

WPLFE

最短的直角行星减速机 配有法兰输出轴 扭转刚度极高

即使面临困境，也要冲破局限，发挥创新思维。**WPLFE** 是一款配有紧凑型法兰输出轴的直角行星减速机。它可以节省超过三分之一的空间而且扭转刚度显著提高。凭借其标准化的法兰接口，该行星减速机的安装极其简便。内置的定位销孔还为固定时的安全性提供了额外的保障。

The shortest right angle planetary gearbox with flange output shaft and maximum torsional stiffness

Thinking around corners even in tight spaces. The **WPLFE** is our right angle planetary gearbox with compact flange output shaft. You save more than a third of the space and gain a significantly higher torsional stiffness. Thanks to its standardized flange interface, it is especially easy to install. The integrated dowel hole provides additional secureness during fitting.

额定扭矩
Nominal output torque **14 - 260 Nm**

回程间隙
Torsional backlash **11 - 18 arcmin**

倾斜力矩
Tilting moment **12 - 109 Nm**

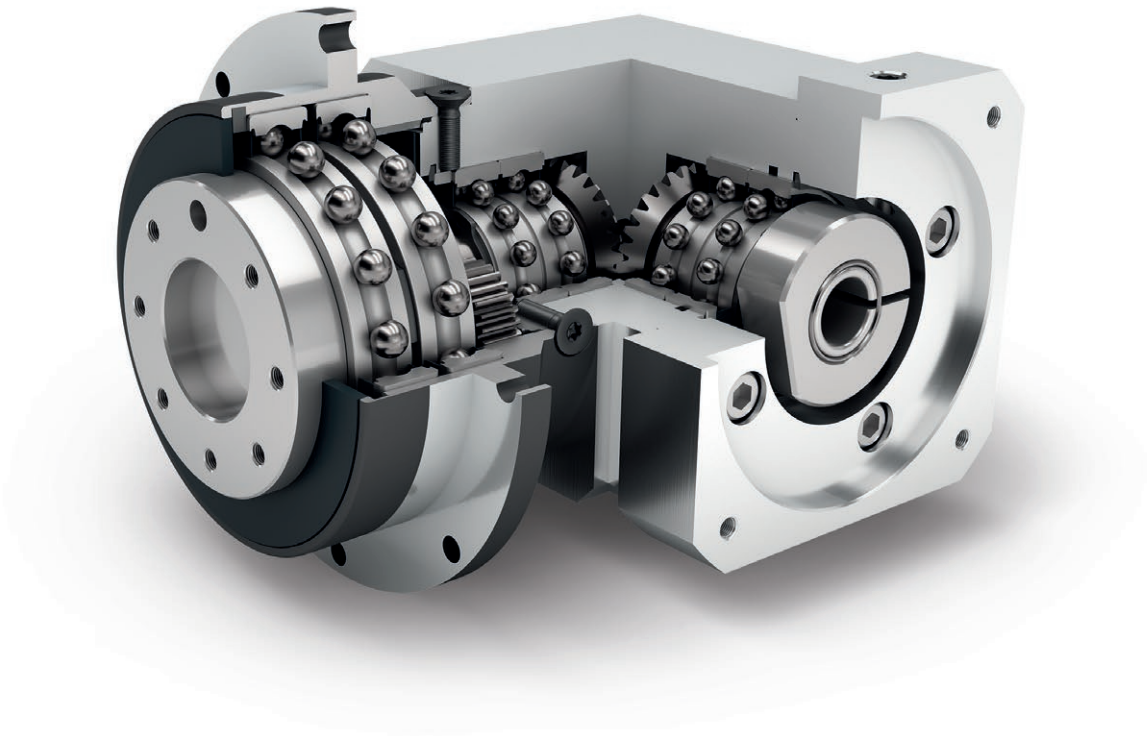
防护等级
Protection class **IP54**

结构尺寸
Frame sizes

64

90

110



Economy Line
Economy Line



转角型减速机
Right angle gearbox



直齿
Spur gear



圆形特大号输出法兰
Extra large round type output flange



法兰输出轴 (按 ISO 9409 标准)
Flange output shaft (ISO 9409)



旋转方向 同方向
Equidirectional rotation



锥齿轮 角度级
Bevel gear right angle stage



低摩擦深沟球轴承
Low-friction deep groove ball bearings



行星齿轮架 (片状结构)
Planet carrier in disc design

| Code | 减速机参数 | Gearbox characteristics | | | WPLFE064 | WPLFE090 | WPLFE110 | p ⁽¹⁾ |
|------|-------------------------------|--|------------------|-------------|--|-------------|-------------|------------------|
| | 使用寿命 (L _{10h}) | Service life (L _{10h}) | t _L | h | 20.000 | | | |
| | T _{2N} × 0,88 时的使用寿命 | Service life at T _{2N} × 0,88 | | | 30.000 | | | |
| | 满载时效率 ⁽²⁾ | Efficiency at full load ⁽²⁾ | η | % | 94 | | | 1 |
| | | | | | 93 | | | 2 |
| | 最低工作温度 | Min. operating temperature | T _{min} | °C | -25 | | | |
| | 最高工作温度 | Max. operating temperature | T _{max} | | 90 | | | |
| | 防护等级 | Protection class | | | IP54 | | | |
| S | 标准润滑 | Standard lubrication | | | 润滑脂 (终生润滑) / Grease (lifetime lubrication) | | | |
| F | 食品级润滑 | Food grade lubrication | | | 润滑脂 (终生润滑) / Grease (lifetime lubrication) | | | |
| L | 低温润滑 ⁽³⁾ | Low temperature lubrication ⁽³⁾ | | | 润滑脂 (终生润滑) / Grease (lifetime lubrication) | | | |
| | 安装位置 | Installation position | | | 任意 / Any | | | |
| S | 标准回程间隙 | Standard backlash | j _t | arcmin | < 16 | < 13 | < 11 | 1 |
| | | | | | < 18 | < 15 | < 13 | 2 |
| | 抗扭刚度 ⁽²⁾ | Torsional stiffness ⁽²⁾ | c _G | Nm / arcmin | 2,9 - 6,2 | 5,8 - 17,5 | 15,9 - 40,5 | 1 |
| | | | | | 4,9 - 9,9 | 14,3 - 29,5 | 26,0 - 69,0 | 2 |
| | 减速机重量 | Gearbox weight | m _G | kg | 1,9 | 5,2 | 13 | 1 |
| | | | | | 2,3 | 5,7 | 15 | 2 |
| S | 标准的箱体表面 | Standard surface | | | 箱体: 钢 - 热处理后氧化 (黑色) Housing: Steel - heat-treated and post-oxidized (black) | | | |
| | 运行噪音 ⁽⁴⁾ | Running noise ⁽⁴⁾ | Q _g | dB(A) | 70 | 73 | 75 | |
| | 基于减速机输入法兰的最大弯矩 ⁽⁵⁾ | Max. bending moment based on the gearbox input flange ⁽⁵⁾ | M _b | Nm | 5 | 10,5 | 26 | |

| 输出轴载荷 | Output shaft loads | | | WPLFE064 | WPLFE090 | WPLFE110 | p ⁽¹⁾ |
|---------------------------------|---|------------------------|----|----------|----------|----------|------------------|
| 20,000 h 的径向力 ⁽⁶⁾⁽⁷⁾ | Radial force for 20,000 h ⁽⁶⁾⁽⁷⁾ | F _{r20.000 h} | N | 550 | 1400 | 2400 | |
| 20,000 h 的轴向力 ⁽⁶⁾⁽⁷⁾ | Axial force for 20,000 h ⁽⁶⁾⁽⁷⁾ | F _{a20.000 h} | | 1200 | 3000 | 3300 | |
| 30,000 h 的径向力 ⁽⁶⁾⁽⁷⁾ | Radial force for 30,000 h ⁽⁶⁾⁽⁷⁾ | F _{r30.000 h} | | 500 | 1200 | 2100 | |
| 30,000 h 的轴向力 ⁽⁶⁾⁽⁷⁾ | Axial force for 30,000 h ⁽⁶⁾⁽⁷⁾ | F _{a30.000 h} | | 1200 | 3000 | 3300 | |
| 最大径向力 ⁽⁷⁾⁽⁸⁾ | Maximum radial force ⁽⁷⁾⁽⁸⁾ | F _{r Stat} | | 900 | 2200 | 3800 | |
| 最大轴向力 ⁽⁷⁾⁽⁸⁾ | Maximum axial force ⁽⁷⁾⁽⁸⁾ | F _{a Stat} | | 1200 | 3300 | 5200 | |
| 20,000 h 倾斜力矩 ⁽⁶⁾⁽⁸⁾ | Tilting moment for 20,000 h ⁽⁶⁾⁽⁸⁾ | M _{K20.000 h} | Nm | 12 | 46 | 109 | |
| 30,000 h 倾斜力矩 ⁽⁶⁾⁽⁸⁾ | Tilting moment for 30,000 h ⁽⁶⁾⁽⁸⁾ | M _{K30.000 h} | | 11 | 40 | 96 | |

| 转动惯量 | Moment of inertia | | | WPLFE064 | WPLFE090 | WPLFE110 | p ⁽¹⁾ |
|---------------------|---------------------------------------|---|-------------------|---------------|---------------|---------------|------------------|
| 转动惯量 ⁽²⁾ | Mass moment of inertia ⁽²⁾ | J | kgcm ² | 0,228 - 0,439 | 0,957 - 1,783 | 1,926 - 3,914 | 1 |
| | | | | 0,220 - 0,359 | 0,909 - 1,286 | 1,819 - 2,892 | 2 |

(1) 减速机级数
 (2) 传动比相关的数值可在 Tec Data Finder 中检索 - www.neugart.com
 (3) T_{min} = -40°C. 理想运行温度最高为 50°C
 (4) 距离减速机 1 m 时; 在输入转速为 n₁=3000 min⁻¹ 且无负荷时测得; i=5
 (5) 最大发动机重量* (单位: kg) = 0.2 × M_b / 发动机长度 (单位: m)
 * 发动机重量对称分布
 * 水平和固定的安装位置
 (6) 数据以 n₂=100 min⁻¹ 的输出轴转速为准。
 (7) 基于输出轴末端
 (8) 更改 T_{2N}, F_r, F_a 以及周期和轴承使用寿命时, 数值存在偏差 (部分较高)。利用 NCP 针对应用进行专门设计 - www.neugart.com

(1) Number of stages
 (2) The ratio-dependent values can be retrieved in Tec Data Finder - www.neugart.com
 (3) T_{min} = -40°C. Optimal operating temperature max. 50°C
 (4) Sound pressure level from 1 m, measured on input running at n₁=3000 rpm no load; i=5
 (5) Max. motor weight* in kg = 0.2 × M_b / motor length in m
 * with symmetrically distributed motor weight
 * with horizontal and stationary mounting
 (6) These values are based on an output shaft speed of n₂=100 rpm
 (7) Based on center of output shaft
 (8) Other (sometimes higher) values following changes to T_{2N}, F_r, F_a, cycle, and service life of bearing. Application specific configuration with NCP - www.neugart.com

| 输出扭矩 | Output torques | | | WPLFE064 | WPLFE090 | WPLFE110 | i ⁽¹⁾ | p ⁽²⁾ | | | | | |
|-----------------------|--------------------------------------|-----------------|-----|-----------------------|-----------------------------------|--------------------|------------------|------------------|----|----|-----|---|---|
| 额定输出扭矩 ⁽³⁾ | Nominal output torque ⁽³⁾ | T _{2N} | Nm | 14 | 40 ⁽⁴⁾ | 80 ⁽⁴⁾ | 3 | 1 | | | | | |
| | | | | 19 | 53 ⁽⁴⁾ | 105 ⁽⁴⁾ | 4 | | | | | | |
| | | | | 24 | 67 ⁽⁴⁾ | 130 ⁽⁴⁾ | 5 | | | | | | |
| | | | | 25 | 65 | 135 | 7 | | | | | | |
| | | | | 18 | 50 | 120 | 8 | | | | | | |
| | | | | 15 | 38 | 95 | 10 | | | | | | |
| | | | | 44 ⁽⁴⁾ | 130 ⁽⁴⁾ | 210 ⁽⁴⁾ | 9 | 2 | | | | | |
| | | | | 44 | 120 ⁽⁴⁾ | 260 ⁽⁴⁾ | 12 | | | | | | |
| | | | | 44 | 110 | 230 | 15 | | | | | | |
| | | | | 44 | 120 | 260 | 16 | | | | | | |
| | | | | 44 | 120 | 260 | 20 | | | | | | |
| | | | | 40 | 110 | 230 | 25 | | | | | | |
| | | | | 44 | 120 | 260 | 32 | | | | | | |
| | | | | 40 | 110 | 230 | 40 | | | | | | |
| | | | | 18 | 50 | 120 | 64 | | | | | | |
| | | | | 15 | 38 | 95 | 100 | | | | | | |
| | | | | 最大输出扭矩 ⁽⁵⁾ | Max. output torque ⁽⁵⁾ | T _{2max} | Nm | | 22 | 64 | 128 | 3 | 1 |
| | | | | | | | | | 30 | 85 | 168 | 4 | |
| 38 | 107 | 208 | 5 | | | | | | | | | | |
| 40 | 104 | 216 | 7 | | | | | | | | | | |
| 29 | 80 | 192 | 8 | | | | | | | | | | |
| 24 | 61 | 152 | 10 | | | | | | | | | | |
| 70 | 208 | 336 | 9 | | | | | 2 | | | | | |
| 70 | 192 | 416 | 12 | | | | | | | | | | |
| 70 | 176 | 368 | 15 | | | | | | | | | | |
| 70 | 192 | 416 | 16 | | | | | | | | | | |
| 70 | 192 | 416 | 20 | | | | | | | | | | |
| 64 | 176 | 368 | 25 | | | | | | | | | | |
| 70 | 192 | 416 | 32 | | | | | | | | | | |
| 64 | 176 | 368 | 40 | | | | | | | | | | |
| 29 | 80 | 192 | 64 | | | | | | | | | | |
| 24 | 61 | 152 | 100 | | | | | | | | | | |

⁽¹⁾ 传动比 (i=n₁/n₂)

⁽²⁾ 减速机级数

⁽³⁾ 利用 NCP 针对应用进行专门设计 – www.neugart.com

⁽⁴⁾ T_{2N} 作用时 寿命不是10.000 h

⁽⁵⁾ 允许输出轴转动30.000转；参见第 142 页

⁽¹⁾ Ratios (i=n₁/n₂)

⁽²⁾ Number of stages

⁽³⁾ Application specific configuration with NCP – www.neugart.com

⁽⁴⁾ Different service life: 10,000 h at T_{2N}

⁽⁵⁾ 30,000 rotations of the output shaft permitted; see page 143

| 输出扭矩 | Output torques | | | WPLFE064 | WPLFE090 | WPLFE110 | $i^{(1)}$ | $p^{(2)}$ |
|---------------------|--------------------------------------|-------------|----|----------|----------|----------|-----------|-----------|
| 急停扭矩 ⁽³⁾ | Emergency stop torque ⁽³⁾ | T_{2Stop} | Nm | 66 | 180 | 360 | 3 | 1 |
| | | | | 86 | 240 | 474 | 4 | |
| | | | | 80 | 220 | 500 | 5 | |
| | | | | 80 | 178 | 340 | 7 | |
| | | | | 80 | 190 | 380 | 8 | |
| | | | | 70 | 170 | 430 | 10 | |
| | | | | 88 | 260 | 500 | 9 | 2 |
| | | | | 88 | 240 | 520 | 12 | |
| | | | | 88 | 220 | 500 | 15 | |
| | | | | 88 | 240 | 520 | 16 | |
| | | | | 88 | 240 | 520 | 20 | |
| | | | | 80 | 220 | 500 | 25 | |
| | | | | 88 | 240 | 520 | 32 | |
| | | | | 80 | 220 | 500 | 40 | |
| | | | | 80 | 190 | 380 | 64 | |
| | | | | 80 | 200 | 430 | 100 | |

| 输入转速 | Input speeds | | | WPLFE064 | WPLFE090 | WPLFE110 | $i^{(1)}$ | $p^{(2)}$ | | | | | |
|---|--|----------|-------------------|-------------------------|--|---------------------|-------------------|-----------|-------|------|------|--|--|
| T_{2N} 和 S1 时的平均热输入转速 ⁽⁴⁾⁽⁵⁾ | Average thermal input speed at T_{2N} and S1 ⁽⁴⁾⁽⁵⁾ | n_{1N} | min^{-1} | 4000 ⁽⁶⁾ | 2800 ⁽⁶⁾ | 2200 ⁽⁶⁾ | 3 | 1 | | | | | |
| | | | | 4400 ⁽⁶⁾ | 3000 ⁽⁶⁾ | 2400 ⁽⁶⁾ | 4 | | | | | | |
| | | | | 4500 ⁽⁶⁾ | 3200 ⁽⁶⁾ | 2600 ⁽⁶⁾ | 5 | | | | | | |
| | | | | 4500 ⁽⁶⁾ | 4000 ⁽⁶⁾ | 3000 ⁽⁶⁾ | 7 | | | | | | |
| | | | | 4500 | 4000 ⁽⁶⁾ | 3300 ⁽⁶⁾ | 8 | | | | | | |
| | | | | 4500 | 4000 | 3500 ⁽⁶⁾ | 10 | | | | | | |
| | | | | 4300 ⁽⁶⁾ | 2900 ⁽⁶⁾ | 2400 ⁽⁶⁾ | 9 | 2 | | | | | |
| | | | | 4500 ⁽⁶⁾ | 3400 ⁽⁶⁾ | 2600 ⁽⁶⁾ | 12 | | | | | | |
| | | | | 4500 ⁽⁶⁾ | 3800 ⁽⁶⁾ | 3100 ⁽⁶⁾ | 15 | | | | | | |
| | | | | 4500 ⁽⁶⁾ | 3800 ⁽⁶⁾ | 3000 ⁽⁶⁾ | 16 | | | | | | |
| | | | | 4500 | 4000 ⁽⁶⁾ | 3400 ⁽⁶⁾ | 20 | | | | | | |
| | | | | 4500 | 4000 ⁽⁶⁾ | 3500 ⁽⁶⁾ | 25 | | | | | | |
| | | | | 4500 | 4000 | 3500 ⁽⁶⁾ | 32 | | | | | | |
| | | | | 4500 | 4000 | 3500 | 40 | | | | | | |
| | | | | 4500 | 4000 | 3500 | 64 | | | | | | |
| | | | | 4500 | 4000 | 3500 | 100 | | | | | | |
| | | | | 最高机械输入转速 ⁽⁴⁾ | Max. mechanical input speed ⁽⁴⁾ | n_{1Limit} | min^{-1} | | 13000 | 7000 | 6500 | | |

⁽¹⁾ 传动比 ($i=n_1/n_2$)

⁽²⁾ 减速级数

⁽³⁾ 允许 1000 次

⁽⁴⁾ 利用 NCP 针对应用设计转速 – www.neugart.com

⁽⁵⁾ 定义请参见第 142 页

⁽⁶⁾ 在 50% T_{2N} 输出和 S1 模式下的平均热传动转速

⁽¹⁾ Ratios ($i=n_1/n_2$)

⁽²⁾ Number of stages

⁽³⁾ Permitted 1000 times

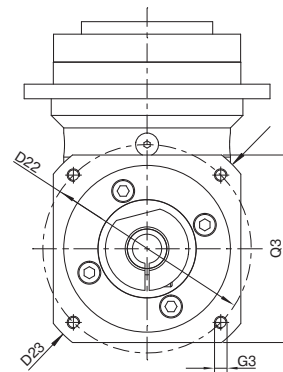
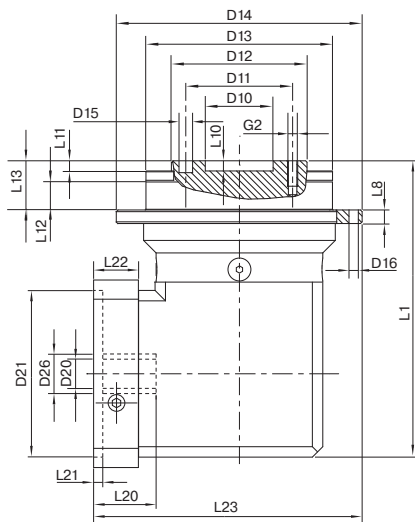
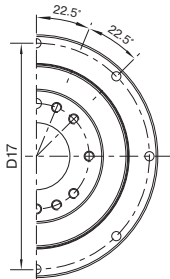
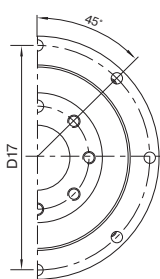
⁽⁴⁾ Application-specific speed configurations with NCP – www.neugart.com

⁽⁵⁾ See page 143 for the definition

⁽⁶⁾ Average thermal input speed at 50% T_{2N} and S1

WPLFE064
WPLFE090

WPLFE110



图示为带平键的 WPLFE090 / 1 级 / 带有配合销孔的法兰输出轴 / 19 mm 锁紧系统 / 适配电机法兰 - 2 件式 - 正方形通用法兰 / B5 电机法兰类型

Drawing corresponds to a WPLFE090 / 1-stage / flange output shaft with dowel hole / 19 mm clamping system / motor adaptation - 2-part - square universal flange / B5 flange type motor
所有其它变量可在 www.neugart.com 下 Tec Data Finder 中检索 - All other variants can be retrieved in the Tec Data Finder at www.neugart.com

| 几何尺寸 ⁽¹⁾ | Geometry ⁽¹⁾ | | | WPLFE064 | WPLFE090 | WPLFE110 | z ⁽²⁾ | Code |
|------------------------------|---|-----|----|---|-----------|------------|------------------|------|
| 输出端定位凹槽直径 | Centering diameter output shaft | D10 | H7 | 20 | 31,5 | 40 | | |
| 输出端安装孔节圆直径 | Pitch circle Ø output shaft | D11 | | 31,5 | 50 | 63 | | |
| 输出轴定位凸台直径 | Centering diameter output shaft | D12 | h7 | 40 | 63 | 80 | | |
| 输出法兰定位凸台直径 | Centering Ø output flange | D13 | | 64 | 90 | 110 | | |
| 输出法兰直径 | Flange diameter output | D14 | | 86 | 118 | 145 | | |
| 输出端安装孔直径 | Mounting bore output | D16 | | 4,5 8x45° | 5,5 8x45° | 5,5 8x45° | | |
| 输出法兰安装孔节圆直径 | Pitch circle Ø output flange | D17 | | 79 | 109 | 135 | | |
| 总长 | Total length | L1 | | 110 | 149 | 198,5 | 1 | |
| | | | | 122,5 | 165,5 | 225,5 | 2 | |
| 输出端法兰厚度 | Flange thickness output | L8 | | 4 | 7 | 8 | | |
| 输出轴定位凸台深度 | Centering depth output shaft | L10 | | 4 | 6 | 6 | | |
| | | L11 | | 3 | 6 | 6 | | |
| 输出法兰定位凸台深度 | Centering depth output flange | L12 | | 7,5 | 10,5 | 10,5 | | |
| 输出法兰长度 | Output flange length | L13 | | 19,5 | 30,0 | 29,0 | | |
| 最小总高度 | Min. overall height | L23 | | 99 | 129 | 161 | | |
| 输入端锁紧系统直径 | Clamping system diameter input | D26 | | 更多信息见第 131 页 More information on page 131 | | | | |
| 电机轴直径 j6/k6 | Motor shaft diameter j6/k6 | D20 | | 具体尺寸视电机/减速机法兰而定。 可以在 www.neugart.com 下 Tec Data Finder. 中针对每个电机适配电机特有的输入法兰几何尺寸 The dimensions vary with the motor/gearbox flange. The input flange dimensions can be retrieved for each specific motor in Tec Data Finder at www.neugart.com | | | | |
| 最大允许的电机轴长 | Max. permis. motor shaft length | L20 | | | | | | |
| 最小允许的电机轴长 | Min. permis. motor shaft length | | | | | | | |
| 输入端定位凹槽直径 | Centering diameter input | D21 | | | | | | |
| 输入端定位凹槽深度 | Centering depth input | L21 | | | | | | |
| 输入端安装孔节圆直径 | Pitch circle diameter input | D22 | | | | | | |
| 输入法兰长度 | Motor flange length | L22 | | | | | | |
| 输入法兰对角线尺寸 | Diagonal dimension input | D23 | | | | | | |
| 安装螺纹 x 深度 | Mounting thread x depth | G3 | 4x | | | | | |
| 输入端法兰外方 | Flange cross section input | Q3 | ■ | | | | | |
| 带有配合销孔的法兰输出轴 (EN ISO 9409-1) | Flange output shaft with dowel hole (EN ISO 9409-1) | | | | | | | |
| 配合销孔 x 深度 | Dowel hole x depth | D15 | H7 | 5x6 | 6x7 | 6x7 | | E |
| 数量 x 螺纹 x 深度 | Number x thread x depth | G2 | | 7 x M5x7 | 7 x M6x10 | 11 x M6x12 | | |

⁽¹⁾ 所有的尺寸单位为mm
⁽²⁾ 减速机级数

⁽¹⁾ Dimensions in mm
⁽²⁾ Number of stages