100000	52000
SPN11	-	200000	200000	65000	-	140000	140000	60000
SPN13	-	250000	250000	80000	-	160000	160000	75000
SPN14	-	280000	280000	90000	-	210000	210000	90000
SPN15	-	280000	280000	90000	-	210000	210000	90000
SPN16	-	360000	360000	150000	-	300000	300000	150000
SPN17	-	360000	360000	150000	-	300000	300000	150000
SPN18	-	500000	500000	200000	-	450000	450000	200000
SPN19	-	500000	500000	200000	-	450000	450000	200000
SPN21	-	180000	180000	120000	-	240000	240000	180000

输出轴上径向载荷位置系数

Load application point factor for radial loading on output shaft

Fh2=n2×h		10000	25000	50000	100000	500000	1000000
fh2(SPN00-SPN07)	MZ-MC-FZ	1	0.74	0.58	0.46	0.27	0.21
	HZ-HC-PC-PZ	1	0.76	0.61	0.50	0.31	0.25
fh2(SPN09-SPN21)	FZ	1	0.74	0.58	0.46	0.27	0.21
	HZ-HC-PC-PZ	1	0.76	0.61	0.50	0.31	0.25

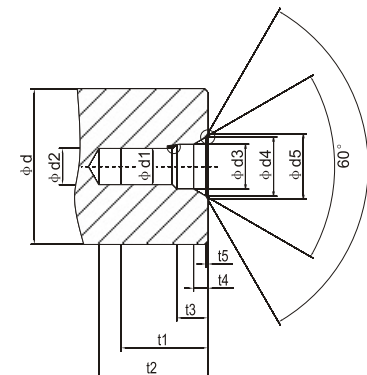
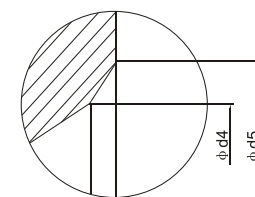
C型轴伸中心孔

C型
带螺纹孔和护锥孔

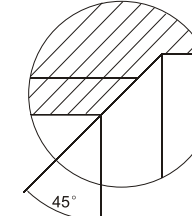
Centre Holes Form C in Shaft Ends

Form C
Tapped hole, with straight running face and counterbore

B局部放大
Detail "B"



A局部放大
Detail "A"



推荐直径范围 Recommended diameters		C型 / Form C												
大于/above	至/to	C型 中心孔 Centering	d1	d2(1)	d3	d4	d5	t1+2	t2		t3+1	t4≈	t5≈	
mm			mm											
16	21	CM6	M6	5	6.4	9.6	10.5	16	20	22	5	2.8	0.4	
21	24	CM8	M8	6.8	8.4	12.2	13.2	19	25	28	6	3.3	0.4	
24	30	CM10	M10	8.5	10.5	14.9	16.3	22	30	34	7.5	3.8	0.6	
30	38	CM12	M12	10.2	13	18.1	19.8	28	37	42	9.5	4.4	0.7	
38	50	CM16	M16	14	17	23	25.3	36	45	50	12	5.2	1.0	
50	85	CM20	M20	17.5	21	28.4	31.3	42	53	59	15	6.4	1.3	
85	130	CM24	M24	21	25	34.2	38	50	63	68	18	8	1.6	
130 2)	225 2)	CM30	M30 2)	26.5	31	44	48	60	77	83	17	11	1.9	
225 2)	320 2)	CM36	M36 2)	32	37	55	60	74	93	99	22	15	2.3	
320 2)	500 2)	CM42	M42 2)	37.5	43	65	71	84	105	111	26	19	2.7	
500 2)	710 2)	Cm48	M48 2)	43	49	76	83	94	115	121	30	23	3.2	

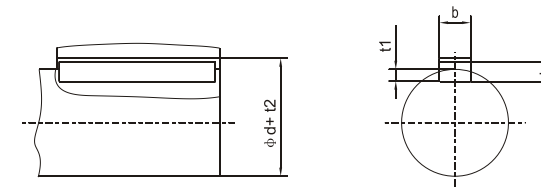
1) 螺纹底孔直径按标准GB196第一系列确定
2) 不是按照标准JB/ZQ4166确定尺寸

1) Drill diameters for tapping-size holes acc.to GB196 PT.1
2) Dimensions not acc.to JB/ZQ4166

平键和平键槽 / Parallel keyways and parallel keys

平键紧固方式, 采用无锥度连接
Drive type fastening without taper action

平键和平键槽按照标准GB1096和GB1095
Parallel key acc.to GB1096 and Gb1095



1) 轮毂平键键槽宽度的公差带按JS9确定, 重载条件下按照P9确定
1) The tolerance zone for the hub keyway width b for Parallel keys is ISO JS9, or ISO P9 for heavy-duty operating conditions.

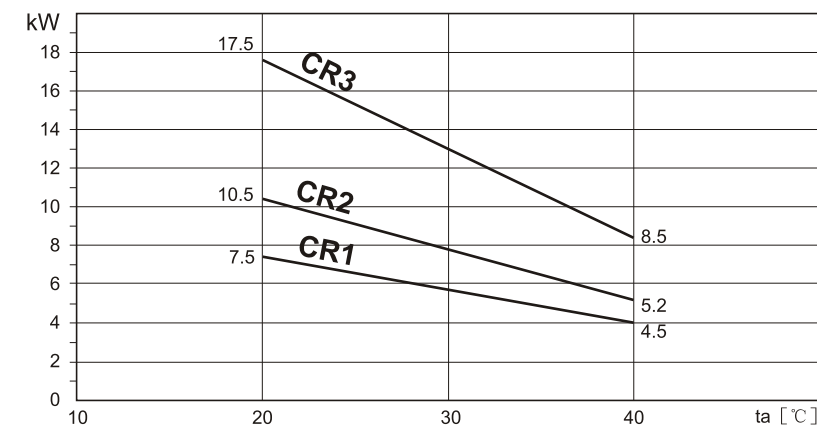
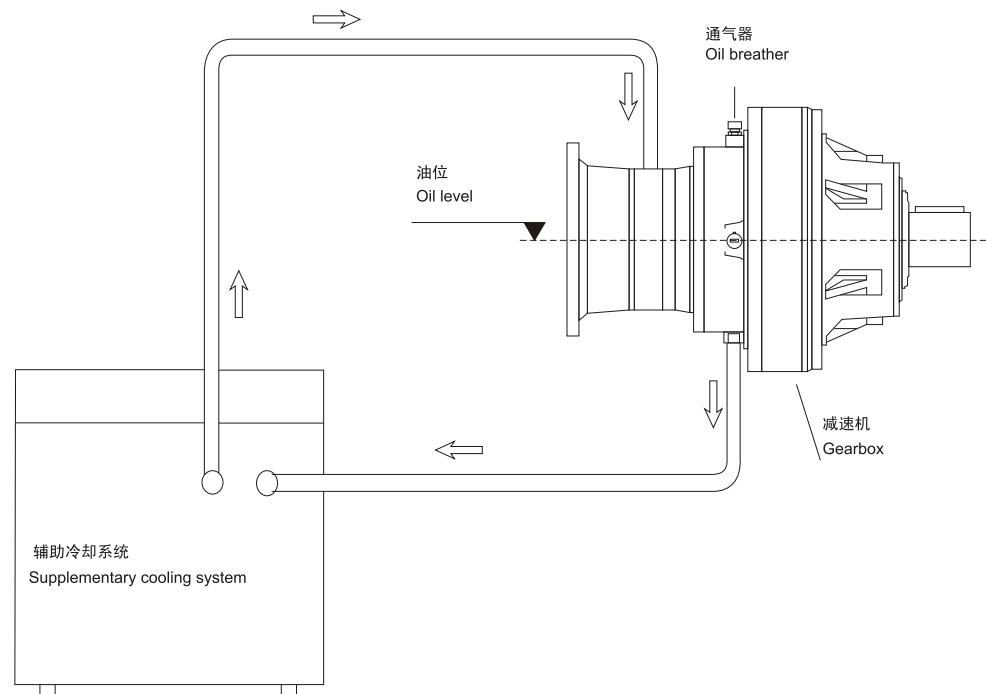
直径 Nominal diameter d		宽度 Width b	高度 Height h	轴键槽深度 Depth of key -way in shaft t1	轮毂键槽深度 Depth of key -way in hub d+2
大于 above	至/to	mm	mm	mm	mm
17	22	6	6	3.5	d+2.8
22	30	8	7	4	d+3.3
30	38	10	8	5	d+3.3
38	44	12	8	5	d+3.3
44	50	14	9	5.5	d+3.8
50	58	16	10	6	d+4.3
58	65	18	11	7	d+4.4
65	75	20	12	7.5	d+4.9
75	85	22	14	9	d+5.4
85	95	25	14	9	d+5.4
95	110	28	16	10	d+6.4
110	130	32	18	11	d+7.4
130	150	36	20	12	d+8.4
150	170	40	22	13	d+9.4
170	200	45	25	15	d+10.4
200	230	50	28	17	d+11.4
230	260	56	32	20	d+12.4
260	290	63	32	20	d+12.4
290	330	70	36	22	d+14.4
330	380	80	40	25	d+15.4
380	440	90	45	28	d+17.4

27 辅助冷却系统

如果减速机传递的机械功率大于额定热功率，可指定使用辅助冷却系统。

27 SUPPLEMENTARY COOLING SYSTEMS

Should the transmitted mechanical power be greater than the thermal capacity the unit is rated for, supplementary cooling systems can be specified.



减速机 Gearbox	L1	L2	L3	L4	R2	R3	R4
SPN06	CR1	CR1	-	-	-	-	-
SPN07	CR1	CR1	-	-	CR1	-	-
SPN09	CR1	CR1	CR1	-	CR1	-	-
SPN10	CR2	CR1	CR1	-	-	CR1	-
SPN11	CR2	CR1	CR1	-	CR1	CR1	-
SPN13	CR2	CR1	CR1	-	CR1	CR1	-
SPN14	CR3	CR2	CR1	-	-	CR1	-

减速机 Gearbox	L1	L2	L3	L4	R2	R3	R4
SPN15	CR3	CR2	CR1	-	-	CR1	-
SPN16	CR3	CR2	CR1	-	-	CR1	-
SPN17	CR3	CR2	CR2	CR1	-	-	-
SPN18	CR3	CR2	CR2	CR1	-	-	-
SPN19	CR3	CR2	CR2	CR1	-	-	-
SPN21	CR3	CR2	CR2	CR2	-	-	-

独立冷却系统由空气-润滑油换热器、电动泵、滤清器和一套电气系统组成，电气系统含有保护电机的温度传感器。

冷却单元运行时非常安静。

Independent cooling systems are made up of an air-oil heat exchanger, a motor pump, a filter and an electric system that incorporates a thermostatic sensor that protects the electric motor.

Cooling Units are particularly quiet in operation.

27.1 技术参数

		CR1	CR2	CR3
消耗功率 Absorbed power	kw	0.55	0.75	1.1
润滑油流量 Oil flow rate	l/min	13	22	34
气体流量 Air flow rate	m ³ /h	850	1500	2000
1米处噪音值 Noise level at 1 m	dB(A)	68	70	75
重量 Weight	kg	24	36	58

27.1 Technical data

27.2 选型规范

如果机械功率P大于额定热功率Pt,需要冷却的热量[PS]可通过以下公式计算。

$$Ps = 0.1 \cdot (P - Pt)$$

根据环境温度ta (20~40°C) 在图表中选取冷却系统规格。参照表格检查所选择的冷却系统是否适合于减速机。

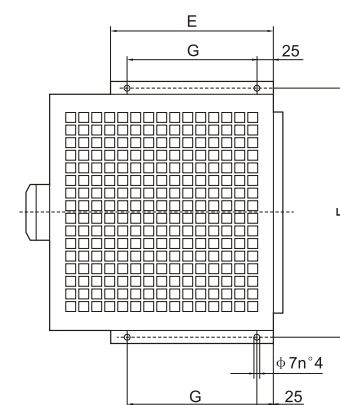
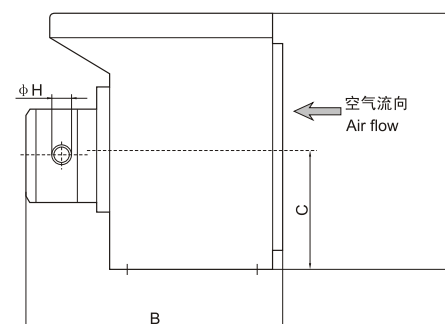
27.2 Selection criteria

Power P to be transmitted is known. Once you have determined that it is higher than thermal power Ps using this formula.

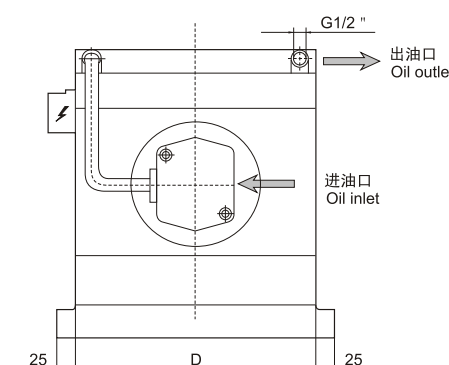
$$Ps = 0.1 \cdot (P - Pt)$$

Select cooling system size in chart according to ambient temperature ta (20~40°C). Check that the cooling system you have selected will fit the gearbox.

27.3 尺寸



27.3 Dimensions



	A	B	C	D	E	F	G	H
CR1	410	395	193	370	250	400	200	G1/2"
CR2	450	405	203	470	250	500	200	G3/4"
CR3	495	455	225	520	290	550	240	G3/4"

28 电机

28.1 电机按标准供货，若指定货高于此标准必须说明。

Y 普通三相异步电动机
电压 380V，频率 50HZ（其它电压、频率需说明）

防护等级：IP54
（指定IP55、IP56、IP65等需说明）

绝缘等级：B或F（指定F等需注明）

制动电机的制动器电压：380V或220V
（指定电压或其它电压需注明）

防爆电机防爆等级：d IIBT4（其它等级需注明）

变频电机频率范围：5-50HZ
(0-60HZ、0-120HZ或指定范围需提出)

电机的噪声、电流、效率、功率因素、额定转矩等项目按国家标准。

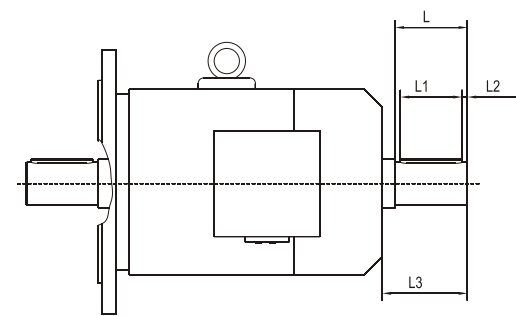
28.2 以下要求及辅具需另行说明：

- * 指定电机配手动次方装置
- * 电机的热传感器
- * 不带风冷或强制风冷
- * 配选择编码器
- * 防水、防潮、防尘的要求

28.3 电机代号

四级三相异步电动机代号-Y
制动电机代号 - YEJ
防爆电机代号 - YB
变频电机代号 - YP
多速电机代号 - YD
变频制动电机代号 YPEJ
其它电机代号另咨询

28.3 电机双出轴



	71	80	90/100	112	132S	132M	160L	180	200-225
d	11	14	19	24	28	38	42	48	55
L	23	30	40	50	60	80	110	110	110
L1	20	22	32	40	50	70	70	80	90
L2	1	4	4	5	5	5	10	10	10
L3	25	31	42	55	65	85	115	115	115
t1	12.5	16	21.5	27	31	41	45	51.5	59
u1	4	5	6	8	8	10	12	14	16

28.4 电机接线盒未注明位置一般以0° 供货

28 MOTOR

28.1 Motors comply with National standard ,please state if specification of other standards needed.

Y general tri-phase asynchronous motor data :
380V, 50HZ (other voltage & frequency should be stated)

Index of performance: IP54
(specification of IP55、IP56、IP65 should be stated)

Insulation class : B & F (using F should be stated)

Braking voltage of braking motor : 380V or 220V (other classes should be stated)

Explosion-proof class : d IIBT4 (other classes should be stated)

Frequency range : 5-50HZ (0-60HZ、0-120HZ or other range will be stated)

Noise、current、efficiency、power factor、nominal torque all comply with national standard.

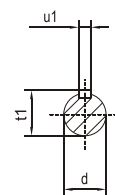
28.2 The following will be specified by customers:

- * Brake motor equipped with manual brake release
- * Thermal sensor
- * No air cooling or forced air cooling
- * Installation of rotation encoder
- * Water proof ,damp proof,dust proof

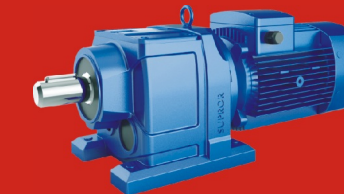
28.3 Motor code

Y4-pole tri-phase asynchronous motor
YEJ Brake motor
YB Explosion-proof motor
YP Frequency conversion motor
YD Multi-speed motor
YPEJ Frequency conversion brake motor
Other codes are available on request

28.3 Double extended shaft motor



28.4 In general,position of terminal box is at angular 0° without specification.



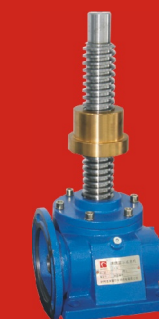
RFKS 齿轮减速机系列
RFKS Helical Gear Reducer Series



RV 减速机系列
RV Series Reducer



WP 减速机系列
WP Series Reducer



SPS 蜗轮丝杆升降机系列
SPS Screw jack series

速博雷尔其它系列产品

详见相关系列减速机样本
此手册为速博雷尔行星减速机系列样本