

ServoFit® PHQA 行星齿轮减速器

ServoFit® PHQA Planetary Gear Units



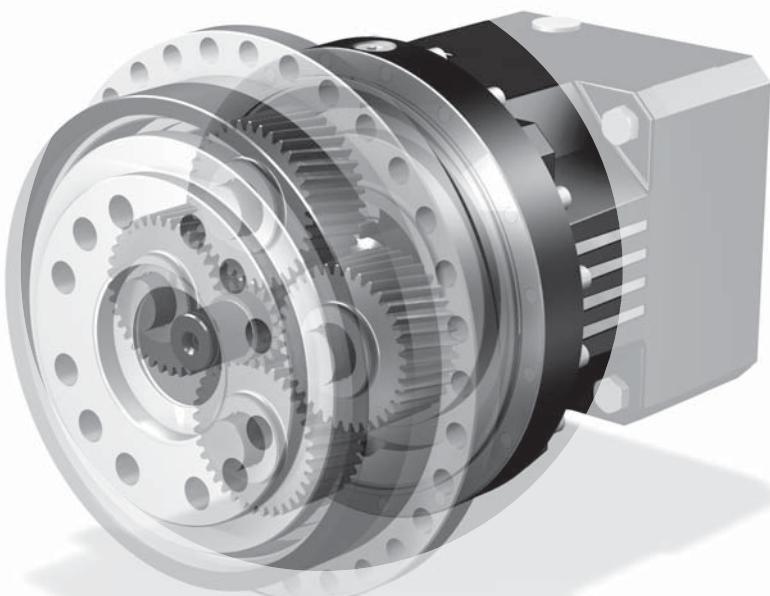
四驱动力
实现最大功率密度

- 加速扭矩:
950 – 10000 Nm
- 极低齿隙:
1 - 1.5 arcmin
- 高功率密度来源于
4 倍数 (四轮驱动) 行星系统
- 超高的扭转和侧倾刚度
- 输入端 FKM 密封,
无冷却连续运转
- 夹紧毂的传导功能
使安装简便
- 先进的传动技术
- 输入端长度热补偿
- 易于连接任何伺服电机
- 可在任意位置安装电机,
安全, 并且轻松
- 静音运转
- 效率:
2 级 $\geq 93\%$
3 级 $\geq 90\%$

**Quattro Power
for maximum power density**

- Acceleration torque:
950 – 10000 Nm
- Lowest backlash:
1 - 1.5 arcmin
- High power density due to 4-fold
(Quattro) planet system
- extremely high torsional and
tilting stiffness
- FKM seal at input and output,
continuous operation
without cooling
- easy to assemble due to spreading
function in the clamping hub
- advanced gear technology
- input with thermal expansion
compensation
- readily attaches any servo motor
- easy and secure motor attachment
in any mounting position
- quiet running
- efficiency:
2 stage $\geq 93\%$
3 stage $\geq 90\%$

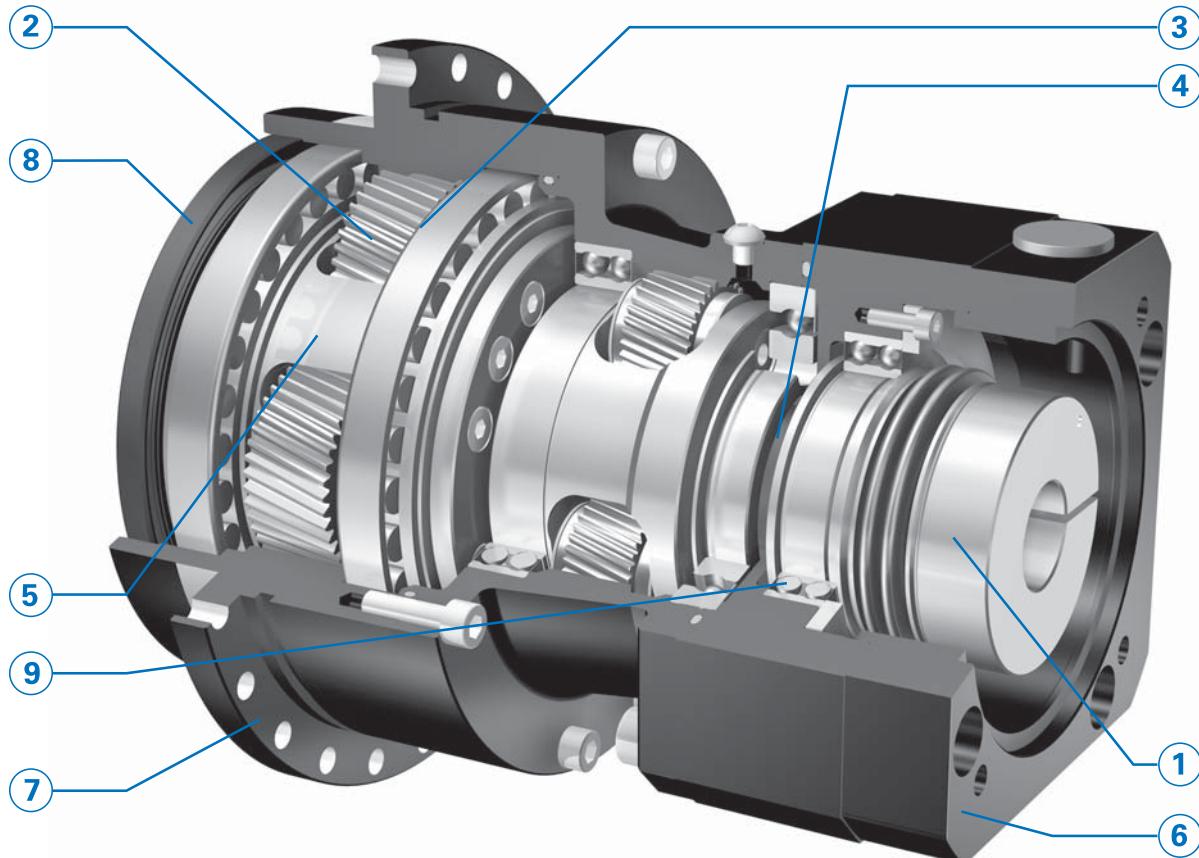
ServoFit® PHQA



ServoFit® PHQA 行星齿轮减速器

ServoFit® PHQA Planetary Gear Units

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- 四驱动力实现最大功率密度和旋转刚度。

一个优化的四行星系统（四轮驱动）允许扭矩分布到 4 个行星轮而不是 3 个。其结果是：扭矩增加高达 35%，而且旋转刚度增加高达 80%。

- 传动部件的精度选择确保齿隙小于一弧分。

- 主要轴承对称分布，法兰轴可容许高强度载荷并拥有巨大的侧倾刚度。

成 O 形排列的角接触轴承已成为标准版本，适用于高轴向推力和径向负荷。

- 无需特殊工具，斯德博 FlexiAdapt® 电机适配器系统，其综合热膨胀补偿功能让电机的安装变得轻松准确，可在几分钟内完成作业。

- 选择范围宽松的 IEC 和 NEMA 电机适配器几乎适用于所有品牌的电机。

- Quattro Power for maximum power density and rotation rigidity**

An optimized four-planet system (Quattro) permits torque to be distributed over 4 planets instead of 3. The result: increases in torque of up to 35% and increases in rotation rigidity of up to 80%.

- Precision selection** of the gearing parts ensures backlash of less than **one arc minute**.

- Symmetrically arranged main bearings** for highest load capacity and highest tilting rigidity of the flange shaft. Due to angular bearings in O alignment already the standard version is suitable for **high axial thrust and radial loads**.

- The STÖBER FlexiAdapt® motor adapter system** with its integrated thermal expansion compensation feature allows easy and accurate motor installation in minutes with no special tools required.

- Wide selection** of IEC and NEMA motor adapters for all common brands of motors.

ServoFit® PHQA 行星齿轮减速器

ServoFit® PHQA Planetary Gear Units



① FlexiAdapt® 联轴器

精准的电机安装由紧固螺栓完成。还有用于**大规格电机轴直径**的设计。

一体化设计并优化部件以适应电机轴径，此举有助于**惯量最小化**，同时确保出众的动态性能。

平衡的夹紧联轴节确保高速时也能安静、无振动运转。

轴套用于适应用户的电机轴径。

② **高品质传动**由经过表面硬化处理和精磨的太阳轮和行星轮提供。

③ **行星齿轮的轴承容许负载**增加了约100%。

④ **防护等级 IP65**。使用 **FKM** 油封在尽可能最小的轴径处密封，减小摩擦，从而防止内部热量的堆积，增加效率。无需外部冷却即可**持续运转**。

⑤ **最高抗扭刚度和极限抗拉强度**由高抗拉材料制成的一体化行星架提供。

⑥ 铝合金制成的电机适配器特别适合**低重量减速器**。

⑦ 一体化箱体设计确保**最高的运转精度**。箱体材料：高强度回火钢。

⑧ **FKM 径向双唇油封**。适用于连续运转，具有非常好的化学稳定性。

⑨ 输入轴带罩轴承以及耐高温油脂，特别适合免维护运转。

⑩ 使用高质量防水合成齿轮油保证**终生润滑**。

① FlexiAdapt® coupling

Accurate and precise motor installation by clamping screw. Designed **for large motor shaft diameters**.

The integrated thermal expansion compensation feature in the shape of a bellows coupling compensates linear expansion of the motor shaft.

Balanced clamp coupling for smooth operation, also at high speeds.

Spacer bushes to accommodate custom motor shaft diameters.

② **High gearing quality** provided by case-hardened and finish-ground sun gear and planet gears as well as nitrided and honed internal gearing.

③ **Load capacity of the planet gear bearings** increased by about 100%.

④ **IP65** enclosure. Sealed with a **FKM** radial oil seal for the smallest possible shaft diameter. Reduces friction, thus preventing internal heat build-up. Increases efficiency. **Continuous duty** operation possible without addition cooling.

⑤ **Highest torsional stiffness and ultimate tensile strength** provided by oversized single-piece planet carriers made of high-tensile material.

⑥ Motor adapter made of aluminium for **low gear unit weight**.

⑦ **Highest running accuracy and precision** ensured by single-piece housing design. Housing material: High-tensile tempered steel.

⑧ **FKM double-lip radial oil seals**. For continuous duty applications, with very good chemical resistance.

⑨ Input shaft bearings with shields and high-temperature grease for maintenance-free operation.

⑩ **Lubricated for life** with high-quality hydrophobic synthetic gear oil.

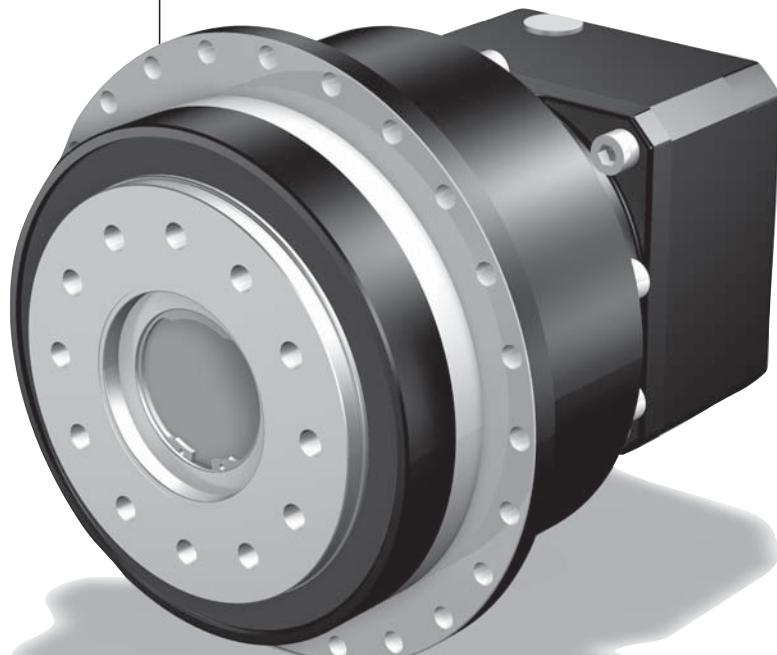
ServoFit® PHQA

行星齿轮减速器

ServoFit® PHQA

Planetary Gear Units

 **STÖBER**



PHQA

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型号标识

Type designation



PHQA 7 2 2 F 0220 MF C

| | | | | | | |
1 2 3 4 5 6 7 8

1 减速器类型

PHQA - 行星齿轮减速器

2 减速器规格

3 生产代号

4 齿轮级数

2 - 2 级

3 - 3 级

5 结构

F - 法兰轴

6 传动比 $i \times 10$

7 电机适配器

ME - 带有 EasyAdapt® 联轴器的电机适配器

MEL - 带有 EasyAdapt® 联轴器和大规格电机法兰盘的电机适配器

MF - 带有 FlexiAdapt® 联轴器的电机适配器

MFL - 带有 FlexiAdapt® 联轴器和大规格电机法兰盘的电机适配器

按需定制 (需要客户的电机尺寸图!)

还请参阅电机输出图与 PHQA15 页的电机连接图，并注意最大尺寸)。

8 冷却模块

C - ServoCool (可选)
(见手册 ID 441851)

订货数据依照以上型号标识。

更多订货细节:

- 3 级齿轮减速器的安装位置
- 如果是水平安装，输出轴的回转运行是否在 ± 20 到 ± 90 度之间?
(也可参见 A12 页)

警告! 为确保达到标定的扭矩，齿轮箱装配到机械上的螺栓必须是 12.9 级。

1 Gear unit type

PHQA - Planetary gear unit

2 Gear unit size

3 Generation number

4 Stages

2 - 2 stage

3 - 3 stage

5 Design

F - flange shaft

6 Transmission ratio $i \times 10$

7 Mounting series

ME - Motor adapter with EasyAdapt® coupling

MEL - Motor adapter with EasyAdapt® coupling and large motor plate

MF - Motor adapter with FlexiAdapt® coupling

MFL - Motor adapter with FlexiAdapt® coupling and large motor plate

Acc. to customer specs (Dimension drawing of customer motor necessary! Also see pic. motor output and motor connection from page PHQA15, please observe the max. dimensions).

8 Ventilator module

C - ServoCool (option)
(see brochure ID 441851)

Ordering data according to the type designation above.

Further ordering details:

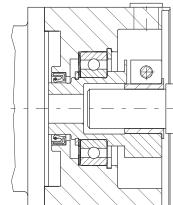
- Mounting position for 3 stage gear units
- reversing operation of the output shaft ± 20 to ± 90 degrees (horizontal mounting)?
(also see page A12)

WARNING! In order to ensure that the specified torques are attained it is essential to attach the gear units at the machine with screws of grade 12.9.

PHQA722 F 0220 MF



EasyAdapt® 联轴器 ME
EasyAdapt® Coupling ME



FlexiAdapt® 联轴器 MF
FlexiAdapt® Coupling MF

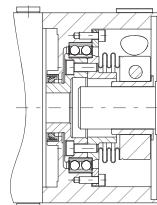
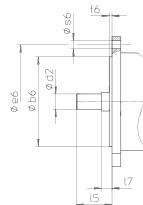


图: 电机输出端
Picture: motor output

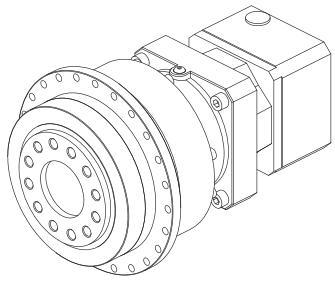


安装位置

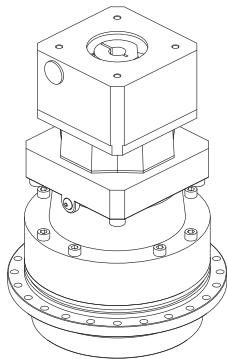
Mounting positions

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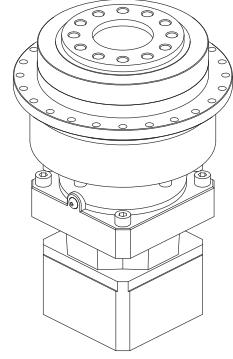
EL1



EL5



EL6



减速器润滑油的类型和填充量在其铭牌上有所标定。对 3 级齿轮减速器而言，润滑油的填充水平以及减速器的结构方式取决于安装位置。

因此，任何减速器的修改只有咨询斯德博之后才能允许进行。

关于油的等级和数量，请访问我们的网站，可得到更详细的资料 (ID 441871) 。

The gear units are filled with the quantity and type of lubricant specified on the rating plate. For 3 stage gear units the lubricant fill level and the setup of the gear units depend on the mounting position .

Therefore, any modification of the gear units is permitted only after consulting STÖBER.

Please visit our web site for more detailed information about oil grades and quantities (ID 441871).

PHQA

轴系 / 箱体设计
PHQA 输出轴

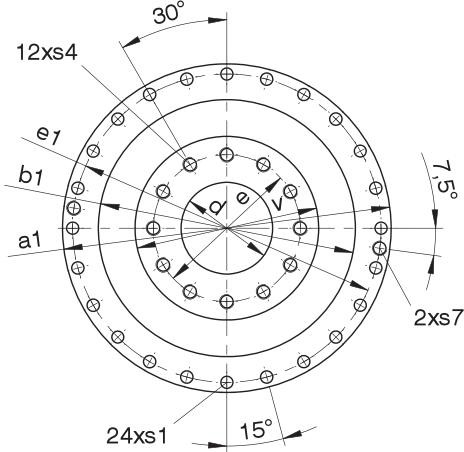
Shaft / housing design
Output PHQA



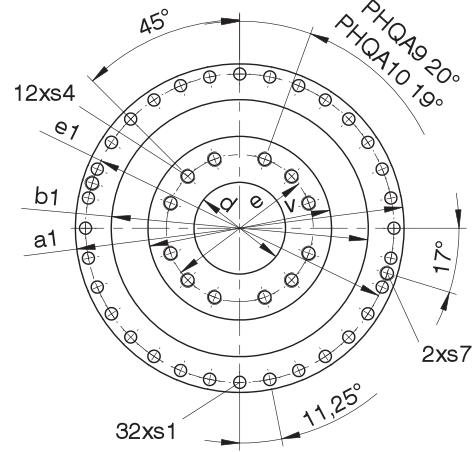
法兰轴

Flange shaft

PHQA7 + PHQA8



PHQA9 + PHQA10



轴系设计 "F"

Shaft design "F"

Typ	øa1	øb1	ød	øe	øe1	øs1	s4	s7	v
PHQA7	179h7	140h7	50H6	80	168	6,6	M10	-	100h7
PHQA8	247h7	200h7	80H6	125	233	9,0	M12	M10	160h7
PHQA9	300	255h7	90H6	145	280	13,5	M20	M8	180h7
PHQA10	330	285h7	95H6	166	310	13,5	M24	M10	200h7

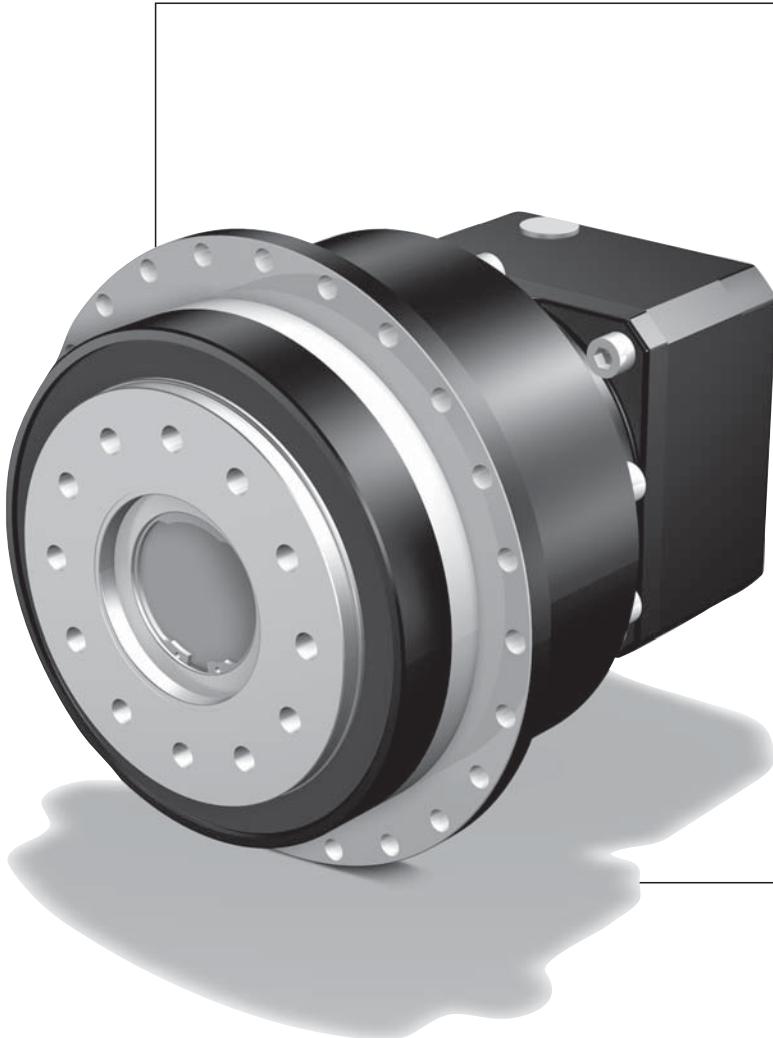
警告! 为确保达到标定的扭矩, 齿轮箱装
配到机械上的螺栓必须是 12.9 级。

WARNING! In order to ensure that the specified torques are attained it is essential to attach the gear units at the machine with screws of grade 12.9.

选型数据：
ServoFit® PHQA
行星齿轮减速器

Selection data:
ServoFit® PHQA
Planetary Gear Units

 STÖBER



PHQA

**选型数据：
ServoFit® PHQA
行星齿轮减速器**



**Selection data:
ServoFit® PHQA
Planetary Gear Units**

符号：

i	- 减速器传动比
n_{1MAX}	- 最大输入转速 DB - 连续运转 ZB - 间歇运转 (环境温度 20°C, 还请参阅 A10/A11 页)
MWØ	- 电机轴径
J₁	- 质量惯性矩 (针对输入端)
G	- 重量
Λφ₂	- 齿隙
C₂	- 齿轮箱刚度 (针对 M _{2N} 时的输出端)
L_{PA}	- 最大噪音水平 (n ₁ = 2000 rpm)
M_{2N}	- 额定扭矩 1)
M_{2B}	- 最大容许加速扭矩
M_{2NOT}	- 紧急制动扭矩 (1000 次负载变化)

请注意 A10/A11 页的运转系数！

1) 所列数值适用于输入转速 n₁=1500 rpm。

产品构成的容许扭矩 M_{2N} 和所容许的转速 n_{1MAXDB}
不考虑最大热容量。

Symbols:

i	- Gear unit ratio
n_{1MAX}	- Max. input speed DB - Continuous operation ZB - Cycle operation (at ambient temperature 20°C, also see page A10/A11)
MWØ	- Motor shaft diameter
J₁	- Mass mom. of inertia (related to input)
G	- Weight
Λφ₂	- Backlash
C₂	- Gear unit rigidity (related to output at M _{2N})
L_{PA}	- Max. noise level (n ₁ = 2000 rpm)
M_{2N}	- Rated torque 1)
M_{2B}	- Max. perm. acceleration torque
M_{2NOT}	- Emergency-Off moment (10 ³ load changes)

**Please take notice of the operating factors
on page A10/A11 !**

1) Figures applied to input speed n₁ = 1500 rpm.

The product consisting of permissible torque M_{2N} and
permissible speed n_{1MAXDB} does not consider the
maximum thermal capacity.

行星齿轮减速器 PHQA

Planetary Gear Units **PHQA**



请注意 PHQA6 页的符号注释!

Please take notice of the indications on page PHQA6!

i	Typ	n1MAX DB [min-1]	n1MAX ZB [min-1]	MWØ [mm]	J1 [10 ⁻⁴ kgm ²]	G [kg]	Δφ2 [arcmin]	C2 [Nm/arcmin]	LPA [dB(A)]	M2N [Nm]	M2B [Nm]	M2NOT [Nm]
PHQA722 (M_{2BMAX}=950 Nm)												
22,00	PHQA722F0220 MF	3000	5000	≤19	6,0	14,6	1	203	62	650	950	1900
22,00	PHQA722F0220 MF	3000	5000	>19≤24	6,1	14,6	1	203	62	650	950	1900
22,00	PHQA722F0220 MF	3000	5000	>24≤32	6,0	14,6	1	203	62	650	950	1900
22,00	PHQA722F0220 MF	3000	5000	>32≤35	6,0	14,6	1	203	62	650	950	1900
22,00	PHQA722F0220 MFL	3000	5000	>32≤38	13	16,3	1	205	62	650	950	1900
27,50	PHQA722F0280 MF	3500	6000	≤19	5,5	14,6	1	203	60	650	950	1900
27,50	PHQA722F0280 MF	3500	6000	>19≤24	5,6	14,6	1	203	60	650	950	1900
27,50	PHQA722F0280 MF	3500	6000	>24≤32	5,5	14,6	1	203	60	650	950	1900
27,50	PHQA722F0280 MF	3500	6000	>32≤35	5,5	14,6	1	203	60	650	950	1900
27,50	PHQA722F0280 MFL	3500	6000	>32≤38	12	16,3	1	204	60	650	950	1900
38,50	PHQA722F0390 MF	3700	6500	≤19	5,2	14,6	1	201	59	650	950	1900
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38,50	PHQA722F0390 MF	3700	6500	>32≤35	5,1	14,6	1	201	59	650	950	1900
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55,00	PHQA722F0550 MF	3700	6500	>32≤35	4,9	14,6	1	195	57	650	950	1900
55,00	PHQA722F0550 MFL	3700	6500	>32≤38	12	16,3	1	195	57	650	950	1900
PHQA723 (M_{2BMAX}=950 Nm)												
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275,0	PHQA723F2750 MF	4000	7000	>14≤19	1,7	16,4	1	202	56	650	950	1900
275,0	PHQA723F2750 MFL	4000	7000	>19≤24	1,6	16,4	1	202	56	650	950	1900
275,0	PHQA723F2750 MFL	4000	7000	>24≤32	4,8	17,1	1	202	56	650	950	1900
385,0	PHQA723F3850 MF	4000	7000	≤14	1,7	16,4	1	201	56	650	950	1900
385,0	PHQA723F3850 MF	4000	7000	>14≤19	1,7	16,4	1	201	56	650	950	1900
385,0	PHQA723F3850 MF	4000	7000	>19≤24	1,6	16,4	1	201	56	650	950	1900
385,0	PHQA723F3850 MFL	4000	7000	>24≤32	4,8	17,1	1	201	56	650	950	1900
550,0	PHQA723F5500 MF	4000	7000	≤14	1,7	16,4	1	195	56	650	950	1900
550,0	PHQA723F5500 MF	4000	7000	>14≤19	1,7	16,4	1	195	56	650	950	1900
550,0	PHQA723F5500 MF	4000	7000	>19≤24	1,6	16,4	1	195	56	650	950	1900
550,0	PHQA723F5500 MFL	4000	7000	>24≤32	4,7	17,1	1	195	56	650	950	1900

行星齿轮减速器 PHQA

Planetary Gear Units **PHQA**



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请注意 PHQA6 页的符号注释!

Please take notice of the indications on page PHQA6!

i	Typ	n1MAX DB [min-1]	n1MAX ZB [min-1]	MWØ [mm]	J1	G [10-4 kgm²]	Δφ2 [arcmin]	C2 [Nm/arcmin]	LPA [dB(A)]	M2N [Nm]	M2B [Nm]	M2NOT [Nm]
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PHQA822 (M2BMAX=2600 Nm)

22,00	PHQA822F0220 MF	2500	4500	≤24	16	39,8	1	634	63	1700	2600	4400
22,00	PHQA822F0220 MF	2500	4500	>24≤32	16	39,8	1	639	63	1700	2600	4400
22,00	PHQA822F0220 MF	2500	4500	>32≤38	16	39,8	1	639	63	1700	2600	4400
22,00	PHQA822F0220 MFL	2500	4500	>38≤48	35	43,6	1	649	63	1700	2600	4400
27,50	PHQA822F0280 MF	3000	5500	≤24	14	39,8	1	639	61	1700	2600	4400
27,50	PHQA822F0280 MF	3000	5500	>24≤32	15	39,8	1	642	61	1700	2600	4400
27,50	PHQA822F0280 MF	3000	5500	>32≤38	15	39,8	1	642	61	1700	2600	4400
27,50	PHQA822F0280 MFL	3000	5500	>38≤48	34	43,6	1	648	61	1700	2600	4400
38,50	PHQA822F0390 MF	3300	6000	≤24	13	39,8	1	634	60	1700	2600	4400
38,50	PHQA822F0390 MF	3300	6000	>24≤32	13	39,8	1	634	60	1700	2600	4400
38,50	PHQA822F0390 MFL	3300	6000	>32≤38	13	39,8	1	634	60	1700	2600	4400
38,50	PHQA822F0390 MFL	3300	6000	>38≤48	32	43,6	1	639	60	1700	2600	4400
55,00	PHQA822F0550 MF	3300	6000	≤24	12	39,8	1	611	58	1580	2600	4400
55,00	PHQA822F0550 MF	3300	6000	>24≤32	12	39,8	1	611	58	1580	2600	4400
55,00	PHQA822F0550 MF	3300	6000	>32≤38	12	39,8	1	611	58	1580	2600	4400
55,00	PHQA822F0550 MFL	3300	6000	>38≤48	31	43,6	1	613	58	1580	2600	4400

PHQA823 (M2BMAX=2600 Nm)

88,00	PHQA823F0880 MF	3000	5000	≤19	6,1	42,6	1	644	62	1700	2600	4400
88,00	PHQA823F0880 MF	3000	5000	>19≤24	6,2	42,6	1	645	62	1700	2600	4400
88,00	PHQA823F0880 MF	3000	5000	>24≤32	6,1	42,6	1	645	62	1700	2600	4400
88,00	PHQA823F0880 MF	3000	5000	>32≤35	6,1	42,6	1	645	62	1700	2600	4400
88,00	PHQA823F0880 MFL	3000	5000	>32≤38	13	44,3	1	646	62	1700	2600	4400
110,0	PHQA823F1100 MF	3500	6000	≤19	6,0	42,6	1	645	62	1700	2600	4400
110,0	PHQA823F1100 MF	3500	6000	>19≤24	6,1	42,6	1	645	62	1700	2600	4400
110,0	PHQA823F1100 MF	3500	6000	>24≤32	6,0	42,6	1	645	62	1700	2600	4400
110,0	PHQA823F1100 MF	3500	6000	>32≤35	6,0	42,6	1	645	62	1700	2600	4400
110,0	PHQA823F1100 MFL	3500	6000	>32≤38	13	44,3	1	646	62	1700	2600	4400
137,5	PHQA823F1380 MF	3500	6000	≤19	5,5	42,6	1	645	60	1700	2600	4400
137,5	PHQA823F1380 MF	3500	6000	>19≤24	5,6	42,6	1	645	60	1700	2600	4400
137,5	PHQA823F1380 MFL	3500	6000	>32≤35	5,5	42,6	1	645	60	1700	2600	4400
137,5	PHQA823F1380 MFL	3500	6000	>32≤38	12	44,3	1	645	60	1700	2600	4400
154,0	PHQA823F1540 MF	3700	6500	≤19	5,2	42,6	1	644	59	1700	2600	4400
154,0	PHQA823F1540 MF	3700	6500	>19≤24	5,2	42,6	1	644	59	1700	2600	4400
154,0	PHQA823F1540 MF	3700	6500	>24≤32	5,1	42,6	1	644	59	1700	2600	4400
154,0	PHQA823F1540 MF	3700	6500	>32≤35	5,1	42,6	1	644	59	1700	2600	4400
154,0	PHQA823F1540 MFL	3700	6500	>32≤38	12	44,3	1	644	59	1700	2600	4400
192,5	PHQA823F1930 MF	3700	6500	≤19	5,2	42,6	1	644	59	1700	2600	4400
192,5	PHQA823F1930 MF	3700	6500	>19≤24	5,2	42,6	1	644	59	1700	2600	4400
192,5	PHQA823F1930 MF	3700	6500	>24≤32	5,1	42,6	1	644	59	1700	2600	4400
192,5	PHQA823F1930 MF	3700	6500	>32≤35	5,1	42,6	1	644	59	1700	2600	4400
192,5	PHQA823F1930 MFL	3700	6500	>32≤38	12	44,3	1	645	59	1700	2600	4400
220,0	PHQA823F2200 MF	3700	6500	≤19	5,0	42,6	1	641	57	1700	2600	4400
220,0	PHQA823F2200 MF	3700	6500	>19≤24	5,0	42,6	1	641	57	1700	2600	4400
220,0	PHQA823F2200 MF	3700	6500	>24≤32	4,9	42,6	1	641	57	1700	2600	4400
220,0	PHQA823F2200 MF	3700	6500	>32≤35	4,9	42,6	1	641	57	1700	2600	4400
220,0	PHQA823F2200 MFL	3700	6500	>32≤38	12	44,3	1	641	57	1700	2600	4400
275,0	PHQA823F2750 MF	3700	6500	≤19	5,0	42,6	1	643	57	1700	2600	4400
275,0	PHQA823F2750 MF	3700	6500	>19≤24	5,0	42,6	1	643	57	1700	2600	4400
275,0	PHQA823F2750 MF	3700	6500	>24≤32	4,9	42,6	1	643	57	1700	2600	4400
275,0	PHQA823F2750 MF	3700	6500	>32≤35	4,9	42,6	1	643	57	1700	2600	4400
275,0	PHQA823F2750 MFL	3700	6500	>32≤38	12	44,3	1	643	57	1700	2600	4400
385,0	PHQA823F3850 MF	3700	6500	≤19	5,0	42,6	1	635	57	1700	2600	4400
385,0	PHQA823F3850 MF	3700	6500	>19≤24	5,0	42,6	1	635	57	1700	2600	4400
385,0	PHQA823F3850 MF	3700	6500	>24≤32	4,9	42,6	1	635	57	1700	2600	4400
385,0	PHQA823F3850 MF	3700	6500	>32≤35	4,9	42,6	1	635	57	1700	2600	4400
385,0	PHQA823F3850 MFL	3700	6500	>32≤38	12	44,3	1	635	57	1700	2600	4400
550,0	PHQA823F5500 MF	3700	6500	≤19	5,0	42,6	1	611	57	1580	2600	4400
550,0	PHQA823F5500 MF	3700	6500	>19≤24	5,0	42,6	1	611	57	1580	2600	4400

行星齿轮减速器 PHQA

Planetary Gear Units **PHQA**



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Please take notice of the indications on page PHQA6!

i	Typ	n1MAX DB [min-1]	n1MAX ZB [min-1]	MWØ [mm]	J1 [10 ⁻⁴ kgm ²]	G [kg]	Δφ2 [arcmin]	C2 [Nm/arcmin]	LPA [dB(A)]	M2N [Nm]	M2B [Nm]	M2NOT [Nm]
PHQA823 (M_{2BMAX}=2600 Nm)												
550,0	PHQA823F5500 MF	3700	6500	>24≤32	4,9	42,6	1	611	57	1580	2600	4400
550,0	PHQA823F5500 MF	3700	6500	>32≤35	4,9	42,6	1	611	57	1580	2600	4400
550,0	PHQA823F5500 MFL	3700	6500	>32≤38	12	44,3	1	611	57	1580	2600	4400
PHQA932 (M_{2BMAX}=6000 Nm)												
18,00	PHQA932F0180 MF	1800	3000	≤32	78	81,0	1	1167	66	3800	6000	8490
18,00	PHQA932F0180 MF	1800	3000	>32≤38	78	81,0	1	1177	66	3800	6000	10080
18,00	PHQA932F0180 MF	1800	3000	>38≤48	77	81,0	1	1177	66	3800	6000	12000
24,00	PHQA932F0240 MF	2200	3500	≤32	49	81,0	1	1185	64	3800	6000	11320
24,00	PHQA932F0240 MF	2200	3500	>32≤38	49	81,0	1	1191	64	3800	6000	12000
24,00	PHQA932F0240 MF	2200	3500	>38≤48	48	81,0	1	1191	64	3800	6000	12000
30,00	PHQA932F0300 MF	2500	4000	≤32	42	81,0	1	1188	62	3800	6000	12000
30,00	PHQA932F0300 MF	2500	4000	>32≤38	42	81,0	1	1192	62	3800	6000	12000
30,00	PHQA932F0300 MF	2500	4000	>38≤48	42	81,0	1	1192	62	3800	6000	12000
42,00	PHQA932F0420 MF	2800	4500	≤32	37	81,0	1	1182	61	3800	6000	12000
42,00	PHQA932F0420 MF	2800	4500	>32≤38	37	81,0	1	1182	61	3800	6000	12000
42,00	PHQA932F0420 MF	2800	4500	>38≤48	36	81,0	1	1182	61	3800	6000	12000
60,00	PHQA932F0600 MF	2800	4500	≤32	34	81,0	1	1144	59	3800	6000	12000
60,00	PHQA932F0600 MF	2800	4500	>32≤38	34	81,0	1	1144	59	3800	6000	12000
60,00	PHQA932F0600 MF	2800	4500	>38≤48	33	81,0	1	1144	59	3800	6000	12000
PHQA933 (M_{2BMAX}=6000 Nm)												
72,00	PHQA933F0720 MF	2200	4500	≤24	18	85,1	1	1197	63	3800	6000	12000
72,00	PHQA933F0720 MF	2200	4500	>24≤32	18	85,1	1	1198	63	3800	6000	12000
72,00	PHQA933F0720 MF	2200	4500	>32≤38	18	85,1	1	1198	63	3800	6000	12000
72,00	PHQA933F0720 MFL	2200	4500	>38≤48	37	88,9	1	1202	63	3800	6000	12000
96,00	PHQA933F0960 MF	2500	4500	≤24	16	85,1	1	1202	63	3800	6000	12000
96,00	PHQA933F0960 MF	2500	4500	>24≤32	17	85,1	1	1203	63	3800	6000	12000
96,00	PHQA933F0960 MF	2500	4500	>32≤38	17	85,1	1	1203	63	3800	6000	12000
96,00	PHQA933F0960 MFL	2500	4500	>38≤48	36	88,9	1	1205	63	3800	6000	12000
120,0	PHQA933F1200 MF	2500	4500	≤24	16	85,1	1	1199	63	3800	6000	12000
120,0	PHQA933F1200 MF	2500	4500	>24≤32	16	85,1	1	1200	63	3800	6000	12000
120,0	PHQA933F1200 MF	2500	4500	>32≤38	16	85,1	1	1200	63	3800	6000	12000
120,0	PHQA933F1200 MFL	2500	4500	>38≤48	35	88,9	1	1201	63	3800	6000	12000
150,0	PHQA933F1500 MF	3000	5500	≤24	14	85,1	1	1200	61	3800	6000	12000
150,0	PHQA933F1500 MF	3000	5500	>24≤32	15	85,1	1	1200	61	3800	6000	12000
150,0	PHQA933F1500 MF	3000	5500	>32≤38	15	85,1	1	1200	61	3800	6000	12000
150,0	PHQA933F1500 MFL	3000	5500	>38≤48	33	88,9	1	1201	61	3800	6000	12000
168,0	PHQA933F1680 MF	3300	6000	≤24	13	85,1	1	1202	60	3800	6000	12000
168,0	PHQA933F1680 MF	3300	6000	>24≤32	13	85,1	1	1202	60	3800	6000	12000
168,0	PHQA933F1680 MF	3300	6000	>32≤38	13	85,1	1	1202	60	3800	6000	12000
168,0	PHQA933F1680 MFL	3300	6000	>38≤48	32	88,9	1	1203	60	3800	6000	12000
210,0	PHQA933F2100 MF	3300	6000	≤24	13	85,1	1	1199	60	3800	6000	12000
210,0	PHQA933F2100 MF	3300	6000	>24≤32	13	85,1	1	1199	60	3800	6000	12000
210,0	PHQA933F2100 MF	3300	6000	>32≤38	13	85,1	1	1199	60	3800	6000	12000
210,0	PHQA933F2100 MFL	3300	6000	>38≤48	32	88,9	1	1200	60	3800	6000	12000
240,0	PHQA933F2400 MF	3300	6000	≤24	12	85,1	1	1197	58	3800	6000	12000
240,0	PHQA933F2400 MF	3300	6000	>24≤32	12	85,1	1	1197	58	3800	6000	12000
240,0	PHQA933F2400 MF	3300	6000	>32≤38	12	85,1	1	1197	58	3800	6000	12000
240,0	PHQA933F2400 MFL	3300	6000	>38≤48	32	88,9	1	1197	58	3800	6000	12000
300,0	PHQA933F3000 MF	3300	6000	≤24	12	85,1	1	1196	58	3800	6000	12000
300,0	PHQA933F3000 MF	3300	6000	>24≤32	12	85,1	1	1196	58	3800	6000	12000
300,0	PHQA933F3000 MF	3300	6000	>32≤38	12	85,1	1	1196	58	3800	6000	12000
300,0	PHQA933F3000 MFL	3300	6000	>38≤48	31	88,9	1	1196	58	3800	6000	12000
420,0	PHQA933F4200 MF	3300	6000	≤24	12	85,1	1	1184	58	3800	6000	12000
420,0	PHQA933F4200 MF	3300	6000	>24≤32	12	85,1	1	1184	58	3800	6000	12000
420,0	PHQA933F4200 MF	3300	6000	>32≤38	12	85,1	1	1184	58	3800	6000	12000
420,0	PHQA933F4200 MFL	3300	6000	>38≤48	31	88,9	1	1184	58	3800	6000	12000

行星齿轮减速器 PHQA

Planetary Gear Units **PHQA**



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Please take notice of the indications on page PHQA6!

i	Typ	n1MAX DB [min-1]	n1MAX ZB [min-1]	MWØ [mm]	J1	G [10-4 kgm²]	Δφ2 [arcmin]	C2 [Nm/arcmin]	LPA [dB(A)]	M2N [Nm]	M2B [Nm]	M2NOT [Nm]
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PHQA933 (M2BMAX=6000 Nm)

600,0	PHQA933F6000 MF	3300	6000	≤24	12	85,1	1	1144	58	3800	6000	12000
600,0	PHQA933F6000 MF	3300	6000	>24≤32	12	85,1	1	1144	58	3800	6000	12000
600,0	PHQA933F6000 MF	3300	6000	>32≤38	12	85,1	1	1144	58	3800	6000	12000
600,0	PHQA933F6000 MFL	3300	6000	>38≤48	31	88,9	1	1144	58	3800	6000	12000

PHQA1032 (M2BMAX=10000 Nm)

24,00	PHQA1032F0240 ME	2000	3000	≤48	91	118,2	1,5	2062	65	6500	10000	20000
24,00	PHQA1032F0240 ME	2000	3000	>48≤55	96	118,2	1,5	2062	65	6500	10000	20000
24,00	PHQA1032F0240 ME	2000	3000	>55≤60	100	118,2	1,5	2062	65	6500	10000	20000
30,00	PHQA1032F0300 ME	2200	3500	≤48	72	118,2	1,5	2058	63	6500	10000	20000
30,00	PHQA1032F0300 ME	2200	3500	>48≤55	77	118,2	1,5	2058	63	6500	10000	20000
30,00	PHQA1032F0300 ME	2200	3500	>55≤60	82	118,2	1,5	2058	63	6500	10000	20000
42,00	PHQA1032F0420 ME	2500	4000	≤48	57	118,2	1,5	2040	62	6500	10000	20000
42,00	PHQA1032F0420 ME	2500	4000	>48≤55	62	118,2	1,5	2040	62	6500	10000	20000
42,00	PHQA1032F0420 ME	2500	4000	>55≤60	67	118,2	1,5	2040	62	6500	10000	20000
60,00	PHQA1032F0600 ME	2500	4000	≤48	50	118,2	1,5	1970	60	6500	10000	20000
60,00	PHQA1032F0600 ME	2500	4000	>48≤55	55	118,2	1,5	1970	60	6500	10000	20000
60,00	PHQA1032F0600 ME	2500	4000	>55≤60	60	118,2	1,5	1970	60	6500	10000	20000

PHQA1033 (M2BMAX=10000 Nm)

96,00	PHQA1033F0960 ME	2200	3500	≤32	28	128,1	1,5	2061	64	6500	10000	20000
96,00	PHQA1033F0960 ME	2200	3500	>32≤38	32	128,1	1,5	2062	64	6500	10000	20000
96,00	PHQA1033F0960 ME	2200	3500	>38≤48	36	128,1	1,5	2062	64	6500	10000	20000
96,00	PHQA1033F0960 MEL	2200	3500	>48≤55	67	132,7	1,5	2067	64	6500	10000	20000
96,00	PHQA1033F0960 MEL	2200	3500	>55≤60	72	132,7	1,5	2067	64	6500	10000	20000
120,0	PHQA1033F1200 ME	2200	3500	≤32	27	128,1	1,5	2057	64	6500	10000	20000
120,0	PHQA1033F1200 ME	2200	3500	>32≤38	31	128,1	1,5	2058	64	6500	10000	20000
120,0	PHQA1033F1200 ME	2200	3500	>38≤48	35	128,1	1,5	2058	64	6500	10000	20000
120,0	PHQA1033F1200 MEL	2200	3500	>48≤55	66	132,7	1,5	2061	64	6500	10000	20000
120,0	PHQA1033F1200 MEL	2200	3500	>55≤60	71	132,7	1,5	2061	64	6500	10000	20000
150,0	PHQA1033F1500 ME	2500	4000	≤32	20	128,1	1,5	2058	62	6500	10000	20000
150,0	PHQA1033F1500 ME	2500	4000	>32≤38	24	128,1	1,5	2058	62	6500	10000	20000
150,0	PHQA1033F1500 ME	2500	4000	>38≤48	28	128,1	1,5	2058	62	6500	10000	20000
150,0	PHQA1033F1500 MEL	2500	4000	>48≤55	59	132,7	1,5	2060	62	6500	10000	20000
150,0	PHQA1033F1500 MEL	2500	4000	>55≤60	64	132,7	1,5	2060	62	6500	10000	20000
168,0	PHQA1033F1680 ME	2800	4500	≤32	15	128,1	1,5	2062	61	6500	10000	20000
168,0	PHQA1033F1680 ME	2800	4500	>32≤38	18	128,1	1,5	2062	61	6500	10000	20000
168,0	PHQA1033F1680 ME	2800	4500	>38≤48	21	128,1	1,5	2062	61	6500	10000	20000
168,0	PHQA1033F1680 MEL	2800	4500	>48≤55	53	132,7	1,5	2063	61	6500	10000	20000
210,0	PHQA1033F2100 ME	2800	4500	≤32	15	128,1	1,5	2058	61	6500	10000	20000
210,0	PHQA1033F2100 ME	2800	4500	>32≤38	17	128,1	1,5	2058	61	6500	10000	20000
210,0	PHQA1033F2100 ME	2800	4500	>38≤48	20	128,1	1,5	2058	61	6500	10000	20000
210,0	PHQA1033F2100 MEL	2800	4500	>48≤55	53	132,7	1,5	2059	61	6500	10000	20000
240,0	PHQA1033F2400 ME	2800	4500	≤32	12	128,1	1,5	2055	59	6500	10000	20000
240,0	PHQA1033F2400 ME	2800	4500	>32≤38	15	128,1	1,5	2055	59	6500	10000	20000
240,0	PHQA1033F2400 ME	2800	4500	>38≤48	18	128,1	1,5	2055	59	6500	10000	20000
240,0	PHQA1033F2400 MEL	2800	4500	>48≤55	50	132,7	1,5	2056	59	6500	10000	20000
300,0	PHQA1033F3000 ME	2800	4500	≤32	12	128,1	1,5	2053	59	6500	10000	20000
300,0	PHQA1033F3000 ME	2800	4500	>32≤38	14	128,1	1,5	2053	59	6500	10000	20000
300,0	PHQA1033F3000 ME	2800	4500	>38≤48	18	128,1	1,5	2053	59	6500	10000	20000
300,0	PHQA1033F3000 MEL	2800	4500	>48≤55	50	132,7	1,5	2054	59	6500	10000	20000
420,0	PHQA1033F4200 ME	2800	4500	≤32	12	128,1	1,5	2036	59	6500	10000	20000
420,0	PHQA1033F4200 ME	2800	4500	>32≤38	14	128,1	1,5	2036	59	6500	10000	20000
420,0	PHQA1033F4200 ME	2800	4500	>38≤48	18	128,1	1,5	2036	59	6500	10000	20000
420,0	PHQA1033F4200 MEL	2800	4500	>48≤55	50	132,7	1,5	2036	59	6500	10000	20000
600,0	PHQA1033F6000 ME	2800	4500	≤32	12	128,1	1,5	1969	59	6500	10000	20000
600,0	PHQA1033F6000 ME	2800	4500	>32≤38	14	128,1	1,5	1969	59	6500	10000	20000
600,0	PHQA1033F6000 ME	2800	4500	>38≤48	17	128,1	1,5	1969	59	6500	10000	20000

行星齿轮减速器 PHQA

Planetary Gear Units **PHQA**



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请注意 PHQA6 页的符号注释!

Please take notice of the indications on page PHQA6!

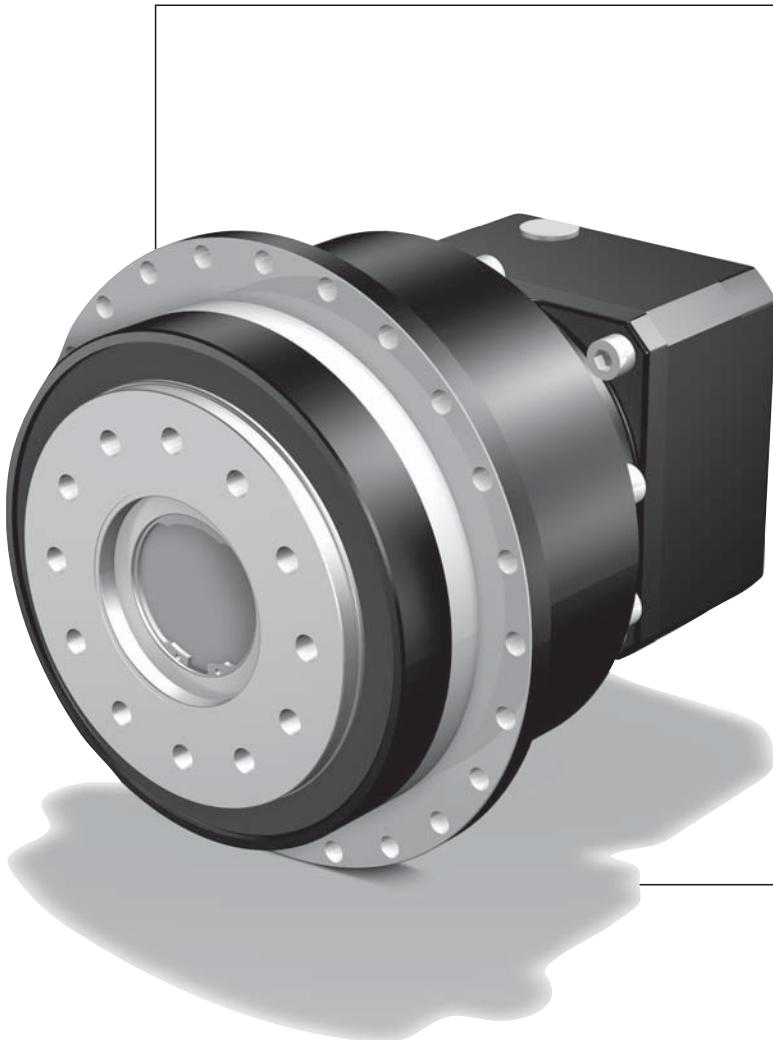
i	Typ	n1MAX DB [min ⁻¹]	n1MAX ZB [min ⁻¹]	MWØ [mm]	J1 [10 ⁻⁴ kgm ²]	G [kg]	Δφ2 [arcmin]	C2 [Nm/arcmin]	LPA [dB(A)]	M2N [Nm]	M2B [Nm]	M2NOT [Nm]
PHQA1033 (M2BMAX=10000 Nm)												
600,0	PHQA1033F6000 MEL	2800	4500	>48≤55	50	132,7	1,5	1969	59	6500	10000	20000

PHQA

尺寸图：
ServoFit® PHQA
直角行星齿轮减速器

Dimension drawings:
ServoFit® PHQA
Planetary Gear Units

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PHQA

行星齿轮减速器 PHQA

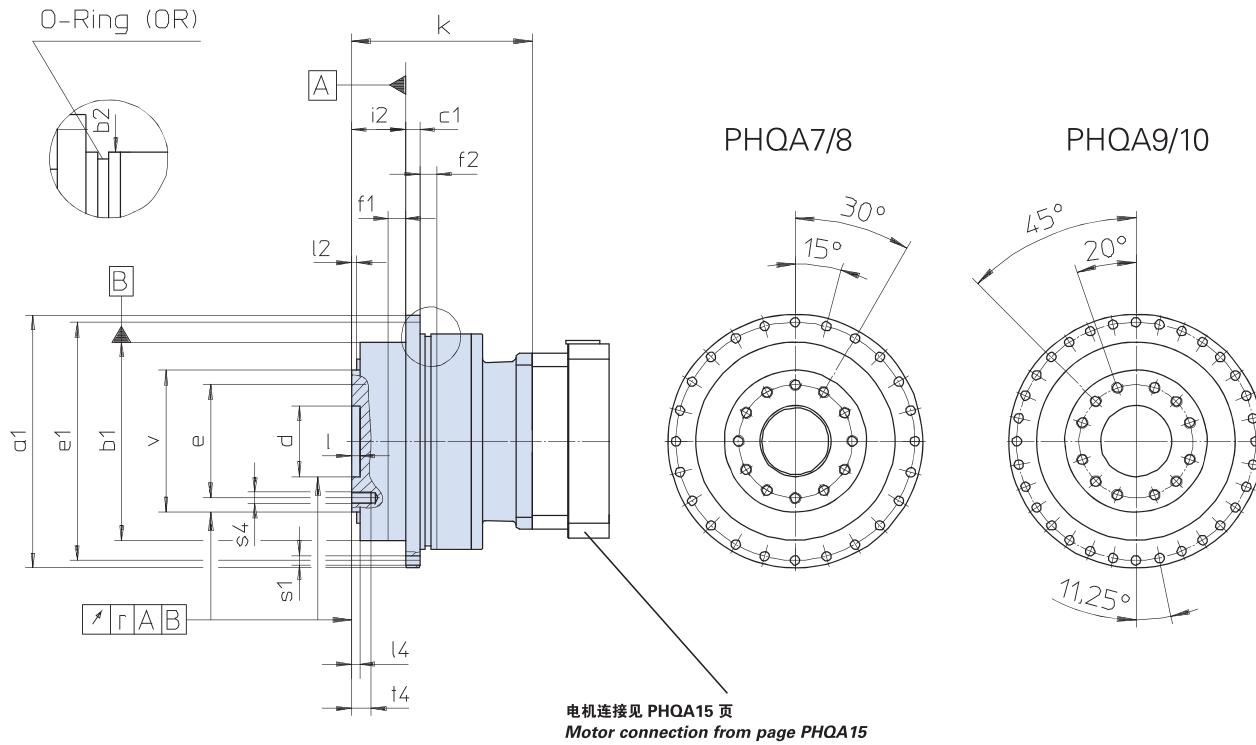
Planetary Gear Units **PHQA**



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PHQA7...MF - PHQA9...MF

PHQA10...ME



Typ	øa1	øb1	øb2	c1	ød	øe	øe1	f1	f2
PHQA722	179h7	140h7	152h7	10	50H6	80	168	12	12
PHQA723	179h7	140h7	152h7	10	50H6	80	168	12	12
PHQA822	247h7	200h7	212h7	12	80H6	125	233	15	15
PHQA823	247h7	200h7	212h7	12	80H6	125	233	15	15
PHQA932	300	255h7	255h7	18	90H6	145	280	20	33
PHQA933	300	255h7	255h7	18	90H6	145	280	20	33
PHQA1032	330	285h7	285h7	20	95H6	166	310	20	20
PHQA1033	330	285h7	285h7	20	95H6	166	310	20	20

Typ	i2	k	l	l2	l4	OR	r	øs1	s4	t4	øv
PHQA722	38	150,0	6	6	6,0	145x3	0,025	6,6	M10	16	100h7
PHQA723	38	204,5	6	6	6,0	145x3	0,025	6,6	M10	16	100h7
PHQA822	50	201,0	8	8	8,5	200x5	0,030	9,0	M12	17	160h7
PHQA823	50	263,0	8	8	8,5	200x5	0,030	9,0	M12	17	160h7
PHQA932	66	290,5	12	11	12,0	238x5	0,030	13,5	M20	28	180h7
PHQA933	66	367,0	12	11	12,0	238x5	0,030	13,5	M20	28	180h7
PHQA1032	75	350,0	10	15	15,0	270x6	0,040	13,5	M24	35	200h7
PHQA1033	75	444,0	10	15	15,0	270x6	0,030	13,5	M24	35	200h7

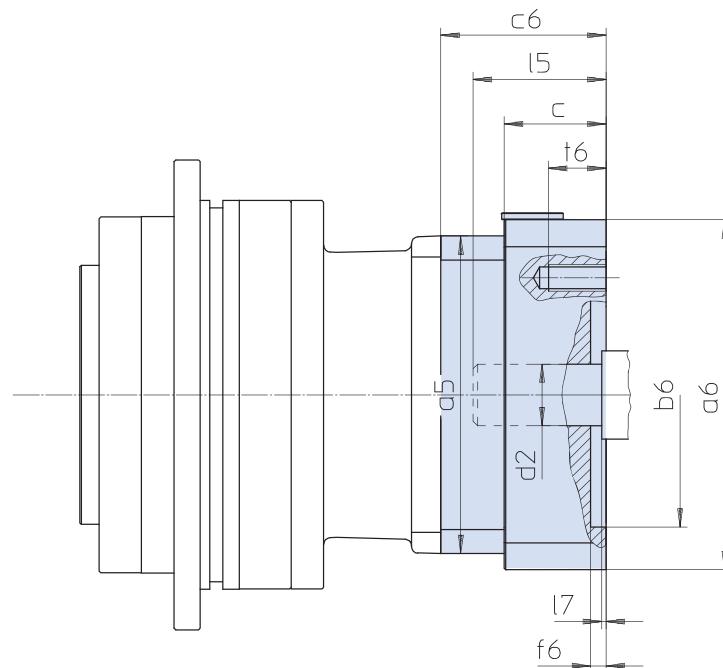
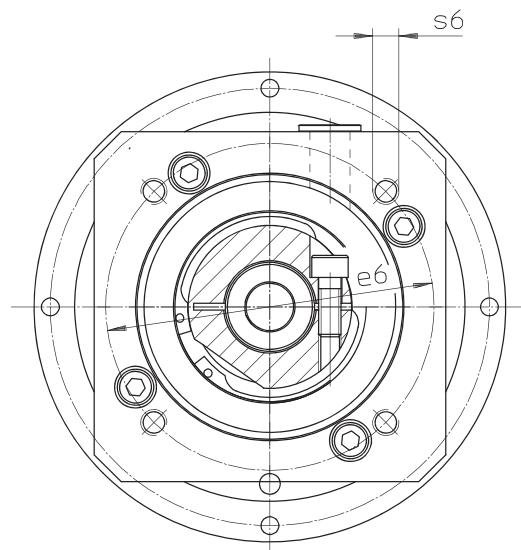
行星齿轮减速器 PHQA 电机连接

Planetary Gear Units **PHQA** motor connection



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PHQA7...MF - PHQA9...MF PHQA10...ME



更多的电机连接尺寸可按需定制

Further motor connection dimensions on request.

Typ	øb6	øe6	ød2max	l5max	□a5	□a6	c	c6	f6	l7max	s6	t6
PHQA723	50,0H7	95	24	40	100	100	21	56	2,5	2,5	M6	13
PHQA723	80,0H7	100	24	40	100	100	-	56	4,0	2,5	M6	13
PHQA723	95,0H7	115	24	50	100	100	30	65	4,0	11,5	M6	16
PHQA723	95,0H7	115	24	40	100	100	-	56	4,0	2,5	M8	16
PHQA723	95,0H7	130	24	40	100	115	21	56	4,0	2,5	M8	16
PHQA723	95,0H7	130	24	50	100	115	30	65	4,0	11,5	M8	16
PHQA723	110,0H7	130	24	50	100	115	30	65	4,0	11,5	M8	16
PHQA723	110,0H7	145	24	58	100	130	38	73	7,0	19,5	M8	16
PHQA723	130,0H7	165	24	50	100	140	30	65	5,0	11,5	M10	20
PHQA722/PHQA823	95,0H7	115	32	50	115	115	-	64	4,0	2,5	M8	16
PHQA722/PHQA823	95,0H7	130	32	50	115	115	24	64	4,0	2,5	M8	16
PHQA722/PHQA823	110,0H7	130	32	50	115	115	-	64	4,0	2,5	M8	16
PHQA722/PHQA823	110,0H7	145	32	58	115	130	32	72	6,5	10,5	M8	16
PHQA722/PHQA823	110,0H7	145	32	68	115	130	42	84	7,0	21,5	M8	14
PHQA722/PHQA823	110,0H7	165	32	50	115	140	24	64	5,0	2,5	M10	24
PHQA722/PHQA823	130,0H7	165	32	58	115	140	32	72	5,0	10,5	M10	20
PHQA822/PHQA933	110,0H7	130	38	60	145	145	26	78	5,0	4,5	M8	14
PHQA822/PHQA933	110,0H7	165	38	60	145	145	26	78	5,0	4,5	M10	26
PHQA822/PHQA933	114,3H7	200	38	80	145	180	45	97	5,0	23,5	M12	25
PHQA822/PHQA933	130,0H7	165	38	60	145	145	26	78	5,0	4,5	M10	26
PHQA822/PHQA933	130,0H7	215	38	60	145	190	26	78	5,0	4,5	M12	26
PHQA822/PHQA933	180,0H7	215	38	80	145	190	45	97	5,0	23,5	M12	25
PHQA1033	110,0H7	165	48	80	190	190	34	93	5,0	4,0	M10	18
PHQA1033	114,3H7	200	48	80	190	190	34	93	4,0	4,0	M12	34
PHQA1033	130,0H7	165	48	80	190	190	34	93	5,0	4,0	M10	18
PHQA1033	130,0H7	215	48	80	190	190	34	93	5,0	4,0	M12	34
PHQA1033	180,0H7	215	48	80	190	190	34	93	5,0	4,0	M12	34
PHQA1033	250,0H7	300	48	82	190	260	38	97	6,0	8,0	M16	38
PHQA932	114,3H7	200	48	80	190	190	34	94	4,0	3,5	M12	34
PHQA932	130,0H7	165	48	80	190	190	34	94	5,0	3,5	M10	18
PHQA932	130,0H7	215	48	80	190	190	34	94	5,0	3,5	M12	34
PHQA932	180,0H7	215	48	80	190	190	34	94	5,0	3,5	M12	34
PHQA932	250,0H7	300	48	82	190	260	38	98	6,0	7,5	M16	38
PHQA1032	250,0H7	300	60	85	225	260	43	108	6,0	5,0	M16	32
PHQA1032	300,0H7	350	60	110	225	314	68	133	6,0	30,0	M16	34

行星齿轮减速器 PHQA 电机连接 - 大规格电机法兰盘

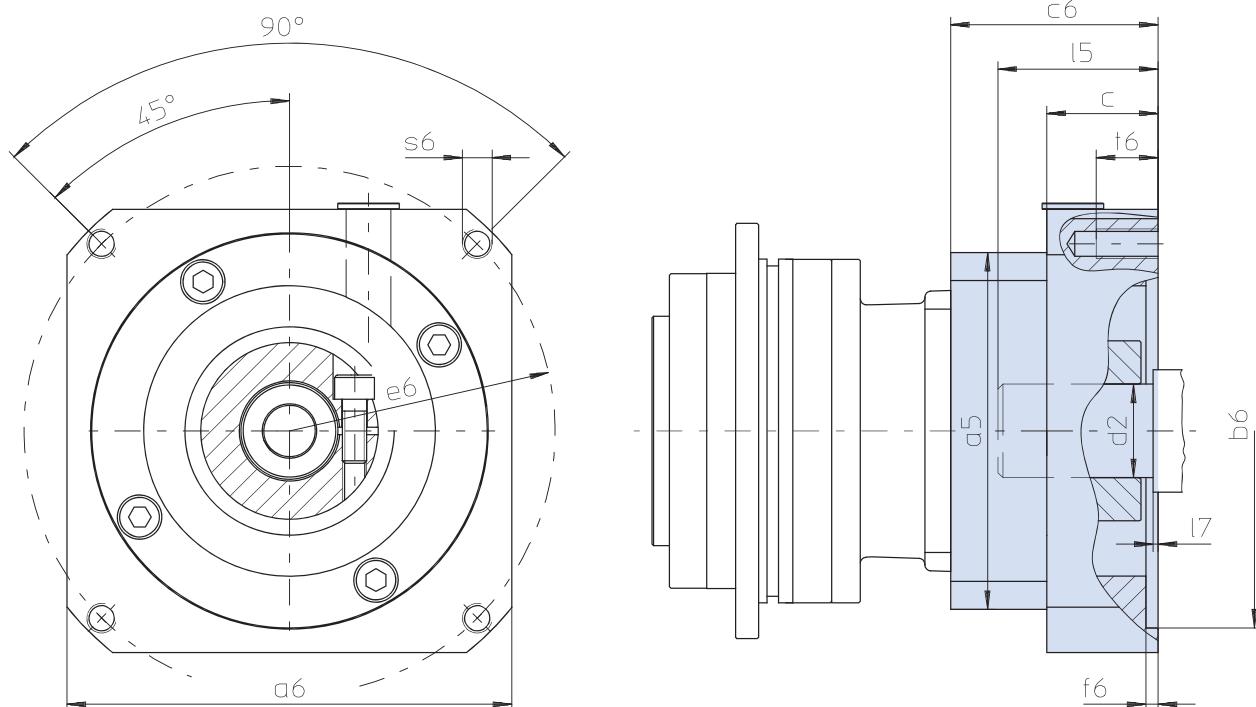
Planetary Gear Units **PHQA** motor connection - large motor plate



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PHQA7...MFL - PHQA9...MFL

PHQA10...MEL



更多的电机连接尺寸可按需定制

Further motor connection dimensions on request.

Typ	øb6	øe6	ød2max	l5max	da5	da6	c	c6	f6	l7max	s6	t6
PHQA723	110,0H7	145	32	58	115	130	32	75,5	6,5	10,5	M8	16
PHQA723	110,0H7	165	32	50	115	140	24	67,5	5,0	2,5	M10	24
PHQA723	130,0H7	165	32	58	115	140	32	75,5	5,0	10,5	M10	20
PHQA722/PHQA823	110,0H7	130	38	60	145	145	26	82,0	5,0	23,5	M8	14
PHQA722/PHQA823	110,0H7	165	38	60	145	145	26	82,0	5,0	23,5	M10	26
PHQA722/PHQA823	130,0H7	165	38	60	145	145	26	82,0	5,0	23,5	M10	26
PHQA722/PHQA823	114,3H7	200	38	80	145	180	45	101,0	5,0	23,5	M12	25
PHQA722/PHQA823	130,0H7	215	38	60	145	190	26	82,0	5,0	4,5	M12	26
PHQA722/PHQA823	180,0H7	215	38	80	145	190	45	101,0	5,0	23,5	M12	25
PHQA822/PHQA933	114,3H7	200	48	80	190	190	34	102,0	4,0	3,5	M12	34
PHQA822/PHQA933	180,0H7	215	48	80	190	190	34	102,0	5,0	3,5	M12	34
PHQA822/PHQA933	250,0H7	300	48	82	190	260	38	106,0	6,0	7,5	M16	38
PHQA1033	250,0H7	300	60	85	225	260	43	110,0	6,0	5,0	M16	32
PHQA1033	300,0H7	350	60	110	225	314	68	135,0	6,0	30,0	M16	34