

ServoFit® PHA 行星齿轮减速器

ServoFit® PHA Planetary Gear Units



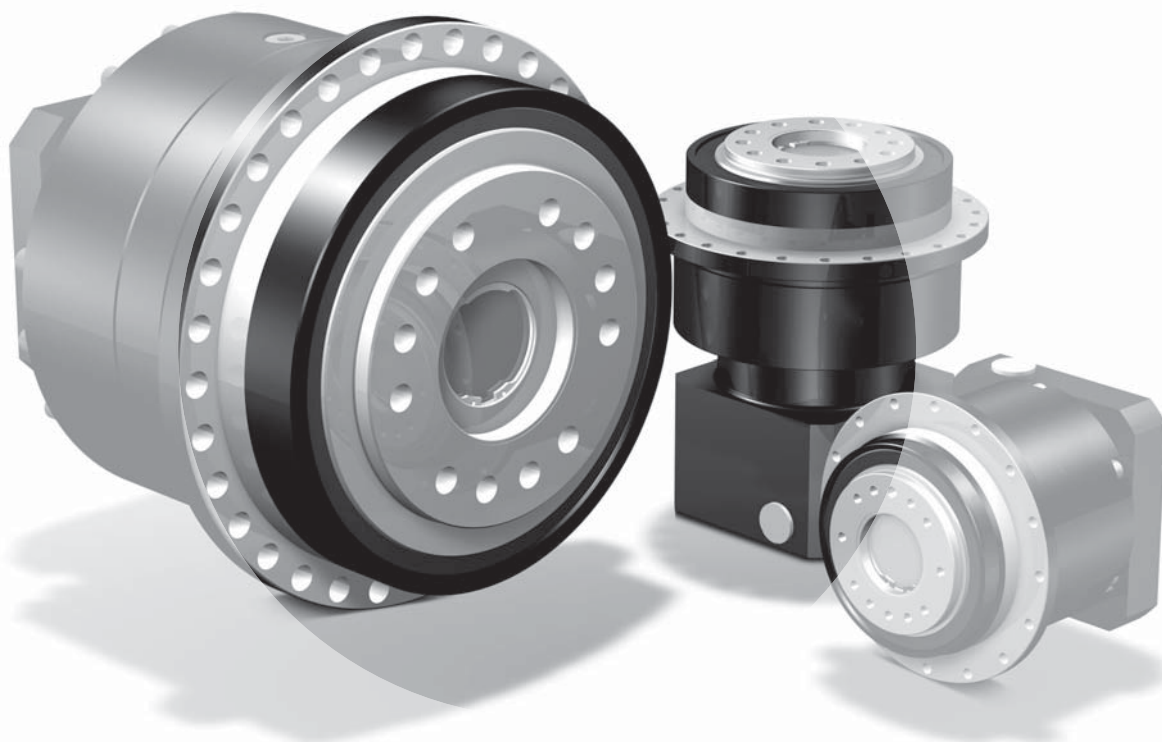
高精度 精密行星齿轮减速器

- 加速扭矩:
50 – 7500 Nm
- 极低齿隙:
1 – 2 arcmin
- 超高的扭转和侧倾刚度
- 油量恒定,
每种安装位置都适用
- 输入端和输出端 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
- 输入端热膨胀补偿
- 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:
1 级 $\geq 96\%$
2 级 $\geq 93\%$

High Performance Precision Planetary Gear Units

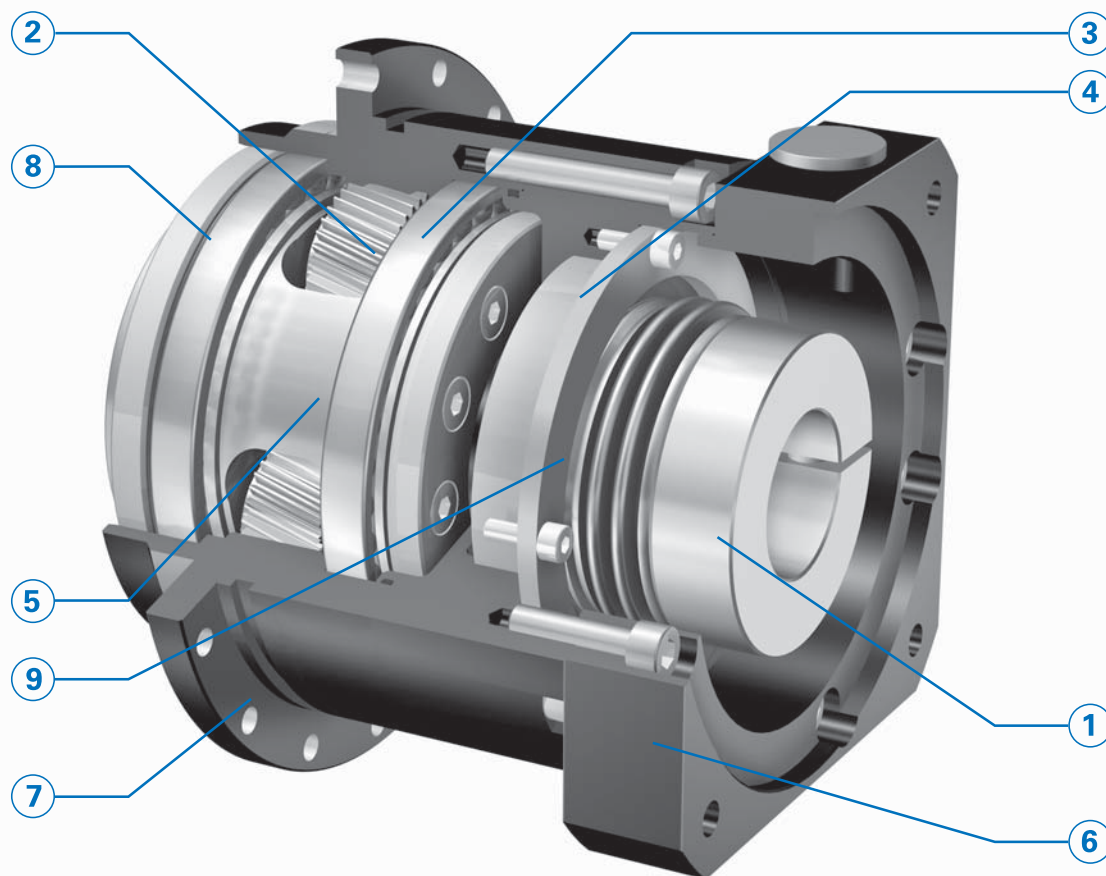
- Acceleration torque:
50 – 7500 Nm
- Lowest backlash:
1 – 2 arcmin
- extremely high torsional and
tilting stiffness
- consistent oil quantity, suitable
for every mounting position
- FKM seal at input and output,
continuous operation
without cooling
- easy to assemble due to spread-
ing function in the 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:
1 stage $\geq 96\%$
2 stage $\geq 93\%$

ServoFit® PHA



ServoFit® PHA 行星齿轮减速器

ServoFit® PHA Planetary Gear Units



- 经过验证的斜齿传动技术和优化后的基本几何结构，使其达到最高的运转平稳度。

手中积累的经验在过去几十年一贯付诸实践。齿轮齿的基本几何结构主要因此被优化，以确保最高的齿隙稳定性和极端安静的齿轮运转。

- 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。

Highest running smoothness achieved by proven helical gearing and optimized microgeometry.

On-hands experience gained over the past decades has consistently been put to practice. This has resulted mainly in optimized gear tooth microgeometry, ensuring highest backlash stability and extremely quiet gear operation.

- **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® PHA 行星齿轮减速器

ServoFit® PHA 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。

波纹管联轴器，其综合**热膨胀补偿**功能用于补偿电机轴的线性膨胀。

平衡的夹紧联轴节确保高速时也能平滑运转。

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,以及经过氮化并珩磨的内部传动装置提供。

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**最高的运转精准度**。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® PHVA 行星齿轮减速器

ServoFit® PHVA Planetary Gear Units



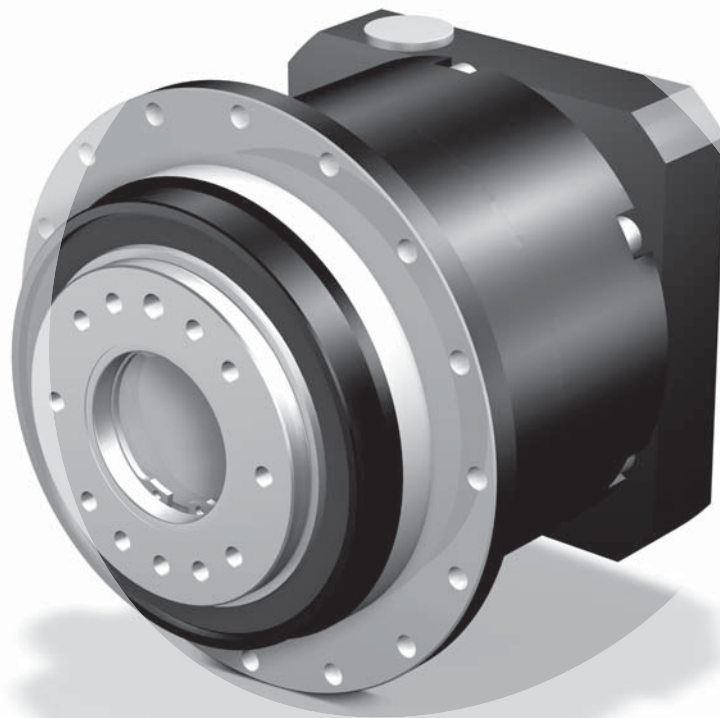
高性能，高精度 行星齿轮减速器

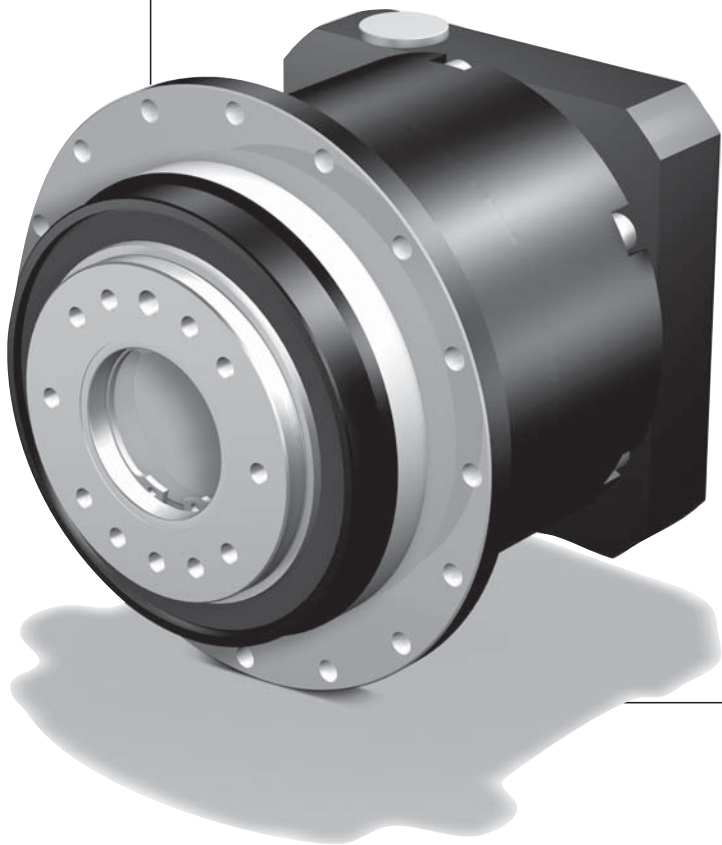
- 加速扭矩：
PHVA933: 4250 Nm
PHVA1033: 7500 Nm
- 极低齿隙: 1 arcmin
- 高速比 (> 60)，设计紧凑，力量分散的多级传动齿轮
- 油量恒定，
每种安装位置都适用
- 超高的扭转和侧倾刚度
- 输入端和输出端 FKM 密封，
无冷却连续运转
- 夹紧毂的传导功能
使安装简便
- 先进的传动技术
- 低转动惯量
- 输入端热膨胀补偿
- 易于连接任何伺服电机
- 静音运转
- 效率: $\geq 90\%$

High Performance Precision Planetary Gear Units

- Acceleration torque:
PHVA933: 4250 Nm
PHVA1033: 7500 Nm
- Lowest backlash:
1 arcmin
- High ratios (> 60) in compact design with power-branched transmission gear steps
- consistent oil quantity, suitable for every mounting position
- 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
- low mass moments of inertia
- input with thermal expansion compensation
- readily attaches any servo motor
- quiet running
- efficiency: $\geq 90\%$

ServoFit® PHVA





PHA

目录 PHA

型号标识	PHA2
轴系/箱体设计 PHA 输出端	PHA3
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尺寸图: ServoFit® PHA 行星齿轮减速器	PHA15

Contents PHA

Type designation	PHA2
Shaft / housing design Output PHA	PHA3
Selection data: ServoFit® PHA Planetary Gear Units	PHA5
Dimension drawings: ServoFit® PHA Planetary Gear Units	PHA15

型号标识

Type designation



PHA 4 2 1 F 0050 MF C

1 2 3 4 5 6 7 8

1 减速器类型

PHA - 行星齿轮减速器
PHVA - 行星齿轮减速器

2 减速器规格

3 生产代号

4 齿轮级数

1 - 1 级
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

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 PHA17 页的电机连接图，并注意最大尺寸）。

MB - 带制动的电机适配器
（可选）（见手册 ID 441904）

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：

- 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

PHA - Planetary gear unit
PHVA - Planetary gear unit

2 Gear unit size

3 Generation number

4 Stages

1 - 1 stage
2 - 2 stage
3 - 3 stage

5 Design

F - flange shaft

6 Transmission ratio $i \times 10$

7 Mounting series

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 PHA17, please observe the max. dimensions).

MB - Motor adapter square with brake (option) (see brochure ID 441904)

8 Ventilator module

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

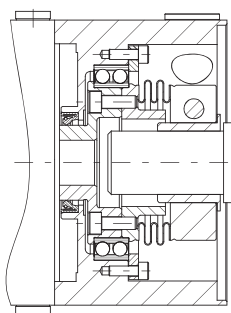
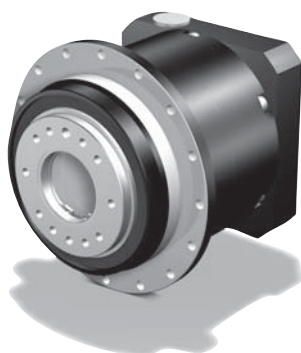
Ordering data according to the type designation above.

Further ordering details:

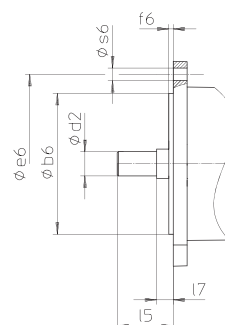
- reversing operation of the output shaft ± 20 to ± 90 degrees (horizontal mounting) ?
(also see page A12)

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.

PHA421 F 0050 MF



FlexiAdapt® 联轴器 **MF**
FlexiAdapt® coupling **MF**



图：电机输出端
Picture: motor output

轴系 / 箱体设计

PHA + PHVA 输出轴

ISO 9409 (PHA3 - PHA8)

Shaft / housing design

Output PHA + PHVA

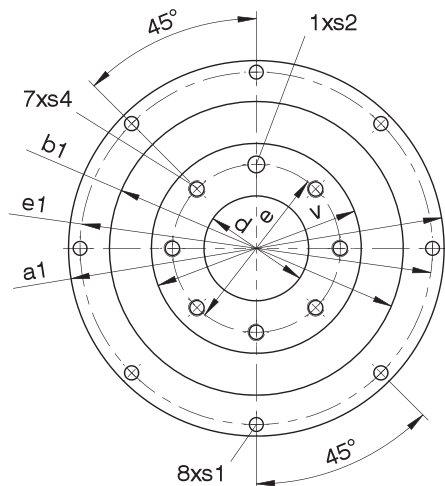
ISO 9409 (PHA3 - PHA8)



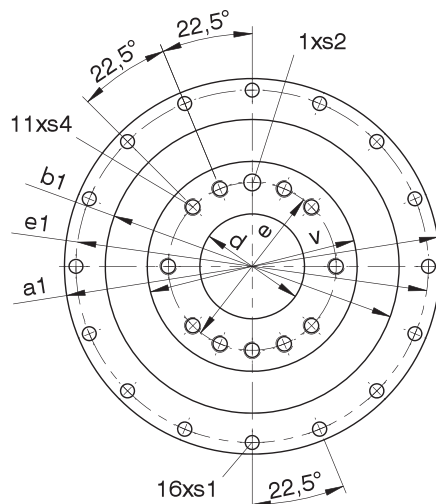
法兰轴

Flange shaft

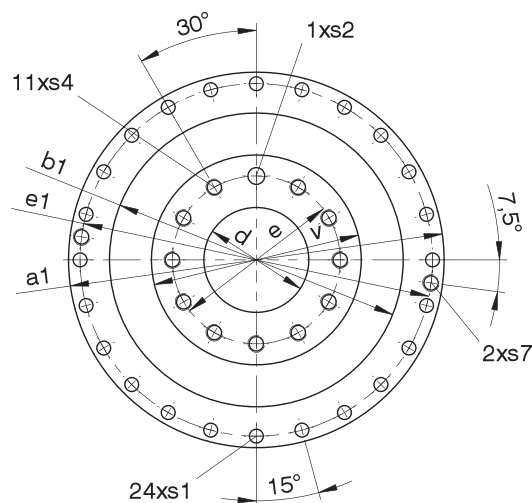
PHA3 + PHA4



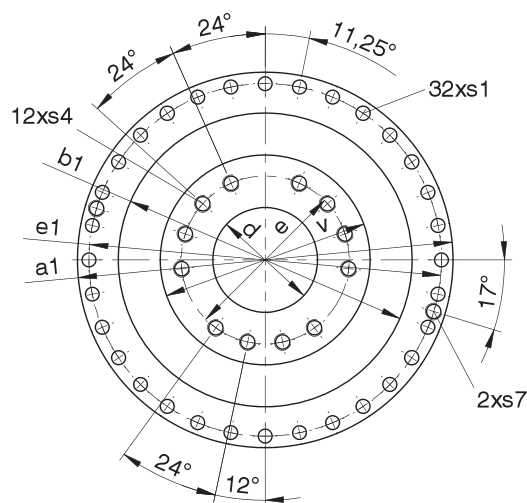
PHA5



PHA7 + PHA8



PHA9 + PHA10
PHVA9 + PHVA10



轴系设计 "F"

Shaft design "F"

Typ	øa1	øb1	ød	øe	øe1	øs1	øs2	s4	s7	v
PHA3	86h7	64h7	20,0H6	31,5	79	4,5	5H7	M5	-	40h7
PHA4	118h7	90h7	31,5H6	50,0	109	5,5	6H7	M6	-	63h7
PHA5	145h7	110h7	40,0H6	63,0	135	5,5	6H7	M6	-	80h7
PHA7	179h7	140h7	50,0H6	80,0	168	6,6	8H7	M8	-	100h7
PHA8	247h7	200h7	80,0H6	125,0	233	9,0	10H7	M10	M10	160h7
PHA9/PHVA9	300	255h7	90,0H6	140,0	280	13,5	-	M16	M8	180h7
PHA10/PHVA10	330	285h7	95,0H6	160,0	310	13,5	-	M20	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.

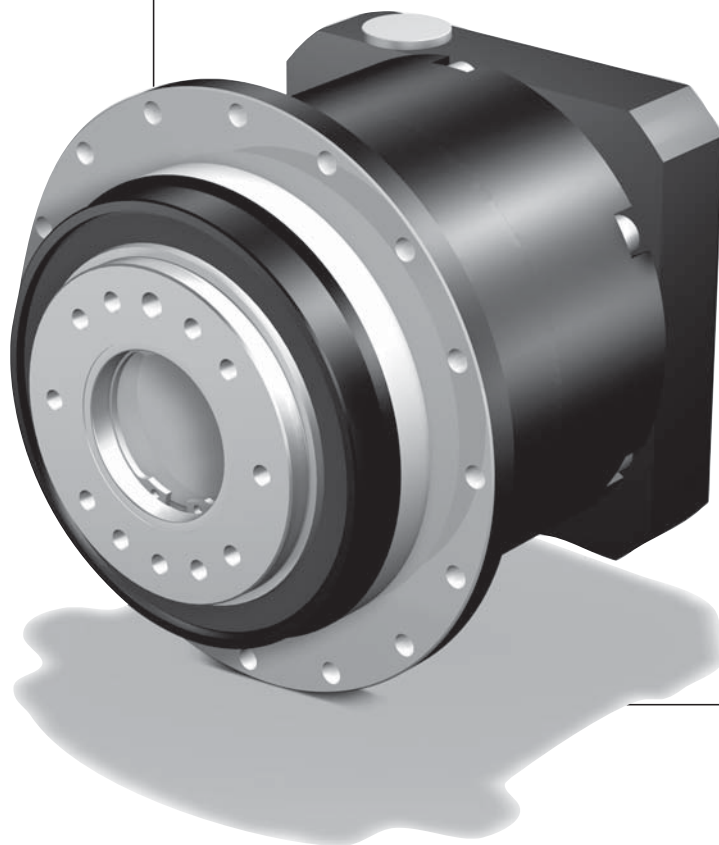
备注

Notes



选型数据：
ServoFit® PHA
行星齿轮减速器

Selection data:
ServoFit® PHA
Planetary Gear Units



P
H
A

选型数据：
ServoFit® PHA
行星齿轮减速器



Selection data:
ServoFit® PHA
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)
MW_ø - 电机轴径
J₁ - 质量惯性矩 (针对输入端)
G - 重量
Δφ₂ - 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 (n₁ = 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)
MW_ø - Motor shaft diameter
J₁ - Mass mom. of inertia (related to input)
G - Weight
Δφ₂ - Backlash
C₂ - Gear unit rigidity
(related to output at M_{2N})
L_{PA} - Max. noise level (n₁ = 2000 rpm)
M_{2N} - Rated torque ¹⁾
M_{2B} - Max. perm. acceleration torque
M_{2NOT} - Emergency-Off moment
(10³ 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 PHA

Planetary Gear Units PHA



请注意 PHA6 页的符号注释!

Please take notice of the indications on page PHA6!

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]
PHA321 (M2BMAX=65 Nm)												
5,000	PHA321F0050 MF	3000	6000	≤11	0,55	1,4	2	14	58	45	65	130
5,000	PHA321F0050 MF	3000	6000	>11≤14	0,56	1,4	2	14	58	45	65	130
5,000	PHA321F0050 MF	3000	6000	>14≤19	0,56	1,4	2	14	58	45	65	130
5,000	PHA321F0050 MFL	3000	6000	>19≤24	1,6	2,3	2	15	58	45	65	130
7,000	PHA321F0070 MF	3500	6000	≤11	0,52	1,4	2	13	57	45	60	130
7,000	PHA321F0070 MF	3500	6000	>11≤14	0,52	1,4	2	13	57	45	60	130
7,000	PHA321F0070 MF	3500	6000	>14≤19	0,52	1,4	2	13	57	45	60	130
7,000	PHA321F0070 MFL	3500	6000	>19≤24	1,6	2,3	2	14	57	45	60	130
10,00	PHA321F0100 MF	3800	6000	≤11	0,50	1,4	2	11	55	30	50	100
10,00	PHA321F0100 MF	3800	6000	>11≤14	0,50	1,4	2	11	55	30	50	100
10,00	PHA321F0100 MF	3800	6000	>14≤19	0,50	1,4	2	11	55	30	50	100
10,00	PHA321F0100 MFL	3800	6000	>19≤24	1,6	2,3	2	11	55	30	50	100
PHA322 (M2BMAX=65 Nm)												
20,00	PHA322F0200 MF	4500	8000	≤9	0,11	1,7	2	15	59	45	65	130
20,00	PHA322F0200 MF	4500	8000	>9≤11	0,12	1,7	2	15	59	45	65	130
20,00	PHA322F0200 MF	4500	8000	>11≤14	0,14	1,7	2	15	59	45	65	130
25,00	PHA322F0250 MF	4500	8000	≤9	0,09	1,7	2	15	57	45	65	130
25,00	PHA322F0250 MF	4500	8000	>9≤11	0,10	1,7	2	15	57	45	65	130
25,00	PHA322F0250 MF	4500	8000	>11≤14	0,12	1,7	2	15	57	45	65	130
28,00	PHA322F0280 MF	4500	8000	≤9	0,10	1,7	2	15	59	45	60	130
28,00	PHA322F0280 MF	4500	8000	>9≤11	0,12	1,7	2	15	59	45	60	130
28,00	PHA322F0280 MF	4500	8000	>11≤14	0,14	1,7	2	15	59	45	60	130
35,00	PHA322F0350 MF	4500	8000	≤9	0,08	1,7	2	15	56	45	65	130
35,00	PHA322F0350 MF	4500	8000	>9≤11	0,09	1,7	2	15	56	45	65	130
35,00	PHA322F0350 MF	4500	8000	>11≤14	0,11	1,7	2	15	56	45	65	130
40,00	PHA322F0400 MF	4500	8000	≤9	0,10	1,7	2	12	59	30	50	100
40,00	PHA322F0400 MF	4500	8000	>9≤11	0,11	1,7	2	12	59	30	50	100
40,00	PHA322F0400 MF	4500	8000	>11≤14	0,14	1,7	2	12	59	30	50	100
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100,0	PHA322F1000 MF	4500	8000	>9≤11	0,08	1,7	2	12	54	30	50	100
100,0	PHA322F1000 MF	4500	8000	>11≤14	0,10	1,7	2	12	54	30	50	100
PHA421 (M2BMAX=130 Nm)												
4,000	PHA421F0040 MF	2300	5000	≤14	2,1	3,9	1	32	61	90	130	190
4,000	PHA421F0040 MF	2300	5000	>14≤19	2,1	3,9	1	33	61	90	130	240
4,000	PHA421F0040 MF	2300	5000	>19≤24	2,0	3,9	1	33	61	90	130	240
4,000	PHA421F0040 MFL	2300	5000	>24≤32	5,2	4,6	1	35	61	90	130	240
5,000	PHA421F0050 MF	2700	6000	≤14	1,9	3,9	1	33	59	90	130	240
5,000	PHA421F0050 MF	2700	6000	>14≤19	2,0	3,9	1	33	59	90	130	240
5,000	PHA421F0050 MF	2700	6000	>19≤24	1,9	3,9	1	33	59	90	130	240
5,000	PHA421F0050 MFL	2700	6000	>24≤32	5,0	4,6	1	35	59	90	130	240
7,000	PHA421F0070 MF	3200	6000	≤14	1,8	3,9	1	29	58	90	110	240
7,000	PHA421F0070 MF	3200	6000	>14≤19	1,8	3,9	1	29	58	90	110	240
7,000	PHA421F0070 MF	3200	6000	>19≤24	1,7	3,9	1	29	58	90	110	240
7,000	PHA421F0070 MFL	3200	6000	>24≤32	4,9	4,6	1	30	58	90	110	240
10,00	PHA421F0100 MF	3500	6000	≤14	1,7	3,9	1	21	56	60	100	200
10,00	PHA421F0100 MF	3500	6000	>14≤19	1,7	3,9	1	21	56	60	100	200
10,00	PHA421F0100 MF	3500	6000	>19≤24	1,6	3,9	1	21	56	60	100	200
10,00	PHA421F0100 MFL	3500	6000	>24≤32	4,8	4,6	1	21	56	60	100	200

PHA

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i	Typ	n1MAX DB [min-1]	n1MAX ZB [min-1]	MWø [mm]	J1 [10-4 kgm2]	G [kg]	Δφ2 [arcmin]	C2 [Nm/arcmin]	LPA [dB(A)]	M2N [Nm]	M2B [Nm]	M2NOT [Nm]
PHA422 (M2BMAX=130 Nm)												
16,00	PHA422F0160 MF	3700	6500	≤11	0,63	4,5	1	26	60	90	130	240
16,00	PHA422F0160 MFL	3700	6500	>11≤14	0,64	4,5	1	26	60	90	130	240
16,00	PHA422F0160 MF	3700	6500	>14≤19	0,64	4,5	1	26	60	90	130	240
16,00	PHA422F0160 MFL	3700	6500	>19≤24	1,7	5,2	1	27	60	90	130	240
20,00	PHA422F0200 MF	3700	6500	≤11	0,62	4,5	1	28	60	90	130	240
20,00	PHA422F0200 MFL	3700	6500	>11≤14	0,63	4,5	1	28	60	90	130	240
20,00	PHA422F0200 MF	3700	6500	>14≤19	0,63	4,5	1	28	60	90	130	240
20,00	PHA422F0200 MFL	3700	6500	>19≤24	1,7	5,2	1	29	60	90	130	240
25,00	PHA422F0250 MF	4000	7000	≤11	0,57	4,5	1	28	58	90	130	240
25,00	PHA422F0250 MFL	4000	7000	>11≤14	0,58	4,5	1	28	58	90	130	240
25,00	PHA422F0250 MF	4000	7000	>14≤19	0,58	4,5	1	28	58	90	130	240
25,00	PHA422F0250 MFL	4000	7000	>19≤24	1,6	5,2	1	29	58	90	130	240
28,00	PHA422F0280 MF	4500	8000	≤11	0,53	4,5	1	25	57	90	130	240
28,00	PHA422F0280 MFL	4500	8000	>11≤14	0,53	4,5	1	25	57	90	130	240
28,00	PHA422F0280 MF	4500	8000	>14≤19	0,53	4,5	1	25	57	90	130	240
28,00	PHA422F0280 MFL	4500	8000	>19≤24	1,6	5,2	1	25	57	90	130	240
35,00	PHA422F0350 MF	4500	8000	≤11	0,52	4,5	1	28	57	90	130	240
35,00	PHA422F0350 MFL	4500	8000	>11≤14	0,52	4,5	1	28	57	90	130	240
35,00	PHA422F0350 MF	4500	8000	>14≤19	0,52	4,5	1	28	57	90	130	240
35,00	PHA422F0350 MFL	4500	8000	>19≤24	1,6	5,2	1	28	57	90	130	240
40,00	PHA422F0400 MF	4500	8000	≤11	0,50	4,5	1	24	55	90	130	240
40,00	PHA422F0400 MFL	4500	8000	>11≤14	0,50	4,5	1	24	55	90	130	240
40,00	PHA422F0400 MF	4500	8000	>14≤19	0,50	4,5	1	24	55	90	130	240
40,00	PHA422F0400 MFL	4500	8000	>19≤24	1,6	5,2	1	24	55	90	130	240
50,00	PHA422F0500 MF	4500	8000	≤11	0,50	4,5	1	27	55	90	130	240
50,00	PHA422F0500 MFL	4500	8000	>11≤14	0,50	4,5	1	27	55	90	130	240
50,00	PHA422F0500 MF	4500	8000	>14≤19	0,50	4,5	1	27	55	90	130	240
50,00	PHA422F0500 MFL	4500	8000	>19≤24	1,6	5,2	1	27	55	90	130	240
70,00	PHA422F0700 MF	4500	8000	≤11	0,50	4,5	1	27	55	90	110	240
70,00	PHA422F0700 MFL	4500	8000	>11≤14	0,50	4,5	1	27	55	90	110	240
70,00	PHA422F0700 MF	4500	8000	>14≤19	0,50	4,5	1	27	55	90	110	240
70,00	PHA422F0700 MFL	4500	8000	>19≤24	1,6	5,2	1	27	55	90	110	240
100,0	PHA422F1000 MF	4500	8000	≤11	0,50	4,5	1	20	55	60	100	200
100,0	PHA422F1000 MFL	4500	8000	>11≤14	0,50	4,5	1	20	55	60	100	200
100,0	PHA422F1000 MF	4500	8000	>14≤19	0,50	4,5	1	20	55	60	100	200
100,0	PHA422F1000 MFL	4500	8000	>19≤24	1,6	5,2	1	20	55	60	100	200
PHA521 (M2BMAX=320 Nm)												
4,000	PHA521F0040 MF	2200	5000	≤19	6,4	6,6	1	73	62	210	320	500
4,000	PHA521F0040 MFL	2200	5000	>19≤24	6,4	6,6	1	77	62	210	320	600
4,000	PHA521F0040 MF	2200	5000	>24≤32	6,3	6,6	1	77	62	210	320	600
4,000	PHA521F0040 MFL	2200	5000	>32≤35	6,3	6,6	1	77	62	210	320	600
4,000	PHA521F0040 MF	2200	5000	>32≤38	13	8,3	1	85	62	210	320	600
5,000	PHA521F0050 MF	2500	5500	≤19	5,8	6,6	1	77	60	220	320	600
5,000	PHA521F0050 MFL	2500	5500	>19≤24	5,8	6,6	1	80	60	220	320	600
5,000	PHA521F0050 MF	2500	5500	>24≤32	5,7	6,6	1	80	60	220	320	600
5,000	PHA521F0050 MFL	2500	5500	>32≤35	5,7	6,6	1	80	60	220	320	600
5,000	PHA521F0050 MF	2500	5500	>32≤38	13	8,3	1	85	60	220	320	600
7,000	PHA521F0070 MF	3000	6000	≤19	5,3	6,6	1	71	59	210	270	600
7,000	PHA521F0070 MFL	3000	6000	>19≤24	5,3	6,6	1	71	59	210	270	600
7,000	PHA521F0070 MF	3000	6000	>24≤32	5,2	6,6	1	71	59	210	270	600
7,000	PHA521F0070 MFL	3000	6000	>32≤35	5,2	6,6	1	71	59	210	270	600
7,000	PHA521F0070 MF	3000	6000	>32≤38	12	8,3	1	73	59	210	270	600
10,00	PHA521F0100 MF	3300	6000	≤19	5,0	6,6	1	53	57	140	250	500
10,00	PHA521F0100 MFL	3300	6000	>19≤24	5,0	6,6	1	53	57	140	250	500
10,00	PHA521F0100 MF	3300	6000	>24≤32	4,9	6,6	1	53	57	140	250	500
10,00	PHA521F0100 MFL	3300	6000	>32≤35	4,9	6,6	1	53	57	140	250	500
10,00	PHA521F0100 MF	3300	6000	>32≤38	12	8,3	1	54	57	140	250	500

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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]
PHA522 (M2BMAX=320 Nm)												
16,00	PHA522F0160 MF	3300	6000	≤14	1,9	8,1	1	63	61	210	320	600
16,00	PHA522F0160 MF	3300	6000	>14≤19	2,0	8,1	1	64	61	210	320	600
16,00	PHA522F0160 MF	3300	6000	>19≤24	1,9	8,1	1	64	61	210	320	600
16,00	PHA522F0160 MFL	3300	6000	>24≤32	5,0	8,8	1	64	61	210	320	600
20,00	PHA522F0200 MF	3300	6000	≤14	2,0	8,1	1	70	61	220	320	600
20,00	PHA522F0200 MF	3300	6000	>14≤19	2,0	8,1	1	70	61	220	320	600
20,00	PHA522F0200 MF	3300	6000	>19≤24	1,9	8,1	1	70	61	220	320	600
20,00	PHA522F0200 MFL	3300	6000	>24≤32	5,0	8,8	1	70	61	220	320	600
25,00	PHA522F0250 MF	3700	6500	≤14	1,9	8,1	1	70	59	220	320	600
25,00	PHA522F0250 MF	3700	6500	>14≤19	1,9	8,1	1	70	59	220	320	600
25,00	PHA522F0250 MF	3700	6500	>19≤24	1,8	8,1	1	70	59	220	320	600
25,00	PHA522F0250 MFL	3700	6500	>24≤32	4,9	8,8	1	70	59	220	320	600
28,00	PHA522F0280 MF	4000	7000	≤14	1,7	8,1	1	61	58	210	320	600
28,00	PHA522F0280 MF	4000	7000	>14≤19	1,7	8,1	1	61	58	210	320	600
28,00	PHA522F0280 MF	4000	7000	>19≤24	1,6	8,1	1	61	58	210	320	600
28,00	PHA522F0280 MFL	4000	7000	>24≤32	4,8	8,8	1	61	58	210	320	600
35,00	PHA522F0350 MF	4000	7000	≤14	1,7	8,1	1	68	58	220	320	600
35,00	PHA522F0350 MF	4000	7000	>14≤19	1,7	8,1	1	68	58	220	320	600
35,00	PHA522F0350 MF	4000	7000	>19≤24	1,6	8,1	1	68	58	220	320	600
35,00	PHA522F0350 MFL	4000	7000	>24≤32	4,8	8,8	1	68	58	220	320	600
40,00	PHA522F0400 MF	4000	7000	≤14	1,7	8,1	1	58	56	210	320	600
40,00	PHA522F0400 MF	4000	7000	>14≤19	1,7	8,1	1	58	56	210	320	600
40,00	PHA522F0400 MF	4000	7000	>19≤24	1,6	8,1	1	58	56	210	320	600
40,00	PHA522F0400 MFL	4000	7000	>24≤32	4,7	8,8	1	58	56	210	320	600
50,00	PHA522F0500 MF	4000	7000	≤14	1,7	8,1	1	66	56	220	320	600
50,00	PHA522F0500 MF	4000	7000	>14≤19	1,7	8,1	1	66	56	220	320	600
50,00	PHA522F0500 MF	4000	7000	>19≤24	1,6	8,1	1	66	56	220	320	600
50,00	PHA522F0500 MFL	4000	7000	>24≤32	4,8	8,8	1	66	56	220	320	600
70,00	PHA522F0700 MF	4000	7000	≤14	1,7	8,1	1	65	56	210	270	600
70,00	PHA522F0700 MF	4000	7000	>14≤19	1,7	8,1	1	65	56	210	270	600
70,00	PHA522F0700 MF	4000	7000	>19≤24	1,6	8,1	1	65	56	210	270	600
70,00	PHA522F0700 MFL	4000	7000	>24≤32	4,7	8,8	1	66	56	210	270	600
100,0	PHA522F1000 MF	4000	7000	≤14	1,7	8,1	1	52	56	140	250	500
100,0	PHA522F1000 MF	4000	7000	>14≤19	1,7	8,1	1	52	56	140	250	500
100,0	PHA522F1000 MF	4000	7000	>19≤24	1,6	8,1	1	52	56	140	250	500
100,0	PHA522F1000 MFL	4000	7000	>24≤32	4,7	8,8	1	52	56	140	250	500
PHA721 (M2BMAX=700 Nm)												
4,000	PHA721F0040 MF	1900	4000	≤24	16	12,3	1	136	63	440	700	1000
4,000	PHA721F0040 MF	1900	4000	>24≤32	17	12,3	1	144	63	440	700	1330
4,000	PHA721F0040 MF	1900	4000	>32≤38	17	12,3	1	144	63	440	700	1370
4,000	PHA721F0040 MFL	1900	4000	>38≤48	35	16,1	1	160	63	440	700	1370
5,000	PHA721F0050 MF	2200	5000	≤24	14	12,3	1	150	61	440	700	1250
5,000	PHA721F0050 MF	2200	5000	>24≤32	15	12,3	1	155	61	440	700	1400
5,000	PHA721F0050 MF	2200	5000	>32≤38	15	12,3	1	155	61	440	700	1400
5,000	PHA721F0050 MFL	2200	5000	>38≤48	34	16,1	1	167	61	440	700	1400
7,000	PHA721F0070 MF	2500	5000	≤24	13	12,3	1	145	60	440	650	1240
7,000	PHA721F0070 MF	2500	5000	>24≤32	13	12,3	1	145	60	440	650	1240
7,000	PHA721F0070 MF	2500	5000	>32≤38	13	12,3	1	145	60	440	650	1240
7,000	PHA721F0070 MFL	2500	5000	>38≤48	32	16,1	1	152	60	440	650	1240
10,00	PHA721F0100 MF	3000	5000	≤24	12	12,3	1	113	58	300	500	1000
10,00	PHA721F0100 MF	3000	5000	>24≤32	12	12,3	1	113	58	300	500	1000
10,00	PHA721F0100 MF	3000	5000	>32≤38	12	12,3	1	113	58	300	500	1000
10,00	PHA721F0100 MFL	3000	5000	>38≤48	31	16,1	1	115	58	300	500	1000

PHA

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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]
PHA722 (M2BMAX=700 Nm)												
16,00	PHA722F0160 MF	3000	5000	≤19	6,0	14,6	1	132	62	440	700	1330
16,00	PHA722F0160 MF	3000	5000	>19≤24	6,1	14,6	1	133	62	440	700	1370
16,00	PHA722F0160 MF	3000	5000	>24≤32	6,0	14,6	1	133	62	440	700	1370
16,00	PHA722F0160 MF	3000	5000	>32≤35	6,0	14,6	1	133	62	440	700	1370
16,00	PHA722F0160 MFL	3000	5000	>32≤38	13	16,3	1	134	62	440	700	1370
20,00	PHA722F0200 MF	3000	5000	≤19	5,9	14,6	1	147	62	440	700	1400
20,00	PHA722F0200 MF	3000	5000	>19≤24	6,0	14,6	1	147	62	440	700	1400
20,00	PHA722F0200 MF	3000	5000	>24≤32	5,9	14,6	1	147	62	440	700	1400
20,00	PHA722F0200 MF	3000	5000	>32≤35	5,9	14,6	1	147	62	440	700	1400
20,00	PHA722F0200 MFL	3000	5000	>32≤38	13	16,3	1	148	62	440	700	1400
25,00	PHA722F0250 MF	3500	6000	≤19	5,5	14,6	1	147	60	440	700	1400
25,00	PHA722F0250 MF	3500	6000	>19≤24	5,6	14,6	1	147	60	440	700	1400
25,00	PHA722F0250 MF	3500	6000	>24≤32	5,5	14,6	1	147	60	440	700	1400
25,00	PHA722F0250 MF	3500	6000	>32≤35	5,5	14,6	1	147	60	440	700	1400
25,00	PHA722F0250 MFL	3500	6000	>32≤38	12	16,3	1	148	60	440	700	1400
28,00	PHA722F0280 MF	3700	6500	≤19	5,2	14,6	1	130	59	440	700	1370
28,00	PHA722F0280 MF	3700	6500	>19≤24	5,2	14,6	1	130	59	440	700	1370
28,00	PHA722F0280 MF	3700	6500	>24≤32	5,1	14,6	1	130	59	440	700	1370
28,00	PHA722F0280 MF	3700	6500	>32≤35	5,1	14,6	1	130	59	440	700	1370
28,00	PHA722F0280 MFL	3700	6500	>32≤38	12	16,3	1	130	59	440	700	1370
35,00	PHA722F0350 MF	3700	6500	≤19	5,1	14,6	1	145	59	440	700	1400
35,00	PHA722F0350 MF	3700	6500	>19≤24	5,1	14,6	1	145	59	440	700	1400
35,00	PHA722F0350 MF	3700	6500	>24≤32	5,0	14,6	1	145	59	440	700	1400
35,00	PHA722F0350 MF	3700	6500	>32≤35	5,0	14,6	1	145	59	440	700	1400
35,00	PHA722F0350 MFL	3700	6500	>32≤38	12	16,3	1	145	59	440	700	1400
40,00	PHA722F0400 MF	3700	6500	≤19	5,0	14,6	1	126	57	440	700	1370
40,00	PHA722F0400 MF	3700	6500	>19≤24	5,0	14,6	1	126	57	440	700	1370
40,00	PHA722F0400 MF	3700	6500	>24≤32	4,9	14,6	1	126	57	440	700	1370
40,00	PHA722F0400 MF	3700	6500	>32≤35	4,9	14,6	1	126	57	440	700	1370
40,00	PHA722F0400 MFL	3700	6500	>32≤38	12	16,3	1	126	57	440	700	1370
50,00	PHA722F0500 MF	3700	6500	≤19	5,0	14,6	1	142	57	440	700	1400
50,00	PHA722F0500 MF	3700	6500	>19≤24	5,0	14,6	1	142	57	440	700	1400
50,00	PHA722F0500 MF	3700	6500	>24≤32	4,9	14,6	1	142	57	440	700	1400
50,00	PHA722F0500 MF	3700	6500	>32≤35	4,9	14,6	1	142	57	440	700	1400
50,00	PHA722F0500 MFL	3700	6500	>32≤38	12	16,3	1	142	57	440	700	1400
70,00	PHA722F0700 MF	3700	6500	≤19	5,0	14,6	1	141	57	440	650	1240
70,00	PHA722F0700 MF	3700	6500	>19≤24	5,0	14,6	1	141	57	440	650	1240
70,00	PHA722F0700 MF	3700	6500	>24≤32	4,9	14,6	1	141	57	440	650	1240
70,00	PHA722F0700 MF	3700	6500	>32≤35	4,9	14,6	1	141	57	440	650	1240
70,00	PHA722F0700 MFL	3700	6500	>32≤38	12	16,3	1	141	57	440	650	1240
100,0	PHA722F1000 MF	3700	6500	≤19	5,0	14,6	1	112	57	300	500	1000
100,0	PHA722F1000 MF	3700	6500	>19≤24	5,0	14,6	1	112	57	300	500	1000
100,0	PHA722F1000 MF	3700	6500	>24≤32	4,9	14,6	1	112	57	300	500	1000
100,0	PHA722F1000 MF	3700	6500	>32≤35	4,9	14,6	1	112	57	300	500	1000
100,0	PHA722F1000 MFL	3700	6500	>32≤38	12	16,3	1	112	57	300	500	1000
PHA821 (M2BMAX=1700 Nm)												
4,000	PHA821F0040 MF	1500	3500	≤32	56	34,6	1	389	64	880	1600	1950
4,000	PHA821F0040 MF	1500	3500	>32≤38	55	34,6	1	413	64	880	1600	2310
4,000	PHA821F0040 MF	1500	3500	>38≤48	55	34,6	1	413	64	880	1600	2310
5,000	PHA821F0050 MF	1700	4000	≤32	47	34,6	1	416	62	1100	1700	2430
5,000	PHA821F0050 MF	1700	4000	>32≤38	46	34,6	1	433	62	1100	1700	2870
5,000	PHA821F0050 MF	1700	4000	>38≤48	46	34,6	1	433	62	1100	1700	2870
7,000	PHA821F0070 MF	2000	4000	≤32	39	34,6	1	411	61	1000	1600	2770
7,000	PHA821F0070 MF	2000	4000	>32≤38	39	34,6	1	411	61	1000	1600	2770
7,000	PHA821F0070 MF	2000	4000	>38≤48	38	34,6	1	411	61	1000	1600	2770
10,00	PHA821F0100 MF	2500	4000	≤32	35	34,6	1	302	59	800	1200	2400
10,00	PHA821F0100 MF	2500	4000	>32≤38	35	34,6	1	302	59	800	1200	2400
10,00	PHA821F0100 MF	2500	4000	>38≤48	35	34,6	1	302	59	800	1200	2400

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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]
PHA822 (M2BMAX=2000 Nm)												
16,00	PHA822F0160 MF	2500	4500	≤24	16	39,8	1	428	63	1100	2000	2760
16,00	PHA822F0160 MF	2500	4500	>24≤32	17	39,8	1	433	63	1100	2000	3150
16,00	PHA822F0160 MF	2500	4500	>32≤38	17	39,8	1	433	63	1100	2000	3150
16,00	PHA822F0160 MFL	2500	4500	>38≤48	35	43,6	1	441	63	1100	2000	3150
20,00	PHA822F0200 MF	2500	4500	≤24	16	39,8	1	444	63	1250	2000	3200
20,00	PHA822F0200 MF	2500	4500	>24≤32	16	39,8	1	447	63	1250	2000	3200
20,00	PHA822F0200 MF	2500	4500	>32≤38	16	39,8	1	447	63	1250	2000	3200
20,00	PHA822F0200 MFL	2500	4500	>38≤48	35	43,6	1	452	63	1250	2000	3200
25,00	PHA822F0250 MF	3000	5500	≤24	14	39,8	1	473	61	1250	2000	3200
25,00	PHA822F0250 MF	3000	5500	>24≤32	14	39,8	1	475	61	1250	2000	3200
25,00	PHA822F0250 MF	3000	5500	>32≤38	14	39,8	1	475	61	1250	2000	3200
25,00	PHA822F0250 MFL	3000	5500	>38≤48	33	43,6	1	479	61	1250	2000	3200
28,00	PHA822F0280 MF	3300	6000	≤24	13	39,8	1	427	60	1100	2000	3150
28,00	PHA822F0280 MF	3300	6000	>24≤32	13	39,8	1	427	60	1100	2000	3150
28,00	PHA822F0280 MF	3300	6000	>32≤38	13	39,8	1	427	60	1100	2000	3150
28,00	PHA822F0280 MFL	3300	6000	>38≤48	32	43,6	1	431	60	1100	2000	3150
35,00	PHA822F0350 MF	3300	6000	≤24	13	39,8	1	443	60	1250	2000	3200
35,00	PHA822F0350 MF	3300	6000	>24≤32	13	39,8	1	443	60	1250	2000	3200
35,00	PHA822F0350 MF	3300	6000	>32≤38	13	39,8	1	443	60	1250	2000	3200
35,00	PHA822F0350 MFL	3300	6000	>38≤48	32	43,6	1	446	60	1250	2000	3200
40,00	PHA822F0400 MF	3300	6000	≤24	12	39,8	1	414	58	1100	1920	3150
40,00	PHA822F0400 MF	3300	6000	>24≤32	12	39,8	1	414	58	1100	1920	3150
40,00	PHA822F0400 MF	3300	6000	>32≤38	12	39,8	1	414	58	1100	1920	3150
40,00	PHA822F0400 MFL	3300	6000	>38≤48	32	43,6	1	416	58	1100	1920	3150
50,00	PHA822F0500 MF	3300	6000	≤24	12	39,8	1	434	58	1250	2000	3200
50,00	PHA822F0500 MF	3300	6000	>24≤32	12	39,8	1	434	58	1250	2000	3200
50,00	PHA822F0500 MF	3300	6000	>32≤38	12	39,8	1	434	58	1250	2000	3200
50,00	PHA822F0500 MFL	3300	6000	>38≤48	31	43,6	1	435	58	1250	2000	3200
70,00	PHA822F0700 MF	3300	6000	≤24	12	39,8	1	420	58	1000	1600	2770
70,00	PHA822F0700 MF	3300	6000	>24≤32	12	39,8	1	420	58	1000	1600	2770
70,00	PHA822F0700 MF	3300	6000	>32≤38	12	39,8	1	420	58	1000	1600	2770
70,00	PHA822F0700 MFL	3300	6000	>38≤48	31	43,6	1	420	58	1000	1600	2770
100,0	PHA822F1000 MF	3300	6000	≤24	12	39,8	1	304	58	800	1200	2400
100,0	PHA822F1000 MF	3300	6000	>24≤32	12	39,8	1	304	58	800	1200	2400
100,0	PHA822F1000 MF	3300	6000	>32≤38	12	39,8	1	304	58	800	1200	2400
100,0	PHA822F1000 MFL	3300	6000	>38≤48	31	43,6	1	304	58	800	1200	2400
PHA932 (M2BMAX=5000 Nm)												
12,00	PHA932F0120 MF	1800	3000	≤32	82	70,6	1	1091	66	3000	3700	4630
12,00	PHA932F0120 MF	1800	3000	>32≤38	82	70,6	1	1110	66	3000	4610	6720
12,00	PHA932F0120 MF	1800	3000	>38≤48	81	70,6	1	1110	66	3000	4610	6740
16,00	PHA932F0160 MF	2200	3500	≤32	54	70,6	1	1127	64	3000	4930	6170
16,00	PHA932F0160 MF	2200	3500	>32≤38	53	70,6	1	1139	64	3000	5000	8960
16,00	PHA932F0160 MF	2200	3500	>38≤48	53	70,6	1	1139	64	3000	5000	8960
18,00	PHA932F0180 MF	1800	3000	≤32	76	70,6	1	1075	66	3000	4500	6940
18,00	PHA932F0180 MF	1800	3000	>32≤38	75	70,6	1	1084	66	3000	4500	9000
18,00	PHA932F0180 MF	1800	3000	>38≤48	75	70,6	1	1084	66	3000	4500	9000
20,00	PHA932F0200 MF	2500	4000	≤32	45	70,6	1	1134	62	3000	5000	7710
20,00	PHA932F0200 MF	2500	4000	>32≤38	45	70,6	1	1142	62	3000	5000	10000
20,00	PHA932F0200 MF	2500	4000	>38≤48	44	70,6	1	1142	62	3000	5000	10000
24,00	PHA932F0240 MF	2200	3500	≤32	50	70,6	1	1091	64	3000	4500	9000
24,00	PHA932F0240 MF	2200	3500	>32≤38	50	70,6	1	1096	64	3000	4500	9000
24,00	PHA932F0240 MF	2200	3500	>38≤48	49	70,6	1	1096	64	3000	4500	9000
28,00	PHA932F0280 MF	2800	4500	≤32	38	70,6	1	1121	61	3000	5000	10000
28,00	PHA932F0280 MF	2800	4500	>32≤38	38	70,6	1	1121	61	3000	5000	10000
28,00	PHA932F0280 MF	2800	4500	>38≤48	37	70,6	1	1121	61	3000	5000	10000
30,00	PHA932F0300 MF	2500	4000	≤32	43	70,6	1	1094	62	3000	4500	9000
30,00	PHA932F0300 MF	2500	4000	>32≤38	42	70,6	1	1097	62	3000	4500	9000
30,00	PHA932F0300 MF	2500	4000	>38≤48	42	70,6	1	1097	62	3000	4500	9000
32,00	PHA932F0320 MF	2800	4500	≤32	37	70,6	1	1093	60	3000	4610	9220

PHA

行星齿轮减速器 PHA

Planetary Gear Units PHA



请注意 PHA6 页的符号注释!

Please take notice of the indications on page PHA6!

i	Typ	n1MAX DB [min-1]	n1MAX ZB [min-1]	MWø [mm]	J1 [10-4 kgm2]	G [kg]	Δφ2 [arcmin]	C2 [Nm/arcmin]	LPA [dB(A)]	M2N [Nm]	M2B [Nm]	M2NOT [Nm]
PHA932 (M2BMAX=5000 Nm)												
32,00	PHA932F0320 MF	2800	4500	>32≤38	36	70,6	1	1093	60	3000	4610	9220
32,00	PHA932F0320 MF	2800	4500	>38≤48	36	70,6	1	1093	60	3000	4610	9220
40,00	PHA932F0400 MF	2800	4500	≤32	35	70,6	1	1046	59	2690	4610	9220
40,00	PHA932F0400 MF	2800	4500	>32≤38	35	70,6	1	1046	59	2690	4610	9220
40,00	PHA932F0400 MF	2800	4500	>38≤48	34	70,6	1	1046	59	2690	4610	9220
42,00	PHA932F0420 MF	2800	4500	≤32	37	70,6	1	1088	61	3000	4500	9000
42,00	PHA932F0420 MF	2800	4500	>32≤38	37	70,6	1	1088	61	3000	4500	9000
42,00	PHA932F0420 MF	2800	4500	>38≤48	36	70,6	1	1088	61	3000	4500	9000
48,00	PHA932F0480 MF	2800	4500	≤32	36	70,6	1	1076	60	3000	4500	9000
48,00	PHA932F0480 MF	2800	4500	>32≤38	36	70,6	1	1076	60	3000	4500	9000
48,00	PHA932F0480 MF	2800	4500	>38≤48	35	70,6	1	1076	60	3000	4500	9000
60,00	PHA932F0600 MF	2800	4500	≤32	34	70,6	1	1055	59	3000	4500	9000
60,00	PHA932F0600 MF	2800	4500	>32≤38	34	70,6	1	1055	59	3000	4500	9000
60,00	PHA932F0600 MF	2800	4500	>38≤48	34	70,6	1	1055	59	3000	4500	9000
PHA1032 (M2BMAX=7500 Nm)												
18,00	PHA1032F0180 MF	1800	3000	≤32	79	86,0	1	1636	66	4610	5550	6940
18,00	PHA1032F0180 MF	1800	3000	>32≤38	79	86,0	1	1656	66	4610	6910	10080
18,00	PHA1032F0180 MF	1800	3000	>38≤48	78	86,0	1	1656	66	4610	6910	10120
24,00	PHA1032F0240 MF	2200	3500	≤32	52	86,0	1	1672	64	4610	7400	9250
24,00	PHA1032F0240 MF	2200	3500	>32≤38	52	86,0	1	1684	64	4610	7500	13430
24,00	PHA1032F0240 MF	2200	3500	>38≤48	51	86,0	1	1684	64	4610	7500	13430
30,00	PHA1032F0300 MF	2500	4000	≤32	44	86,0	1	1679	62	5000	7500	11570
30,00	PHA1032F0300 MF	2500	4000	>32≤38	43	86,0	1	1686	62	5000	7500	15000
30,00	PHA1032F0300 MF	2500	4000	>38≤48	43	86,0	1	1686	62	5000	7500	15000
42,00	PHA1032F0420 MF	2800	4500	≤32	38	86,0	1	1666	61	5000	7500	15000
42,00	PHA1032F0420 MF	2800	4500	>32≤38	38	86,0	1	1666	61	5000	7500	15000
42,00	PHA1032F0420 MF	2800	4500	>38≤48	37	86,0	1	1666	61	5000	7500	15000
48,00	PHA1032F0480 MF	2800	4500	≤32	36	86,0	1	1638	60	4610	6910	13820
48,00	PHA1032F0480 MF	2800	4500	>32≤38	36	86,0	1	1638	60	4610	6910	13820
48,00	PHA1032F0480 MF	2800	4500	>38≤48	35	86,0	1	1638	60	4610	6910	13820
60,00	PHA1032F0600 MF	2800	4500	≤32	35	86,0	1	1591	59	4030	6910	13820
60,00	PHA1032F0600 MF	2800	4500	>32≤38	35	86,0	1	1591	59	4030	6910	13820
60,00	PHA1032F0600 MF	2800	4500	>38≤48	34	86,0	1	1591	59	4030	6910	13820

更高传动比参阅 PHVA 减速器

Higher ratios see PHVA gear units.

行星齿轮减速器 PHA

Planetary Gear Units PHA



请注意 PHA6 页的符号注释!

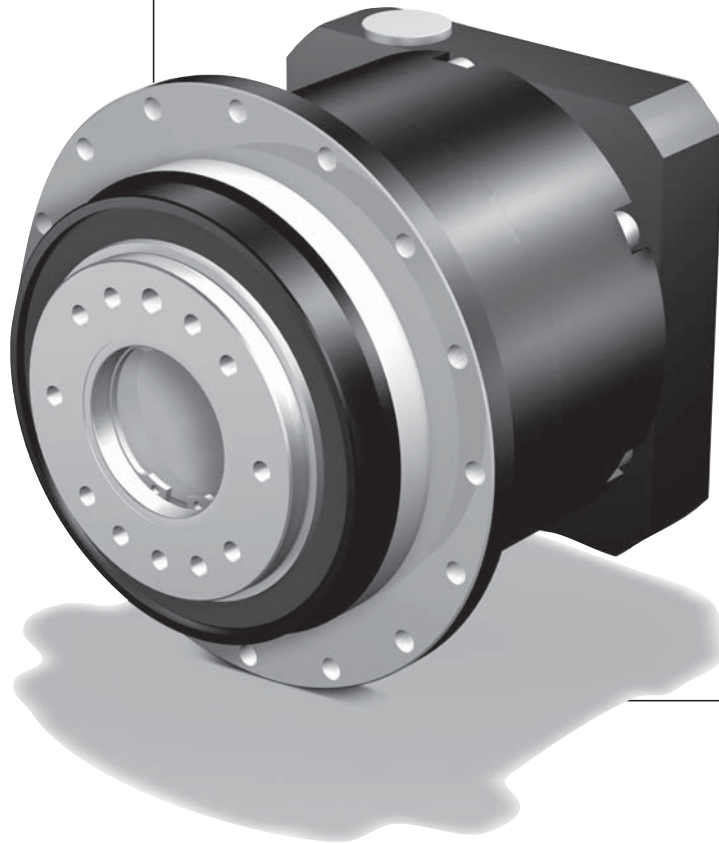
Please take notice of the indications on page PHA6!

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]
PHVA933 (M2BMAX=4250 Nm)												
61,00	PHVA933F0610 MF	2500	4500	≤24	17	62,8	1	844	62	2500	4250	9000
61,00	PHVA933F0610 MF	2500	4500	>24≤32	18	62,8	1	845	62	2500	4250	9000
61,00	PHVA933F0610 MF	2500	4500	>32≤38	18	62,8	1	845	62	2500	4250	9000
61,00	PHVA933F0610 MFL	2500	4500	>38≤48	36	66,6	1	848	62	2500	4250	9000
91,00	PHVA933F0910 MF	2500	4500	≤24	14	62,8	1	836	62	2500	4250	9000
91,00	PHVA933F0910 MF	2500	4500	>24≤32	14	62,8	1	836	62	2500	4250	9000
91,00	PHVA933F0910 MF	2500	4500	>32≤38	14	62,8	1	836	62	2500	4250	9000
91,00	PHVA933F0910 MFL	2500	4500	>38≤48	33	66,6	1	837	62	2500	4250	9000
121,0	PHVA933F1210 MF	2500	4500	≤24	13	62,8	1	804	62	2500	4250	9000
121,0	PHVA933F1210 MF	2500	4500	>24≤32	13	62,8	1	804	62	2500	4250	9000
121,0	PHVA933F1210 MF	2500	4500	>32≤38	13	62,8	1	804	62	2500	4250	9000
121,0	PHVA933F1210 MFL	2500	4500	>38≤48	32	66,6	1	804	62	2500	4250	9000
PHVA1033 (M2BMAX=7500 Nm)												
61,00	PHVA1033F0610 MF	2500	4500	≤32	39	90,0	1	1362	63	4000	7500	15000
61,00	PHVA1033F0610 MF	2500	4500	>32≤38	38	90,0	1	1364	63	4000	7500	15000
61,00	PHVA1033F0610 MF	2500	4500	>38≤48	38	90,0	1	1364	63	4000	7500	15000
91,00	PHVA1033F0910 MF	2500	4500	≤32	36	90,0	1	1339	63	4000	7500	15000
91,00	PHVA1033F0910 MF	2500	4500	>32≤38	35	90,0	1	1339	63	4000	7500	15000
91,00	PHVA1033F0910 MF	2500	4500	>38≤48	35	90,0	1	1339	63	4000	7500	15000

PHA

尺寸图：
ServoFit® PHA
行星齿轮减速器

Dimension drawings:
ServoFit® PHA
Planetary Gear Units



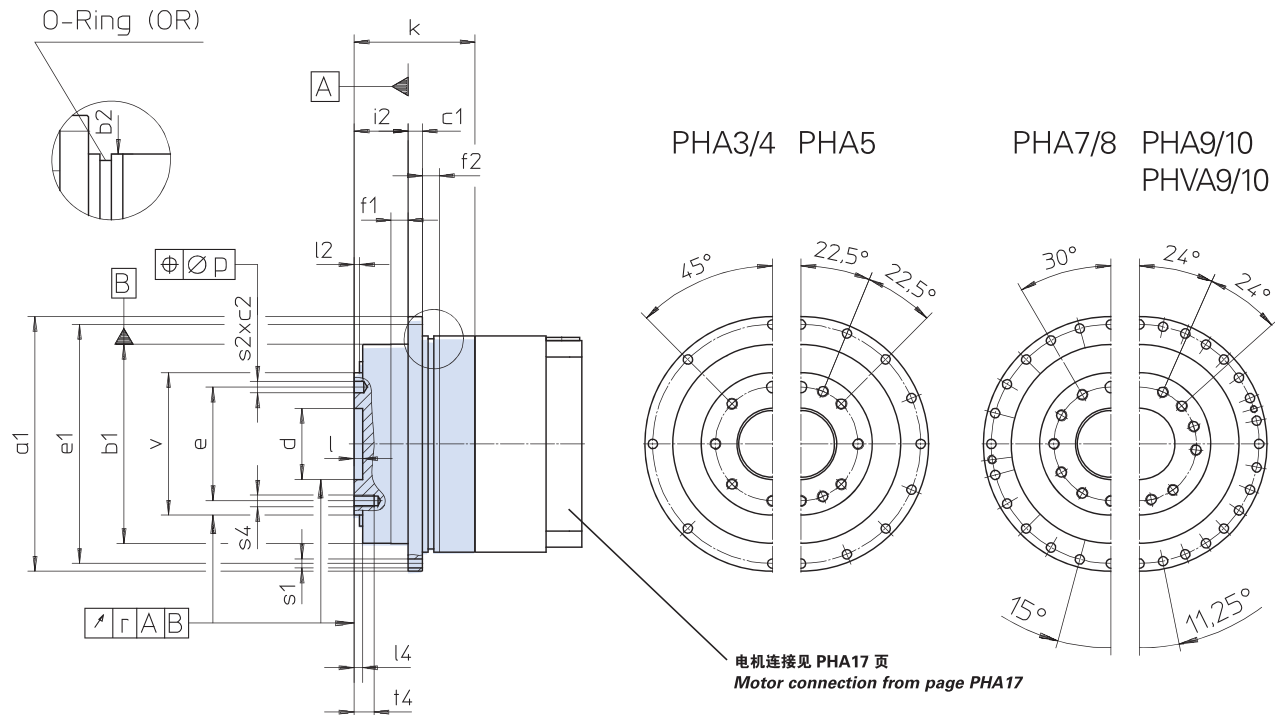
P
H
A

行星齿轮减速器 PHA + PHVA

Planetary Gear Units PHA + PHVA



PHA3...MF - PHA10...MF PHVA9...MF - PHVA10...MF



Typ	øa1	øb1	øb2	c1	c2	ød	øe	øe1	f1	f2	i2
PHA321	86h7	64h7	70h7	4	3	20,0H6	31,5	79	7	8	20
PHA322	86h7	64h7	70h7	4	3	20,0H6	31,5	79	7	8	20
PHA421	118h7	90h7	95h7	7	7	31,5H6	50,0	109	10	10	30
PHA422	118h7	90h7	95h7	7	7	31,5H6	50,0	109	10	10	30
PHA521	145h7	110h7	120h7	8	7	40,0H6	63,0	135	10	12	29
PHA522	145h7	110h7	120h7	8	7	40,0H6	63,0	135	10	12	29
PHA721	179h7	140h7	152h7	10	7	50,0H6	80,0	168	12	12	38
PHA722	179h7	140h7	152h7	10	7	50,0H6	80,0	168	12	12	38
PHA821	247h7	200h7	212h7	12	10	80,0H6	125,0	233	15	15	50
PHA822	247h7	200h7	212h7	12	10	80,0H6	125,0	233	15	15	50
PHA932	300	255h7	255h7	18	-	90,0H6	140,0	280	20	33	66
PHVA933	300	255h7	255h7	18	-	90,0H6	140,0	280	20	33	66
PHA1032	330	285h7	285h7	20	-	95,0H6	160,0	310	20	20	75
PHVA1033	330	285h7	285h7	20	-	95,0H6	160,0	310	20	20	75

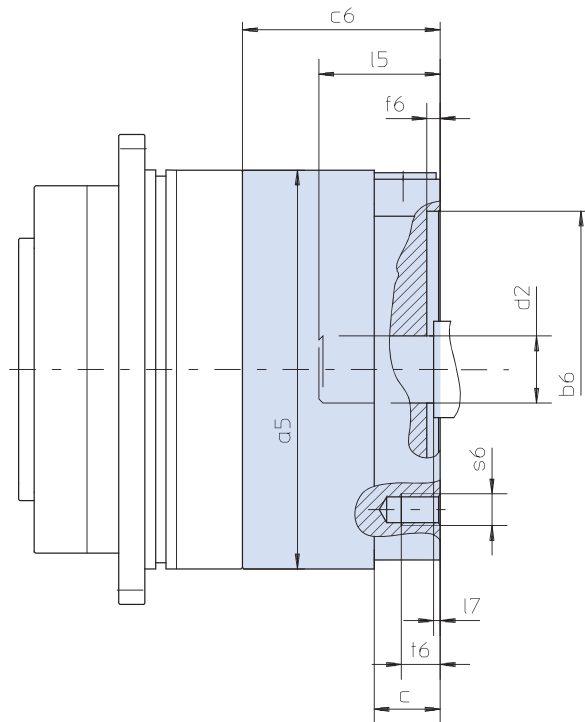
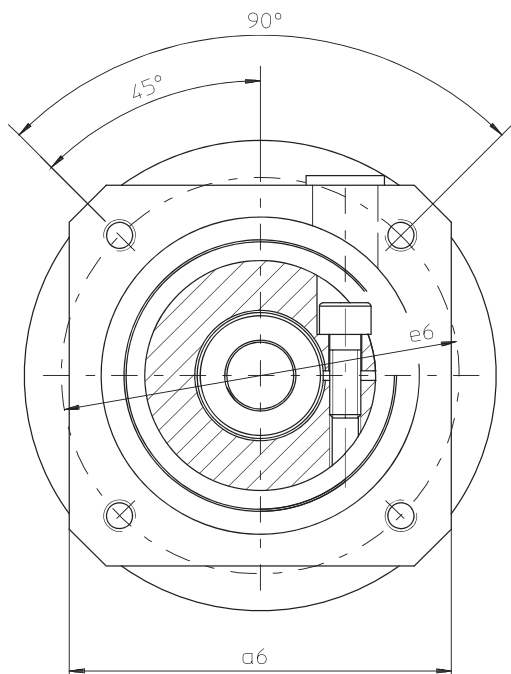
Typ	k	l	l2	l4	OR	øp	r	øS1	øS2	s4	t4	øv
PHA321	50,0	4	3	3,5	65x2	0,02	0,020	4,5	5H7	M5	7	40h7
PHA322	87,0	4	3	3,5	65x2	0,02	0,020	4,5	5H7	M5	7	40h7
PHA421	66,0	6	6	6,0	90x3	0,02	0,020	5,5	6H7	M6	11	63h7
PHA422	113,0	6	6	6,0	90x3	0,02	0,020	5,5	6H7	M6	11	63h7
PHA521	70,0	6	6	6,0	110x3	0,02	0,020	5,5	6H7	M6	11	80h7
PHA522	124,5	6	6	6,0	110x3	0,02	0,020	5,5	6H7	M6	11	80h7
PHA721	88,0	6	6	6,0	145x3	0,02	0,025	6,6	8H7	M8	14	100h7
PHA722	150,0	6	6	6,0	145x3	0,02	0,025	6,6	8H7	M8	14	100h7
PHA821	126,0	8	8	8,0	200x5	0,02	0,030	9,0	10H7	M10	18	160h7
PHA822	201,0	8	8	8,0	200x5	0,02	0,030	9,0	10H7	M10	18	160h7
PHA932	290,5	12	11	12,0	238x5	-	0,030	13,5	-	M16	24	180h7
PHVA933	205,5	12	11	12,0	238x5	-	0,030	13,5	-	M16	24	180h7
PHA1032	307,0	10	15	15,0	270x6	-	0,040	13,5	-	M20	30	200h7
PHVA1033	250,0	10	15	15,0	270x6	-	0,040	13,5	-	M20	30	200h7

行星齿轮减速器 PHA + PHVA 电机连接

Planetary Gear Units **PHA + PHVA** motor connection



PHA321...MF - PHA821...MF PHVA933...MF - PHVA1033...MF



更多的电机连接尺寸可按需定制

Further motor connection dimensions on request.

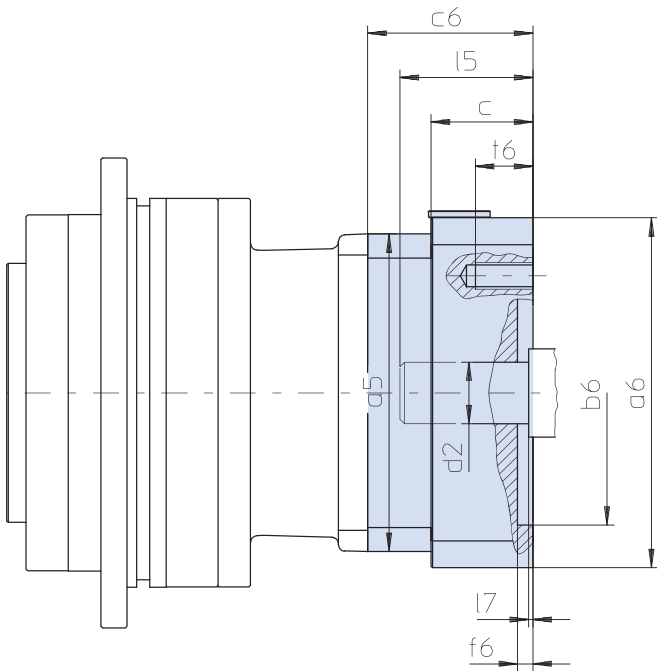
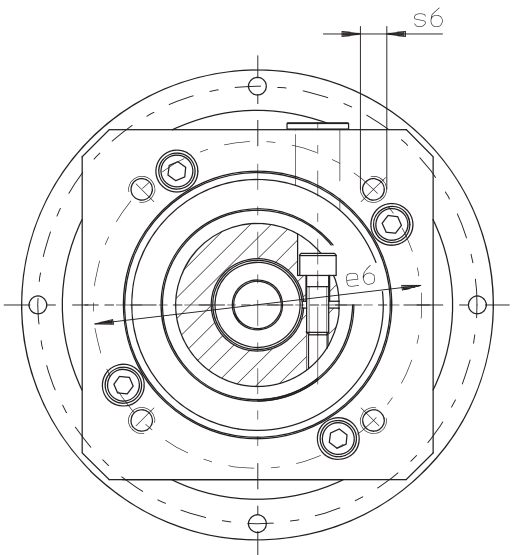
Typ	øb6	øe6	ød2max	l5max	□a6	c	c6	f6	l7max	s6	t6
PHA321	40,0H7	63	19	40	75	22	52,5	3,5	6,5	M5	11
PHA321	50,0H7	70	19	40	75	22	52,5	3,5	6,5	M4	9
PHA321	50,0H7	95	19	40	80	22	52,5	3,5	6,5	M6	13
PHA321	60,0H7	75	19	40	75	22	52,5	3,5	6,5	M5	11
PHA321	60,0H7	90	19	40	75	22	52,5	3,5	6,5	M5	11
PHA321	70,0H7	90	19	40	80	22	52,5	3,5	6,5	M5	11
PHA321	80,0H7	100	19	40	90	22	52,5	3,5	6,5	M6	13
PHA321	95,0H7	115	19	40	100	22	52,5	4,0	6,5	M8	22
PHA321	95,0H7	130	19	40	115	22	52,5	4,0	6,5	M8	18
PHA421	50,0H7	95	24	40	100	21	54,0	2,5	2,5	M6	13
PHA421	80,0H7	100	24	40	100	21	54,0	4,0	2,5	M6	13
PHA421	95,0H7	115	24	40	100	21	54,0	4,0	2,5	M8	21
PHA421	95,0H7	115	24	50	100	30	63,0	4,0	11,5	M8	16
PHA421	95,0H7	130	24	40	115	21	54,0	4,0	2,5	M8	21
PHA421	110,0H7	130	24	50	115	30	63,0	4,0	11,5	M8	16
PHA421	110,0H7	145	24	58	130	38	71,0	7,0	16,5	M8	16
PHA421	130,0H7	165	24	50	140	30	63,0	5,0	11,5	M10	20
PHA521	95,0H7	115	32	50	115	24	64,0	4,0	2,5	M8	16
PHA521	95,0H7	130	32	50	115	24	64,0	4,0	2,5	M8	16
PHA521	110,0H7	130	32	50	115	24	64,0	4,0	2,5	M8	16
PHA521	110,0H7	145	32	62	130	37	77,0	7,0	15,5	M8	14
PHA521	110,0H7	165	32	50	140	24	64,0	5,0	2,5	M10	24
PHA521	130,0H7	165	32	58	140	32	72,0	5,0	10,5	M10	20
PHA721/PHVA933	110,0H7	130	38	60	145	26	78,0	5,0	4,5	M8	14
PHA721/PHVA933	110,0H7	165	38	60	145	26	78,0	5,0	4,5	M10	26
PHA721/PHVA933	114,3H7	200	38	80	180	45	97,0	5,0	23,5	M12	25
PHA721/PHVA933	130,0H7	165	38	60	145	26	78,0	5,0	4,5	M10	26
PHA721/PHVA933	130,0H7	215	38	60	190	26	78,0	5,0	4,5	M12	26
PHA721/PHVA933	180,0H7	215	38	80	190	45	97,0	5,0	23,5	M12	25
PHA821/PHVA1033	114,3H7	200	48	80	190	34	92,5	4,0	3,5	M12	34
PHA821/PHVA1033	130,0H7	165	48	80	190	34	92,5	5,0	3,5	M10	18
PHA821/PHVA1033	130,0H7	215	48	80	190	34	92,5	5,0	3,5	M12	34
PHA821/PHVA1033	180,0H7	215	48	80	190	34	92,5	5,0	3,5	M12	34
PHA821/PHVA1033	250,0H7	300	48	82	260	38	96,5	6,0	7,5	M16	38

行星齿轮减速器 PHA 电机连接

Planetary Gear Units PHA motor connection



PHA322...MF - PHA1032...MF



更多的电机连接尺寸可按需定制

Further motor connection dimensions on request.

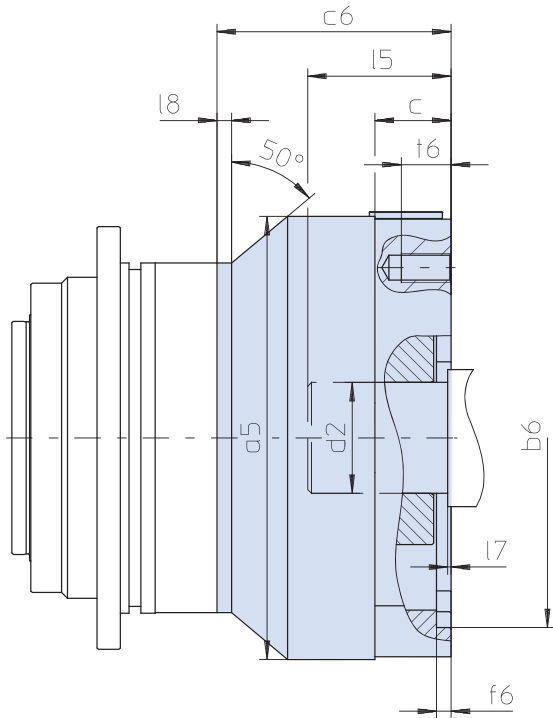
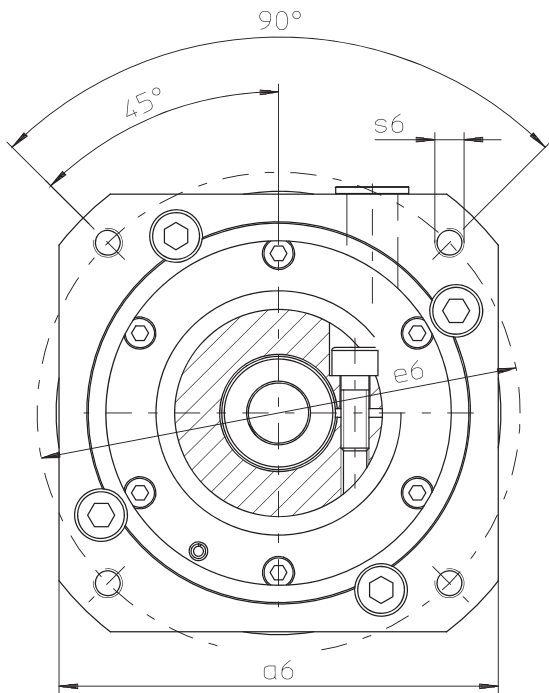
Typ	øb6	øe6	ød2max	l5max	□a6	c	c6	f6	l7max	s6	t6
PHA322	40,0H7	63	14	30	55	15	36,0	3,5	2,5	M5	10
PHA322	50,0H7	70	14	30	60	15	36,0	3,5	2,5	M4	9
PHA322	50,0H7	95	14	30	90	15	36,0	3,5	2,5	M6	15
PHA322	60,0H7	75	14	30	75	15	36,0	3,5	2,5	M5	10
PHA422	40,0H7	63	19	40	75	18	51,5	3,0	2,5	M5	11
PHA422	50,0H7	70	19	40	75	18	51,5	3,0	2,5	M4	9
PHA422	50,0H7	95	19	40	80	18	51,5	3,0	2,5	M6	13
PHA422	60,0H7	75	19	40	75	-	51,5	3,5	2,5	M5	11
PHA422	60,0H7	90	19	40	75	18	51,5	3,5	2,5	M5	9
PHA422	70,0H7	90	19	40	80	18	51,5	3,5	2,5	M5	9
PHA422	80,0H7	100	19	40	90	-	51,5	3,5	2,5	M6	13
PHA422	95,0H7	115	19	40	100	18	51,5	4,0	2,5	M8	18
PHA422	95,0H7	130	19	40	115	18	51,5	4,0	2,5	M8	18
PHA522	50,0H7	95	24	40	100	21	56,0	2,5	2,5	M6	13
PHA522	80,0H7	100	24	40	100	-	56,0	4,0	2,5	M6	13
PHA522	95,0H7	115	24	50	100	30	65,0	4,0	11,5	M6	16
PHA522	95,0H7	115	24	40	100	-	56,0	4,0	2,5	M8	16
PHA522	95,0H7	130	24	40	115	21	56,0	4,0	2,5	M8	16
PHA522	95,0H7	130	24	50	115	30	65,0	4,0	11,5	M8	16
PHA522	110,0H7	130	24	50	115	30	65,0	4,0	11,5	M8	16
PHA522	110,0H7	145	24	58	130	38	73,0	7,0	19,5	M8	16
PHA522	130,0H7	165	24	50	140	30	65,0	5,0	11,5	M10	20
PHA722	95,0H7	115	32	50	115	-	64,0	4,0	2,5	M8	16
PHA722	95,0H7	130	32	50	115	24	64,0	4,0	2,5	M8	16
PHA722	110,0H7	130	32	50	115	-	64,0	4,0	2,5	M8	16
PHA722	110,0H7	145	32	58	130	32	72,0	6,5	10,5	M8	16
PHA722	110,0H7	165	32	50	140	24	64,0	5,0	2,5	M10	24
PHA722	130,0H7	165	32	58	140	32	72,0	5,0	10,5	M10	20
PHA822	110,0H7	130	38	60	145	26	78,0	5,0	4,5	M8	14
PHA822	110,0H7	165	38	60	145	26	78,0	5,0	4,5	M10	26
PHA822	114,3H7	200	38	80	180	45	97,0	5,0	23,5	M12	25
PHA822	130,0H7	165	38	60	145	26	78,0	5,0	4,5	M10	26
PHA822	130,0H7	215	38	60	190	26	78,0	5,0	4,5	M12	26
PHA822	180,0H7	215	38	80	190	45	97,0	5,0	23,5	M12	25
PHA932/PHA1032	114,3H7	200	48	80	190	34	94,0	4,0	3,5	M12	34
PHA932/PHA1032	130,0H7	165	48	80	190	34	94,0	5,0	3,5	M10	18
PHA932/PHA1032	130,0H7	215	48	80	190	34	94,0	5,0	3,5	M12	34
PHA932/PHA1032	180,0H7	215	48	80	190	34	94,0	5,0	3,5	M12	34
PHA932/PHA1032	250,0H7	300	48	82	260	38	98,0	6,0	7,5	M16	38

行星齿轮减速器 **PHA + PHVA** 电机连接 - 大规格电机法兰盘

Planetary Gear Units **PHA + PHVA** motor connection - large motor plate



PHA321...MFL - PHA721...MFL
PHVA933...MFL



PHA

更多的电机连接尺寸可按需定制

Further motor connection dimensions on request.

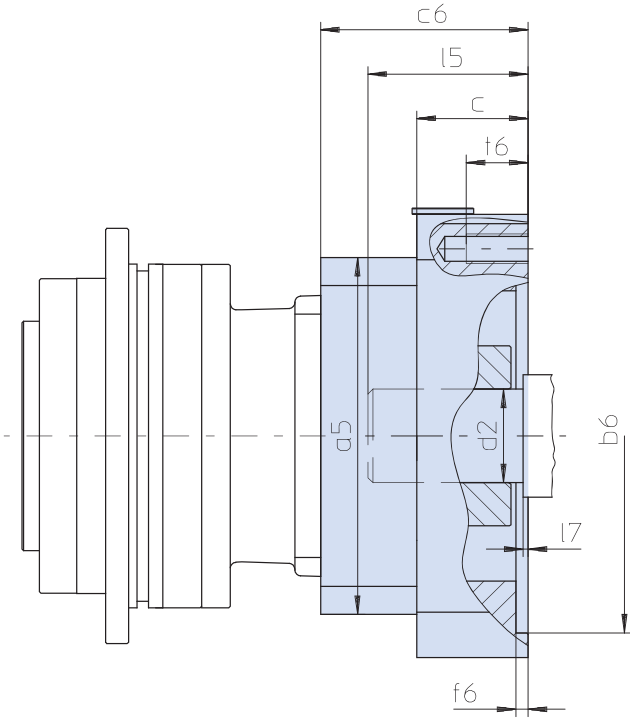
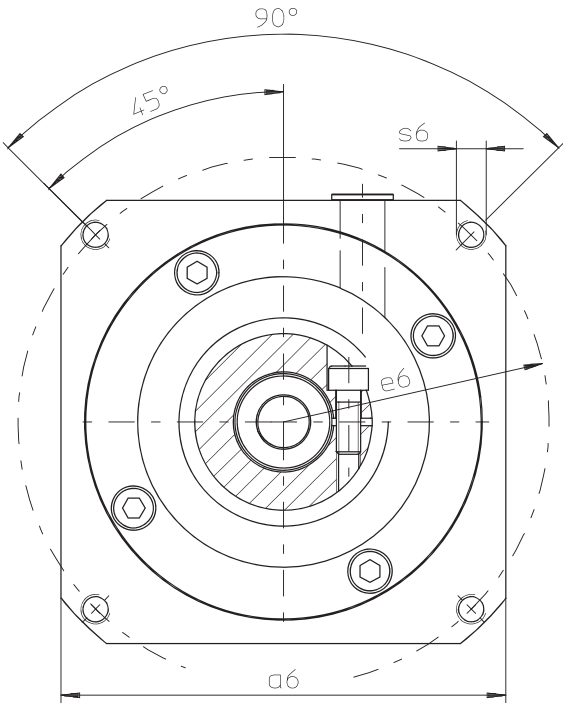
Typ	øb6	øe6	ød2max	l5max	□a6	c	c6	f6	l7max	s6	t6
PHA321	95,0H7	115	24	40	100	21	56,5	4,0	2,5	M8	21
PHA321	95,0H7	130	24	40	115	21	56,5	4,0	2,5	M8	21
PHA321	95,0H7	130	24	50	115	30	65,5	4,0	11,5	M8	16
PHA321	110,0H7	130	24	50	115	30	65,5	4,0	11,5	M8	16
PHA321	110,0H7	145	24	58	130	38	73,5	7,0	16,5	M8	16
PHA321	130,0H7	165	24	50	140	30	65,5	5,0	11,5	M10	20
PHA421	110,0H7	145	32	62	130	37	78,5	7,0	15,5	M8	14
PHA421	110,0H7	165	32	50	140	24	65,5	5,0	2,5	M10	24
PHA421	130,0H7	165	32	58	140	32	73,5	5,0	10,5	M10	20
PHA521	130,0H7	215	38	60	190	26	82,0	5,0	4,5	M12	26
PHA721/PHVA933	114,3H7	200	48	80	190	34	102,0	4,0	3,5	M12	34
PHA721/PHVA933	180,0H7	215	48	80	190	34	102,0	5,0	3,5	M12	34
PHA721/PHVA933	250,0H7	300	48	82	260	38	106,0	6,0	7,5	M16	38

行星齿轮减速器 PHA 电机连接 - 大规格电机法兰盘

Planetary Gear Units PHA motor connection - large motor plate



PHA422...MFL - PHA822...MFL



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	□a6	c	c6	f6	l7max	s6	t6
PHA422	95,0H7	115	24	50	100	30	30,0	4,0	5,5	M6	16
PHA422	95,0H7	115	24	40	100	21	55,5	4,0	2,5	M8	16
PHA422	95,0H7	130	24	40	115	21	55,5	4,0	2,5	M8	16
PHA422	95,0H7	130	24	50	115	30	64,5	4,0	11,5	M8	16
PHA422	110,0H7	130	24	50	115	30	64,5	4,0	11,5	M8	16
PHA422	110,0H7	145	24	58	130	38	72,5	7,0	19,5	M8	16
PHA422	130,0H7	165	24	50	140	30	64,5	5,0	11,5	M10	20
PHA522	110,0H7	145	32	58	130	32	75,5	6,5	10,5	M8	16
PHA522	110,0H7	165	32	50	140	24	67,5	5,0	2,5	M10	24
PHA522	130,0H7	165	32	58	140	32	75,5	5,0	10,5	M10	20
PHA722	110,0H7	130	38	60	145	26	82,0	5,0	23,5	M8	14
PHA722	110,0H7	165	38	60	145	26	82,0	5,0	23,5	M10	26
PHA722	114,3H7	200	38	80	180	45	101,0	5,0	23,5	M12	25
PHA722	130,0H7	165	38	60	145	26	82,0	5,0	23,5	M10	26
PHA722	130,0H7	215	38	60	190	26	82,0	5,0	4,5	M12	26
PHA722	180,0H7	215	38	80	190	45	101,0	5,0	23,5	M12	25
PHA822	114,3H7	200	48	80	190	34	102,0	4,0	3,5	M12	34
PHA822	180,0H7	215	48	80	190	34	102,0	5,0	3,5	M12	34
PHA822	250,0H7	300	48	82	260	38	106,0	6,0	7,5	M16	38