PYG® 鵬銀精密

精密直线导轨
LINEAR GUIDE

公司简介

浙江鹏银科技发展有限公司坐落于中国重要先进制造业中心——长三角经济带，是台湾鹏银传动科技股份有限公司在大陆的生产基地。

鹏银科技自成立以来，一直秉承“工匠精神”，凭借创始团队 20 余年传动精密部件研发生产技术沉淀，结合台湾鹏银传动科技股份有限公司创新的研发团队和核心价值观，在国内制造业迅速崛起，发展成为集特钢型材研制、精密直线导轨副、精密直线电机模组研发生产及销售于一体的国家高新技术企业。

同时，公司引进了国际先进的精密设备与技术，能够量产行走精度小于 0.003 毫米的直线导轨副，是业界罕有的具有生产超高精密级直线导轨能力的企业之一。

公司旗下“SLOPES(斯乐普)”品牌产品以过硬的质量保证体系和高品质的服务理念短时间内在业界建立了良好口碑，形成了较大影响力。我们始终坚持品质第一的原则，不断提升产品的质量和可靠性，于 2022 年推出“PYG”品牌，完成了产品的迭代升级，直接对标行业内超高精密级的直线导轨副，更好地实现客户需求。

鹏银科技今后将继续进行企业转型升级，走“软性制造 + 个性化定制”道路，紧随全球工业步入 4.0 阶段。

Company Profile

Zhejiang Pengyin Technology & Development Co., Ltd. is located in the Yangtze River Delta Economic Belt, an important center of advanced manufacturing in China. It is the production base of Taiwan Pengyin Transmission Technology Co., Ltd. in China mainland.

Since its establishment, we have been adhering to the "spirit of craftsman", relying on the founding team of more than 20 years of transmission precision parts research and development technology precipitation, combined with Taiwan Pengyin' s innovative research and development team as well as core values, we are growing rapidly in the domestic manufacturing industry, developed into one of the science and technology enterprises that has a collection of special steel profile development, precision linear guide pair, precision linear motor module R & D and sales.

At the same time, our company has introduced international advanced precision equipment and technology, which can mass produce linear guide pairs with walking accuracy less than 0.003mm. It is one of the rare enterprises in the industry with the ability to produce ultra-high precision linear guide.

Our company's brand products of "SLOPES" will create a favorable reputation in a short time with our excellent quality assurance system and high-quality service concepts, forming a greater influence. We always adhere to the principle of quality first, and constantly improve the quality and reliability of products. In 2022, we launched the "PYG" brand to complete the iterative upgrade of products, and directly standard the ultra-high precision linear guide pair in the industry, so as to better meet the needs of customers.

In the future, Pengyin Technology will continue to carry out enterprise transformation and upgrading, take the road of "soft manufacturing + personalized customization", and follow the global industry into the 4.0 stage.

我们的优势 /Our Advantage

型材厂 Raw Material

选材从源头开始把控 Quality Control from Raw Material



加工车间
Guideway Processing Workshop



质量检测 Quality Control



● 我们的荣誉 /Our Honor

16大专利加持，塑造科技型产品

We got more than 16 patent certificates which include utility model patents, invention patents and high-tech enterprise certificates.

● 我们的服务 /Our Service

售前 + 售中 + 售后，7*24小时，优质服务永远在线

Pre-sales + on sales + after sales, excellent service always online for your side

产品优势
PRODUCTS ADVANTAGE

超高精度
FINE-ULTRA-HIGH PRECISION

可量产行走精度小于0.003MM 的直线导轨副

High Precision - We can mass produce linear guides which walking accuracy can reach less than 0.003mm

净 - 全方位防尘
GOOD PERFORMANCE FOR DUSTPROOF - ALL ROUND DUST CONTROL

静 - 低噪音，运行稳
LOW NOISE，MOVE STABLE

目录
CATALOGUE

前言
PREFACE

直线导轨是一种直线运动部件，通过滚动体在滑块与导轨之间作无限循环滚动运动，滑块只需克服极小的摩擦阻力就能在导轨上做高精度，高速度，高刚性的直线运动。和传统滑动导轨相比，具有更低的摩擦系数，大幅度降低滚道接触面的磨损和运行噪音，大大提高了精度，速度和可靠性。是各种数控机床、光学机械、精密仪器等自动化设备中不可或缺的重要功能部件。

Linear guide is a kind of linear motion unit which makes infinite cyclic rolling movements between the slider and the guide rail through the rolling elements such as balls or rollers. The slider only needs to overcome the minimal friction resistance to do high-precision, high-speed, high-rigidity linear movement on the guide rail. Compared to traditional sliding guide, it has lower friction coefficient that reduces the wear of rolling contact surface and operation noise to a large extent, which greatly improved accuracy, speed and reliability. Linear guide becomes an indispensable and important functional component in various CNC machine tools, optical machinery, precision instruments and other automation equipment.

1-1 PYG® 直线导轨的优点

ADVANTAGES OF PYG® LINEAR GUIDE

01
定位精度高
High precision of positioning

由于直线导轨与滑块之间的摩擦方式为滚动摩擦，摩擦系数极小，仅是滑动摩擦的 1/50，动摩擦力与静摩擦力的差距变的特别小，即使在微量进给时也不会出现打滑现象，因此可实现 μm 级的定位精度。

Since the mode of friction between the linear guide slide and the slider block is rolling friction,the friction coefficient is minimal,which is only 1/50 of the sliding friction.The gap between the kinetic and static friction forces becomes very small, and it will not slip even in small feeds,so the positioning accuracy of the μm level can be achieved.

02
低摩擦阻力，精度维持时间长
Low friction resistance,long accuracy maintenance time

直线导轨滚动摩擦阻力小，润滑结构简单，润滑容易，润滑效果好，接触面的磨损非常低，因此可以长时间维持行走平行度。

The linear guide slide has the advantages of small rolling friction resistance,simple lubrication structure,easy lubrication,good lubrication effect,and shallow abrasion of the contact surface,so that it can maintain the walking parallelism for a long time.

03
可同时承受四方向的高负荷能力
High load capacity in four directions at the same time

最佳的几何力学结构设计，可同时承受上，下，左，右方向的负荷，并保持其行走精度，同时可简单方便的施于预压与增加滑块数量，以提高其刚性与负荷能力

The optimal geometric and mechanical structure design can bear the loads in the upper,lower,left,right directions while maintaining its walking accuracy,applying pressure,and increasing the number of sliders to improve its rigidity and load capability.

04
适用高速运动
Suitable for high-speed motion

由于直线导轨移动时摩擦阻力小的特性，对设备的驱动马力需求低，节省能源。且因其运动磨耗小，温升效应低，可同时实现机械小型化与高速化。

Due to the small friction resistance of the linear guides when moving,the driving power of the equipment is required less,which saves energy.Moreover,mechanical miniaturization and high speed can be realized due to its small moving wear and low temperature rising effect.

05
组装容易且具有互换性
Easy assembly and interchangeability

直线导轨的安装只要在铣削或者研磨加工的安装面上，以一定的组装步骤，既可以实现滑轨的加工精密度，可降低传统加工工艺的时间与成本。并且其可互换性，可以将滑块任意装配在同型号的滑轨上，同时又保持相同的顺畅度与精密度 组装方便吗，维修保养简单。

The installation of the linear guides slide can be realize the processing accuracy of the guides by using certain assembly steps on the installation surface of milling or grinding,which can reduce the time and cost of traditional processing processes.Moreover,its interchangeable feature allows the slider to be assembled on the same slide model while maintaining the same smoothness and precision,making it easy to assemble and maintain.

06
润滑简单
Simple lubrication

直线滑轨副若润滑不足，滚动部分的摩擦将会增加，长期的使用会缩短使用寿命，润滑剂可减少滚动部分的摩擦、防止烧伤并降低磨损；在滚动的面与面之间形成油膜，可延长滚动疲劳寿命；同时可防止生锈。直线滑轨副已在滑块上安装油嘴，可直接以注油枪打入油脂，或者换上专用油管接头连接油管，以自动供油机润滑。

The friction on the rolling part will increase if the linear guide slide pair is not lubricated enough,and long-term use will shorten the service life.The lubricants can reduce friction on the rolling parts,prevent burns and reduce wear. Forming an oil film between the rolling faces can prolong the rolling fatigue life and prevent rusting.The linear guide slide pair has a grease nozzle on the slider,which can be directly injected with grease by a grease gun or replaced with a special oil pipe connector to connect the oil pipe to automatically lubricate the oil supply machine.

1-2 选用流程

SELECTION PROCESS

使用条件设定 /Identify the condition

- 用在什么设备上 Type of equipment
- 内部空间的限制 Space limitations
- 精度要求 Accuracy requirements
- 刚性要求 Rigidity
- 受力方式 Stress modes
- 行程 Travel length
- 运行速度、加速度 Moving speed,acceleration
- 使用频率 Working frequency
- 使用环境 Working environment
- 要求寿命年限 Service life

选用产品系列 /Selection of series

- **PHG 系列**：磨床、铣床、车床、钻床、综合加工机、放电加工机、搪床、线切割机、精密量测仪器、木工机器、搬运机器、运送装置。
  PHG series：Grinding machine,milling machine,lathe machine,drilling machine,machining center， electric discharge machine ,boring machine,wire cutting machine,precision measure equipment,wood working machine, handling machine,transporting equipment.

- **PQE/PQH 系列 :** 精密量测仪器、半导体机械、产业自动化机器、雷射雕刻机，可广泛应用于具有高速、安静、低发尘需求的高科技产业。
  PQE/PQH series：Precision measure equipment,semiconductor machinery，automatic equipment，laser marking machine，can be widely used in high-tech industry which required high speed, low noise, low dust generation.

- **PRG/PQR 系列：** CNC 加工机、重切削加工机、CNC 磨床、射出成型机、大型龙门机床
  PRG/PQR series: CNC machining centers,heavy duty cutting machine,CNC grinding machine,injection molding machine,Plano milling machine.

- **PMG 系列：** 印表机、机器手臂、电子仪器设备、半导体设备
  PMG series:Printer machine,robotic arms,electronic equipment,semiconductor equipment.

- **PEG 系列：** 产业自动化机器、半导体机械、雷射雕刻机、包装机器
  PEG series: Automatic equipment, semiconductor equipment，laser marking machine，packing machine.

- **PWE 系列：** 自动化装置、运输设备、精密量测仪器、半导体设备、塑料瓶拉吹设备、机械臂、单轴机器人。
  PWE series:Automatic equipment,transporting equipment,precision measure equipment,semiconductor equipment,blow moulding machine,single axis robot-robotics.

选用精度等级 /Selection of accuracy

- C、H、P、SP、UP 等级视设备精度要求而定
  Precision: C、H、P、SP、UP depends on the accuracy of equipment

滑块尺寸及数量的确定 / Determines the size & the number of blocks

- 根据经验选用 Based on previous experience
- 负荷承载 Dynamic load condition
- 若与滚柱丝杆配合使用，则直线导轨型号与丝杆直径相似，如丝杆外径为 32mm, 则要选择 PHG35 的规格。
  If accompanied with a ball screw, the size should be similar to the diameter of ball screw. For example, if the diameter of the ball screw is 32mm, then the model size of linear guides should be PHG35.

计算滑块最大负荷 / Calculate the maximum load of block

- 参照负荷计算单个滑块最大的有效负荷
  Make reference to load calculation examples, and calculate the max.load.
- 确认选用的直线导轨静安全系数应超过静安全系数使用表所列的数值
  Be sure that the static safety factor of selected linear guides is larger than the rated static safety factor.

选择预压力 /Choosing preload

- 依据刚性要求及安装面精度选用
  Depends on the rigidity requirement and accuracy of mounting surface

确认刚性 /Identify rigidity

- 参考刚性表计算变形量
  提高预压力，加大选用尺寸或增加滑块数量以提高刚性
  Calculate the deformation by using the table of rigidity values, choosing heavier preload and larger size linear guides to enhance the rigidity.

计算使用寿命 / Calculating service life

- 根据使用速度、频率计算寿命距离要求
  Calculate the life time requirement by using the moving speed and frequency.
- 参考寿命公式计算选定的直线导轨的寿命
  Make reference to the life calculation example

润滑选用 / Selection of lubrication

- 可根据设备实际需求选择润滑脂、润滑油或特殊润滑剂润滑
  Select lubricating grease, lubricating oil or special lubricant according to the requirements of the equipment
- 定期注入润滑脂或者自助供油
  Grease supplied by piping joint or self-lubricated.

1-3 额定负荷和导轨寿命

RATED LOAD AND SERVICE LIFE

1. 基本静额定负荷 /Basic Static Load

(1) 基本静额定负荷 [C_0] 的定义

直线导轨在静止或运动中若承受过大的负荷，或受有很大负荷时，会导致珠道接触面和钢珠产生局部的永久变形 : 当永久变形量超过某一限度，将妨碍直线导轨运动的平稳性。基本静额定负荷便是容许这个永久变形量的极限负荷。依照定义 : 负荷的方向和大小不变的状态下 , 在受到最大应力接触面处 , 钢珠与珠道表面的总永久变形量恰为钢珠直径万分之一时的静止负荷。

(1) Static load rating [C_0]

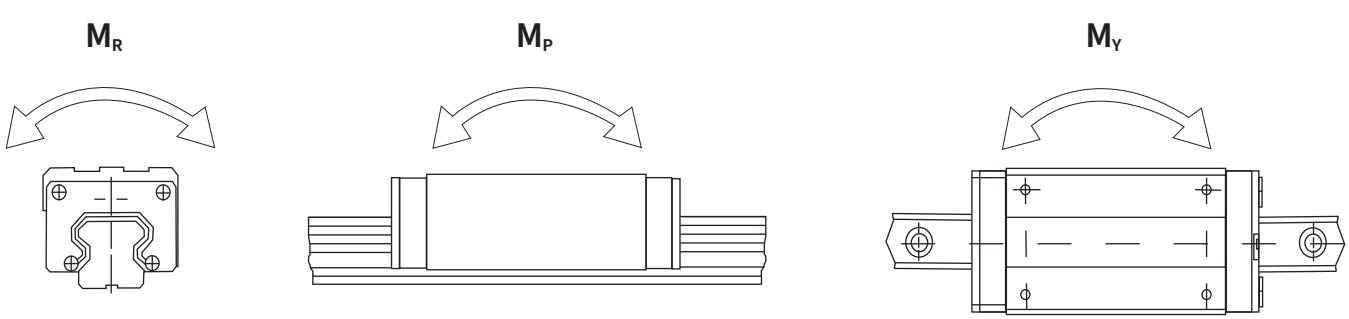
Localized permanent deformation will be caused between the raceway surface and the roling elements when a linear guide is subjected to an excessively large load or an impact load while either at rest or in motion. If the amount of this permanent deformaion exceeds a certain limit, it becomes an obstacle to the smooth operaion of the linear guides. Generally, the definition of the basic static load rating is a staic load of constant magnitude and direction resulting in a total permanent deformation of 0.0001 times the diameter of the rolling element and the raceway at the contact point subiected to the largest stress. The value is described in the dimension tables for each linear guide, A desianer can select a suitable linear guides by referring to these tables. The maximum static load applied to a linear guide must not exceed the basic static load rating.

(2) 容许静力矩 [M_0] 的定义

当滑块中受到最大应力的钢珠达到上述定义之静额定负荷时 , 此时滑块所承载之力矩称为静额定力矩。在直线导轨运动中是以 M_R、M_P、M_Y 这三个方向来定义。

(2)Static permissible moment [M_0]

The static permissible moment refers to a moment in a given direction and magnitude when the largest stress of the rolling elements in an applied system equals the stress induced by the Static Load Rating. The static permissible moment in linear motion systems is defined for three directions: M_R, M_P and M_Y.



(3) 静安全系数

当直线导轨使用在慢速运动或作动频率不高的状况下 , 需考虑静安全系数。根据不同的使用状况，计算静负荷必须考虑不同的安全系数，尤其是当导轨受冲击性负荷时，需要取用较大的安全系数。

(3)Static safety factor

This condition applys when the linear guides system is static or under low speed motion. The static safety factor, which depends on environmental and operating conditions, must be taken into consideration. A larger safety factor is especially important for linear guides subject to impact loads (See Table 1-1). The static load can be obtained by using Eq.1.1.

表格 1 -1 静安全系数使用

Table 1-1 Static Safter Factor

负载条件 /Load Condition	f_{SL}/f_{SM} 下限 (Min)
一般运行状况 /Normal Load	1.0~3.0
运行时受冲击、振动 /With impacts vibration	3.0~5.0

$$f_{SL} = \frac{C_0}{P} \text{ 或是 (or)} f_{SM} = \frac{M_0}{M} \quad \text{Eq.1.1}$$

f_{SL} 静安全系数	f_{SL}:Static safety factor for simple load
f_{SM}: 静安全系数 [力矩负荷]	f_{SM}:Static safety factor for moment
C_0: 基本静额定负荷 [kN]	C_0:Static load rating [kN]
M_0: 容许静力矩 [kN・m]	M_0:Static permissible moment [kN・m]
P : 工作负荷 [kN]	P :Calculated working load [kN]
M : 静力矩负荷 [kN・m]	M :Calculated appling moment [kN・m]

2. 基本动额定负荷 /Basic Dynamic Load

(1) 基本动额定负荷 [C] 的定义

基本动额定负荷用于直线导轨承受负荷并做滚动运动时的寿命计算。其定义是在负荷的方向和大小不变的状态之下，直线导轨的额定寿命为 50km 时（滚柱式直线导轨为 100km) 的最大负荷，此值详列于各规格尺寸表中，使用者可借由此值预先估算出选用之直线导轨的额定寿命。

(1)Dynamic load rating [C]

The basic dynamic load rating is an important factor used for calculation of service life of linear guides . It is defined as the maximum load when the load that does not change in direction or magnitude and results in a nominal life of 50km of operation for a ball type linear guides and 100km for a roller type linear guides. The values for the basic dynamic load rating of linear guides are shown in dimension tables. They can be used to predict the service life for a selected linear guides.

3. 寿命 / Service Life

当直线导轨承受负荷并作运动时，珠道表面与钢珠因不断地受到循环应力的作用 , 一旦到达滚动疲劳的临界值，接触面就会开始产生疲劳破捐，并在部分表面发生鱼鳞状薄片的剥落现象，此种现象叫做表面剥离。寿命的定义即为珠道表面及钢珠因材料疲劳而产生表面剥离时为止的总运行距离。

When the raceway and the rolling elements of the linear guides are continuously subjected to repeated stresses,the raceway surface shows fatigue. Flaking will eventually occur. This is called fatique flaking. The life of a linear guides is defined as the total distance traveled until fatique flaking appears on the surface ofthe raceway or rolling elements.

4. 额定寿命 /Nominal Life

直线导轨的寿命，具有很大的分散性，即使同一批制造的产品，在相同的运动状态下使用，寿命也会所有不同 : 这大多归咎于材料本身在疲劳特性上固有的变化。因此为定义线性滑轨的寿命 , 一般以额定寿命为基准 ; 其定义是 : 以一批同样的产品，逐个在相同的条件及额定负荷下运行 , 其中 90% 未曾发生表面剥离现象而能达到的总运行距离。

The service life varies greatly even when the linear motion guides are manufactured in the same way or operated under the same motion conditions. For this reason, nominal life is used as the criteria for predicting the service life of a linear guide. The nominal life is the total distance that 90% of a group of identical linear guides , operated under identical conditions, can travel without flaking. When the basic dynamic rated load is applied to a linear guide, the nominal life is 50km.

5. 寿命的计算 /Calculation of Nominal Life

直线导轨的寿命会因实际承受工作负荷而不同 , 可依选用之直线导轨的基本动额定负荷及工作负荷推算出使用寿命 .

The acting load will affect the nominal life of a linear guide. Based on the selected basic dynamic rated load and the actual load. The nominal life of ball type and roller type linear guides can be calculated by Eg.1.2 and Eg. 1.3 respectively.

(1) 不考虑环境因素影响 , 寿命计算如下所示。

The nominal life of ball type and roller type linear guides can be calculated by Eg.1.2 and Eg. 1.3respectively.

滚珠型 /Ball type： $L=\left(\frac{C}{P}\right)^{3}\cdot 50km=\left(\frac{C}{P}\right)^{3}\cdot 31mile$ ····· **Eq.1.2**

滚柱型 /Roller type： $L=\left(\frac{C}{P}\right)^{\frac{10}{3}}\cdot 100km=\left(\frac{C}{P}\right)^{\frac{10}{3}}\cdot 62mile$ ····· **Eq.1.3**

L: 额定寿命	L:Nominal life
C：基本动额定负荷	C:Basic dynamic load rating
P：工作负荷	P:Actual load

(2) 若考虑直线导轨使用的环境因素，其寿命会随运动的状态、珠道表面硬度及系统温度而有所变化。

If the environmental factors are taken into consideration, the nominal life is influenced greatly by the motionconditions, the hardness of the raceway, and the temperature of the linear guides, The relationship between these factors is expressed in Eq.1.4 and Eq. 1.5.

滚珠型 /Ballbype： $L=\left(\frac{f_h\cdot f_t\cdot C}{f_w.P_c}\right)^{3}\cdot 50km=\left(\frac{f_h\cdot f_t\cdot C}{f_w.P_c}\right)^{3}\cdot 31mile$ ····· **Eq.1.4**

滚柱型 /Rolerypm： $L=\left(\frac{f_h\cdot f_t\cdot C}{f_w.P_c}\right)^{\frac{10}{3}}\cdot 100km=\left(\frac{f_h\cdot f_t\cdot C}{f_w.P_c}\right)^{\frac{10}{3}}\cdot 62mile$ ····· **Eq.1.5**

L: 寿命	f_t：温度系数	L:Nominal life	f_t：Temperature factor
f_h: 硬度系数	P_c：工作负荷	f_h:Hardness factor	P_c：Calculated load
C：基本动额定负荷	f_w：负荷系数	C：Basic dynamic load	f_w：Load factor

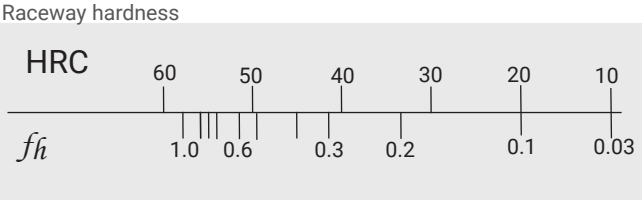
6. 寿命系数 / Factors of Normal Life

(1) 硬度系数 [f_h]/Hardness factor(f_h)

直线导轨的珠道接触表面硬度要求在一定的硬化深度之硬度为 HRC 58~62，倘若硬度值无法达到要求的水准，将会降低直线导轨的额定负荷及使用寿命，此时动、静额定负荷为尺寸表列值再乘以对应的硬度系数。PYG 出厂之直线导轨硬度要求皆为 HRC 58 以上，故 f_h 为 1。

In general. the raceway surface in contact with the roling elements must have the hardness of HRc 58-62 to an appropriate depth. When the specified hardness is not obtained, the permissible load is reduced and the nominal life is decreased. in this situation, the basic dynamic load rating and the basic static load rating must be multiplied by the hardness factor for calculation.

Raceway hardness

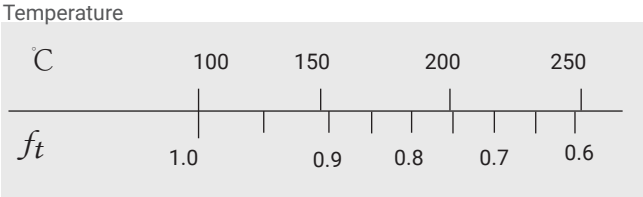


(2) 温度系数 [f_t]/Temperature factor(f_t)

系统温度会对直线导轨的材质有影响 , 当温度高于 100°C时直线导轨的额定负荷及使用寿命将会降低，此时动、静额定负荷表尺寸我列值再乘以对应的温度系数。由于有些配件是塑胶材质较不耐高温 , 故建议使用温度应低于 100° C。

Due to the temperature will affect the material of linear guide, therefore the permissible load will be reduced and the nominal service life will be decreased when over 100℃ . Therefore, the basic dynamic and static load rating mustbe multiplied by the temperature factor. As some accessories are plastic which can't resist high temperature, the working enviornment is recommended to be lower than 100°C

Temperature



(3) 负荷系数 [f_W]/ Load factor[f_W]

作用于直线导轨的负荷，除装置本身自重、起动停止时的惯性负荷及因悬置而产生的力距负荷外，还有因运动伴随而来的振动及冲机负荷，此种型式的负荷并不容易算出 , 根据经验依负荷状况及使用速度，建议将计算负荷值再乘以对应的负荷系数。

The loads acting on a linear guids incude the weight of slide, the inertia load at the times of start and stop and the moment loads caused by overhanging. These load factors are especially difficult to estimate because of mechanical vibrations and impacts. Therefore, the load on a linear guide should be divided by the empircal factor.

表 1-2 负荷系数 Load factor

负荷状况 /Loading Condition	使用速度 /Service Speed	f_W
无冲击力且平滑 /No impacts & vibration	V ⩽ 15m/min	1~1.2
微小冲击力 /Small impacts	15m/min ＜ V ⩽ 60m/min	1.2~1.5
普通负荷力 /Normal load	60m/min ＜ V ⩽ 120m/min	1.5~2.0
受冲击力及振动 /With impacts & vibration	V ＞ 120m/min	2.0~3.5

7. 寿命时间的换算 /Calculation of Service Life

依使用速度及频率将寿命距离换算成寿命时间 。

Transform the nominal life into the service life time by using speed and frequency

滚珠型 /Ball type： $L_h=\frac{L\cdot10^3}{V_e\cdot60}=\frac{(\frac{C}{P})^3\cdot50\cdot10^3}{V_e\cdot60}$ hr ····· **Eq.1.6**

滚柱型 /Roller type： $L_h=\frac{L\cdot10^3}{V_e\cdot60}=\frac{(\frac{C}{P})^{\frac{10}{3}}\cdot100\cdot10^3}{V_e\cdot60}$ hr ····· **Eq.1.7**

L_h: 寿命时间 (hr)　Ve: 运行速率（m/min）　　L_h: Service life　　Ve :Speed (m/min)

L: 寿命（km）　C/P：负荷比　　L: Nominal life（km）　C/P :Load factor

1-4 工作负荷
WORKLOAD

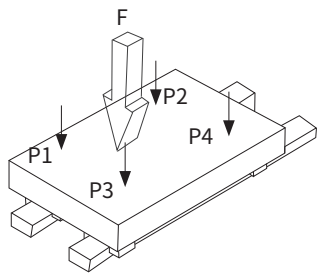
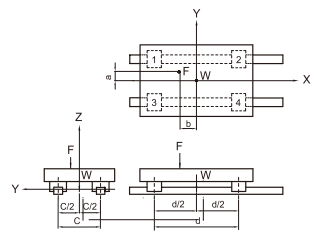
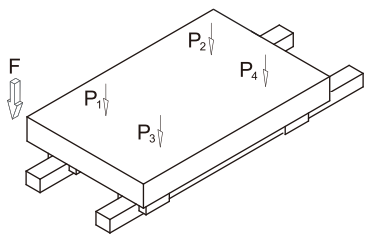
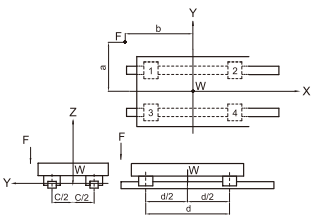
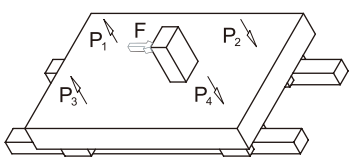
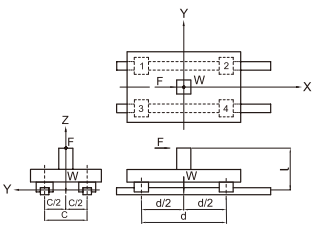
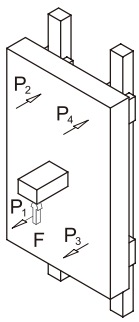
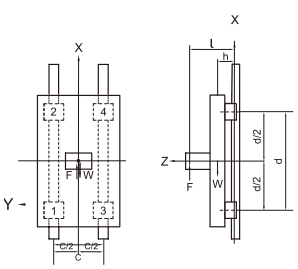
1. 工作负荷计算 / Calculation of Load

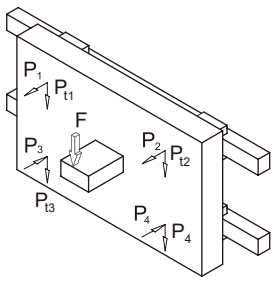
工作负荷的计算方式会随实际受力分布的情形而产生变化 , 例如承载物体本身重心的位置、施力的位置，以及运行时起动、停止的加速度惯性力等皆对负荷的计算发生影响 , 因此使用直线导轨时必须仔细考虑各种负荷状况，以计算出最正确的负荷值。

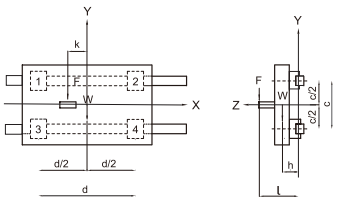
Several factors affect the calculation of loads acting on a linear guides such as the position of the object's center of gravity, the thrust position, and the inertial forces at the time of start and stop. To obtain the correct load value, each load condition should be carefully considered.

(1) 单个导轨承受负荷 / Load on one block

表格 1-3 负荷计算 Table 1-3 Calculation example of loads on block

直线导轨配置图 /Patterns	受力分布图 /Loads layout	单个滑块负荷 /Load on one block
		$P_1=\frac{W}{4}+\frac{F}{4}+\frac{F\cdot a}{2c}+\frac{F\cdot b}{2d}$ $P_2=\frac{W}{4}+\frac{F}{4}+\frac{F\cdot a}{2c}+\frac{F\cdot b}{2d}$ $P_3=\frac{W}{4}+\frac{F}{4}-\frac{F\cdot a}{2c}+\frac{F\cdot b}{2d}$ $P_4=\frac{W}{4}+\frac{F}{4}-\frac{F\cdot a}{4}-\frac{F\cdot b}{2d}$
		$P_1=\frac{W}{4}+\frac{F}{4}+\frac{F\cdot a}{2c}+\frac{F\cdot b}{2d}$ $P_2=\frac{W}{4}+\frac{F}{4}+\frac{F\cdot a}{2c}-\frac{F\cdot b}{2d}$ $P_3=\frac{W}{4}+\frac{F}{4}-\frac{F\cdot a}{2c}+\frac{F\cdot b}{2d}$ $P_4=\frac{W}{4}+\frac{F}{4}-\frac{F\cdot a}{4}-\frac{F\cdot b}{2d}$
		$P_1=P_3=\frac{W}{4}-\frac{F\cdot l}{2d}$ $P_2=P_4=\frac{W}{4}+\frac{F\cdot l}{2d}$
		$P_1 \sim P_4=-\frac{W.h}{2d}+\frac{F\cdot l}{2d}$





$$P_1 \sim P_4 = -\frac{W.h}{2d} + \frac{F \cdot l}{2d}$$

$$P_{t1} = P_{t3} = \frac{W}{4} + \frac{F}{4} + \frac{F \cdot k}{2d}$$

$$P_2 = P_4 = \frac{W}{4} + \frac{F \cdot l}{2d} \cdot \frac{F \cdot k}{2d}$$

注 :W: 重量

F: 外力

P_n: 负荷 (滑块径向，反径向)n=1~4

P_{tn}: 负荷 (滑块侧向)n=1~4

a, b,k: 外力至几何中心之距离

c: 滑轨跨距

d: 滑块跨距

l: 外力至驱动源之距离

h: 重心至驱动源之距离

W: Applied weight

F: External force

Pn: Load(radial,reverse radial),n=1-4

Ptn: Load [lateral), n=1-4

a,b,k: Distance from external force to geometric center

c: Rail spacing

d: Block spacing

l: Distance from external force to driver

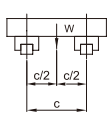
h: Distance from center of gravity to driver

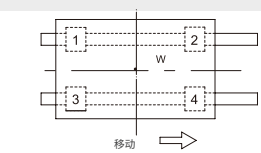
2. 惯性力负荷 / Loads with inertia forces

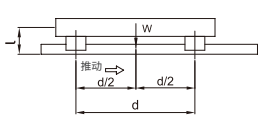
表格 1-4 惯性力负荷计算例　Table 1-4 Calculation Examples for Loads with Inertia Forces

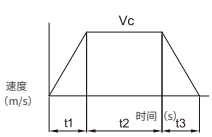
考虑加减速度的范例 /Considering the acceleration and deceleration

F：驱动推力 (N)
W：装置重量 (N)
g: 重力加速度 (9.8m/sec^2)
P_n: 负荷 [径向，反径向) n=1~4
Vc: 速度
tn: 时定数 n=1~3
c、d、l: 距离









W: Weight of object (N)
g:Gravitational acceleration[9.8m/sec^2]
P_n: Load Iradial, reverse radial (N).n=1-4
V_c: Maximum speed [m/sec]
t_1(t_3): Acceleration (deceleration) time (s)
t_2:Constantspeed time (s)
c: Rail spacing(m)
d: Block spacing (m)
l: Distance from center of gravity to driver (m)

滑块承受的作用力 /Load on one block

- 等速 /Constant velocity

$$P_1 \sim P_4 = -\frac{W}{4}$$

- 加速 /Acceleration

$$P_1 = P_3 = \frac{W}{4} + \frac{1}{2} \cdot \frac{W}{g} \cdot \frac{V_c}{t1} \cdot \frac{l}{d}$$

$$P_2 = P_4 = \frac{W}{4} - \frac{1}{2} \cdot \frac{W}{g} \cdot \frac{V_c}{t1} \cdot \frac{l}{d}$$

- 减速 /Deceleration

$$P_1 = P_3 = \frac{W}{4} - \frac{1}{2} \cdot \frac{W}{g} \cdot \frac{V_c}{t3} \cdot \frac{l}{d}$$

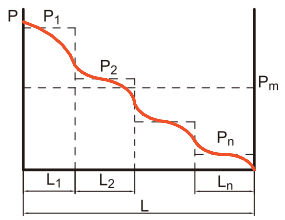
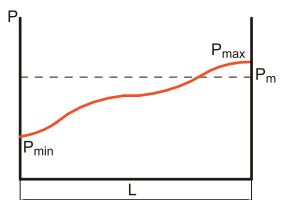
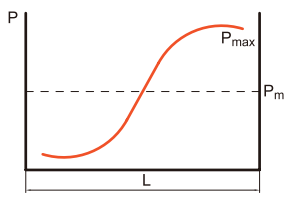
$$P_2 = P_4 = \frac{W}{4} + \frac{1}{2} \cdot \frac{W}{g} \cdot \frac{V_c}{t3} \cdot \frac{l}{d}$$

3. 平均负荷计算 / Calculation of The Mean Load for Variable Loading

在运行中滑块承受的负荷有时并不是均等的，比方搬送装置的运行，其前进时额外承受货物的重量，退回时则只承受装置本身的重量，负荷呈现阶梯式变化，因此必须求出运行中的平均负荷以计算寿命 , 平均负荷的定义是与负荷变动条件下寿命相等的等效负荷值。

When the load on a linear guide fluctuates greatly, the variable load condition must be considered in the life calculation. The definition of the mean load is the load equal to the bearing fatigue load under the variable loading conditions. It can be calculated by using table 1-5.

表格 1-5 平均负荷计算例　Table 1-5 Calculation Examples for Mean Load (Pm)

负荷变动种类 /Operation Condition	平均负荷力 /Mean load
阶梯式变动 Step load 	$P_m=\sqrt[3]{1/L(P_1^3\cdot L_1+P_2^3\cdot L_2+\cdots+Pn^3\cdot Ln)}$ P_m: 平均负荷　P_m : Mean load Pn: 变动负荷　Pn ： Stepping L : 总运行距离　L:Total running distance Ln.: 受 P_n 负荷的运行距　L_n:Running distance under load P_n
单调式变动 Linear variation 	$P_m=1/3(P_{min}+2\cdot P_{max})$ P_m: 平均负荷　P_m: Mean load P_{min}: 最小负荷　P_{min}: M_{min} load P_{max}: 最大负荷　P_{max}: M_{max} load
正弦式变动 Sinusoidal ngvaa 	$P_m=0.65\cdot P_{max}$ P_m: 平均负荷　P_m:Mean load P_{max}: 最大负荷　P_{max}:M_{max} load

4. 两个方向等效负荷计算 / Calculation for Bidirectional Equivalent Loads

PYG 直线导轨能承受上、下、左、右四个方向负荷，故在使用直线导轨时有可能同时受到垂直方向负荷 (Ps): 及侧方向负荷 (Pl) 门，可依照下列公式换算等效负荷 (Pe)。

PYG linear guides can accept loads in several directionss imultaneously.To calculate the service life of the linear guides when the loads appear in multiple directions, calculate the equivalent load (Pe) by using the equations below.

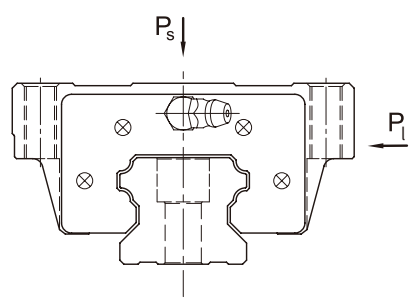
PHG/PQH/PRG/PQR/PEG/PQE/PMG/PWE Series

$P_e=P_s+P_l$ ····· Eq.1.5

PMG Series

when $P_s>P_l$　$P_e=P_s+0.5\cdot P_l$ ····· Eq.1.6

when $P_l>P_s$　$P_e=P_l+0.5.P_s$ ····· E9.1.7

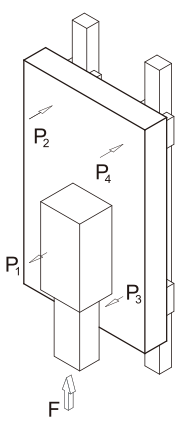


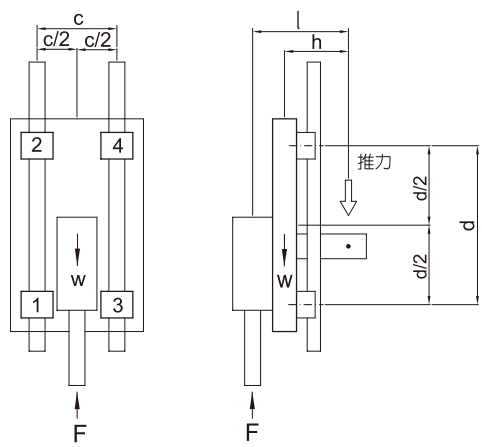
5. 直线导轨使用寿命的计算例 /Calculation Example for Service Life

根据经验选用直线导轨的型式、规格，再依实际使用情况估算单个滑块最大工作负荷，计算动额定负荷与工作负荷之负荷比推算出其使用寿命
A suitable linear guide should be selected based on the acting load. The service life is calculated from the ratio of the working load and the basic dynamic load rating.

表格 6 寿命的计算例　Table 6 Calculation Example for Service Life

直线导轨的使用规格 /Type of Linear Guides	设备尺寸 /Dimension of device	加工条件 /Operating condition
型式 :PHGH 30 CA C :38.74 kN C :52.19 kN 预压 : Z0 Type: PHGH 30 CA C :38.74 kN C.:52.19 kN Preload:Z0	d:600mm c:400mm h :200 mm l:250 mm	装置本身的重量 (W):15 kN 钻孔作用力 (F):1 kN 系统温度 : 常温 负荷状态 : 普通负荷 Weight (w) : 15 kN Acting force (F): 1 kN Temperature:Normal temperature Load status:Normal load





- 滑块承受负荷计算 /Calculation of acting loads

$$P_1 \sim P_4 = +\frac{W \times h}{2d} - \frac{F \times l}{2d} = +\frac{15 \times 200}{2 \times 600} - \frac{1 \times 250}{2 \times 600} = 2.29(KN)$$

$$P_{max} = \left| P_1 \sim P_4 \right| = 2.29(KN)$$

- 因选用 Z0 预压，因此 Pc=Pmax=2.29 (kN) 注 : 若选择较重的预压 (ZA、ZB) 虽会提升刚性，但会降低其使用寿命
- 寿命 L 计算
  Because preloadis Z0,Pc= Pmax= 2.29(kN) Note: The larger preload (ZA, AB) will increase the rigidity.but decrease the nominal life of linear guides.
  Calculation for life L

$$L = \left(\frac{f_h \times f_t \times C}{f_w \times P_c} \right)^3 \times 50 = \left(\frac{1 \times 1 \times 38.74}{2 \times 2.29} \right)^3 \times 50 = 30,258(km)$$

1-5 摩擦系数
FRICTION COEFFICIENT

直线导轨借由钢珠做滚动导引，故其摩擦力可以减小到传统滑动导引的 1/50，尤其是静摩擦非常小、和动摩擦没有太大的差别，因此不会发生空转打滑的现象而能实现微米级的运动精度；一般而言，直线导轨的摩擦系数约为 0.004。

其中刮油片阻力因规格不同而异，其值列于各规格之摩擦力章节。

As mentioned in the preface, a linear guides allows a type of rolling motion, which is achieved by using balls or When a load is 10% or less than the basic static load rate, the most of the resistance comes from the grease viscosityand frictional resistance between balls. In contrast, if the load is more than the basic static load rating, the resistance will mainly come from the load.

$F=\mu \cdot W+S$ Eq.1.8

F: 摩擦力 (kN)

S: 刮油片阻力 (kN)

μ: 摩擦力系数

W: 运动垂直方向负荷 (kN)

F: Friction (kN):

S: Friction resistance (kN)

μ :Coefficient of friction

W : Normal loads (kN)

1-6 预压
PRELOAD

在滚动体线性运动领域中 , 增加预压力可以有效提高滑块刚性 , 但会影响滑块额定寿命。刚性的定义如下式所示。滑块的预压等级分为轻预压 Z0、中预压 ZA、重预压 ZB 三个等级。每个预压等级呈现不同的刚性表现，刚性越好，滑块变形量越低，下图为其范例。

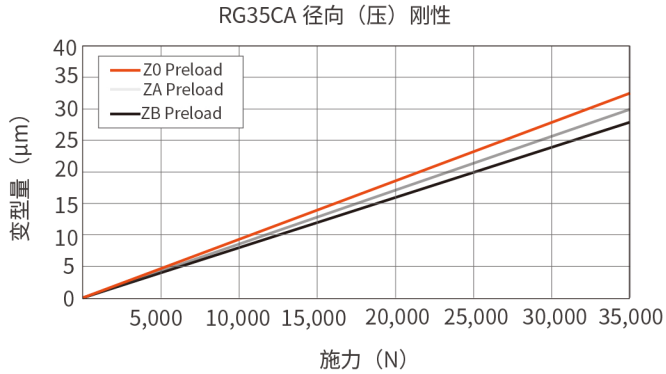
With linear guideways, the block can be preloaded to increase stiffness and the internal preload must be consideredin the life calculation, Preload is classified by three classes: Z0, ZA,ZB, Each preload level has a different deformationof the block, higher stiffness presents lower deformation. Stifness in three axis are used by most applications. Thedefinition of stiffness examples shown below:

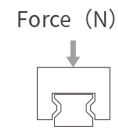
$K=\frac{P}{\delta}$

δ：变形量（μm）

P：施力（N）

K：刚性（N/μm）



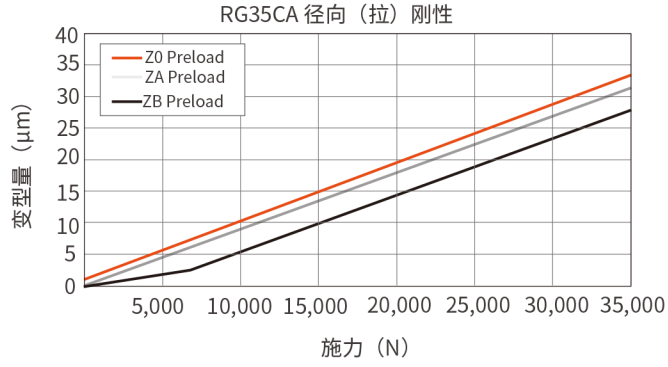


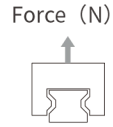
$K=\frac{P}{\delta}$

δ：变形量（μm）

P：施力（N）

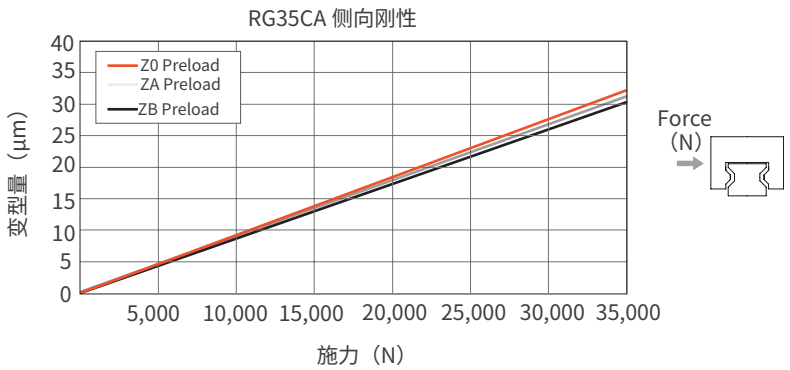
K：刚性（N/μm）





$$K=\frac{P}{\delta}$$

δ：变形量（μm）
P：施力（N）
K：刚性（N/μm）



1-7 润滑与防尘

LUBRICATION AND DUST PROOF

直线导轨若没有适当的进行给予润滑 , 滚动部分的摩擦就会增加，长期的使用下来会成为缩短寿命的主要原因。润滑剂便提供下列几种作用 :

- 减少滚动部分的摩擦、防止烧伤并降低磨损。
- 在滚动的面与面之间形成油膜，可延长滚动疲劳寿命。
- 防止生锈

Supplying insuficient lubrication to the linear guides will greatly reduce the service life due to an increase in rolling friction. The lubricant provides the following functions;

- Reduces the rolling friction between the contact surfaces to avoid abrasion andsurface burning of the linear guides.
- Generates a lubricant film between the rolling surfaces and decreases fatique.
- Anti-corrosion.

1. 润滑油脂 / Grease

每组直线导轨以润滑珠槽轨道，虽然润滑油脂较不易流失 , 但为避至因润滑损耗造成润滑不足，建议客户使用距离达 100 km 时，应再补充润滑油脂一次，此时可用注油枪借由滑块上所附油嘴，将油脂打入滑块中。润滑油脂滴用于速度不超过 60m/min，且对冷却作用无要求的场合。

Linear guides must be lubricated with the lithium soap based grease before installation. After the linear guides is installed, we recommend that the guides be re-lubricated every 100 km. it is possible to carry out the lubrication through the grease nipple. Generally, grease is applied for speeds that do not exceed 60 m/min faster speeds will require high-viscosity oil as a lubricant.

$$T=\frac{100.1000}{V_e \cdot 60}\ \text{hr} \quad \text{Eq.1.9}$$

T: 注油频率（hour）　　T : Feeding frequency of oil (hour)
V_e: 速度（m/min）　　V_e: speed (m/min)

2. 润滑油 / Oil

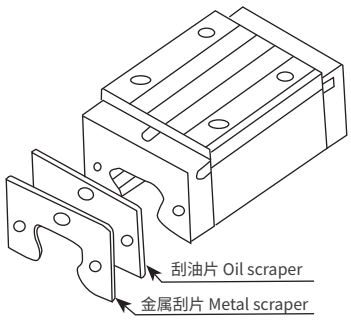
建议客户使用油黏滞力约为 30~150cSt 之润滑油润滑直线导轨。PYG 可根据客户需要在原先放油的位置安装油管接头，因此客户只要将机台预设之油管接上油管接头即可。润滑油的损耗比润滑油脂更快，使用时必须注意供油是否充足，若润滑不足易造成直线导轨异常磨耗降低其寿命，建议打油频率约为 0.3cm^3/hr，客户可依其使用状斟酌使用。润滑油适用于各种负载及速度的场合，但由于润滑油易挥发不适用于高温润滑。

The recommended viscosity of oil is about 30~150cSt. The standard grease nipple may be replaced by an oil piping joint for oil lubrication. Since oil evaporates quicker than grease, the recommended oil feed rate is approximate 0.3cm^3/hr.

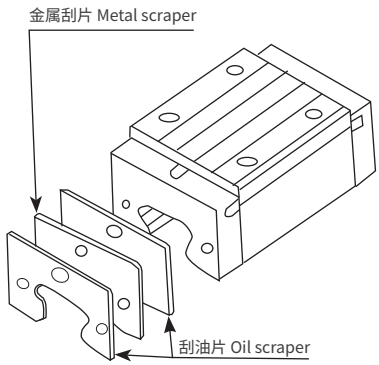
3. 防尘 / Dust Proof

防尘：一般没有特别需求的作业环境使用标准型，若有特殊防座需求，请在产品型号后加注代码（ZZ 或 ZS）。

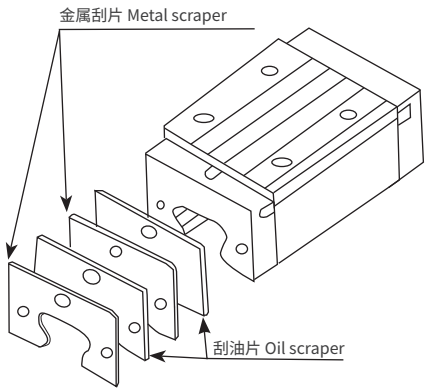
Dustproot: Generally, the standard type is used in a working environment with no special requirement. lf there isa special dustproof requirement, please add the code (ZZ or ZS) after the product model.



标准型
Standard type



ZZ(双防尘型)
ZZ（dual dustproof type）

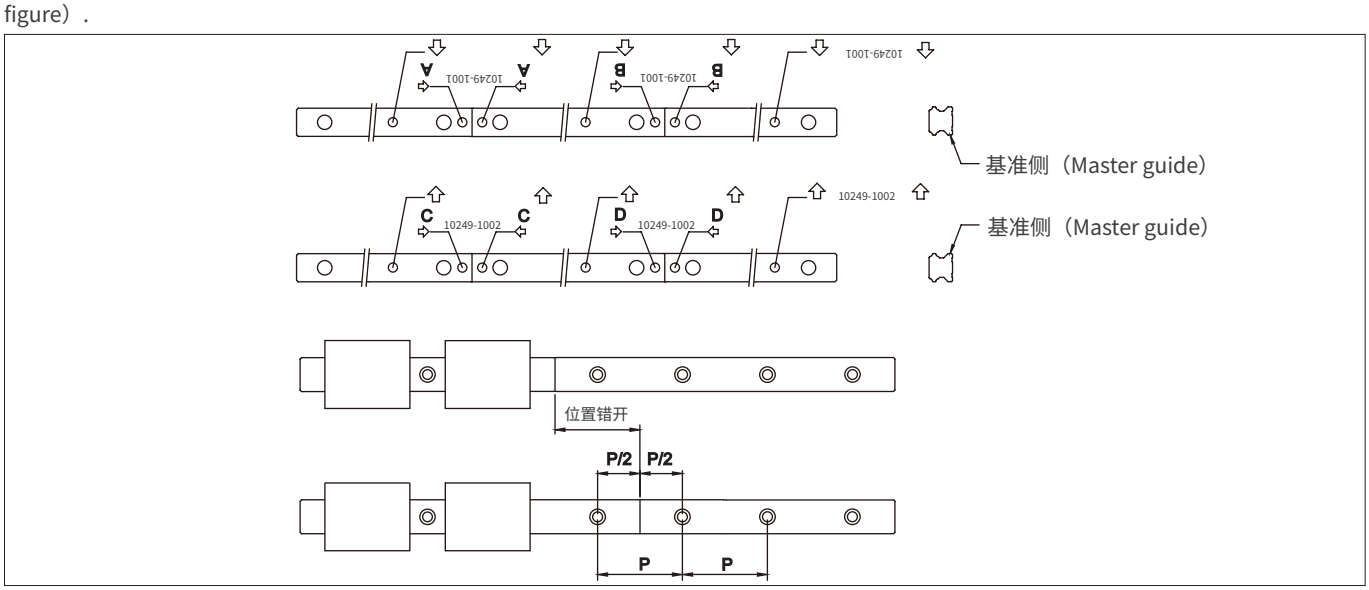


ZS(ZZ+ 金属挡板)
ZS（ZZ+ Metal scraper）

1-8 对接导轨
JOINTED RAIL

直线导轨安装时必须依照滑轨上标示顺序安装，以确保直线导轨精度；且建议配对之滑轨接牙位置最好能错开，以避免床台至接牙虚因不同导轨差异而造成精度不良。

Jointed rail should be installed by following the arrow sign and ordinal number which is marked on the surface ofeach rail.For matched pair, jointed rails, the jointed positions should be staggered. This will avoid accuracy problems due to discrepancies between the 2 rails (see figure）.

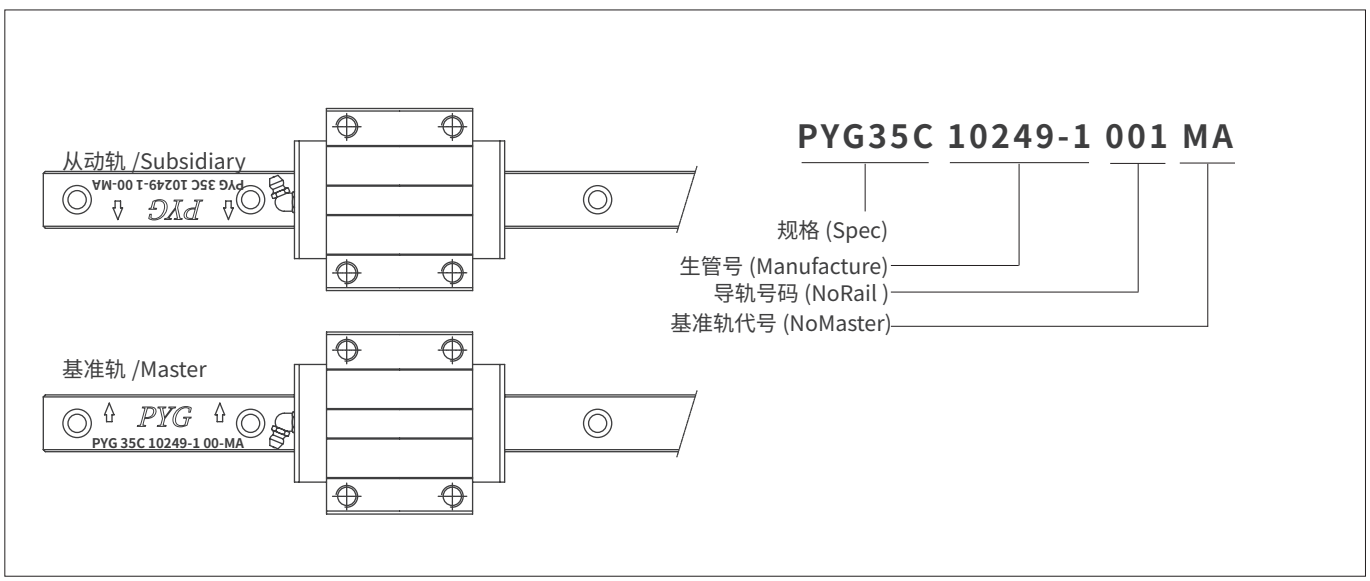


1-9 直线导轨的安装
INSTALLATION OF LINEAR GUIDES

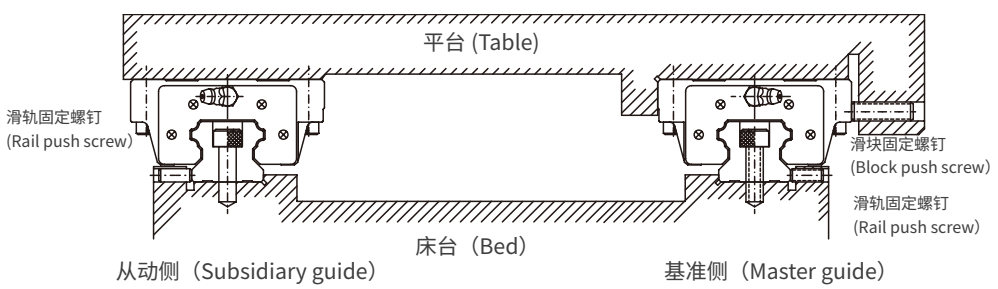
直线导轨必须根据机台使用状况，如受振动、冲击力力的程度 , 要求的行走精度及机台限制而设定其安装方法。
Three installation methods are recommended based on the required running accuracy and the degree of impacts andvibrations.

1. 基准轨与从动轨 / Master and Subsidiary Guide

当非互换型直线导轨配对使用时，需注意基准轨与从动轨之差异。基准轨侧基准面精度较从动轨高，可作为床台安装承靠面。基轨上有刻上 MA 之记号，如图所示。
For non-interchangeable type Linear Guides, there are some differences between the master quide and subsidiary quide. The accuracy of the master quide's datum plane is better than the subsidiary's and it can be areference side for installation. There is a mark "MA" printed on the rail, as shown in the figure below.



2. 床台受到振动及冲击力作用，且要求高副性、高精密度的安装
Installation to Achieve High Accuracy and Rigidity

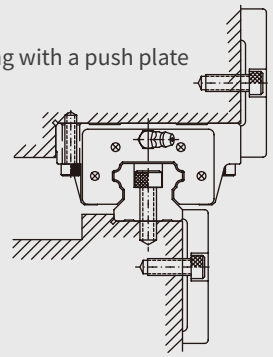


（1）固定方式 /Mounting methods

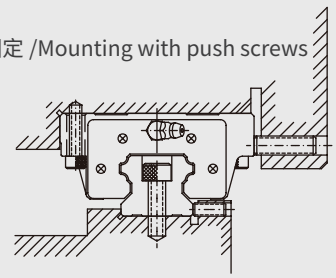
当床台受到振动、衝击力的作用时，滑轨及滑块很可能偏离原来的固定位置 , 而影响精度。为避免发生类似的状况，建议使用下图所列的四种固定方式固定滑轨及滑块，以确保机台的运行精度。

It is possible that the rails and the blocks will be displaced when the machine is subjected to vibrations and impactsTo eliminate these difficulties and achieve high running accuracy, the following four methods are recommendedfor fixing.

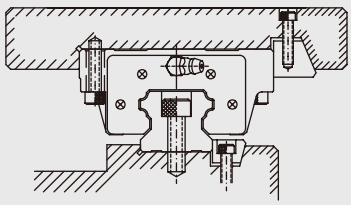
使用压板固定 /Mounting with a push plate



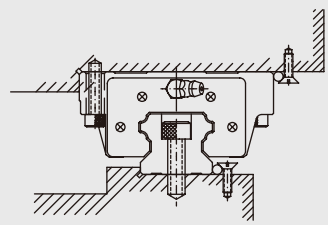
使用固定螺钉固定 /Mounting with push screws



使用推拔固定 Mounting with taper gib



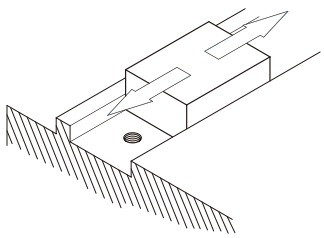
使用滚柱固定 /Mounting with needle roller



(2) 导轨安装 /Procedure of rail installation

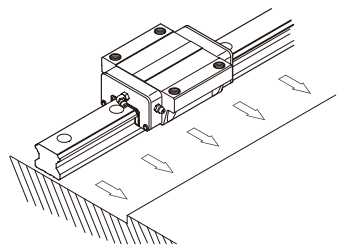
1 . 清除床台装配面的污物。

1.Before starting,remove all dirt from the mounting surface of the machine.



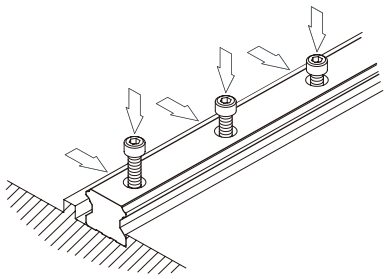
2. 将直线导轨平稳的放在床台上，并让滑轨侧边基淇面靠上床台装配面。

2 .Place the linear guides gently on the bed Bring the guides into close contact with the datum plane of the bed.



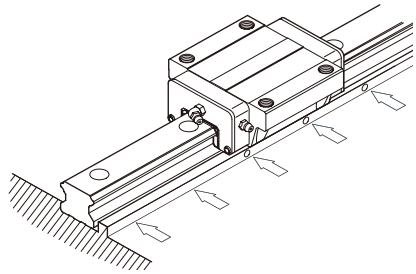
3 试锁装配螺丝以确认螺栓孔是否吻合，并将滑轨底部基准面大概固定于床台底部装配面。

3.Check for correct thread engagement when inserting a bolt into the mounting hole while the railis being placed on the mounting surface of the bed.

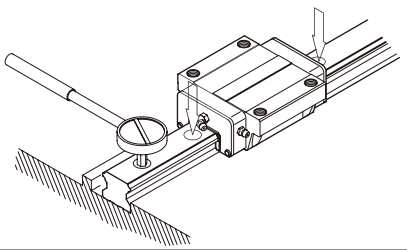


4 使用侧向固定螺钉，按顺序将导轨侧基准面逼紧床台侧边装配面，以确定滑轨位置。

4.Tighten the push screws sequentially to ensure closecontact between the rail and the side datum plane.

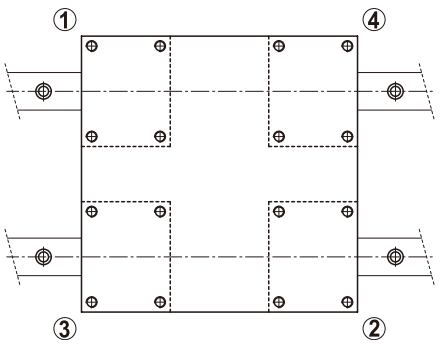


5 使用扭力板手，以特定扭力按顺序锁紧装配螺，
将滑轨底部基准面逼紧床台底部装配面。
5.Tighten the mounting bolts with a torque wrench to the specified torque.



6 . 依步 1 至 5 安装其配对导轨。
6 .Install theremaining linear quidewayin the same way.

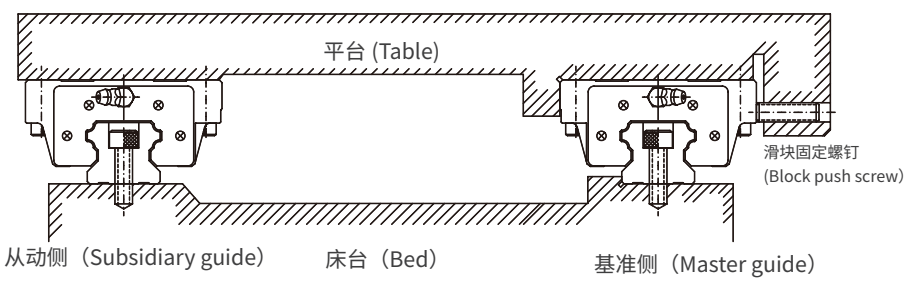
(3) 滑块安装 /Procedure of block installation



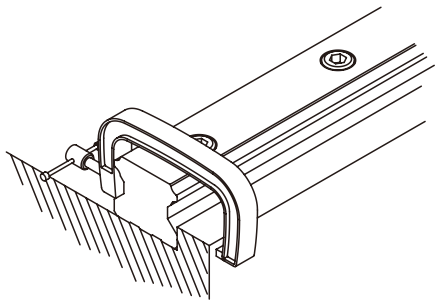
- 使用装配螺丝将承载平台大概固定于滑块上。
- 使用固定螺丝，将滑块侧边基准面紧固于平台侧装配面上，以确定滑块位置。
- 锁紧装配螺丝将承载平台按 1~4 对角线顺序紧固于滑块上。
- Place the table gently on the blocks. Next, tightenthe block mounting bolts temporarily.
- Push the blocks against the datum plane of the table and position the table by tightening the pushs.
- The table can be fixed uniformly by tightening themounting bolts on master guide side and subsidiary side in 1 to 4 sequences.

3. 滑轨无侧向固定螺钉的安装
Installation of the Master Guide without Push Screws

在无固定螺钉的安装例中为确保从动侧滑轨与基准侧滑轨间的平行度，滑轨可依下列所示安装，而滑块的安装则与前述范例相同。
To ensure parallelism between the subsidiary guide and the master quide without push screws, the following railinstallation methods are recommended. The block installation is the same as mentioned previously.



（1）基准侧导轨的安装 /Installation of the rail on the master guide side



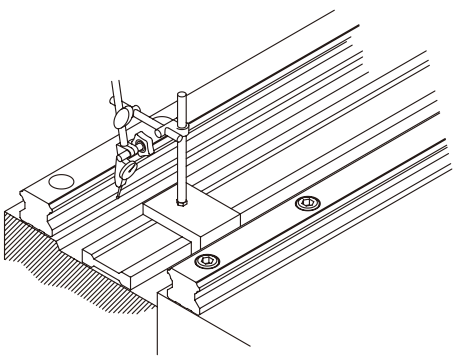
- 虎钳夹紧法

  先使用装配螺丝将滑轨底部基准面大概固定于床台底部装配面，再用虎钳将滑轨侧基面逼紧床台侧边装配面，以确定滑轨位置后，使用扭力板手，以一定的扭力按顺序锁紧固定螺丝，将滑轨底部基准面逼紧床台底部装配面。

- Using a vice

  Place the rail into the mounting plane of the bed.Tighten the mounting bolts temporarily; then use avice to push the rail against the side datum plane othe bed. Tighten the mounting bolts in sequence tothe specified torque.

（1）从动侧导轨的安装 /Installation of the rail on the subsidiary guide side

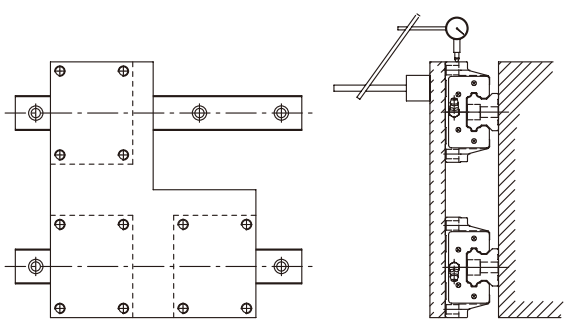


- 直线块规法

  将直线块规置于两支滑轨间，使用干分量表校准直线块规，使之与基准侧滑轨之侧边基准面平行，再依直线块规校准从动侧滑轨，从滑轨的一端开始校准并依序以特定的扭力锁紧装配螺丝。

- Method with use of a straight edge

  Set a straight edge between the rails parallel to the side datum plane of the rail on the master guide side by using a dial gauge. Use the dial gauge to obtain the straight alignment of the rail on the subsidiary guide side. When the rail on the subsidiary guide side is parallel to the master side, tighten the mounting boltsin sequence from one end of the rail to the other.

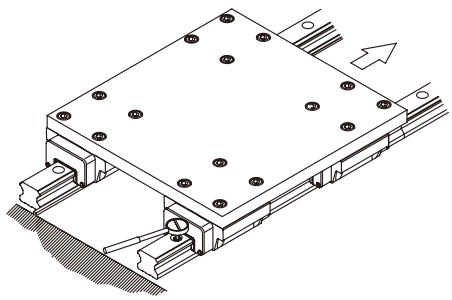


- 移动平台法

  将基准侧两个滑块固定在一个测定平台上，而从动侧只装上一个滑块，其滑轨与滑块都尚未紧固于床台与平台，使用附于从动侧滑块顶面千分量表，量测从动侧滑块的侧基准面，从滑轨的一端开始校准并依序以特定的扭力锁紧装配螺丝。

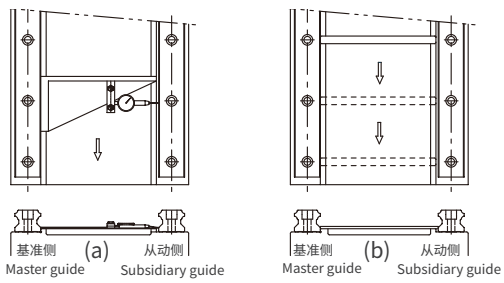
- Method with use of a table

  Fix two blocks on the master quide side to the table Temporarily fix the rail and one block on the subsidiary guide side to the bed and the table. Fix a dial qauge stand on the table surface and bring it into contact with the side of the block on the subsidiary guide side Move the table from one end of the rail to the otherWhile aligning the rail on the subsidiary side paralleto the rail on the master quide side, tighten the bolts insequence.



- 仿效基准侧滑轨法
  将基准侧线轨的两个滑块及从动侧线轨其中一个滑块固定于平台，再将从动侧的滑轨及其另一个滑块略分别固定于床台及平台，以基准侧滑轨为移动平台，从滑轨一端开始，边确认从动侧性滑的滚动阻力，边依序以特定的扭力锁紧装配螺。

- Method following the master guide side
  When a rail on the master guide side is correctly tightened, fix both blocks on the master quide sideand one of the two blocks on the subsidiary guide side completely to the table.When moving the table from one end of the railtighten the mounting bolts on the subsidiary guide side completely.

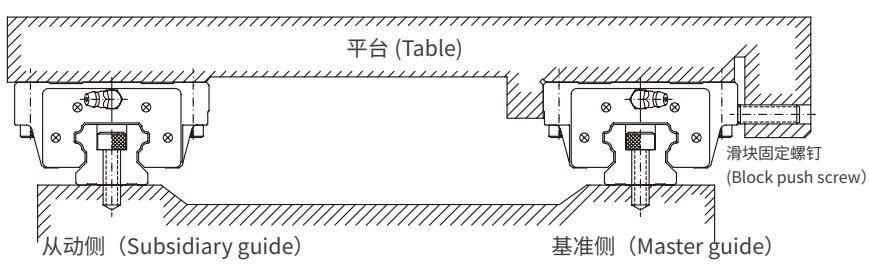


- 专用工具法
  使用专用工具确定从动侧滑轨的位置，并依序以特定的扭力锁紧装配螺丝。

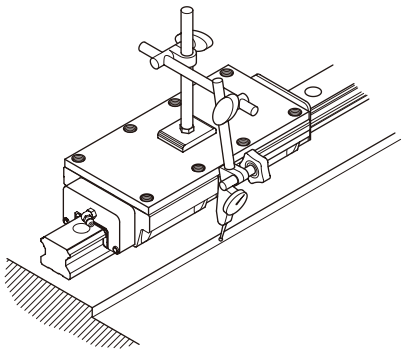
- Method with use of a jig
  Use a special jig to ensure the rail position on the subsidiary guide side. Tighten the mounting bolts to the specified torque in sequence.

4. 滑轨无侧向定位装配面的安装
When There ls No Side Surface of The Bed On The Master Guide Side

在无侧向定位装配面的安装例中为确保从动侧滑轨与基准侧滑轨间的平行度，滑可依下列所示安装，而滑块的安装则与前述范例相同。
To ensure parallelism between the subsidiary guide and the master quide when there is no side surface, the followingrail installation method is recommended. The installation of the blocks is the same as mentioned previously.



（1）基准导轨的安装 /Installation of the rail on the master guide side

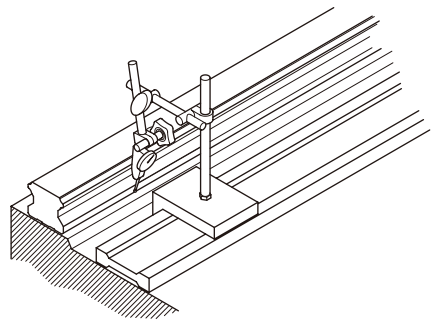


• 假基基面法

使用两个滑块紧密接合固定于测定用平板，依床台滑轨装配附近的基准面为准，使用千分量表校准基准侧滑轨之侧边基准面，从滑轨的一端开始校准并依序以特定的扭力锁紧装配螺丝。

Using a provisional datum plane

Two blocks are fixed in close contact by themeasuring plate. A datum plane provided on the bed is used for straight alignment of the rail from one end to the other. Move the blocks and tighten the mounting bolts to the specified torque in sequence.



• 直线块规法

依直线块规，使用千分量表校准基准侧滑轨之侧边基准面，从滑轨的一端开始校准并依序以特定的扭力锁紧装配螺丝。

Method with use of a straight edge

Use a dial gauge and a straight edge to confirm the straightness of the side datumplane of the rail from one end to the other.Make sure the mounting bolts are tightened securelyin sequence.

（2）从动侧滑轨的安装 /Installation of the rail on the subsidiary guide side

与无侧向固定螺钉安装例所列的方法相同。

The method of installation for the rail on the subsidiary guide side is the same as the case without push screws

5. 直线导轨安装注意事项 / Linear Guides Mounting Instructions

1. 直线导轨产品在出货前，均涂布适量的防铺油，安装使用前请先擦拭滑轨的防油，才可移动滑块 。

2. 确认基准轨与从动轨 : 当非互换型直线导轨配对使用时，需注意基准轨与从动轨之差异。基准轨侧边基准面精度较从动轨高，可作为床台安装承靠面。基准轨上有刻上 MA 之记号。而且，双轨配对使用时，基准轨编号为奇数，而从动轨之滑轨编号为偶数，安装时请依照符号的指示，按顺序进行安装 (例如 :001 与 002 配对、003 与 004 配对…），如图一所示。如为多轨安装，请以此类推。

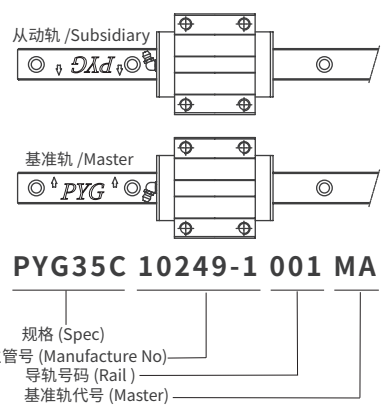
3. 确认安装基准面 : 滑轨基准面为 PYG 字样旁所指的侧边平面（B); 而滑块基准面则为经过研磨的光滑表面 (D)。(如图二)

1. PYG guides are supplied with a coating of anti-corrosion oil before being shipped. Please clean the oil beforemoving or running the blocks.

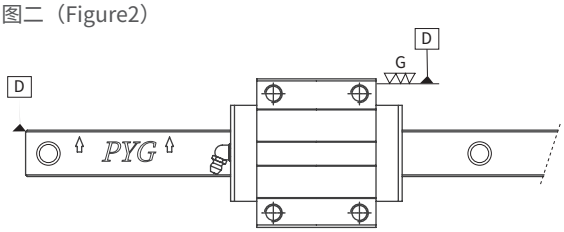
2.Recognition of master and subsidiary rails:Fornon-interchangeable type linear guides, there are some differences between the master rail and subsidiary rail. The accuracy of the master rail'sdatum plane is better than the subsidiary's and it can be a reference side for installation. There is a mark"MA" printed on the rail. Check for the correct order before starting the installation. The rail number omaster is an odd number and the rail number of subsidiaryis an even number. Please install the rails according to the indication and carry on the installation according to the order for multi-railsinstallment (e.g.:001 pairs 002 ;003 pairs 004 etc.)

3.Recognition of datum plane: The datum plane (B)of rail is the side indicated by the arrow, which is marked on the top surface of the rail. The datumplane of block is smooth ground surface which shows as D in Figure 2.

图一（Figure1）



图二（Figure2）



4. 滑轨接牙件 : 滑轨接牙安装时必须依照滑轨上标示顺序安装，以确保直线轨道精度。接牙标帜在接牙端的上表面，请将相同接牙标志的两端接在一起 , 如图三所示。且建议配对之滑轨接牙位置最好能错开，以避免床台至接牙虚因不同滑轨差异而造成精度不良，如图四所示。

Butt-joint rail: Butt-joint rail should be installed by following the arrow sign and ordinal number which is markedon the surface of each rail as shown in the figure 3. To avoid accuracy problems due to discrepancies between the 2rails such as for matched pair, butt-joint rails, the jointed positions should be staggered as shown in figure 4.

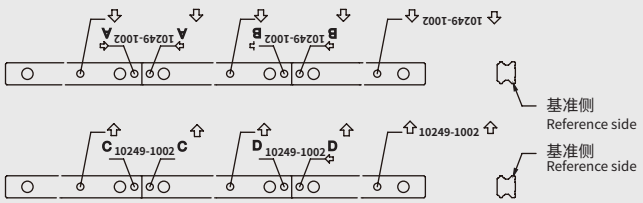


图 3 （Figure 3）

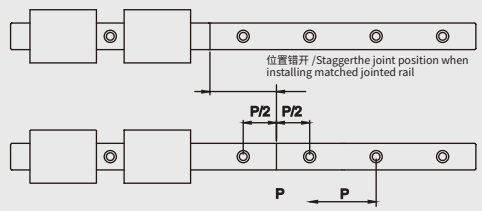
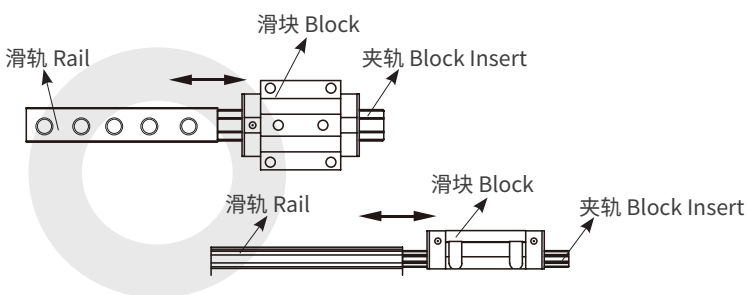
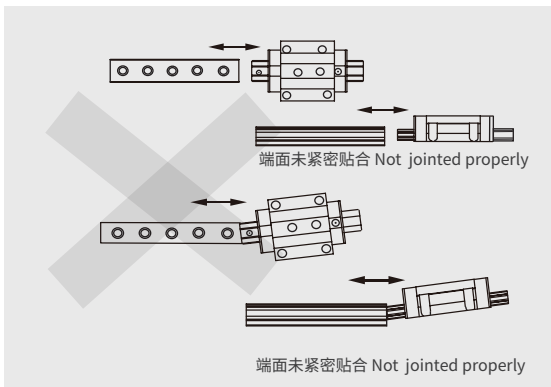


图 4 （Figure 4）

5. 安装直线导轨时，非必要 , 请勿将滑块卸下。如须将滑块自滑轨上拆下或装上时 , 请使用所附的夹轨 (使用方式如图五)。

Do not remove blocks from rails when assembling the quideways in machines as far as possible. Please use blockinserts lplease see Fiqure (5) if it is necessary to remove /mount block from /onto rail.





6. 安装直线导轨时，请勿将非互换型滑轨之滑块任意对调使用，以免影响精度。

Please do not randomly mix block units and rails for noninterchangeable type to avoid any installation problem.

7. 安装直线导轨时，请使用扭力板手，并依据本公司之建议扭力，依序锁上螺栓以确保滑轨直度。

To ensure the straightness of rail, please tighten the mountingbolts sequentially with a torque wrench to the specified torque (Refer to PYG Technical Information)

6. 直线导轨维护注意事项 / Linear Guides Usage Instructions

1. 直线导轨的标准产品在出货前已将良质的润滑剂 (润滑油或锂皂基油脂) 封入滑块内，在装用并试运转之后、于正式运转之前，请再次对滑块进行润滑作业，润滑时请使用相同锂皂基的润滑剂。
2. 直线导轨的标准产品在出货前，滑轨表层四周已涂布防锈油 : 安装时 , 若有清洗滑轨的动作，请于机台设备完装时，再次将滑轨表面四周涂布一层适当的润滑油（请使用相容之润滑剂)。
3. 因为直线导轨的滑块系由许多塑胶材质云件组成，清洁时请避至以有机溶剂接触或浸泡些雪件，以充造成产品损坏。
4. 异物进入滑块内是造成滑块故障与损坏的原因之一 , 应注意予以避免。
5. 任意拆解直线导轨的需配件有可能造成异物进入滑块或降低直线导轨的精度 , 请勿任意拆解直线导轨。
6. 不当的倾斜直线导轨可能造成滑块因自重而滑出滑轨，请在移动直线导轨时保持直线导轨为水平状态。
7. 直线导轨摔落或撞击会损伤正常功能 , 请避觅让直线导轨产生不当的摔落或撞击。
8. 使用于特殊环境，请使用适当的表面处理或与 PYG 联络。
9. 自润式直线导轨 (E2 type) 可容许的环境温度范围为 -10°C ~50°C ; 静音式线性滑轨 (Q1 type) 可容许的环境温度范围为 -10°C ~80°C ; 而金端盖式直线导轨 (SE type) 可容许的最高环境温度为 150°C。除此之外，一般直线导轨可容许的最高环境温度为 100°C。
10. 其他详细说明请参阅技术型录。如有其他疑问或使用上的问题，请与 PYG 联络

1. Lubricate the blocks after assembling the guides in machines. Use a lithium soap-base grease or oil.
2. The guides are packaged with anti-corrosion oil before delivery. If the rails were cleaned before installation,remember to lubricate the rails after assembling the guides in machine.(Please confirm the compatibility between lubricant & anti rust rail)
3.The blocks are composed of various plastic parts, please avoid prolonged exposure of these parts with any organic solvent when cleaning the blocks to prevent possible damage.
4. Try to avoid any foreign objects from getting into the block as this could result in damage to the product.
5.Please do not disassemble the parts, the incautious actions of disassembly may bring foreign objects into the block and diminish the precision of the guides or cause possible damage.
6.When handling the guides please hold them horizontally. lmproper handling can cause the blocks to fall off the rail.
7. Please avoid the inappropriate falling or clash on the blocks, which will damage the function of quideways.
8. For special application conditions, please apply the appropriate surface treatment or refer to the Linear Guides Technical lnformation catalog for more detailed instructions.
9.The operating temperature range of the E2 type (Self lubricant kit is -10°C ~50°C . For Q1 types (Quiet lineal quidesl, the range is -10°C ~80°C . The maximum service temperature of the SE type lMetallic end cap) is 150°C and for other standard types it is 100° C.
10. Please refer to the Linear Guides Technical information catalog for more detailed instructions. Please do not hesitate to contact PYG if there are further questions related to the application.

附注：Q1 type 直线导轨 [PQH&PQE] 属于静音式的直线导轨，除上述安装与维护注意事项外，仍需注意以下事项：

1. 如需将 Q1 Type 滑块自滑轨上拆下或装上时，请使用所附的夹轨，并避觅将夹轨拔出滑块。（一个滑块配一个夹轨）

2.Q1 Type 直线导轨产品使用特殊配件，严禁任何未经许可的调整预压动作。

3.Q1 type 直线导轨部分规格滑块固定螺孔与流道相通，需注意固定螺丝长度，避免螺丝干涉回流配件而产生顺畅问题。

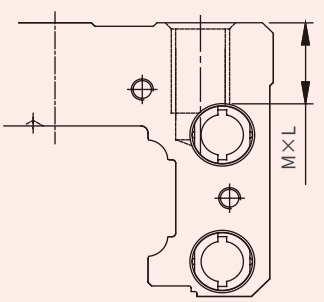
Note: For Q1 type guides (PQH & PQE) please pay attention to the following instructions:

1.When assembling and disassembling the Q1 blocks, please use the block insert that is provided. lone block insert is equipped perblock).

2.Special accessories are used in the Q1 type guides any adustment on the preload is prohibited

3.For some of our Q1 type linear Guideways, the boreholes for fixing the slider on the block are connected with recirculation channels.Therefore please pay attention to the length of screws, to avoid the screw with longer length might interfere the recirculation parts and influence the operating performance.

规格 /Specification	最大固定螺孔深度 MXL(mm) Max length of screw M×L（mm）
PQHH20	M5x6
PQHH25	M6x8
PQHH30	M8 x10
PQHH35	M8 x12
PQEH20	M5x7
PQEH25	M6x9
PQEH30	M8 x10
PQWH27	M6x6
PQWH35	M8x8



2-1PHG 系列—重负荷型滚线性滑轨

PHG SERIES -HEAVY LOAD BALL TYPE LINEAR GUIDES

PHG 系列线性滑轨，为四列式单圆弧牙型接触直线导轨，同时整合最佳化结构设计之超重负荷精密线性滑轨，相较于其他之直线导轨提升了负荷与刚性能力；具备四方向等负载特色、及自动调心的功能，可吸收安装面的装配误差，得到高精度的诉求。高速度、高负荷、高刚性与高精度化概念已成为未来全世界工业产品发展的趋势，PYG 四列式超重负荷线性滑轨，即为基于此理念开发之产品。

PHG series linear guides are designed with load capacity and rigidity higher than other similar products withcircular-arc groove and structure optimization. It features equal load ratings in the radial, reverse radial and lateral directions, and self-aligning to absorb installation-error. Thus, PYG PHG series linear guides can achieve a longlife with high speed, high accuracy and smooth linear motion.

1. PHG 系列直线导轨特点 /Features of PHG Series

(1) 自动调心能力

来自圆弧沟槽的 DF (45°-45°) 组合，在安装的时候，借由钢珠的弹性变形反接触点的转移，即使安装面多少有些偏差，也能被直线导轨内部吸收，产生自动调心能力之效果而得到高精度稳定的平滑运动。

(2) 具有互换性

由于对生产制造精度严格管控，线性滑轨尺寸能维持在一定的水准内，且滑块有保持器的设计以防止钢珠脱落因此部份系列精度具可互换性，客户可依需要购买滑轨或滑块，亦可分开储存滑轨及滑块，以减少储存空间。

(3) 所有方向皆具有高副性

运用四列式圆弧沟槽，配合四列钢珠等 45 度之接触角度，让钢珠达到理想的两点接触构造，能承受来自上下和左右方向的负荷：在必要时更可施加预压以提高副性。

(1) Self-aligning capability

By design, the circular-arc qroove has contact points at 45 degrees. HG series can absorb most installation errors dueto surface irregularities and provide smooth linear motion through the elastic deformation of rolling elements andthe shift of contact points. Self-aligning capability, high accuracy and smooth operation can be obtained with an easyinstallation.

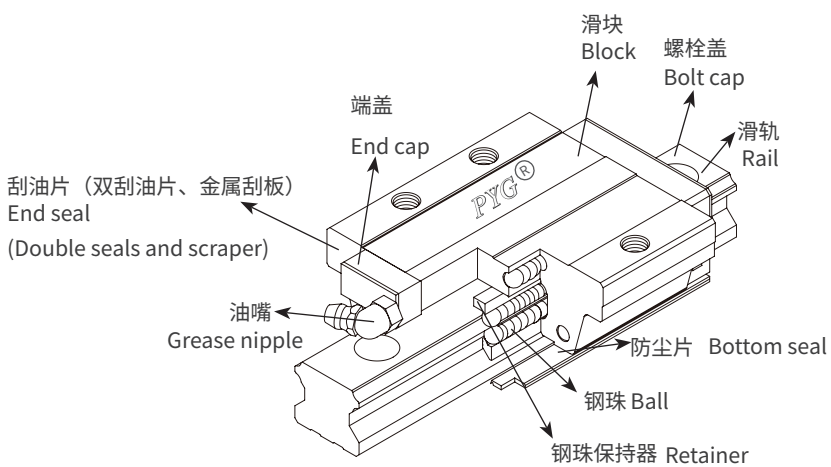
(2) Interchangeability

Because of precision dimensional control, the dimensional tolerance of HG series can be kept in a reasonable rangewhich means that any blocks and any rails in a specific series can be used together while maintaining dimensionaltolerance, And a retainer is added to prevent the balls from falling out when the blocks are removed from the rail.

(3) High rigidity in all four directions

Because of the four-row design, the HG series linear guideway has equal load ratings in the radial, reverse radialand lateral directions, Furthermore, the circular-arc aroove provides a wide-contact width between the bals and thegroove raceway allowing large permissible loads and high rigidity.

2. PHG 本体结构 /Construction of PHG Series



- 滚动循环统：滑块、滑轨、端盖、钢珠、钢珠保持器
- 润滑系统 : 油嘴、油管接头
- 防尘系统 : 刮油片、底面尘封防尘片、滑轨螺栓盖、金属刮板

- Rolling circulation system: Block, Rail, End Cap and Retainer.
- Lubrication system: Grease Nipple and Piping Joint.
- Dust protection system: End seal, Bottom Seal, Bolt Cap, Double Seals and Scraper

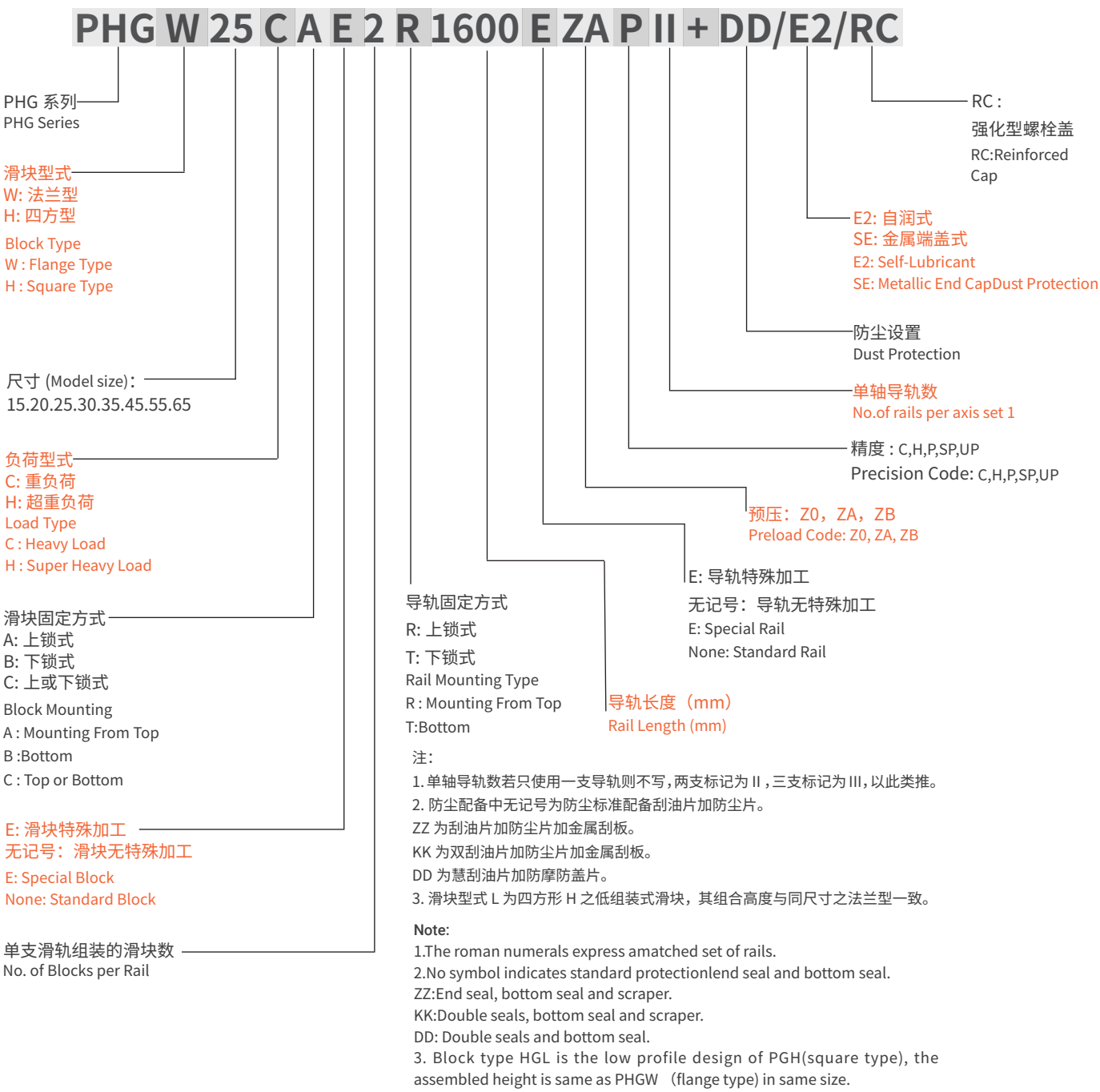
3. 产品规格说明 /Model Number of PHG Series

PHG 系列分为非互换性及互换性型两种直线导轨，两者规格尺寸相同，主要差异点在于互换性型之滑块、滑轨可单出互换使用，较便利，但其组合精度无法达到非互换性型之超高精度，不过由于 PYG 在制造上有良好的尺寸控制及严格的质量要求，互换性型之组合精度目前已达到一定的水准，对不需配对安装线性滑轨的客户而言，是一项很好的选择。直线导轨的产品规格型号主要标明直线导轨尺寸、型式、精度等级、预压等规格要求，以利于订货时售方对产品的确认。

HG series guides can be classified into non-interchangeable and interchangeable types. The sizes are identical .The only difference between the two types is that the interchangeable type of blocks and rails can be freely exchanged and their accuracy can reach up to P class, The model number of PHG series contains the size, type, accuracy classpreload class, etc.

PHG 系列重负荷型滚珠导轨
PHG Series Heavy Load Ball Type

(1) 非互换性线性滑轨产品型号 /Non-interchangeable type

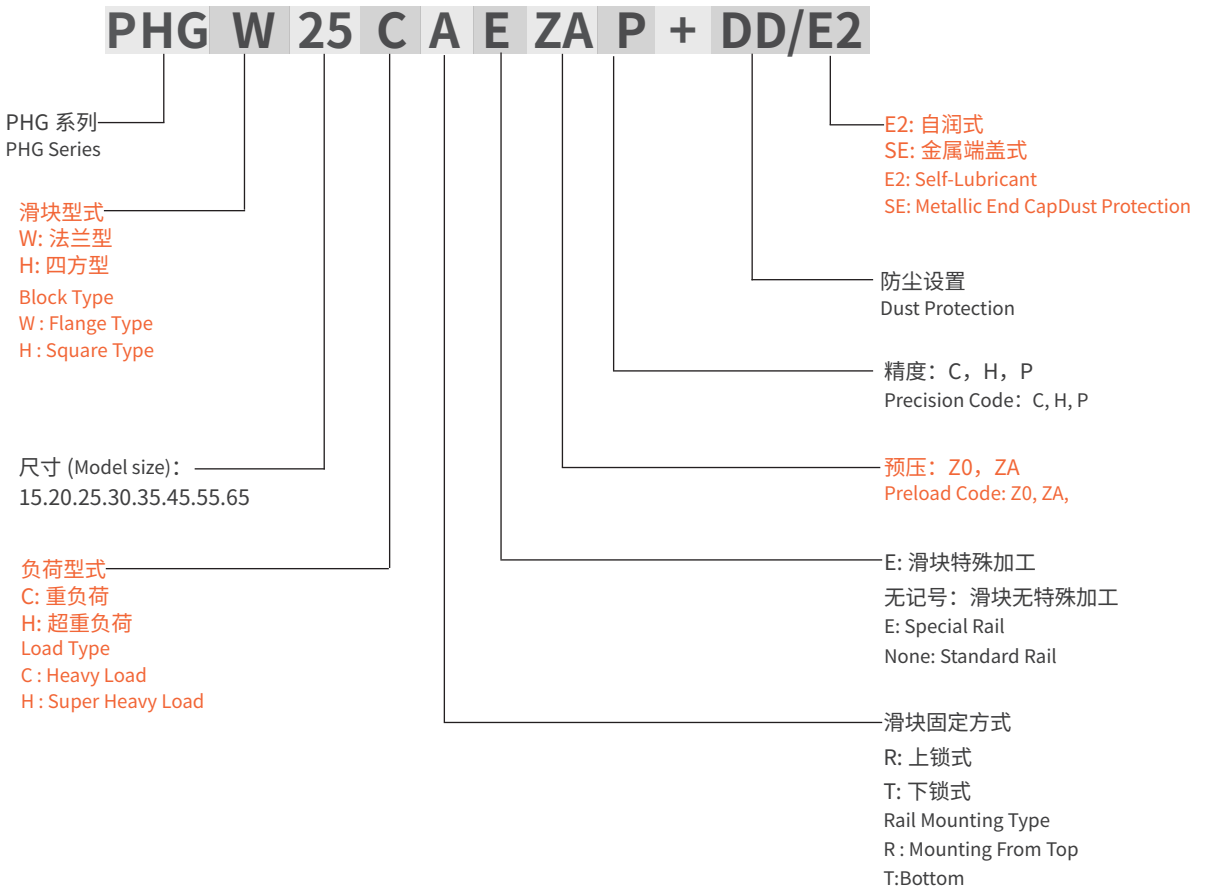


注：
1. 单轴导轨数若只使用一支导轨则不写，两支标记为 II，三支标记为 III，以此类推。
2. 防尘配备中无记号为防尘标准配备刮油片加防尘片。
ZZ 为刮油片加防尘片加金属刮板。
KK 为双刮油片加防尘片加金属刮板。
DD 为慧刮油片加防摩防盖片。
3. 滑块型式 L 为四方形 H 之低组装式滑块，其组合高度与同尺寸之法兰型一致。

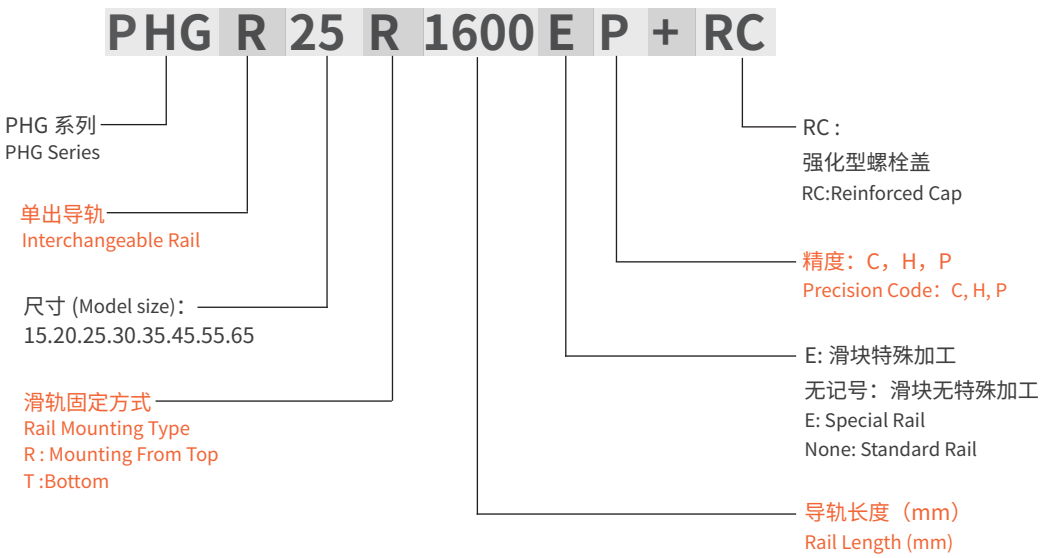
Note:
1.The roman numerals express amatched set of rails.
2.No symbol indicates standard protectionlend seal and bottom seal.
ZZ:End seal, bottom seal and scraper.
KK:Double seals, bottom seal and scraper.
DD: Double seals and bottom seal.
3. Block type HGL is the low profile design of PGH(square type), the assembled height is same as PHGW （flange type) in same size.

(1) 互换性直线导轨产品型号 /Interchangeable type

- 互换型滑块产品型号 /Model Number of PHG Block



- 互换型导轨产品型号 / Model Number of PHG Rail



4.PHG 系列型式 /PHG Types

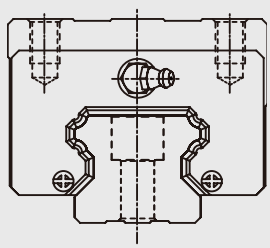
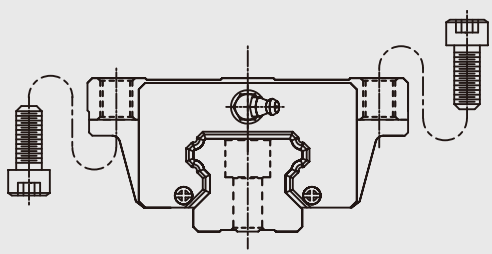
(1) 滑块型式

PYG 提供法兰型及四方型两种线性滑轨，四方型线性滑轨分 H 型与 L 型，L 型为 H 型之低组装式线性滑轨，其组合高度与法兰型线性滑轨一致。

(1)Block types

There're two types of blocks:flange and square. The flange type is suitable for heavy moment load application because of the lower assembly height and wider mounting surface.

表格 2-1-1 滑块型式 /Block types

型式 /Type	规格 / Model	形状 /Shape	高度尺寸 Height (mm)	滑轨长度 Length (mm)	应用设备 Main Application
四方型 Square	PHGH-CA PHGH-HA		28 ⇩ 90	100 ⇩ 4000	● 机械加工中心 ● 工具机 ● 精密加工机 ● 重型切削机床 ● 大理石切割机磨床 ● 射出机 ● 冲床 ● 自动化装置 ● 运输设备 ● 测量仪器
法兰型 Flange	PHGW-CC PHGW-HC		24 ⇩ 90	100 ⇩ 4000	● Machine Centers ● NC Lathes ● Grinding Machines ● Precision Machining Machines ● Heavy Cutting Machines ● Automation Devices ● Transportation Equipment ● Measuring Equipment ● Devices Requiring High Positional Accuracy

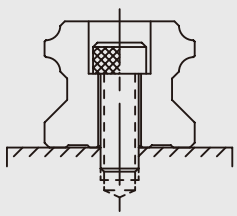
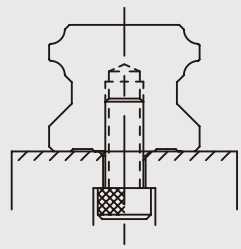
(2) 滑轨形式

滑轨型式除了一般上锁式螺栓孔滑轨外，PHMWIN 亦提供下锁式螺丝孔滑轨，方便客户安装使用。

(2)Rail types

Besides the standard top mounting type, the bottom mounting type is also available.

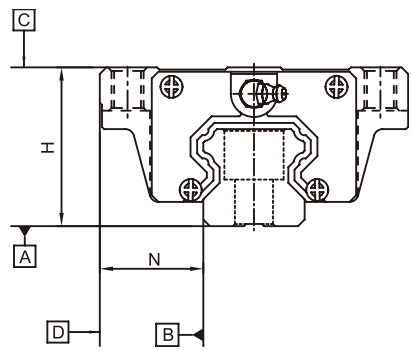
表格 2-1-2 滑轨形式

上锁式螺栓孔 /Mounting from Top	下锁式螺栓孔 /Mounting from bottom
	

5. 精度等级 /Accuracy Classes

PHG 系列直线导轨的精度，分普通、高、精密、超精密、超高精密极共五级，客户可依设备精度篇求选用精度。

The accuracy of PHG series can be classified intonormal (C), high (H), precision (P), super precision (SP),ultra precision (UP), five classes. Please choose the class by referring the accuracy of applied equipment.



(1) 非互换性直线导轨精度 /Accuracy of non-interchangeable guides

表 2-1-3 组合件精度表 /Accuracy Standard　　单位 /Unit（mm）

型号 /Item	PHG-15,20				
精度等级 Accuracy Classes	普通级（C） Normal（C）	高级（H） High（H）	精密级（P） Precision（P）	超精密级（SP） Super Precision(SP)	超高精密级（UP） Ultra Precision（UP）
高度 H 的容许尺寸误差 Dimensional tolerance of height H	± 0.03	± 0.03	0 - 0.03	0 -0.015	0 -0.008
宽度 N 的容许尺寸误差 Dimensional tolerance of width N	± 0.03	± 0.03	0 -0.03	0 -0.015	0 -0.008
成对高度 H 的相互误差 Variation of height H	0.02	0.01	0.006	0.004	0.003
成对宽度 N 的相互误差 Variation of width N	0.02	0.01	0.006	0.004	0.003
滑块 C 面对滑轨 A 面的行走平行度 Running parallelism of block surface C to surface A	行走平行度（见表格 2-1-11） See Table 2-1-11				
滑块 D 面对滑轨 B 面的行走平行度 Running parallelism of block surface D to surface B	行走平行度（见表格 2-1-11） See Table 2-1-11				

表 2-1-4 组合件精度表 /Accuracy Standards　　单位 /Unit（mm）

型号 /Item	PHG-25,30,35				
精度等级 Accuracy Classes	普通级（C） Normal（C）	高级（H） High（H）	精密级（P） Precision（P）	超精密级（SP） Super Precision(SP)	超高精密级（UP） Ultra Precision（UP）
高度 H 的容许尺寸误差 Dimensional tolerance of height H	± 0.1	± 0.04	0 - 0.04	0 -0.02	0 -0.01
宽度 N 的容许尺寸误差 Dimensional tolerance of width N	± 0.1	± 0.04	0 -0.04	0 -0.02	0 -0.01
成对高度 H 的相互误差 Variation of height H	0.02	0.015	0.007	0.005	0.003
成对宽度 N 的相互误差 Variation of width N	0.03	0.015	0.007	0.005	0.003
滑块 C 面对滑轨 A 面的行走平行度 Running parallelism of block surface C to surface A	行走平行度（见表格 2-1-11） See Table 2-1-11				
滑块 D 面对滑轨 B 面的行走平行度 Running parallelism of block surface D to surface B	行走平行度（见表格 2-1-11） See Table 2-1-11				

表 2-1-5 组合件精度表 /Accuracy Standard

单位 /Unit（mm）

型号 /Item	PHG-45,55				
精度等级 Accuracy Classes	普通级（C） Normal（C）	高级（H） High（H）	精密级（P） Precision（P）	超精密级（SP） Super Precision(SP)	超高精密级（UP） Ultra Precision（UP）
高度 H 的容许尺寸误差 Dimensional tolerance of height H	± 0.1	± 0.05	0 - 0.05	0 -0.03	0 -0.02
宽度 N 的容许尺寸误差 Dimensional tolerance of width N	± 0.1	± 0.05	0 -0.05	0 -0.03	0 -0.02
成对高度 H 的相互误差 Variation of height H	0.03	0.015	0.007	0.005	0.003
成对宽度 N 的相互误差 Variation of width N	0.03	0.02	0.01	0.007	0.005
滑块 C 面对滑轨 A 面的行走平行度 Running parallelism of block surface C to surface A	行走平行度（见表格 2-1-11） See Table 2-1-11				
滑块 D 面对滑轨 B 面的行走平行度 Running parallelism of block surface D to surface B	行走平行度（见表格 2-1-11） See Table 2-1-11				

表 2-1-6 组合件精度表 /Accuracy Standards

单位 /Unit（mm）

型号 /Item	PHG-65				
精度等级 Accuracy Classes	普通级（C） Normal（C）	高级（H） High（H）	精密级（P） Precision（P）	超精密级（SP） Super Precision(SP)	超高精密级（UP） Ultra Precision（UP）
高度 H 的容许尺寸误差 Dimensional tolerance of height H	± 0.1	± 0.07	0 - 0.07	0 -0.05	0 -0.03
宽度 N 的容许尺寸误差 Dimensional tolerance of width N	± 0.1	± 0.07	0 -0.07	0 -0.05	0 -0.03
成对高度 H 的相互误差 Variation of height H	0.03	0.02	0.01	0.007	0.005
成对宽度 N 的相互误差 Variation of width N	0.03	0.025	0.015	0.01	0.007
滑块 C 面对滑轨 A 面的行走平行度 Running parallelism of block surface C to surface A	行走平行度（见表格 2-1-11） See Table 2-1-11				
滑块 D 面对滑轨 B 面的行走平行度 Running parallelism of block surface D to surface B	行走平行度（见表格 2-1-11） See Table 2-1-11				

（2）互换性直线导轨精度 /Accuracy of interchangeable guides

表 2-1-7 单出件精度表 /Accuracy Standard

单位 /Unit（mm）

型号 /Item	PHG-15,20		
精度等级 Accuracy Classes	普通级（C） Normal（C）	高级（H） High（H）	精密级（P） Precision（P）
高度 H 的容许尺寸误差 Dimensional tolerance of height H	± 0.1	± 0.03	± 0.015
宽度 N 的容许尺寸误差 Dimensional tolerance of width N	± 0.1	± 0.03	± 0.015
成对高度 H 的相互误差 Variation of height H	0.02	0.01	0.006
成对宽度 N 的相互误差 Variation of width N	0.02	0.01	0.006
滑块 C 面对滑轨 A 面的行走平行度 Running parallelism of block surface C to surface A	行走平行度（见表格 2-1-11） See Table 2-1-11		
滑块 D 面对滑轨 B 面的行走平行度 Running parallelism of block surface D to surface B	行走平行度（见表格 2-1-11） See Table 2-1-11		

表 2-1-8 单出件精度表 /Accuracy Standards

单位 /Unit（mm）

型号 /Item	PHG-25,30,35		
精度等级 Accuracy Classes	普通级（C） Normal（C）	高级（H） High（H）	精密级（P） Precision（P）
高度 H 的容许尺寸误差 Dimensional tolerance of height H	± 0.1	± 0.04	± 0.02
宽度 N 的容许尺寸误差 Dimensional tolerance of width N	± 0.1	± 0.04	± 0.02
成对高度 H 的相互误差 Variation of height H	0.02	0.015	0.007
成对宽度 N 的相互误差 Variation of width N	0.02	0.015	0.007
滑块 C 面对滑轨 A 面的行走平行度 Running parallelism of block surface C to surface A	行走平行度（见表格 2-1-11） See Table 2-1-11		
滑块 D 面对滑轨 B 面的行走平行度 Running parallelism of block surface D to surface B	行走平行度（见表格 2-1-11） See Table 2-1-11		

表 2-1-9 单出件精度表 /Accuracy Standard

单位 /Unit（mm）

型号 /Item	PHG-45,55		
精度等级 Accuracy Classes	普通级（C） Normal（C）	高级（H） High（H）	精密级（P） Precision（P）
高度 H 的容许尺寸误差 Dimensional tolerance of height H	± 0.1	± 0.05	± 0.025
宽度 N 的容许尺寸误差 Dimensional tolerance of width N	± 0.1	± 0.05	± 0.025
成对高度 H 的相互误差 Variation of height H	0.03	0.015	0.007
成对宽度 N 的相互误差 Variation of width N	0.03	0.02	0.01
滑块 C 面对滑轨 A 面的行走平行度 Running parallelism of block surface C to surface A	行走平行度（见表格 2-1-11） See Table 2-1-11		
滑块 D 面对滑轨 B 面的行走平行度 Running parallelism of block surface D to surface B	行走平行度（见表格 2-1-11） See Table 2-1-11		

表 2-1-10 单出件精度表 /Accuracy Standards

单位 /Unit（mm）

型号 /Item	PHG-65		
精度等级 Accuracy Classes	普通级（C） Normal（C）	高级（H） High（H）	精密级（P） Precision（P）
高度 H 的容许尺寸误差 Dimensional tolerance of height H	± 0.1	± 0.07	± 0.035
宽度 N 的容许尺寸误差 Dimensional tolerance of width N	± 0.1	± 0.07	± 0.0035
成对高度 H 的相互误差 Variation of height H	0.03	0.02	0.01
成对宽度 N 的相互误差 Variation of width N	0.03	0.025	0.015
滑块 C 面对滑轨 A 面的行走平行度 Running parallelism of block surface C to surface A	行走平行度（见表格 2-1-11） See Table 2-1-11		
滑块 D 面对滑轨 B 面的行走平行度 Running parallelism of block surface D to surface B	行走平行度（见表格 2-1-11） See Table 2-1-11		

（3）行走平行度精度 /Accuracy of running parallelism

表 2-1-11 行走平行度精度 /Accuracy of running parallelism

单位 /Unit（mm）

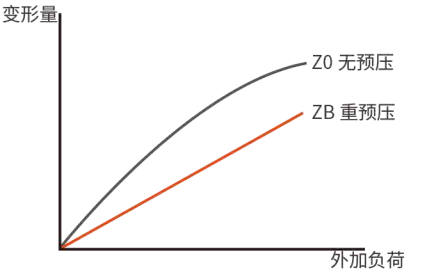
滑轨长度 /Rall Length (mm)	精度等级 /Accuracy (μm)				
	C	H	P	SP	UP
~ 100	12	7	3	2	2
100 ~ 200	14	9	4	2	2
200 ~ 300	15	10	5	3	2
300 ~ 500	17	12	6	3	2
500 ~ 700	20	13	7	4	2
700 ~ 900	22	15	8	5	3
900 ~ 1,100	24	16	9	6	3
1,100 ~ 1,500	26	18	11	7	4
1,500 ~ 1,900	28	20	13	8	4
1,900 ~ 2,500	31	22	15	10	5
2,500 ~ 3,100	33	25	18	11	6
3,100 ~ 3,600	36	27	20	14	7
3,600 ~ 4,000	37	28	21	15	7

6. 预压力 /Preload

（1）预压力定义 /Definition

预压力是预先给予钢珠负荷力，亦即加大钢珠直径，利用钢珠与珠道之间负向间隙给予预压，此举能提高导轨的刚性及消除间隙；以右图来解释，提高预压力可增加直线导轨刚性，但小规格建议选用轻预压以下预压，以避至因预压选用过重降低其使用寿命。

A preload can be applied to each guideway.Oversized balls are used. Generally, a linear motion guidewayhas a negative clearance between groove and balls inorder to improve stiffness and maintain high precision.The figure shows the load is multiplied by the preloadthe rigidity is doubled and the deflection is reducedby one half. The preload no larger than ZA would be recommended for the model size under HG20 to avoidan over-preload affecting the guideway's life.



（2）预压等级 /Preload classes

PHG 系列线性滑轨提供三种标预压，可依据用途选择适当预压力。

PHG offers three classes of standard preload for various applications and conditions

表 2-1-12 预压等级 /Preload classes

预压等级 Class	标记 Code	预压力 Preload	使用条件 Condition	适用范围 Examples of Application
无预压 Light Preload	Z0	0~0.02C	负荷方向固定且冲整小，精度要求低 Certain load direction,low impact ,low precision required	搬送装置，自动包装机，自动化产业机械，一般工业机械的 XY 轴，焊接，熔断机，工具交换装置。 Transportation devices, auto-packing machines,X-Y axis for general industrial machines, welding machines,welders
中预压 Medium Preload	ZA	0.05C~0.07C	轻负荷且要求高精度 High precision required	一般工业机械的 Z 轴，放电加工机，NC 车床，精密 XY 平台，测定器，机械加工中心，立式加工中心工业用机器人，自动涂装机，各种高速材料供给装置。 Machining centers,grinding industrial machines, EDM, NC lathes, Precision X-Y tables,measuring equipment
重预压 Heavy Preload	ZB	0.10C~0.12C	刚性要求，且有振动，冲击之使用环境 High rigidity required, with vibration and impact	机械加工中心，磨床，NC 更床，立式或卧式铣床，机床的 Z 轴，重切削加工机。 Machining centers,grinding machines ,NC lathes horizontal and vertical milling machines, Z axis of machine tools, Heavy cutting machines

等级 Class	互换性导轨（单出件） Interchangeable Guides	非互换性导轨（组合件） Non-Interchangeable Guides
预压等级	Z0，ZA	Z0，ZA，ZB

注：预压力 C 为动额定负荷

Note: The "C" in the preload column denotes basic dynamic load rating.

（3）预压力 /Stiffness performance

不同的预压力呈现不一样的滑块刚性，下表为各尺寸的滑块副性值。

Stiffness depends on preload. The following table shows stiffness value of each size.

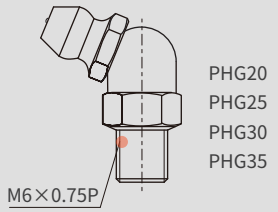
表 2-1-13 HG 系列径向刚性 /Stiffness performance

负荷型式 Load type	系列 / 尺寸 Series/Size	不同预压力的刚性表现（N/μm） Stiffness(N/μm)		
		Z0	ZA	ZB
重负荷 Heavy load	HG 15C	196	365	483
	HG 20C	232	460	678
	HG 25C	292	539	705
	HG 30C	354	618	823
	HG 35C	395	642	865
	HG 45C	505	738	980
	HG 55C	609	828	1092
	HG 65C	716	918	1201
超重负荷 Suoer heavy load	HG 20H	300	611	824
	HG 25H	378	715	935
	HG 30H	453	820	1093
	HG 35H	509	855	1150
	HG 45H	649	870	1298
	HG 55H	789	1085	1445
	HG 65H	946	1221	1599

7. 润滑方式/Lubrication

（1）润滑油脂 /Grease

● 油嘴型式 /Grease nipple



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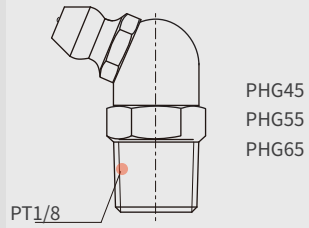

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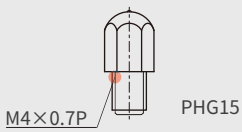

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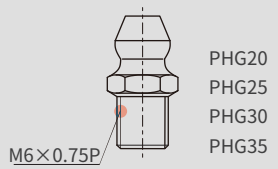
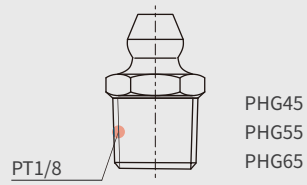


NO.34320003(OPTION)



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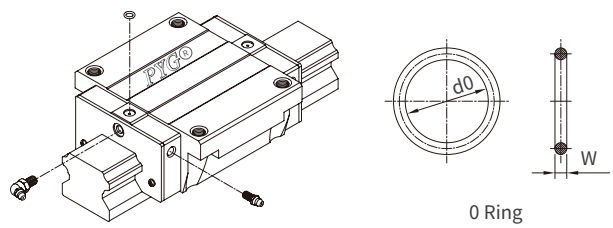
● 油嘴位置

依客户需要在滑块前端或后端装上油嘴以供手动打油，PHG 系列特别在端盖侧预留侧油孔位置安装油嘴 [一般为直油嘴〕，提供侧向打油，侧向打油的位置建议在非侧基准边，但若有特殊需要亦可放在侧基准。客户如有上述侧向打油需求请与我们联络。使用接管方式自动供润滑油脂之直线导轨，则可依连接管型式选用安装油管接头。

● Mounting location

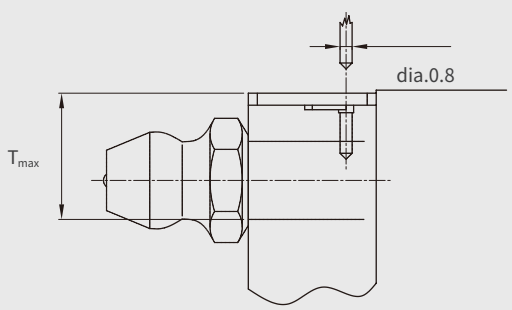
The standard location ofthe grease fitting is at both endsof the block, but the nipple can be mounted at each sideof block. For lateral installation, we recommend that thenipple be mounted at the non-reference side, otherwiseplease contact us. It is possible to perform lubrication byusing the oil-piping joint.



表格 2-1-14 0-Ring 规格与穿孔最大容许深度

Table 2-1-14 0-Ring size and max.permissible depth for piercing

规格 Size	0 Ring 规格 d0(mm)	0 Ring 规格 W(mm)	穿孔最大容许深度 T_{max}（mm） Lube hole at top: max.permissible depth forpiercing T_{max}（mm）
PHG15	2.5±0.15	1.5±0.15	3.75
PHG20	4.5±0.15	1.5±0.15	5.7
PHG25	4.5±0.15	1.5±0.15	5.8
PHG30	4.5±0.15	1.5±0.15	6.3
PHG35	4.5±0.15	1.5±0.15	8.8
PHG45	4.5±0.15	1.5±0.15	8.2
PHG55	4.5±0.15	1.5±0.15	11.8
PHG65	4.5±0.15	1.5±0.15	10.8



● 单个滑块填满润滑油脂油量

● The lubricant amount for a block filled with grease

表格 2-1-15 单个滑块填满润滑油脂油量

Table 2-1-15 The lubricant Amount for a Block Filled with Grease

规格 Size	重负荷 Heavy load (cm^3)	超重负荷 Spuer heavy load (cm^3)	规格 Size	重负荷 Heavy load (cm^3)	超重负荷 Spuer heavy load (cm^3)
PHG15	1	-	PHG35	10	12
PHG20	2	3	PHG45	17	21
PHG25	5	6	PHG55	26	33
PHG30	7	8	PHG65	50	61

● 润滑频率

每运行 100Km，或每 3-6 个月确认一次油脂。

● Frequency of replenishment

Check the grease every 100 km, or every 3-6 months.

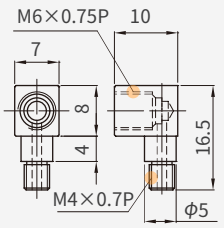
（2）润滑油 / Oil

建议使用油黏滞度约为 30~150cSt 之润滑油润滑线性滑轨，客户可先跟我们说明需要使用油润滑，出货之直线导轨将不会封入润滑油脂。

The recommended viscosity of oil is about 30-150cSt. If customers need to use oil-type lubrication, please inform us.

● 油管接头型式
Types of oil piping joint

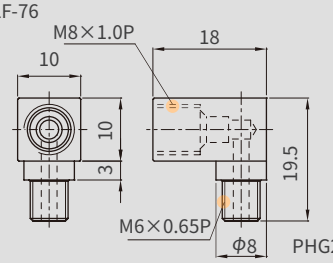
LF-64



PHG15

NO.97000EA1

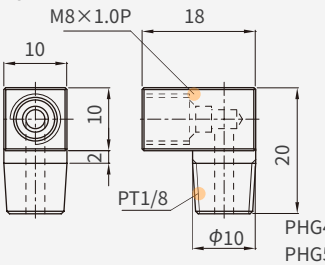
LF-76



PHG20
PHG25
PHG30
PHG35

NO.970002A1

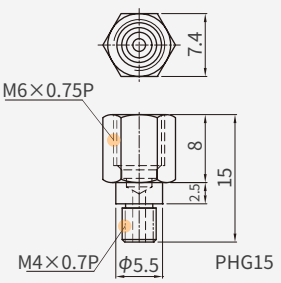
LF-78



PHG45
PHG55
PHG65

NO.970006A1

SF-64



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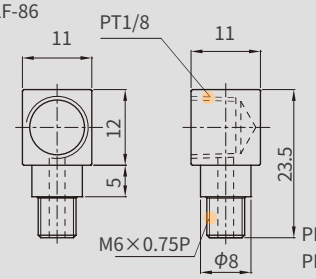
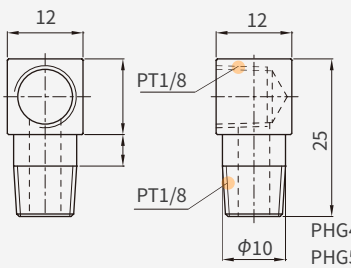
LF-86



PHG20
PHG25
PHG30
PHG35

NO.970004A1

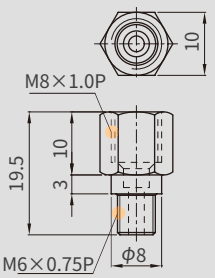
LF-88



PHG45
PHG55
PHG65

NO.970008A1

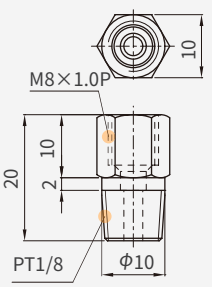
SF-76



PHG20
PHG25
PHG30
PHG35

NO.970001A1

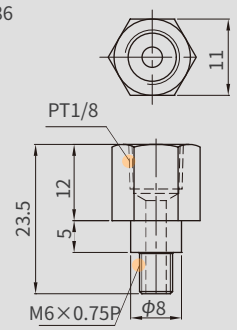
SF-78



PHG45
PHG55
PHG65

NO.970005A1

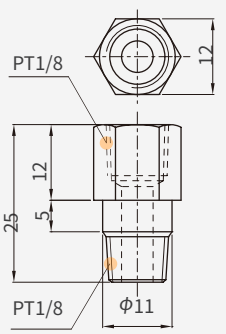
SF-86



PHG20
PHG25
PHG30
PHG35

NO.970003A1

SF-88



PHG45
PHG55
PHG65

NO.970007A1

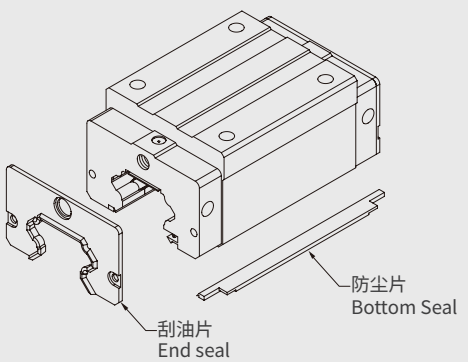
● 供油速率
Oil refilling rate

规格 Size	供油速率 Oil refilling rate (cm³/hr)	规格 Size	供油速率 Oil refilling rate (cm³/hr)
PHG15	0.2	PHG35	0.3
PHG20	0.2	PHG45	0.4
PHG25	0.3	PHG55	0.5
PHG30	0.3	PHG65	0.6

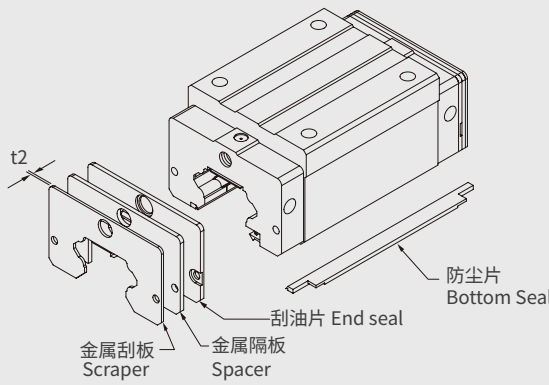
8. 防尘配备 /Dust Proof Accessories

（1）标准防尘配备代码 /Dust Proof Accessories

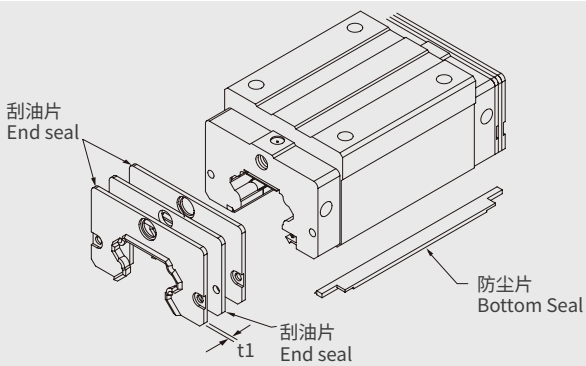
一般无特别需求之作业环境下使用，若有下列防尘配件需求时，请于产品型号后面加注代码。
Codes of standard dust proof accessoriesIf the following accessories are needed, please add the code followed by the model number.



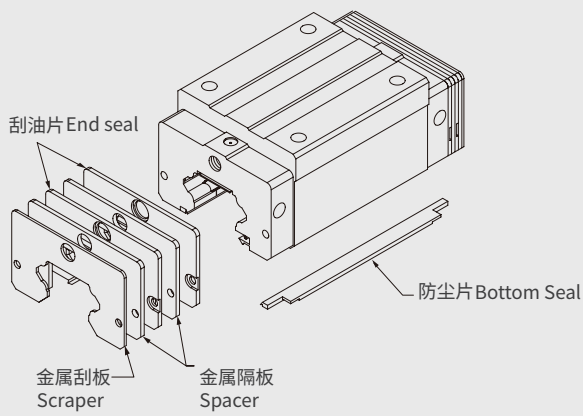
无记号为标准防尘配备（刮油片 + 防尘片）
No symbol:Standard Protection lEnd seal + Bottom Seal)



无记号为标准防尘配备（刮油片 + 防尘片）
ZZ lEnd seal +Bottom Seal+ Scraper)



DD（双刮油片 + 防尘片）
DD (Double seals + Bottom Seal)

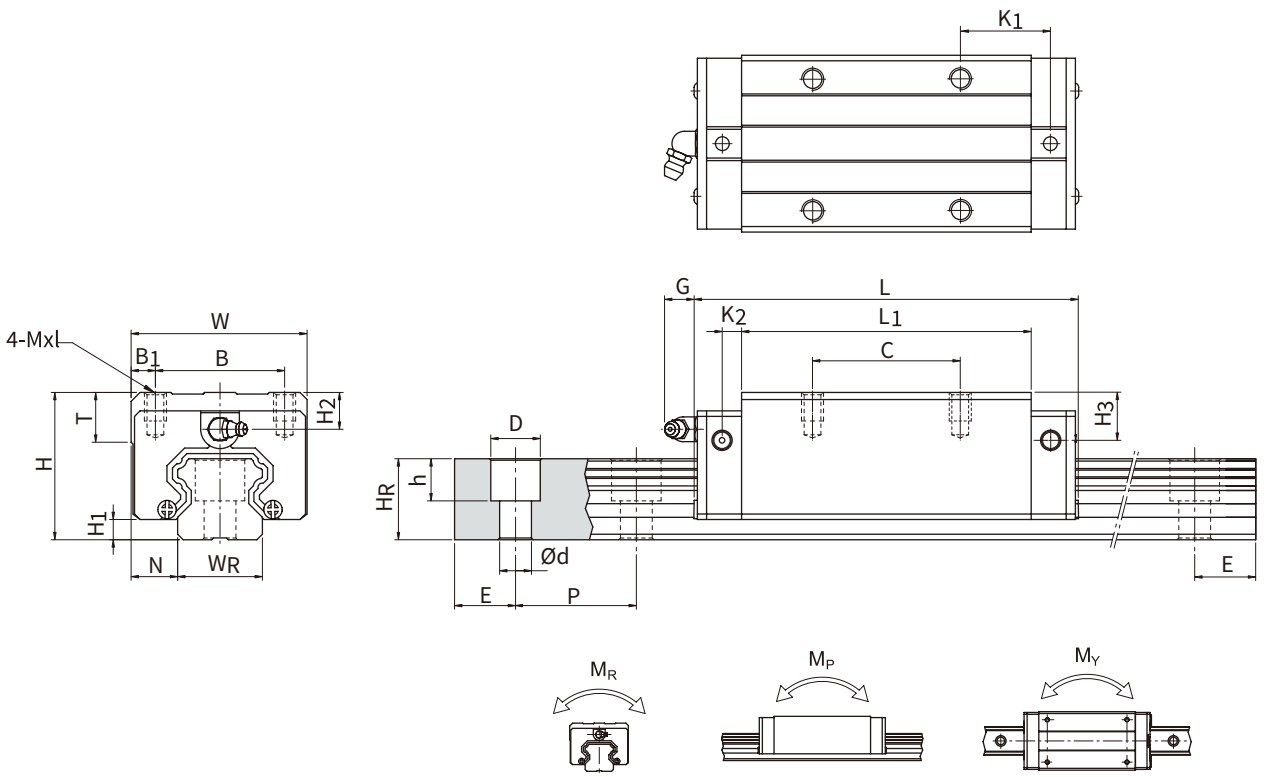


KK（双刮油片 + 金属刮板 + 防尘片）
KK(Double seals+ Bottom Seal+Scraper)

注：PHG20/PHG25/PHG65 无金属隔板模型
Note: HG20/25/65 are without spacer.

9.PHG 系列直线导轨尺寸表 /Dimensions for PYG PHGH Series

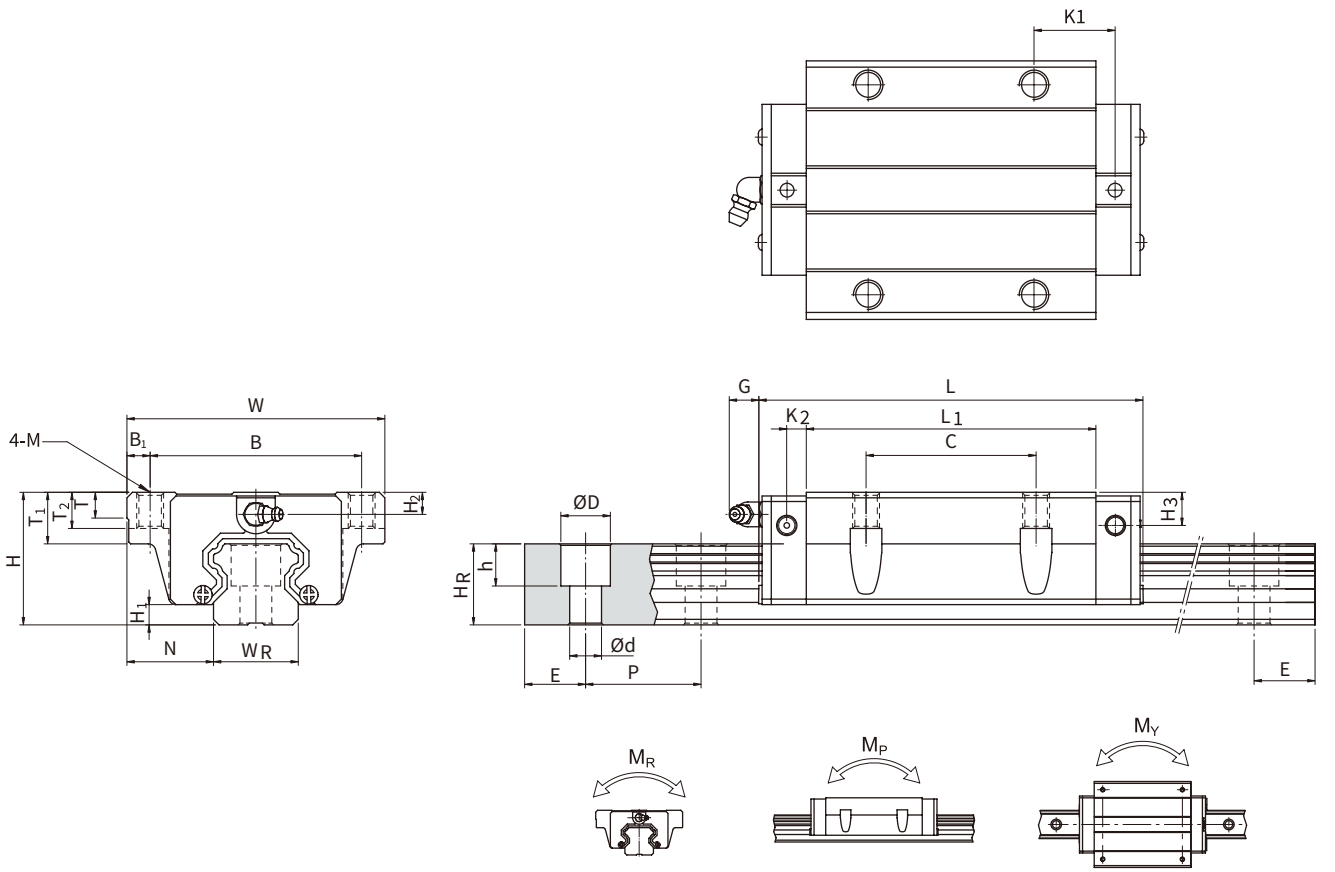
（1）PHGH-CA/PHGH-HA



型号 Model No.	组件尺寸 Dimensions of Assembly (mm)			滑块尺寸 Dimensions of Block(mm)																			滑轨尺寸（mm） Dimensions of Rail (mm)							滑轨的固定螺栓尺寸 Mounting Bolt for Rail	基本动额定负荷 Basic Dynamic load Rating	基本静额定负荷 Basic Static Load Rating	容许静力矩 Static Rated Moment			重量 Weight	
	H	H_1	N	W	B	B_1	C	L_1	L	K_1	K_2	G	MxI	T	H_2	H_3	W_R	H_R	D	h	d	P	E	(mm)	C (kN)	C_0 (kN)	M_R kN-m	M_P kN-m	M_Y kN-m	滑块 kg	滑轨 kg/m
PHGH 15CA	28	4.3	9.5	34	26	4	26	39.4	61.4	10	4.85	5.3	M_{4x5}	6	7.95	7.7	15	15	7.5	5.3	4.5	60	20	M_{4x16}	14.7	23.47	0.12	0.10	0.10	0.18	1.45
PHGH 20CA	30	4.6	12	44	32	6	36	50.5	77.5	12.25	6	12	M_{5x6}	8	6	6	20	17.5	9.5	8.5	6	60	20	M_{5x16}	27.1	36.68	0.27	0.20	0.20	0.30	2.21
PHGH 20HA							50	65.2	92.2	12.6															32.7	47.96	0.35	0.35	0.35	0.39	
PHGH 25CA	40	5.5	12.5	48	35	6.5	35	58	84	15.7	6	12	M_{6x8}	8	10	9	23	22	11	9	7	60	20	M_{6x20}	34.9	52.82	0.42	0.33	0.33	0.51	3.21
PHGH 25HA							50	78.4	104.6	18.5															42.2	69.07	0.56	0.57	0.57	0.69	
PHGH 30CA	45	6	16	60	40	10	40	70	97.4	20.25	6	12	M_{8x10}	8.5	9.5	13.8	28	26	14	12	9	80	20	M_{8x25}	48.5	71.87	0.66	0.53	0.53	0.88	4.47
PHGH 30HA							60	93	120.4	21.75															58.6	93.99	0.88	0.92	0.92	1.16	
PHGH 35CA	55	7.5	18	70	50	10	50	80	112.5	20.6	7	12	M_{8x12}	10.2	16	19.6	34	29	14	12	9	80	20	M_{8x25}	64.6	93.88	1.16	0.81	0.81	1.45	6.30
PHGH 35HA							72	105.8	138.2	22.5															77.9	122.77	1.54	1.40	1.40	1.92	
PHGH 45CA	70	9.5	20.5	86	60	13	60	97	139.4	23	10	12.9	M_{10x17}	16	18.5	30.5	45	38	20	17	14	105	22.5	M_{12x35}	103.8	146.71	1.98	1.55	1.55	2.73	10.41
PHGH 45HA							80	128.8	171.2	28.9															125.3	191.85	2.63	2.68	2.68	3.61	
PHGH 55CA	80	13	23.5	100	75	12.5	75	117.7	166.7	27.35	11	12.9	M_{12x18}	17.5	22	29	53	44	23	20	16	120	30	M_{14x45}	153.2	211.23	3.69	2.64	2.64	4.17	15.06
PHGH 55HA							95	155.8	204.8	36.4															184.9	276.23	4.88	4.57	4.57	5.49	
PHGH 65CA	90	15	31.5	126	76	25	70	144.2	200.2	43.1	14	12.9	M_{16x20}	25	15	15	63	53	26	22	18	150	35	M_{16x50}	213.2	287.48	6.65	4.27	4.27	7.00	21.18
PHGH 65HA							120	203.6	259.6	47.8															277.8	420.17	9.38	7.38	7.38	9.82	

注：1kg=9.81N
Note：1kg=9.81N

（2）PHGW-CC/PHGW-HC



型号 Model No.	组件尺寸 Dimensions of Assembly (mm)			滑块尺寸 Dimensions of Block(mm)															滑轨尺寸（mm） Dimensions of Rail (mm)						滑轨的固定螺栓尺寸 Mounting Bolt for Rail	基本动额定负荷 Basic Dynamic load Rating	基本静额定负荷 Basic Static Load Rating	容许静力矩 Static Rated Moment			重量 Weight	
	H	H_1	N	W	B	B_1	C	L_1	L	K_1	K_2	G	M	T	T_1	T_2	H_2	H_3	W_R	H_R	D	h	d	P	E	(mm)	C (kN)	C_0 (kN)	M_R kN-m	M_P kN-m	M_Y kN-m	滑块 kg	滑轨 kg/m
PHGW 15CC	24	4.3	16	47	38	4.5	30	39.4	61.4	8	4.85	5.3	M5	6	8.9	6.95	3.95	3.7	15	15	7.5	5.3	4.5	60	20	M_{4x16}	14.7	23.47	0.12	0.10	0.10	0.17	1.45
PHGW 20CC	30	4.6	21.5	63	53	5	40	50.5	77.5	10.25	6	12	M6	8	10	9.5	6	6	20	17.5	9.5	8.5	6	60	20	M_{5x16}	27.1	36.68	0.27	0.20	0.20	0.30	2.21
PHGW 20HC								65.2	92.2	17.6																	32.7	47.96	0.35	0.35	0.35	0.39	
PHGW 25CC	36	5.5	23.5	70	57	6.5	45	58	84	10.7	6	12	M8	8	14	10	6	5	23	22	11	9	7	60	20	M_{6x20}	34.9	52.82	0.42	0.33	0.33	0.51	3.21
PHGW 25HC								78.4	104.6	21																	42.2	69.07	0.56	0.57	0.57	0.69	
PHGW 30CC	42	6	31	90	72	9	52	70	97.4	14.25	6	12	M10	8.5	16	10	6.5	10.8	28	26	14	12	9	80	20	M_{8x25}	48.5	71.87	0.66	0.53	0.53	0.88	4.47
PHGW 30HC								93	120.4	25.75																	58.6	93.99	0.88	0.92	0.92	1.16	
PHGW 35CC	48	7.5	33	100	82	9	62	80	112.5	14.6	7	12	M10	10.1	18	13	9	12.6	34	29	14	12	9	80	20	M_{8x25}	64.6	93.88	1.16	0.81	0.81	1.45	6.30
PHGW 35HC								105.8	138.2	27.5																	77.9	122.77	1.54	1.40	1.40	1.92	
PHGW 45CC	70	9.5	20.5	86	60	13	80	97	139.4	23	10	12.9	M12	15.1	22	15	8.5	20.5	45	38	20	17	14	105	22.5	M_{12x35}	103.8	146.71	1.98	1.55	1.55	2.73	10.41
PHGW 45HC								128.8	171.2	28.9																	125.3	191.85	2.63	2.68	2.68	3.61	
PHGW 55CC	80	13	23.5	100	75	12.5	95	117.7	166.7	27.35	11	12.9	M14	17.5	26.5	17	12	19	53	44	23	20	16	120	30	M_{14x45}	153.2	211.23	3.69	2.64	2.64	4.17	15.06
PHGW 55HC								155.8	204.8	36.4																	184.9	276.23	4.88	4.57	4.57	5.49	
PHGW 65CC	90	15	31.5	126	76	25	110	144.2	200.2	43.1	14	12.9	M16	25	37.5	23	15	15	63	53	26	22	18	150	35	M_{16x50}	213.2	287.48	6.65	4.27	4.27	7.00	21.18
PHGW 65HC								203.6		47.8																	277.8	420.17	9.38	7.38	7.38	9.82	

注：1kg=9.81N
Note：1kg=9.81N

2-2 PQH 系列—静音式滚珠直线导轨

PQH SERIES-SILENT TYPE BALL LINEAR GUIDES

PQH 系列静音式直线导轨，乃基于四列式单回弧牙型接触设计，为提升竞优势，而积极研发之高性能直线导轨。采用 SynchMotion™ “技术的 PQH 系列直线导轨搭战具储油功能的同步联结器，可有效降低连转时噪音、提升运转平顺性、寿命与润滑效率。采用 SynchMotion™ “技术的 PQH 系列直线导轨具有更广泛的产业应用性，更适用于高速、宁静与低发展需求的高科技产业。

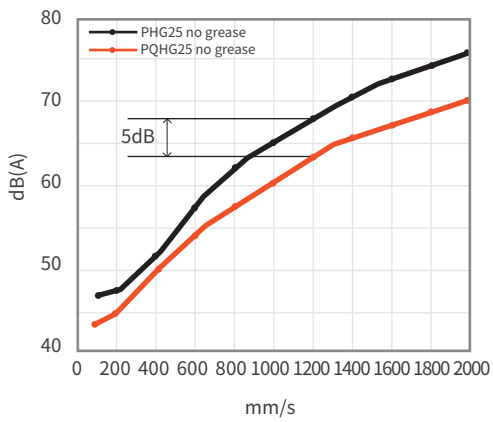
The development of PYG-PQH linear guides is based on a four-row circular-arc contact. The PQH series linear guides with SychMotion™ Technology offers smooth movement, superior lubrication, quieter operation and longer running life. Therefore the PQH linear guides has broad industrial applicability. In the high-tech industry where high speed, low noise, and reduced dust generation is required, the PQH series is interchangeable with the PQH series.

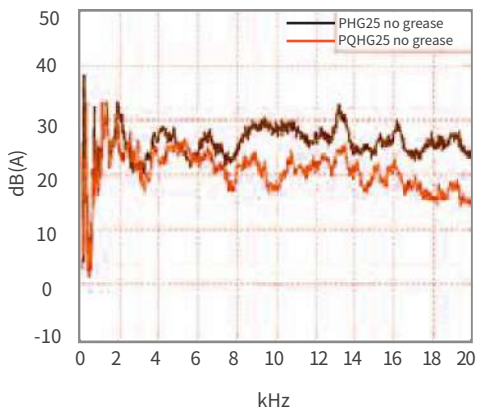
1. 产品特点 /Features

(1) 低噪音设计 /Low Noise Design

利用同步联结器可使滚珠均匀等间隔的排列，滚珠与滚珠间的相互撞击金属声消失，尖锐的高频声音强度有效降低（见右下图）。总和的声音强度与旧有系列比较在各个速度域有效降低约 5 分贝（见左下图）。

With SynchMotion™ technology, rolling elements are interposed between the partitions of SynchMotion™ to provide impoved circulation. Due to the elimination of contact between the rolling elements, collision noise and sound levelsare drastically reduced.



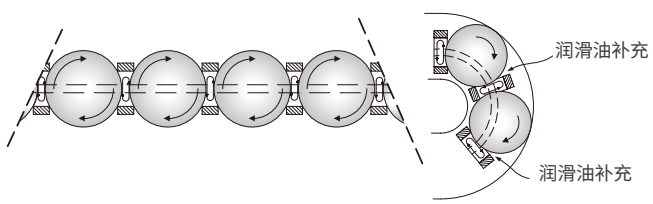


(2) 自润设计无须添油 /Self-Lubricant Design

同步联结器在中间的间隔部设计有储油的空间，可供给钢珠在运行时润滑之需要，且在经过方向回转部时，能够将润滑油均匀的补充于储油空间内，继均匀润滑珠，所以补充润滑油的频率可有效的减少。

由表格 2-5-1 的测试数据显示，在出厂前添加高性能的锂皂基油脂，在 0.2 倍的动额定负荷下，可持续使用超过 4000 公里的寿命里程而不产生疲劳破坏。所以在出厂时即添加高性能的润滑油脂，在一般极轻负载使用下无需进行维护，即可确保其寿命年限。

The partition is a grouping of hollow ring-like structures formed with a through hole to facilitate circulation of the lubricant. Because of the special lubrication path design, the lubricant of the partition storage space can be refilled.Therefore, the frequency of lubricant refilling can be decreased.The OH-series linear guides is pre-lubricated. Performance testing at a 0.20 basic dynamic loadl shows that after running 4,000km no damage was apparent to either the rolling elements or the raceway.



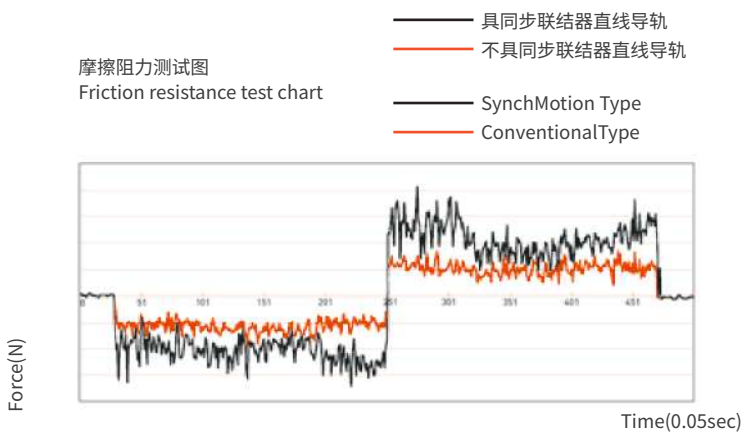
表格 2-2-1 试验资料
Table 2-2-1 Load Test

试件 /Test Sample	QHH25CAZAH	负荷测试 /Load Test
速度 (Speed)	24m/min	
润滑侧 (Lubricant)	锂皂基油脂（初期添加） lithium soap base grease(initial lubrication only)	
负荷 (Load)	5kN	
行走里程 (Distance travel)	4,000km	

(3) 提升运动平顺度 /Smooth Movement

传统不具同步联结器之直线导轨开始运行时，负荷侧的钢珠会先运动，再推挤方向回转部与无负荷侧内的钢珠，造成连锁的来回碰撞，使得摩擦阻力变动起伏剧烈。而采用 SynchMotion“技术的 QH 系列线性滑轨由于具有同步联结器，将同一循环内的所有钢珠串联在一起，所以当滑块开始运动时，所有钢珠几乎同时启动，且钢珠间并无来回的碰撞，在保持一定的运动惯性下，摩擦阻力的变动幅度能有效的减少。

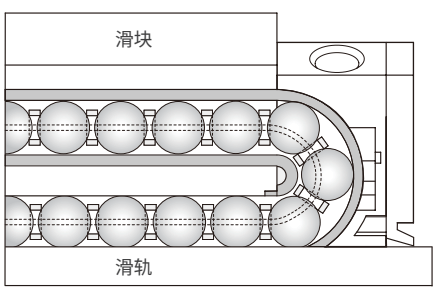
In standard linear guideways, rolling elements on the load side of the guide block begin rolling and push their way through the raceway, When they contact other rolling elements they create counter-rotational friction. This results in a great variation of rolling resistance. The PQH linear guides, with SynchMotion technology prevents this conditionAs the block starts to move, the roling elements begin rolling consecutively and remain separated to prevent contact with one another thus keeping the element's kinetic energy extremely stable in order to effectively reduce fluctuations in rolling resistance.



(4) 高速设计 / HighSpeed Performance

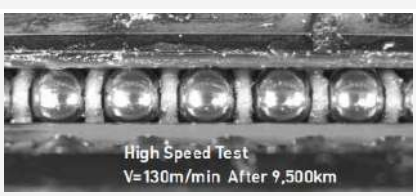
同步联结器的间隔部设计可使滚珠与滚珠之间的相互摩擦消失，且 PYG 之设计使得滚珠与同步结器之间为环形线接触，进而有效降低摩擦阻力，使得 SynchMotion ™ 静音式直线导轨具有卓越的高速性能。

The PYG-PQH series offers excellent high-speedperformance due to the partitions of the SynchMotion™ structure.They are employed to separate the adjacent balls thereby resulting in low rolling traction and the metallicfriction between adiacent balls is eliminated.

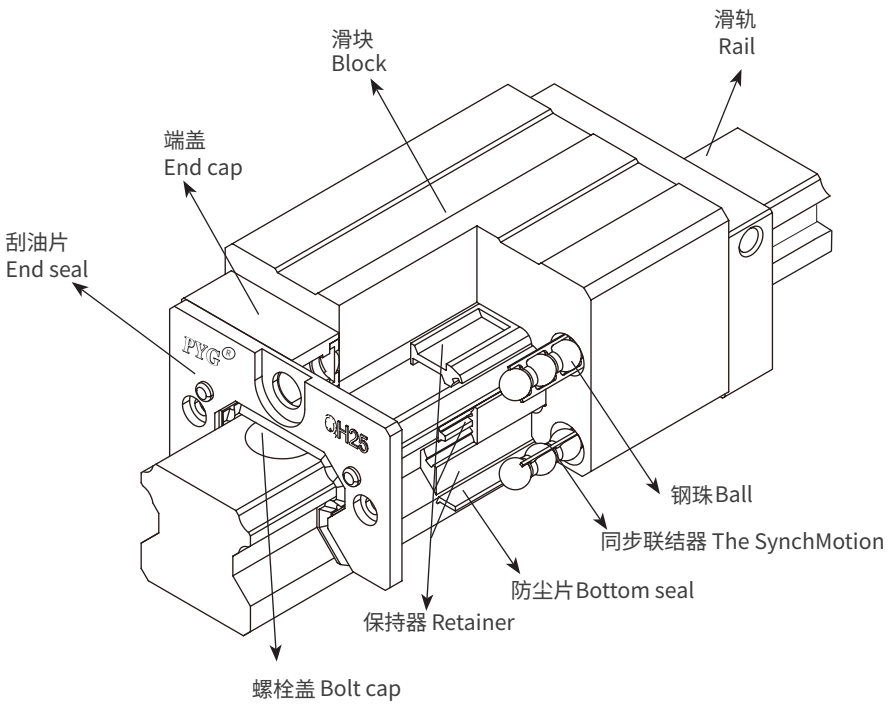


表格 2-2-2 试验资料
Table 2-2-2 Load Test

试件 /Test Sample	QHW25CAZAH	高速测试 /High Speed Test
速度 (Speed)	130m/min	
润滑侧 (Lubricant)	锂皂基油脂（初期添加） lithium soap base grease(initial lubrication only)	
负荷 (Load)	5kN	
行走里程 (Distance travel)	9,500km	



2. 本体结构 /Construction

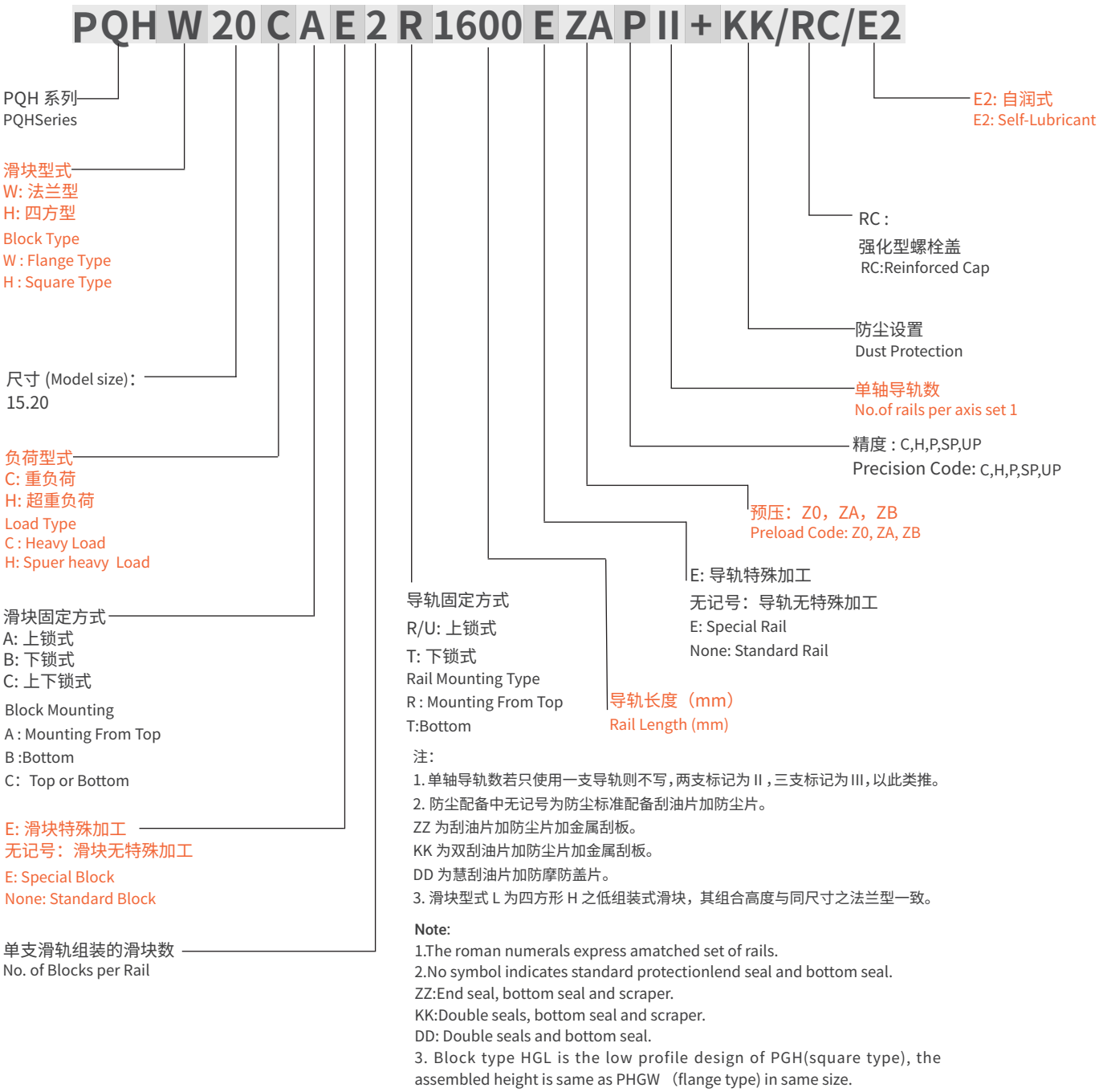


3 .PQH 系列产品规格说明

PQH 系列分为非互换性及互换性两种线性滑轨，两者规格尺寸相回，主要差异点在于互换性型之滑块、滑动可单出互换使用，较便利，但其组合精度无法达到非互换型所拥有的超高精度等级。不通由于 HIWIN 在制造上有良好的尺寸控制及严格的质量要求，互换性型之组合精度已達到一定的水进，对不需配对安装线性滑轨的客户而言，是一项很好的滨择。PQH 系列与 PHG 系列滑轨共享，客户无需为了选用静音式产品而重新设计安装尺寸，如此更加提升了 QH 系列的应用性与可互换性。

PYG-PQH series guides can be classified into non-interchangeable and interchangeable types. The sizes areidentical. The main difference is that the interchangeable blocks and rails can be freely exchanged. Because oldimensional control, the interchangeable type linear guides is a perfect choice for the client when rails do not needto be paired for an axis. And since the PQH and PHG share the identical rails, the customer does not need to redesignwhen choosing the PQH series. Therefore the HlWIN-QH linear quideway has increased applicability.

(1) 非互换性线性滑轨产品型号 /Non-interchangeable type



注：

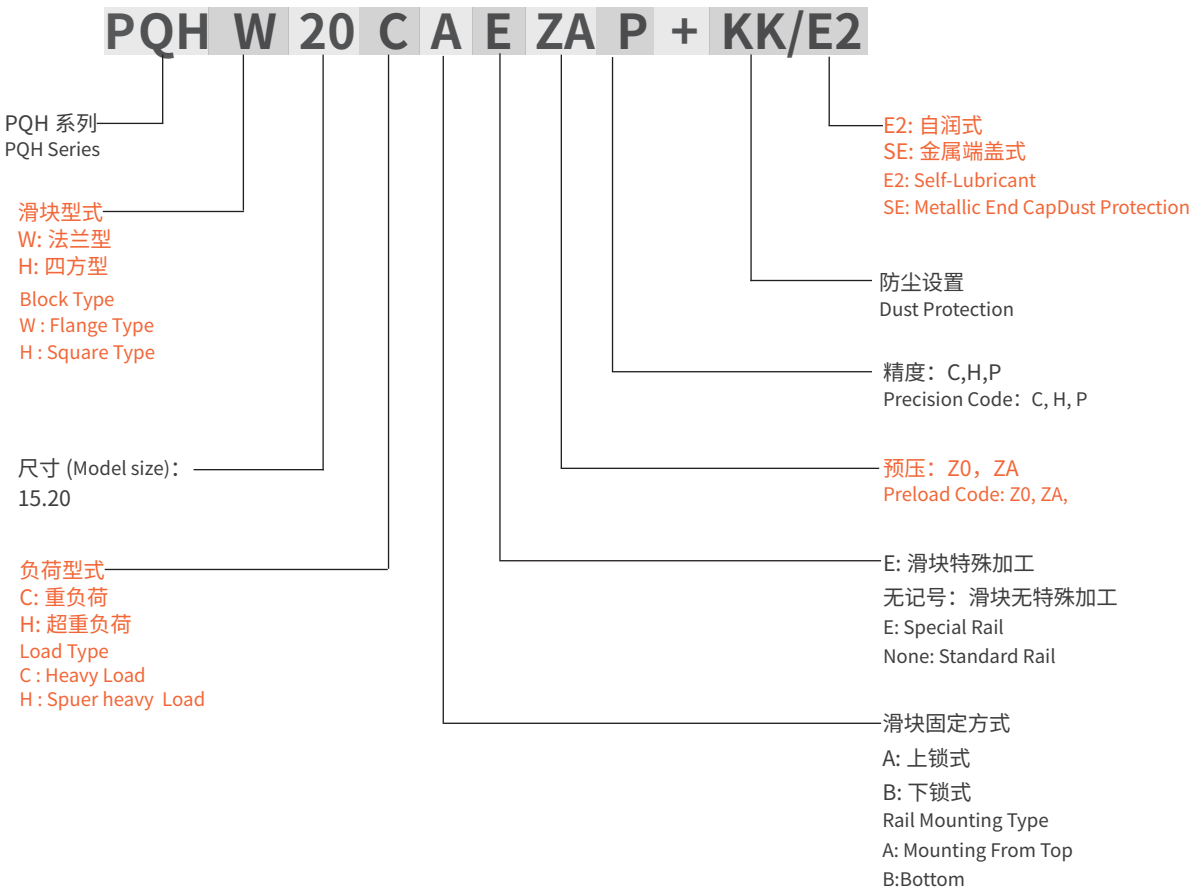
1. 单轴导轨数若只使用一支导轨则不写，两支标记为 II，三支标记为 III，以此类推。
2. 防尘配备中无记号为防尘标准配备刮油片加防尘片。
ZZ 为刮油片加防尘片加金属刮板。
KK 为双刮油片加防尘片加金属刮板。
DD 为慧刮油片加防摩防盖片。
3. 滑块型式 L 为四方形 H 之低组装式滑块，其组合高度与同尺寸之法兰型一致。

Note:

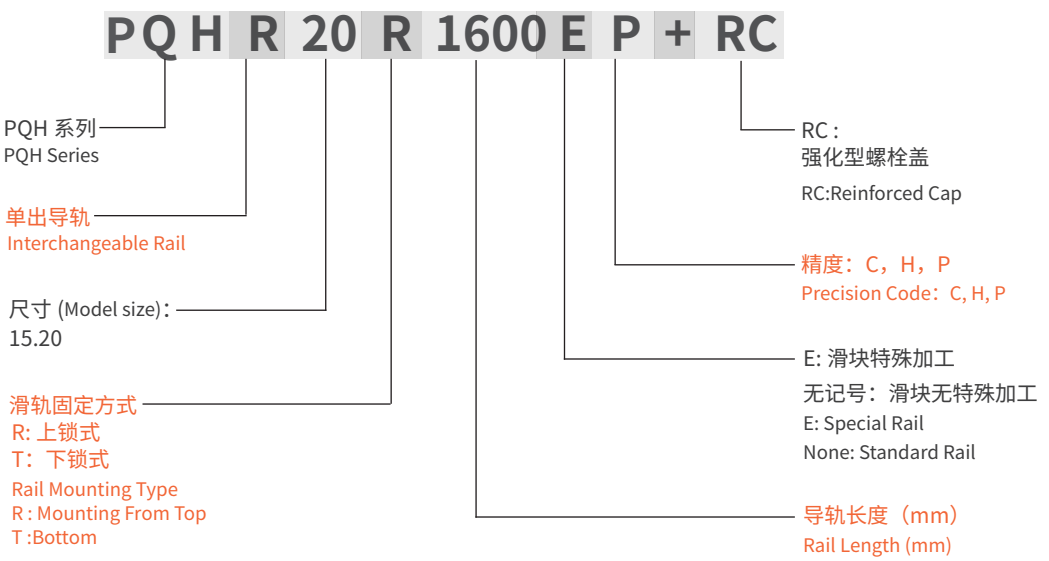
1.The roman numerals express amatched set of rails.
2.No symbol indicates standard protectionlend seal and bottom seal.
ZZ:End seal, bottom seal and scraper.
KK:Double seals, bottom seal and scraper.
DD: Double seals and bottom seal.
3. Block type HGL is the low profile design of PGH(square type), the assembled height is same as PHGW （flange type) in same size.

(1) 互换性直线导轨产品型号 /Interchangeable type

- 互换型滑块产品型号 /Model Number of PQH Block



- 互换型导轨产品型号 / Model Number of PQH Rail

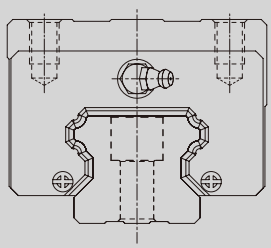


4. PQH 系列型式 /PQH Types

（1）滑块型式 /Block types

PYG 提供四方型直线导轨。
PYG offers square types of linear guides.

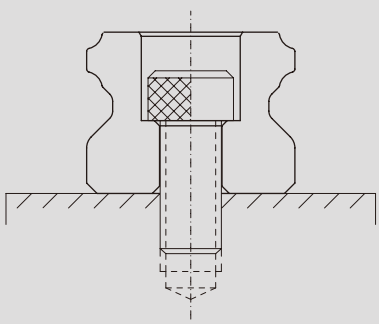
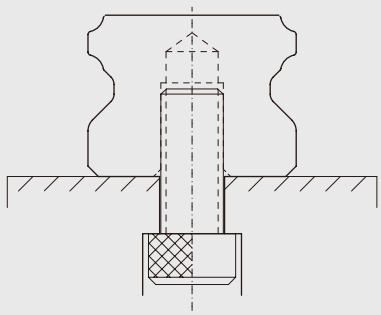
表格 2-2-3 滑块形式
Table 2-2-3 BlockTypes

型号 Type	规格 Model	形状 Shape	高度尺寸 Height (mm)	滑轨长度 Rail Length (mm)	应用设备 Main Application(mm)
四方型 Square	PQHH-CA PQHH-HA		28 ⇩ 70	100 ⇩ 4000	• 自动化装置 • 高速运输设备 • 精密测量仪器 • 半导体设备 • Automation devices • High-speed transportation equipment • Precision measuring equipment • Semiconductor manufacturing equipment

（2）滑块型式 /Block types

除了一般上锁式螺栓孔滑轨外，PYG 亦提供下锁式螺孔滑轨，方便客户安装使用。
Besides the standard top mounting type, PYG also offers bottom mounting type rails.

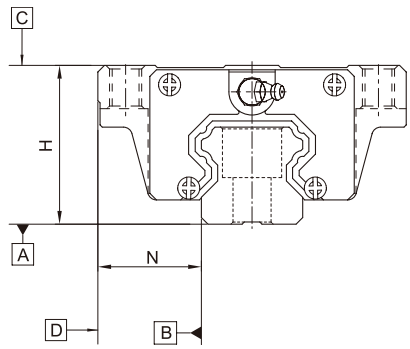
表格 2-2-4 滑轨型式
Table 2-2-4 Rail Types

上锁式螺栓孔 Mounting from Top	下锁式螺丝孔 Mounting from Bottom
	

5. 精度等级 /Accuracy Classes

PQH 系列线性滑轨的精度，分为普通、高、精密、超精密、超高精密级共五级，客户可依设备精度需求选用精度。

The accuracy of PQH series can be classified intonormal （C）, high (H）, precision （P）,super precision (SP),ultra precision (UP）, five classes. Please choose the class by referring the accuracy of applied equipment.



（1）非互换性直线导轨精度 /Accuracy of non-interchangeable guides

表 2-2-5 组合件精度表 /Accuracy Standards　　单位 /Unit（mm）

型号 /Item	PQH-15,20				
精度等级 Accuracy Classes	普通级（C） Normal（C）	高级（H） High（H）	精密级（P） Precision（P）	超精密级（SP） Super Precision(SP)	超高精密级（UP） Ultra Precision（UP）
高度 H 的容许尺寸误差 Dimensional tolerance of height H	± 0.1	± 0.03	0 - 0.03	0 -0.015	0 -0.008
宽度 N 的容许尺寸误差 Dimensional tolerance of width N	± 0.1	± 0.03	0 -0.03	0 -0.015	0 -0.008
成对高度 H 的相互误差 Variation of height H	0.02	0.01	0.006	0.004	0.003
成对宽度 N 的相互误差 Variation of width N	0.02	0.01	0.006	0.004	0.003
滑块 C 面对滑轨 A 面的行走平行度 Running parallelism of block surface C to surface A	行走平行度（见表格 2-2-11） See Table 2-2-11				
滑块 D 面对滑轨 B 面的行走平行度 Running parallelism of block surface D to surface B	行走平行度（见表格 2-2-11） See Table 2-2-11				

（2）互换性直线导轨精度 /Accuracy of interchangeable guides

表 2-2-6 单出件精度表 /Accuracy Standard　　单位 /Unit（mm）

型号 /Item	PHG-15,20		
精度等级 Accuracy Classes	普通级（C） Normal（C）	高级（H） High（H）	精密级（P） Precision（P）
高度 H 的容许尺寸误差 Dimensional tolerance of height H	± 0.1	± 0.03	± 0.015
宽度 N 的容许尺寸误差 Dimensional tolerance of width N	± 0.1	± 0.03	± 0.015
成对高度 H 的相互误差 Variation of height H	0.02	0.01	0.006
成对宽度 N 的相互误差 Variation of width N	0.02	0.01	0.006
滑块 C 面对滑轨 A 面的行走平行度 Running parallelism of block surface C to surface A	行走平行度（见表格 2-2-11） See Table 2-2-11		
滑块 D 面对滑轨 B 面的行走平行度 Running parallelism of block surface D to surface B	行走平行度（见表格 2-2-11） See Table 2-2-11		

（3）行走平行度精度 /Accuracy of running parallelism

表 2-2-11 行走平行度精度 /Accuracy of running parallelism　　单位 /Unit（mm）

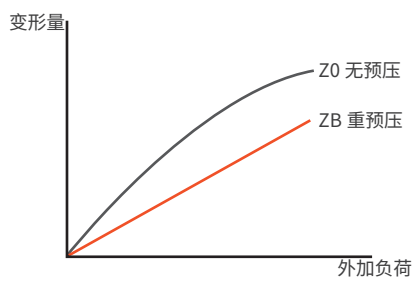
滑轨长度 /Rall Length (mm)	精度等级 /Accuracy (μm)				
	C	H	P	SP	UP
~ 100	12	7	3	2	2
100 ~ 200	14	9	4	2	2
200 ~ 300	15	10	5	3	2
300 ~ 500	17	12	6	3	2
500 ~ 700	20	13	7	4	2
700 ~ 900	22	15	8	5	3
900 ~ 1,100	24	16	9	6	3
1,100 ~ 1,500	26	18	11	7	4
1,500 ~ 1,900	28	20	13	8	4
1,900 ~ 2,500	31	22	15	10	5
2,500 ~ 3,100	33	25	18	11	6
3,100 ~ 3,600	36	27	20	14	7
3,600 ~ 4,000	37	28	21	15	7

6. 预压力 /Preload

（1）预压力定义 /Definition

预压力是预先给予钢珠负荷力，亦即加大钢珠直径，利用钢珠与珠道之间负向间隙给予预压，此举能提高导轨的刚性及消除间隙；以右图来解释，提高预压力可增加直线导轨刚性，但小规格建议选用轻预压以下预压，以避至因预压选用过重降低其使用寿命。

A preload can be applied to each quideway. Oversizedballs are used. Generally, a linear motion quidewayhas a negative clearance between groove and balls inorder to improve stiffness and maintain high precision.The fiqure shows the load is multiplied by the preloadthe rigidity is doubled and the deflection is reducedby one half. The preload no larger than ZA would berecommended for the model size under HG20 to avoidan over-preload affecting the quideway's life.



（2）预压等级 /Preload classes

PHG 系列线性滑轨提供三种标预压，可依据用途选择适当预压力。
PHG offers three classes of standard preload for various applications and conditions.

表 2-1-12 预压等级 /Preload classes

预压等级 Class	标记 Code	预压力 Preload	使用条件 Condition	适用范围 Examples of Application
无预压 Light Preload	Z0	0~0.02C	负荷方向固定且冲整小，精度要求低 Certain load direction,low impact ,low precision required	搬送装置，自动包装机，自动化产业机械，一般工业机械的 XY 轴，焊接，熔断机，工具交换装置。 Transportation devices, auto-packing machines,X-Y axis for general industrial machines, welding machines,welders
中预压 Medium Preload	ZA	0.05C~0.07C	轻负荷且要求高精度 High precision required	一般工业机械的 Z 轴，放电加工机，NC 车床，精密 XY 平台，测定器，机械加工中心，立式加工中心工业用机器人，自动涂装机，各种高速材料供给装置。 Machining centers,grinding industrial machines, EDM, NC lathes, Precision X-Y tables,measuring equipment
重预压 Heavy Preload	ZB	0.10C~0.12C	刚性要求，且有振动，冲击之使用环境 High rigidity required, with vibration and impact	机械加工中心，磨床，NC 更床，立式或卧式铣床，机床的 Z 轴，重切削加工机。 Machining centers,grinding machines ,NC lathes horizontal and vertical milling machines, Z axis of machine tools, Heavy cutting machines

等级 Class	互换性导轨（单出件） Interchangeable Guides	非互换性导轨（组合件） Non-Interchangeable Guides
预压等级	Z0，ZA	Z0，ZA，ZB

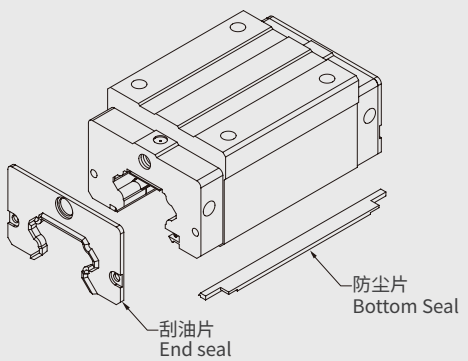
注：预压力 C 为动额定负荷
Note: The "C" in the preload column denotes basic dynamic load rating.

7. 防尘配备 /Dust Proof Accessories

（1）标准防尘配备代码 /Dust Proof Accessories

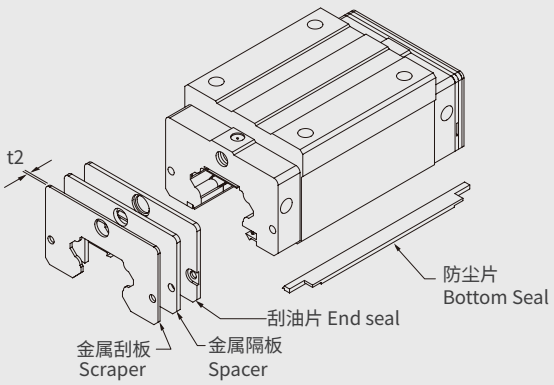
一般无特别需求之作业环境下使用，若有下列防尘配件需求时，请于产品型号后面加注代码。

Codes of standard dust proof accessoriesIf the following accessories are needed, please add the code followed by the model number.



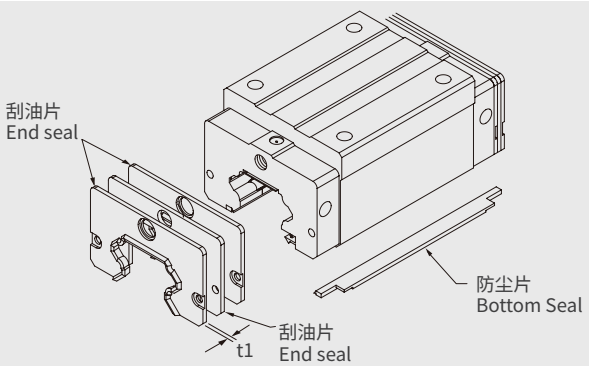
无记号为标准防尘配备（刮油片 + 防尘片）

No symbol:Standard Protection lEnd seal + Bottom Seal)



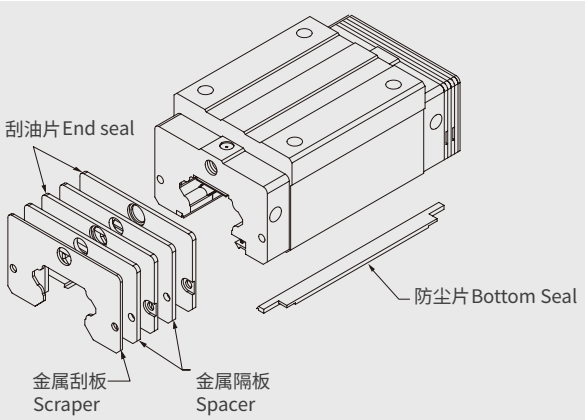
无记号为标准防尘配备（刮油片 + 防尘片）

ZZ lEnd seal +Bottom Seal+ Scraper)



DD（双刮油片 + 防尘片）

DD (Double seals + Bottom Seal)



KK（双刮油片 + 金属刮板 + 防尘片）

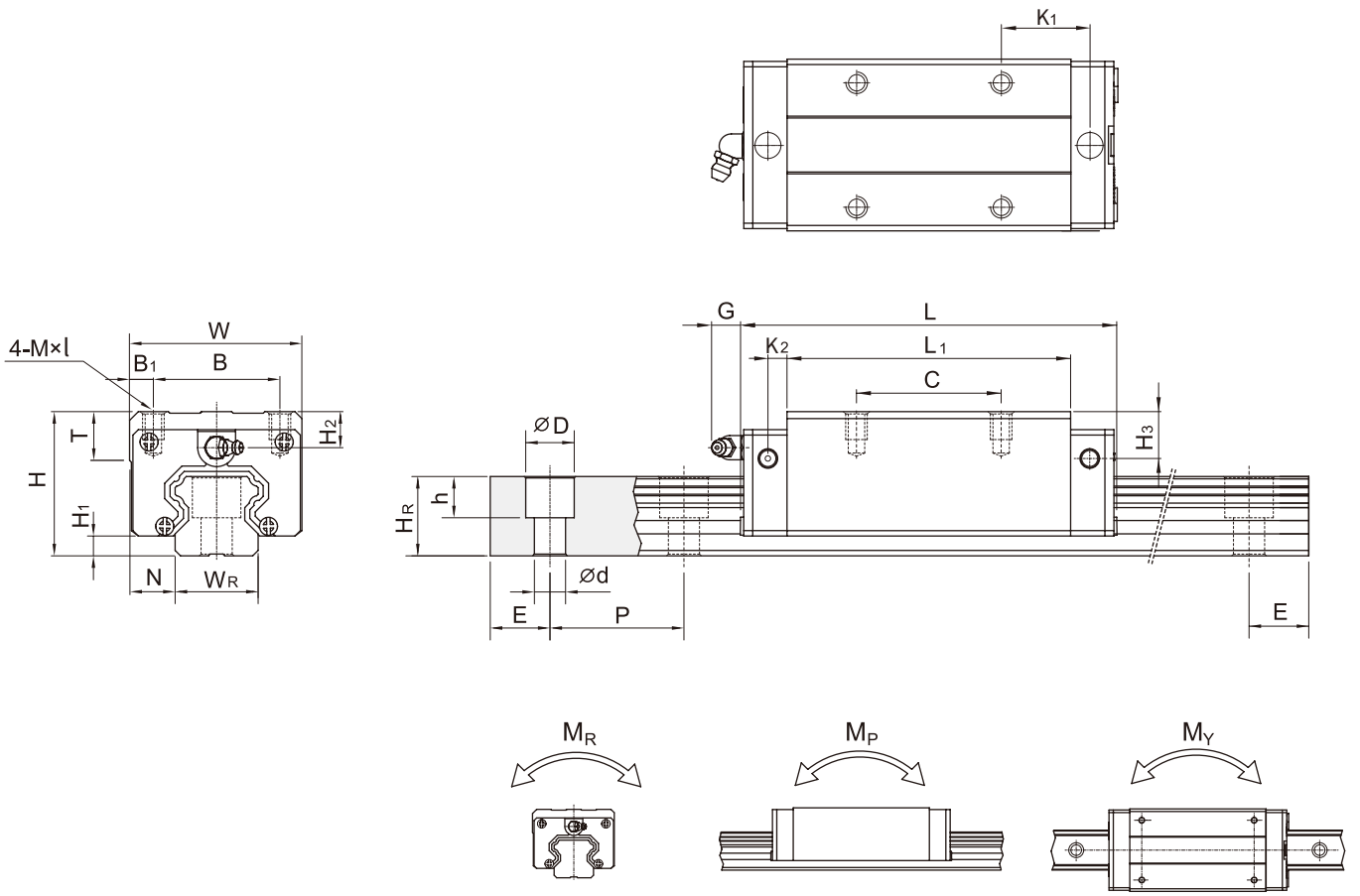
KK(Double seals+ Bottom Seal+Scraper)

注：PHG20/PHG25/PHG65 无金属隔板模型

Note: HG20/25/65 are without spacer.

8.PQH 系列直线导轨尺寸表 /Dimensions for PYG PQH Series

（1）PQHH-CA/PQHH-HA



型号 Model No.	组件尺寸 Dimensions of Assembly (mm)			滑块尺寸 Dimensions of Block(mm)												滑轨尺寸（mm） Dimensions of Rail (mm)							滑轨的固定螺栓尺寸 Mounting Bolt for Rail	基本动额定负荷 Basic Dynamic load Rating	基本静额定负荷 Basic Static Load Rating	容许静力矩 Static Rated Moment			重量 Weight	
	H	H_1	N	W	B	B_1	C	L_1	L	K_1	K_2	G	Mxl	T	H_2	H_3	W_R	H_R	D	h	d	P	E	(mm)	C（kN）	C_0（kN）	M_R kN-m	M_P kN-m	M_Y kN-m	滑块 kg	滑轨 kg/m
PQHH 15CA	28	3	9.5	34	26	4	26	39.8	62.2	10	5	5.3	M4x5	6	7.95	8.2	15	15	7.5	5.3	4.5	60	20	M4x16	17.94	19.86	0.10	0.08	0.08	0.18	1.45
PQHH 20CA	30	4.6	12	44	32	6	36	50.5	77.5	11.75	6	12	M5x6	8	6	6	20	17.5	9.5	8.5	6	60	20	M5x16	30.0	33.86	0.26	0.19	0.19	0.29	2.21
PQHH 20HA							50	65.2	91.4	12.1															35.7	42.31	0.31	0.27	0.27	0.38	

注：1kg=9.81N
Note：1kg=9.81N

2-3 PRG 系列—滚柱直线导轨

PRG SERIES-ROLLER LINEAR GUDES

1. PRG 系列线性滑轨特点 / Advantages and features

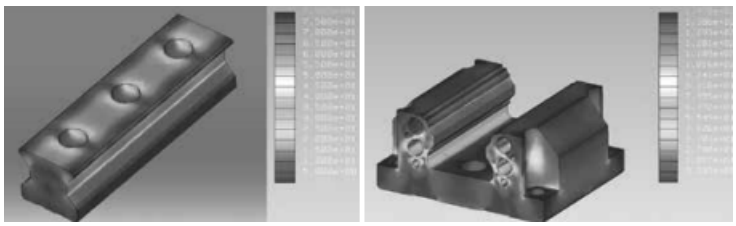
PRG 系列直线导轨以滚柱型滚动体取代了钢珠，为实现超高刚性与超重负荷能力而设计；透过滚动体与滑轨与滑块的线接触方式，让滚动体在承受高负荷时仅仅形成微量的弹性变形，更借由 45 度的接触角度的设计，让整体线性滑轨达到四方向等高刚性、等高负荷能力的特性表现。透过超高刚性的实现，可大幅提升加工精度，达到高精度的诉求；由于超重负荷的特性，进而延长线性滑轨的使用寿命。非常适合高速自动化产业机械及高刚性需求的设备使用。

The new PRG series from PYG features a roller as the rolling element instead of steel balls. The roller series offers super high rigidity and very high load capacities. The PRG series is designed with a 45-degree angle of contact. Elasticdeformation of the linear contact surface, during load, is greatly reduced there by offering greater rigidity and higher load capacities in all 4 load directions.The PRG series linear guides offers high performance for high-precision manufacturing and achieving longer service life.

(1) 最佳化设计 /Optimal design

PRG 系列直线导轨的回流模块能确保滚柱型滚动体可顺畅地进行无限循环滚动。并利用先进有限元素法进行结构应力分析，求出滑块与滑轨结构的最佳化设计。

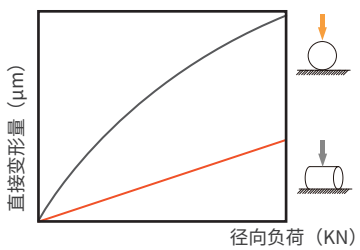
FEM analysis was performed to determinethe optimal structure of the block and therail. The unique design of the circulation pathallows the PRG series linear guides to offer smoother linear motion.



(2) 四方向皆具有超高副性 /Super high rigidity

PRG 系列直线导轨以滚柱型滚动取代了滚珠，借由滚柱与滑轨与滑块的线接触方式，滚柱在承受高负载时仅仅形成微量的弹性变形，不仅可大幅提升直线导轨的刚性值，更能维持高精度的加工。右图为等体积的滚珠与滚柱的刚性表现。

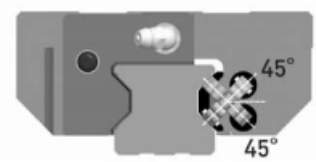
The PRG series is a type of linear guides that uses rollers as the rolling elements, Rollers have a greater contact area than balls so that the roller guides features higher load capacity and greater rigidity. The figure shows the rigidity of a roller and a ball with equal volume.



(3) 四方向告具有超重负载能力 / Super high load capacity

PRG 系列直线导轨採用 DB（45° -45°）组合，能承受上下和左右方向的负荷，让直线导轨具有超高负戴能力。在相同工作负荷的要求下，PRG 线轨相较于滚珠型线可有较小的体积，即可均匀承受高负载。

With the four rows of rollers arranged at a contact angle of 45-degrees, the PRG series linear guides has equal loadratings in the radial, reverse radial and lateral directions.The PRG series has a higher load capacity in a smaller size than conventional, ball-type linear guides.



(4) 延长寿命 / 0perating life increased

PRG 系列线性滑轨是以 IS0 规范（IIS014728-1）为基础来制定基本动额定负荷，该基本动额定负荷系以额定寿命 100 公里计算之。直线导轨的寿命会因实际承受工作负荷而不同，滚柱型线性滑轨的寿命计算可依选用直线导轨的基本动额定负荷及工作负荷推算出使用寿命。

Compare with the ball element, the contact pressure of rolling element is distributed on the line region. Therefore,stress concentration was reduced siginificantly and the PRG series offers longer running life. The nominal life of PRG series can be calculated by using Eq.

不考虑环境因素影响，寿命计算如下所示。

The acting load will affect the nominal life of a linear quideway. Based on the selected basic dynamic rated load and the actual load. The nominal life of ball type and roller type linear guides can be calculated by Eg.2.5 respectively.

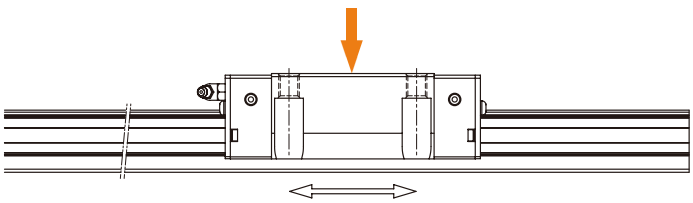
$$L=\left(\frac{C}{P}\right)^{\frac{10}{3}}\cdot 100km=\left(\frac{C}{P}\right)^{\frac{10}{3}}\cdot 62mile \quad \text{Eq.2.5}$$

若考虑直线导轨使用的环境因素，其寿命会随运动的状态、珠道表面硬度及系统温度而有所变化。
If the environmental factors are taken into consideration, the nominal life is influenced greatly by the motion conditions, the hardness of the raceway, and the temperature of the linear guides. The relationship between thesefactors is expresseding Eq.2.6.

$$L=\left(\frac{f_h \cdot f_t \cdot C}{f_w \cdot P}\right)^{\frac{10}{3}} \cdot 100km = \left(\frac{f_h \cdot f_t \cdot C}{f_w \cdot P}\right)^{\frac{10}{3}} \cdot 62mile \quad \text{Eq.2.6}$$

L：寿命	fh：硬度系数	L:Nominal life	fh:Hardness factor
P: 工作负荷	ft：温度系数	P : Actual load	ft:Temperature factor
C：基本动额定负荷	fw：负荷保数	C :Basic dynamic load rating	fw : Load factor

（4）耐久测试 /Teat Data



测试示意图
Model of the test system

表 2-3-1 试验资料 /Test data

试件一：PRGH35CA
预压等级：ZA
移动速度：60m/min
加速度：1G
行程：0.55m
润滑油脂：每 100 公里补充一次
外加负荷：15kN
运行距离：1135 公里

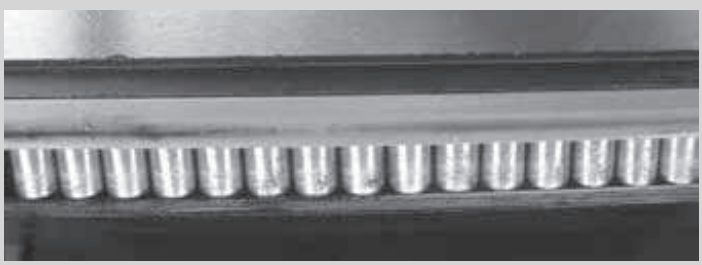
Tested model 1:PRGH35CA
Preload: ZA class
Max. Speed: 60m/min
Acceleration:1G
Stroke: 0.55m
Lubrication: grease held every 100km
Externalload:15kN
Traveling distance:1135km

测试结果：
根据 PRGH35CA 的基本动额定负荷、预压力与工作负荷推算出其寿命值为 1000 公里。本试件运行 1135 公里后，珠道表面与滚柱表面并未发生鱼鳞状薄片的剔落现象。

Test results:
The nominal life of PRGH35CA is 1000km.After traveling 1135km, fatigue flaking did not appear onthe surface of the raceway or rollers.

试件二：RGW35CC
预压等级：ZA
移动速度：120m/min
加速度：1G
行程：2m
润滑油打油频率：0.3cm^3/hr
外加负荷：无负荷
运行距离：15000km

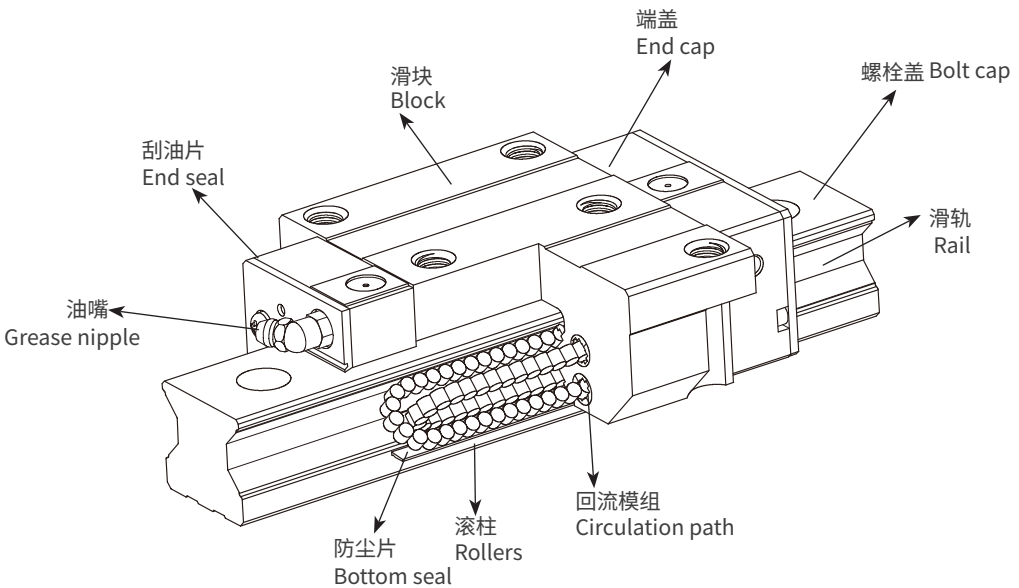
Tested model2:PRGW35CC
Preload: ZA class
Max. Speed:120m/min
Acceleration:1G
Stroke:2m
Lubrication: oil feed rate: 0.3cm^3/hr
Externalload:0kN
Traveling distance:15000km



测试结果：
本试件运行 15000 公里后，珠道表面与滚柱表面并未发生鱼鳞状薄片的剔落现象。

Testresults:
Fatigue flaking did not appear on the surface of theraceway or rollers after traveling 15000km.

2. PRG 本体结构 /Construction of PRG Series



- 滚动循环统：滑块、滑轨、端盖、钢珠、钢珠保持器
- 润滑系统 : 油嘴、油管接头
- 防尘系统 : 刮油片、底面尘封防尘片、滑轨螺栓盖、金属刮板

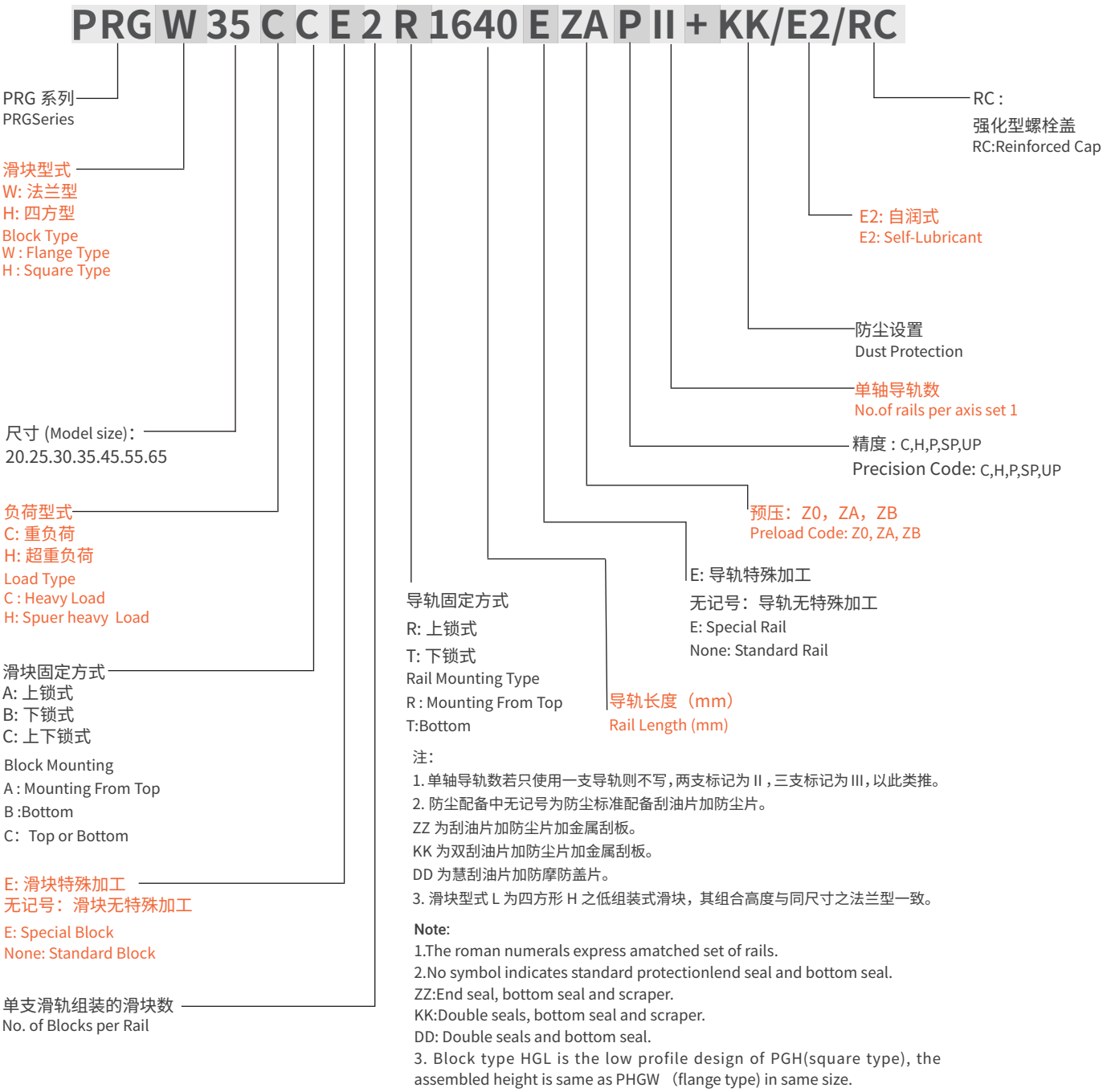
- Rolling circulation system: Block, Rail, End Cap and Retainer.
- Lubrication system: Grease Nipple and Piping Joint.
- Dust protection system: End seal, Bottom Seal, Bolt Cap, Double Seals and Scraper

3. 产品规格说明 /Model Number of PRG series

PRG 系列分为非互换性及互换性型两种线性滑轨，两者规格尺寸相同，主要差异点在于互换性型之滑块、滑轨可单独互换使用，较便利，但其组合精度无法达到非互换性型之超精密级以上的精度，不过由于 PYG 互换性型之组合精度目前已达到一定的水准，对不需配对安装线性滑轨的客户而言，是一项便利的选择。线性滑轨的产品规格型号主要标明直线导轨尺寸、型式、精度等级、预压等规格要求，以利订货时双方对产品的确认。

PRG series linear guideways are classified into non-interchangeable and interchangeable types. The sizes of these two types are the same as one another. The main difference is that the interchangeable type of blocks and rails can be freely exchanged and they can maintain P-class accuracy. Because of strict dimensional control, the interchangeable type linear guideways are a wise choice for customers when rails do not need to be matched for an axis. The model number of the RG series identifies the size, type, accuracy class, preload class, etc.

(1) 非互换性线性滑轨产品型号 /Non-interchangeable type



注：

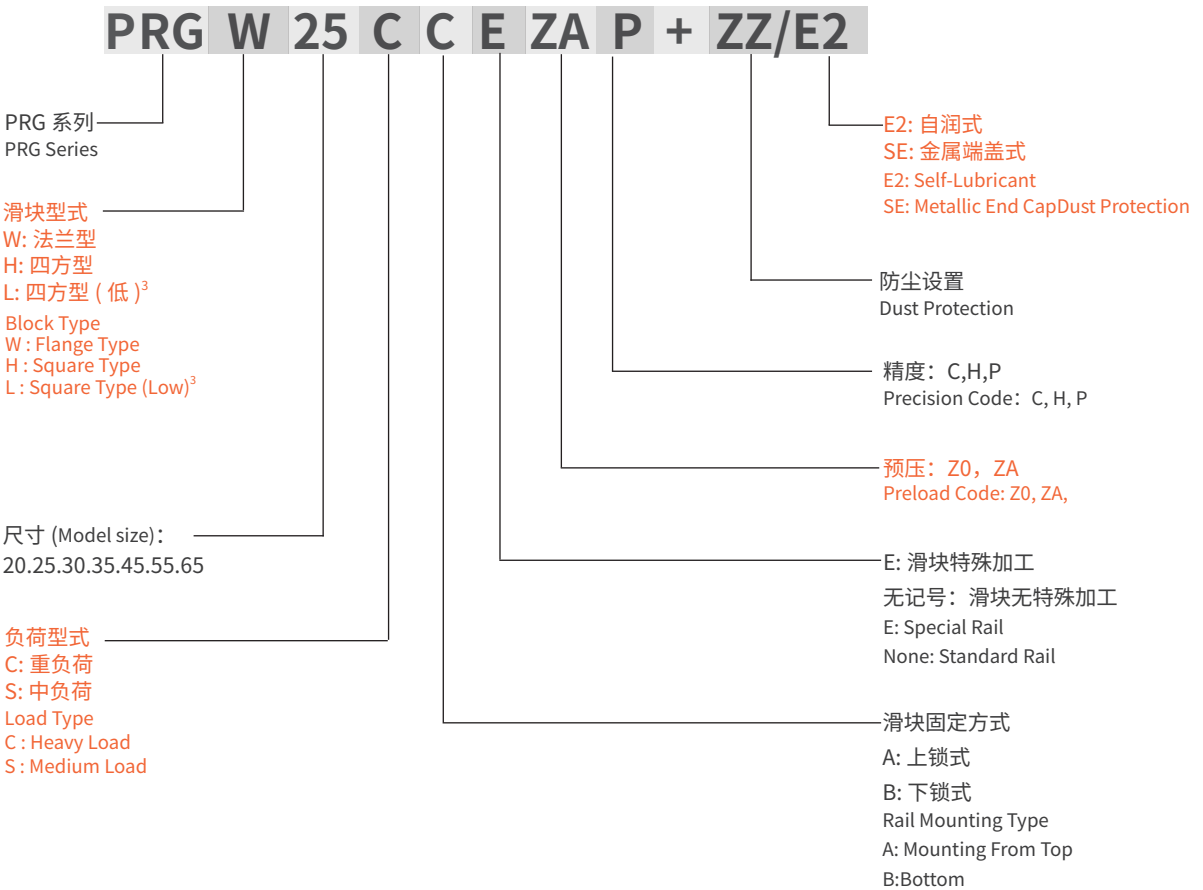
1. 单轴导轨数若只使用一支导轨则不写，两支标记为 II，三支标记为 III，以此类推。
2. 防尘配备中无记号为防尘标准配备刮油片加防尘片。
ZZ 为刮油片加防尘片加金属刮板。
KK 为双刮油片加防尘片加金属刮板。
DD 为慧刮油片加防摩防盖片。
3. 滑块型式 L 为四方形 H 之低组装式滑块，其组合高度与同尺寸之法兰型一致。

Note:

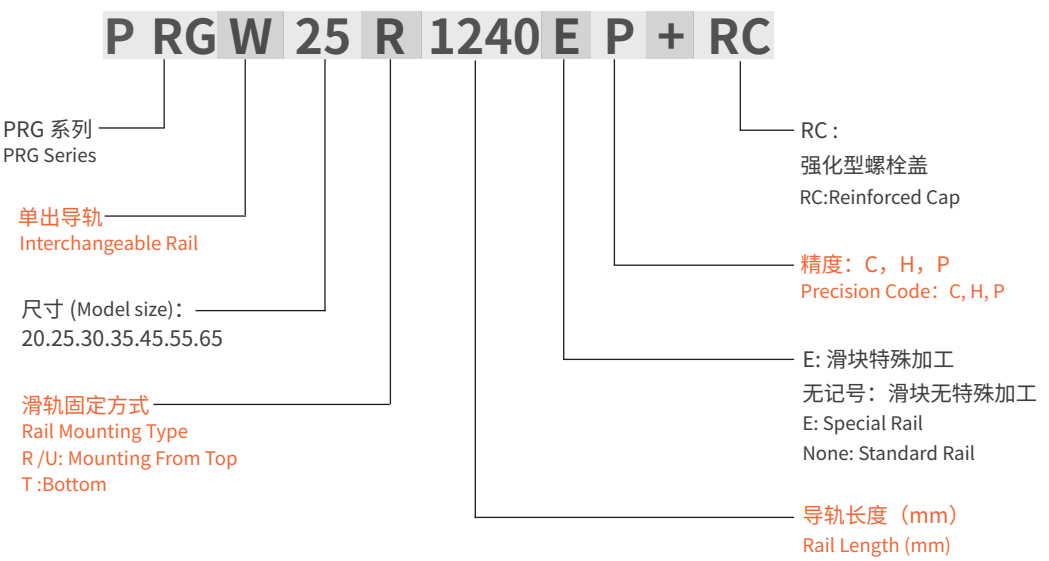
1.The roman numerals express amatched set of rails.
2.No symbol indicates standard protectionlend seal and bottom seal.
ZZ:End seal, bottom seal and scraper.
KK:Double seals, bottom seal and scraper.
DD: Double seals and bottom seal.
3. Block type HGL is the low profile design of PGH(square type), the assembled height is same as PHGW （flange type) in same size.

(2) 互换性直线导轨产品型号 /Interchangeable type

- 互换型滑块产品型号 /Model Number of PRG Block



- 互换型导轨产品型号 / Model Number of PRG Rail



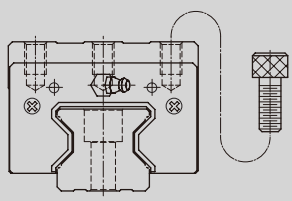
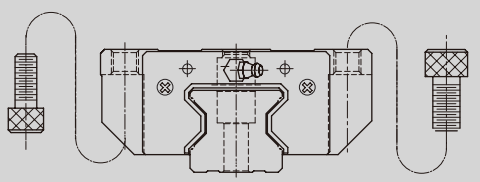
4. PRG 系列型式 /PRG Types

（1）滑块型式 /Block types

PRG 系列提供法兰型及四方型两种直线导轨，法兰型滑块在法兰的部位有加工安装螺丝孔可供安装，对于下锁的安装方式也可适用，其线性滑轨组合高度低，承靠面积大，适用于承受力距负载的场所。四方型滑块宽度较小，适合有安装空间限制的设备，滑块上方安装螺丝孔可配合安装。

PYG offers two types of guide blocks, flange and square type. Because of the low assembly height and large mounting surface, the flange type is excellent for heavy moment load applications

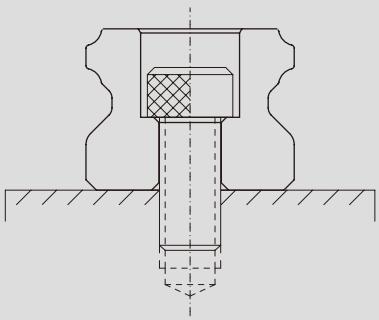
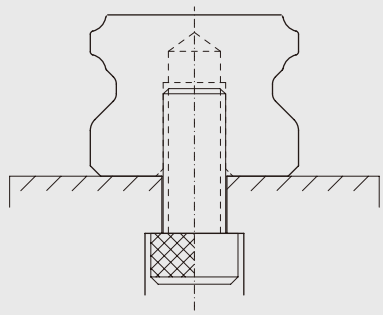
表格 2-3-2 滑块形式
Table 2-3-2 BlockTypes

型号 Type	规格 Model	形状 Shape	高度尺寸 Height (mm)	滑轨长度 Rail Length (mm)	应用设备 Main Application(mm)
四方型 Square	PRGH-CA PRGH-HA		24 ⇩ 48	24 ⇩ 4000	• 自动化装置 • 重型搬运设备 • CNC 加工机 • 重切削加工机 • CNC 磨床 • 射出型机 • 放电加工机 • 大型龙门机床 • 高刚性重负荷需求的工作机械 • Automation Systems • Transportation equipment • CNC machining centers • Heavy duty cutting machines • CNC grinding machines • Injection molding machines • Plano millers • Devices requiring high rigidity • Devices requiring high load capacity • Electric discharge machines
法兰型 Square	PRGH-CC PRGW-HC		24 ⇩ 90	100 ⇩ 4000	

（2）滑块型式 /Block types

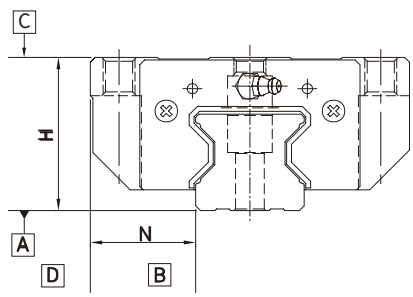
除了一般上锁式螺栓孔滑轨外，PYG 亦提供下锁式螺孔滑轨，方便客户安装使用。
Besides the standard top mounting type, PYG also offers bottom mounting type rails.

表格 2-3-3 滑轨型式
Table 2-3-3 Rail Types

上锁式螺栓孔 Mounting from Top	下锁式螺丝孔 Mounting from Bottom
	

5. 精度等级 /Accuracy Classes

PRG 系列直线导轨的精度，分高、精密、超精密、超高精密极共五级，客户可依设备精度篇求选用精度。
The accuracy of PRG series can be classified high (H), precision (P), super precision (SP),ultra precision (UP), five classes. Please choose the class by referring the accuracy of applied equipment.



（1）非互换性直线导轨精度 /Accuracy of non-interchangeable guides

表 2-3-4 组合件精度表 /Accuracy Standard　　单位 /Unit（mm）

型号 /Item	PRG-15,20			
精度等级 Accuracy Classes	高级（H） High（H）	精密级（P） Precision（P）	超精密级（SP） Super Precision(SP)	超高精密级（UP） Ultra Precision（UP）
高度 H 的容许尺寸误差 Dimensional tolerance of height H	± 0.03	0 - 0.03	0 -0.015	0 -0.008
宽度 N 的容许尺寸误差 Dimensional tolerance of width N	± 0.03	0 -0.03	0 -0.015	0 -0.008
成对高度 H 的相互误差 Variation of height H	0.01	0.006	0.004	0.003
成对宽度 N 的相互误差 Variation of width N	0.01	0.006	0.004	0.003
滑块 C 面对滑轨 A 面的行走平行度 Running parallelism of block surface C to surface A	行走平行度（见表格 2-3-11） See Table 2-3-11			
滑块 D 面对滑轨 B 面的行走平行度 Running parallelism of block surface D to surface B	行走平行度（见表格 2-3-11） See Table 2-3-11			

表 2-3-5 组合件精度表 /Accuracy Standards　　单位 /Unit（mm）

型号 /Item	PRG-25,30,35			
精度等级 Accuracy Classes	高级（H） High（H）	精密级（P） Precision（P）	超精密级（SP） Super Precision(SP)	超高精密级（UP） Ultra Precision（UP）
高度 H 的容许尺寸误差 Dimensional tolerance of height H	± 0.04	0 - 0.04	0 -0.02	0 -0.01
宽度 N 的容许尺寸误差 Dimensional tolerance of width N	± 0.04	0 -0.04	0 -0.02	0 -0.01
成对高度 H 的相互误差 Variation of height H	0.015	0.007	0.005	0.003
成对宽度 N 的相互误差 Variation of width N	0.025	0.007	0.005	0.003
滑块 C 面对滑轨 A 面的行走平行度 Running parallelism of block surface C to surface A	行走平行度（见表格 2-3-11） See Table 2-3-11			
滑块 D 面对滑轨 B 面的行走平行度	行走平行度（见表格 2-3-11） See Table 2-3-11			

表 2-3-6 组合件精度表 /Accuracy Standard

单位 /Unit（mm）

型号 /Item	PRG-45,55			
精度等级 Accuracy Classes	高级（H） High（H）	精密级（P） Precision（P）	超精密级（SP） Super Precision(SP)	超高精密级（UP） Ultra Precision（UP）
高度 H 的容许尺寸误差 Dimensional tolerance of height H	± 0.05	0 - 0.05	0 -0.03	0 -0.02
宽度 N 的容许尺寸误差 Dimensional tolerance of width N	± 0.05	0 -0.05	0 -0.03	0 -0.02
成对高度 H 的相互误差 Variation of height H	0.015	0.007	0.005	0.003
成对宽度 N 的相互误差 Variation of width N	0.02	0.01	0.007	0.005
滑块 C 面对滑轨 A 面的行走平行度 Running parallelism of block surface C to surface A	行走平行度（见表格 2-3-11） See Table 2-3-11			
滑块 D 面对滑轨 B 面的行走平行度 Running parallelism of block surface D to surface B	行走平行度（见表格 2-3-11） See Table 2-3-11			

表 2-3-7 组合件精度表 /Accuracy Standards

单位 /Unit（mm）

型号 /Item	PRG-65			
精度等级 Accuracy Classes	高级（H） High（H）	精密级（P） Precision（P）	超精密级（SP） Super Precision(SP)	超高精密级（UP） Ultra Precision（UP）
高度 H 的容许尺寸误差 Dimensional tolerance of height H	± 0.07	0 - 0.07	0 -0.05	0 -0.03
宽度 N 的容许尺寸误差 Dimensional tolerance of width N	± 0.07	0 -0.07	0 -0.05	0 -0.03
成对高度 H 的相互误差 Variation of height H	0.02	0.01	0.007	0.005
成对宽度 N 的相互误差 Variation of width N	0.025	0.015	0.01	0.007
滑块 C 面对滑轨 A 面的行走平行度 Running parallelism of block surface C to surface A	行走平行度（见表格 2-3-11） See Table 2-3-11			
滑块 D 面对滑轨 B 面的行走平行度	行走平行度（见表格 2-3-11） See Table 2-3-11			

（2）互换性直线导轨精度 /Accuracy of interchangeable guides

表 2-3-8 单出件精度表 /Accuracy Standard

单位 /Unit（mm）

型号 /Item	PRG-45,55	
精度等级 Accuracy Classes	高级（H） High（H）	精密级（P） Precision（P）
高度 H 的容许尺寸误差 Dimensional tolerance of height H	± 0.07	± 0.035
宽度 N 的容许尺寸误差 Dimensional tolerance of width N	± 0.07	± 0.035
成对高度 H 的相互误差 Variation of height H	0.02	0.01
成对宽度 N 的相互误差 Variation of width N	0.025	0.015
滑块 C 面对滑轨 A 面的行走平行度 Running parallelism of block surface C to surface A	行走平行度（见表格 2-3-11） See Table 2-3-11	
滑块 D 面对滑轨 B 面的行走平行度 Running parallelism of block surface D to surface B	行走平行度（见表格 2-3-11） See Table 2-3-11	

表 2-3-9 单出件精度表 /Accuracy Standard

单位 /Unit（mm）

型号 /Item	PRG-66	
精度等级 Accuracy Classes	高级（H） High（H）	精密级（P） Precision（P）
高度 H 的容许尺寸误差 Dimensional tolerance of height H	± 0.07	± 0.035
宽度 N 的容许尺寸误差 Dimensional tolerance of width N	± 0.07	± 0.035
成对高度 H 的相互误差 Variation of height H	0.02	0.01
成对宽度 N 的相互误差 Variation of width N	0.025	0.015
滑块 C 面对滑轨 A 面的行走平行度 Running parallelism of block surface C to surface A	行走平行度（见表格 2-3-11） See Table 2-3-11	
滑块 D 面对滑轨 B 面的行走平行度 Running parallelism of block surface D to surface B	行走平行度（见表格 2-3-11） See Table 2-3-11	

（3）行走平行度精度 /Accuracy of running parallelism

表 2-3-11 行走平行度精度 /Accuracy of running parallelism　　单位 /Unit（mm）

滑轨长度 /Rall Length (mm)	精度等级 /Accuracy (μm) H	P	SP	UP
~ 100	7	3	2	2
100 ~ 200	9	4	2	2
200 ~ 300	10	5	3	2
300 ~ 500	12	6	3	2
500 ~ 700	13	7	4	2
700 ~ 900	15	8	5	3
900 ~ 1,100	16	9	6	3
1,100 ~ 1,500	18	11	7	4
1,500 ~ 1,900	20	13	8	4
1,900 ~ 2,500	22	15	10	5
2,500 ~ 3,100	25	18	11	6
3,100 ~ 3,600	27	20	14	7
3,600 ~ 4,000	28	21	15	7

6. 预压力 /Preload

（1）预压力定义 /Definition

预压力是预先给予滚柱负荷力，亦即加大滚柱直径，利用滚柱与滚道之间负向间隙给予预压，此举能提高直线导轨的刚性及消除间隙；PRG 系列直线导轨提供三种标准预压。

A preload can be applied to each guides using oversized rollers. Generally, a linear motion guides has negative clearance between the raceway and rollers to improve stiffness and maintain high precision. The PRG series linear guides offers three standard preloads for various applications and conditions.

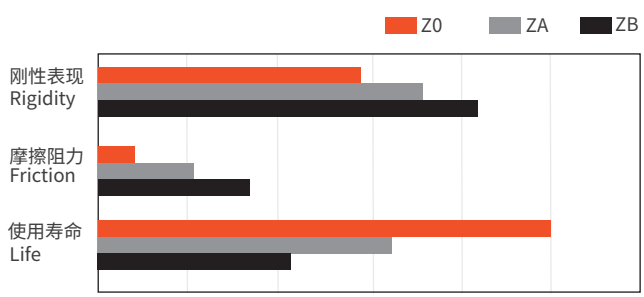
表 2-1-12 预压等级 /Preload classes

预压等级 Class	标记 Code	预压力 Preload	适用范围 Examples of Application
轻预压 Light Preload	Z0	0.02~0.04C	负荷方向固定且冲击小，精度要求低。 Certain load direction, low impact, low precision required.
中预压 Medium Preload	ZA	0.07C~0.09C	刚性需求且轻负荷，高精度要求。 High rigidity required, high precision required.
重预压 Heavy Preload	ZB	0.12C~0.14C	高刚性需求，且有振动与冲击之使用环境。 Super high rigidity required, with vibration and impact

注：预压力 C 为动额定负荷
Note: The "C" in the preload column denotes basic dynamic load rating.

右图为直线导轨不同预压条件下之刚性表现、摩擦阻力与使用寿命关系图，客户可依设备刚性与使用寿命需求选用适当的预压等级，但小规格建议选用中预压以下预压，以避免预压选用过重而降低其寿命。

The figure shows the relationship between the rigidity, friction and nominal life. A preload no larger than ZA would be recommended for smaller model sizes to avoid over-preload affecting the life of the guides.



● 预压力

不同的预压力呈现不一样的滑块刚性，下表为各尺寸的滑块刚性值。

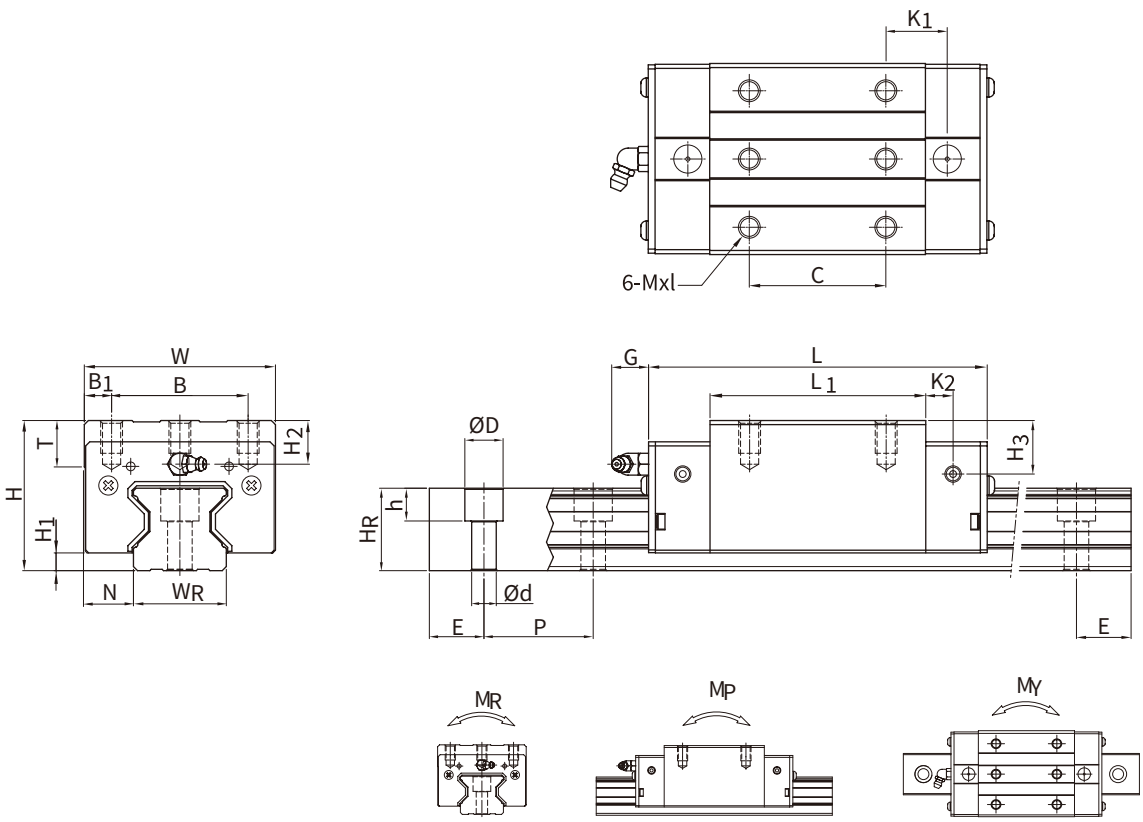
Stiffness depends on preload. The following table shows stiffness value of each size.

表 2-3-13 PRG 系列径向刚性 / Radial stiffness for PRG Series

负荷形式 Load type	系列 / 尺寸 Series / Size	不同预压力的刚性表现（N/μm） Stiffness (N/μm)		
		Z0	ZA	ZB
重负荷 Heavy load	PRG 15C	508	727	788
	PRG 20C	625	853	950
	PRG 25C	692	954	1196
	PRG 30C	882	1082	1333
	PRG 35C	1059	1247	1547
	PRG 45C	1642	1851	2332
	PRG 55C	1784	2053	2506
	PRG 65C	2564	2900	3482
超负荷 Super heavy load	PRG 20H	840	1160	1279
	PRG 25H	887	1242	1549
	PRG 30H	1125	1391	1711
	PRG 35H	1412	1757	2144
	PRG 45H	2207	2511	3172
	PRG 55H	2459	2858	3538
	PRG 65H	3560	4064	4937

7.PRG 系列直线导轨尺寸表 /Dimensions for PYG PRGH Series

（1）PRGH-CA/PRGH-HA



型号 Model No.	组件尺寸 Dimensions of Assembly (mm)			滑块尺寸 Dimensions of Block(mm)													滑轨尺寸（mm） Dimensions of Rail (mm)							滑轨的固定螺栓尺寸 Mounting Bolt for Rail	基本动额定负荷 Basic Dynamic load Rating	基本静额定负荷 Basic Static Load Rating	容许静力矩 Static Rated Moment			重量 Weight	
	H	H_1	N	W	B	B_1	C	L_1	L	K_1	K_2	G	MxI	T	H_2	H_3	W_R	H_R	D	h	d	P	E	(mm)	C (kN)	C_0 (kN)	M_R kN-m	M_P kN-m	M_Y kN-m	滑块 kg	滑轨 kg/m
PRGH 20CA	34	5	12	44	32	6	36	57.5	86	15.8	6	5.3	M_{5x8}	8	8.3	8.3	20	21	9.5	8.5	6	30	20	M_{5x20}	21.3	46.7	0.647	0.46	0.46	0.40	2.76
PRGH 20HA							50	77.5	106	18.8															26.9	63	0.872	0.837	0.837	0.53	
PRGH 25CA	40	5.5	12.5	48	40	6.5	40	55	96	20.75	7.25	12	M_{6x8}	9.5	10.2	10	23	23.6	11	9	7	30	20	M_{6x20}	27.7	57.1	0.758	0.605	0.605	0.61	3.08
PRGH 25HA							50	81	114.4	21.5															33.9	73.4	0.975	0.991	0.991	0.75	
PRGH 30CA	45	6	16	60	40	10	40	71	113	23.5	8	12	M_{8x10}	9.5	9.5	10.3	28	28	14	12	9	40	20	M_{8x25}	39.1	82.1	1.445	1.06	1.06	0.90	4.41
PRGH 30HA							60	93	131.8	24.5															48.1	105	1.846	1.712	1.712	1.16	
PRGH 35CA	55	6.5	18	70	50	10	50	82	131	22.5	10	12	M_{8x12}	12	16	19.6	34	30.2	14	12	9	40	20	M_{8x25}	57.9	105.2	2.17	1.44	1.44	1.57	6.06
PRGH 35HA							72	106.5	151.5	25.25															73.1	142	2.93	2.6	2.6	2.06	
PRGH 45CA	70	8	20.5	86	60	13	60	106	153.2	31	10	12.9	M_{10x17}	16	20	24	45	38	20	17	14	52.5	22.5	M_{12x35}	92.6	178.8	4.52	3.05	3.05	3.18	9.97
PRGH 45HA							80	139.8	187	37.9															116	230.9	6.33	5.47	5.47	4.13	
PRGH 55CA	80	13	23.5	100	75	12.5	75	125.5	183.7	37.75	12.5	12.9	M_{12x18}	17.5	22	27.5	53	44	23	20	16	60	30	M_{14x45}	130.5	252	8.01	5.4	5.4	4.89	13.98
PRGH 55HA							95	173.8	232	51.9															167.8	348	11.15	10.25	10.25	6.68	
PRGH 65CA	90	12	31.5	126	76	25	70	144.2	200.2	43.1	15.8	12.9	M_{16x20}	25	15	15	63	53	26	22	18	75	35	M_{16x50}	213	411.6	16.20	11.59	11.59	8.89	20.22
PRGH 65HA							120	203.6	259.6	47.8															275.3	572.7	22.55	22.17	22.17	12.13	

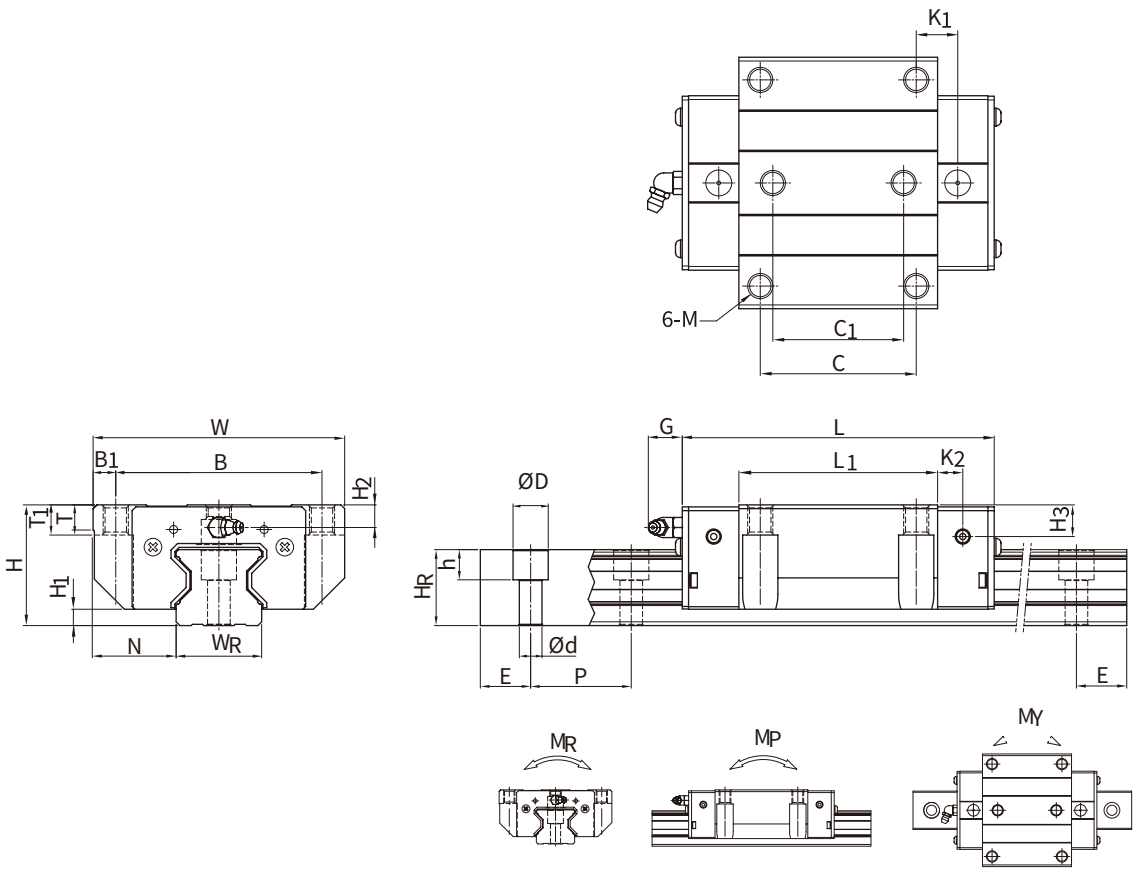
注：1. 1kgf=9.81N

2. 此为 C_{100R} 的理论动额定负荷，若有需要 $C_{50R\ 转换}$公式：$C_{50R} = 1.23 \times C_{100R}$

Note：1. 1kg=9.81N

2. The theoretical dynamic rated load is C100R, if necessary C50R conversion formula is as follows : C50R = 1.23 x C100R

（3）PRGW-CC/PRGW-HC



型号 Model No.	组件尺寸 Dimensions of Assembly (mm)			滑块尺寸 Dimensions of Block(mm)																			滑轨尺寸（mm） Dimensions of Rail (mm)			滑轨的固定螺栓尺寸 Mounting Bolt for Rail	基本动额定负荷 Basic Dynamic load Rating	基本静额定负荷 Basic Static Load Rating	容许静力矩 Static Rated Moment			重量 Weight	
	H	H_1	N	W	B	B_1	C	C_1	L_1	L	K_1	K_2	G	M	T	T_1	H_2	H_3	W_R	H_R	D	h	d	P	E	(mm)	C（kN）	C_0（kN）	M_R kN-m	M_P kN-m	M_Y kN-m	滑块 kg	滑轨 kg/m
PRGW 20CC	30	5	21.5	63	53	5	40	35	57.5	86	13.8	6	5.3	M6	8	10	4.3	4.3	20	21	9.5	8.5	6	30	20	M_{5x20}	21.3	46.7	0.647	0.46	0.46	0.47	1.8
PRGW 20HC									77.5	106	23.8																26.9	63	0.872	0.837	0.837	0.63	
PRGW 25CC	36	5.5	23.5	70	57	6.5	45	40	64.5	97.9	15.75	7.25	12	M8	9.5	10	6.2	6	23	23.6	11	9	7	30	20	M_{6x20}	27.7	57.1	0.758	0.605	0.605	0.72	3.08
PHGW 25HC									81	114.4	24																33.9	73.4	0.975	0.991	0.991	0.91	
PRGW 30CC	42	6	31	90	72	9	52	44	71	113	17.5	8	12	M10	9.5	10	6.5	7.3	28	28	14	12	9	40	20	M_{8x25}	39.1	82.1	1.445	1.06	1.06	1.16	4.41
PRGW 30HC										131.8	28.5																48.1	105	1.846	1.712	1.712	1.52	
PRGW 35CC	48	6.5	33	100	82	9	62	52	82	131	16.5	10	12	M10	12	13	9	12.6	34	30.2	14	12	9	40	20	M_{8x25}	57.9	105.2	2.17	1.44	1.44	1.75	6.06
PRGW 35HC									106.5	151.5	30.25																73.1	142	2.93	2.6	2.6	2.40	
PRGW 45CC	60	8	37.5	120	100	10	80	60	106	153.2	21	10	12.9	M12	14	15	10	14	45	38	20	17	14	52.5	22.5	M_{12x35}	92.6	178.8	4.52	3.05	3.05	3.43	9.97
PRGW 45HC									139.8	187	37.9																116	230.9	6.33	5.47	5.47	4.57	
PRGW 55CC	70	10	43.5	140	116	12	95	70	125.5	183.7	21	12.5	12.9	M14	16	17	12	17.5	53	44	23	20	16	60	30	M_{14x45}	130.5	252	8.01	5.4	5.4	5.43	13.98
PRGW 55HC									173.8	232	51.9																167.8	348	11.15	10.25	10.25	7.61	
PRGW 65CC	90	12	53.5	170	142	14	110	82	160	232	40.8	15.8	12.9	M16	22	23	15	15	63	53	26	22	18	75	35	M_{16x50}	213	411.6	16.20	11.59	11.59	11.63	20.22
PRGW 65HC									223	295	72.3																275.3	572.7	22.55	22.17	22.17	16.58	

注：1. 1kgf=9.81N

2. 此为 C_{100R} 的理论动额定负荷，若有需要 $C_{50R\ 转换}$ 公式 : $C_{50R} = 1.23 \times C_{100R}$

Note: 1. 1kg=9.81N

2. The theoretical dynamic rated load is C100R, if necessary C50R conversion formula is as follows : C50R = 1.23 x C100R

2-4 PQR 系列—静音式滚柱直线导轨

PQR SERIES-SLIENT TYPE ROLLER LINEAR GUIDES

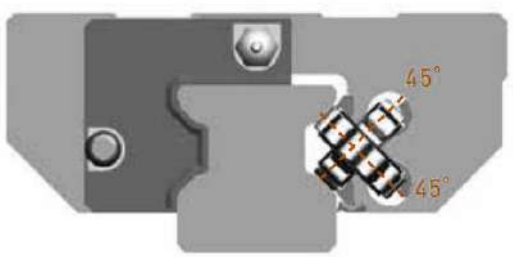
PQR 系列静音式滚柱型线性滑轨，除了具备滚柱型线性滑轨之四方向高刚性与重负荷能力之外，并采用 SynchMotion™ 技术搭载滚柱同步联结器，可有效降低运转时噪音、滚动摩擦阻力、提升运转平顺性并具备超长使用寿命。因此 PQR 系列直线导轨具有更广泛的产业应用性，适用于高速、宁静与高刚性需求的产业。

1. PQR 系列直线导轨特点 / Advantages and features

（1）四方向高负荷承载能力

PQR 系列线性滑轨采用 DB（45° -45°）接触系统，能承受上下和左右方向的负荷，让直线导轨具有超高负载能力。在相同工作负荷的要求下，PQR 线轨相较于滚珠型线轨可有较小的体积，即可均匀承受高负载。

Super high load capacity in linear guides, with the four rows of rollers arranged at a contact angle of 45-degrees, the QR series linear guides has equal load ratings in the radial, reverse radial and lateral directions. The PQR series has a higher load capacity in a smaller size than conventional, ball-type linear guides.

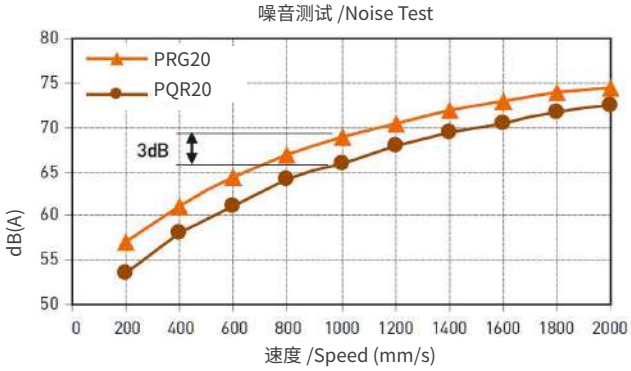


（2）低噪音设计

利用滚柱同步联结器可使滚柱均匀等间隔的排列，使相邻滚柱间的撞击金属声消失，尖锐的高频声音强度有效降低，总和的声音强度与旧有系列比较在各个速度域有效降低约 3 分贝（见右图）。

Low Noise Design With SynchMotion™ technology, rolling elements are interposed between the partitions of SynchMotion™ to provide improved circulation. Due to the elimination of contact between the rolling elements, collision noise and sound levels are drastically reduced.

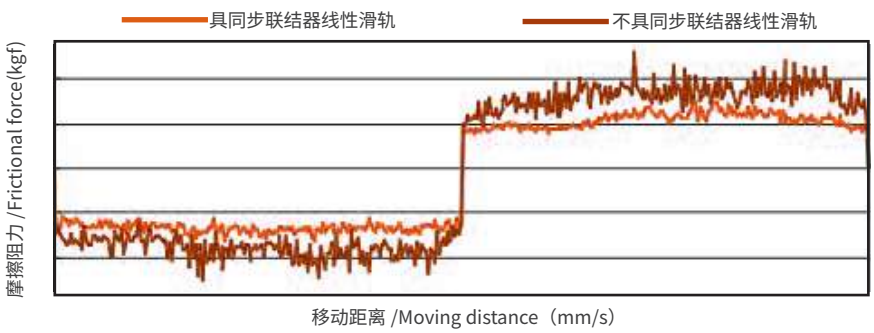
噪音测试 /Noise Test



（3）提升运动平顺度

传统不具同步联结器之直线导轨开始运行时，滚动体会因推挤而造成连锁的来回碰撞，使得摩擦阻力变动起伏剧烈。而采用 SynchMotion™ 技术的 PQR 系列直线导轨由于具有滚柱同步联结器，除了有效防止滚柱进入负荷区之偏摆现象，所有滚柱被均匀的间隔排列进行循环运动，且滚柱间并无来回的碰撞，在保持一定的运动惯性下，摩擦阻力的变动幅度能有效的减少。

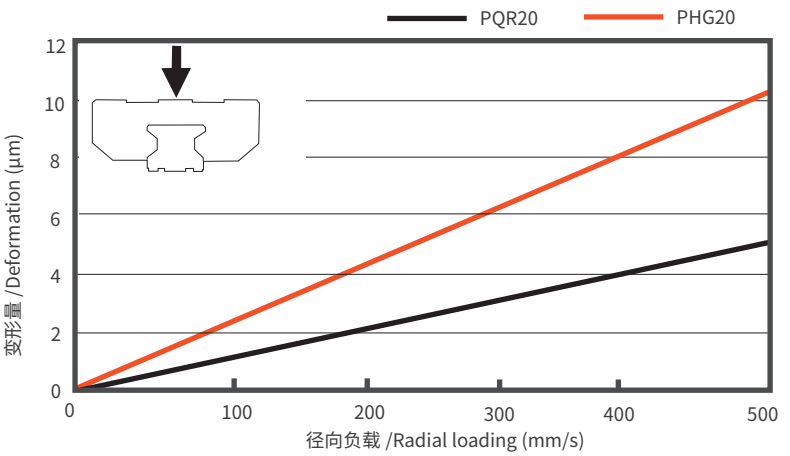
Smooth Movement In standard linear guideways, rolling elements on the load side of the guide block begin rolling and push their way through the raceway. When they contact other rolling elements they create counter-rotational friction. This results in a great variation of rolling resistance. The QR linear guides, with SynchMotion™ technology prevents this condition.



（4）四方向皆具有超高刚性

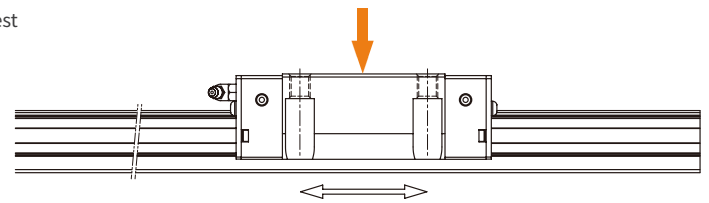
PQR 系列直线导轨除了借由搭载同步联结器以提升高速性能之外，并以滚柱型滚动体取代了滚珠，借由滚柱与滑轨与滑块的线接触方式，有效减少滚柱受负载时之弹性变形，不仅能大幅提升直线导轨的刚性值，更能在高速运行下维持高精度的加工。右图为 PQR 线轨与 PHG 线轨之刚性比较。

The PQR series is a type of linear guides that uses rollers as the rolling elements. Elastic deformation of the linear contact surface, during load, is greatly reduced there by offering greater rigidity and higher load capacities in all 4 load directions.



（5）耐久测试 /Teat Data

①标准寿命测试 /Nominal life test

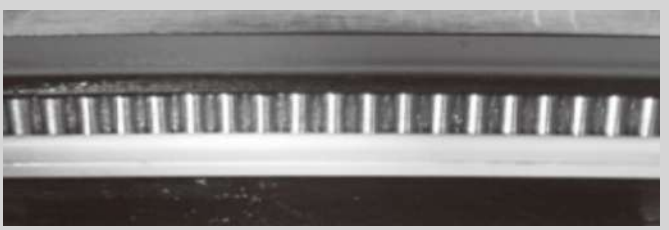


测试示意图
Model of the test system

表 2-4-1 试验资料 /Test data

试件一：PQRW20CC
预压等级：ZA
移动速度：28m/min
加速度：1G
行程：0.2m
润滑油脂：每 100 公里补充一次
外加负荷：8.6kN
运行距离：1024 公里

Tested model 1:PRGH35CA
Preload: ZA class
Max. Speed: 60m/min
Acceleration:1G
Stroke: 0.55m
Lubrication: grease held every 100km
Externalload:15kN
Traveling distance:1135km



测试结果：
根据 PQRW20CC 的基本动额定负荷、预压力与工作负荷推算出其寿命值为 1024 公里。本试件运行 1024 公里后，珠道表面与滚柱表面并未发生鱼鳞状薄片的剔落现象。

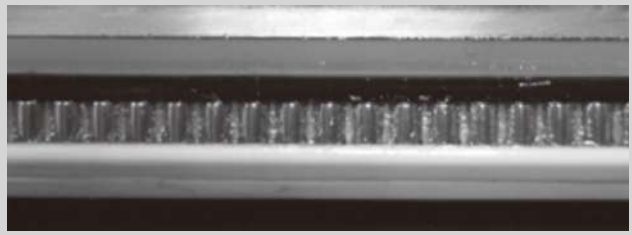
Test results:
The nominal life of PRGH35CA is 1024 km.After traveling 1135km, fatigue flaking did not appear onthe surface of the raceway or rollers.

②耐久力测试 /Durability Test

表 2-4-2 试验资料 /Test data

试件二：PQRH20CA
预压等级：Z0
移动速度：180m/min
加速度：3G
行程：0.23m
润滑油打油频率：0.14cm^3/hr
外加负荷：无负荷
运行距离：10586km

Tested model2:PQRH20CA
Preload: Z0 class
Max. Speed:180m/min
Acceleration:3G
Stroke:0.23m
Lubrication: oil feed rate: 0.14cm^3/hr
Externalload:0kN
Traveling distance:10586km

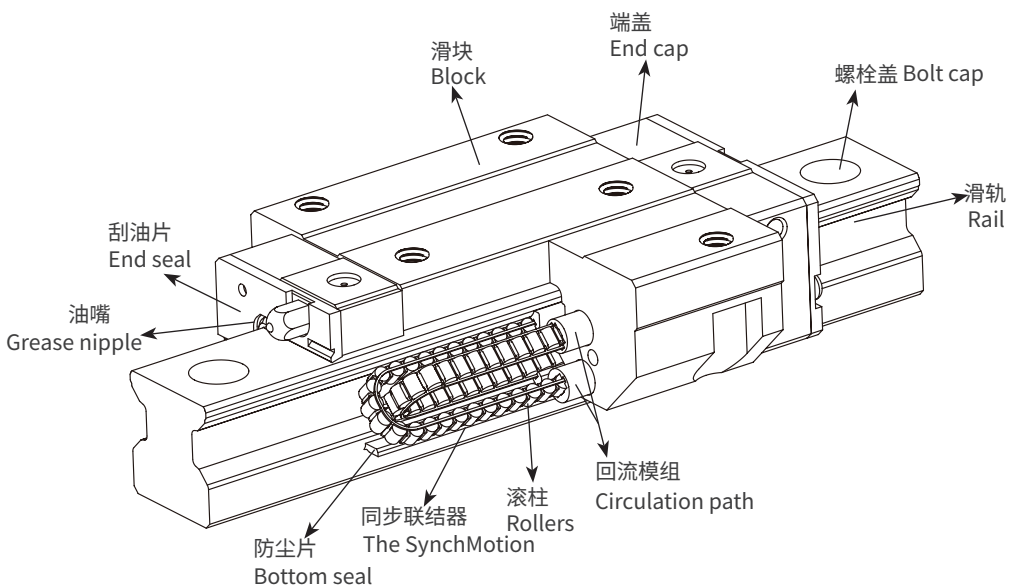


测试结果：
本试件运行 10586 公里后，珠道表面与滚柱表面并未发生鱼鳞状薄片的别落现象。

Testresults:
Fatigue flaking did not appear on the surface of theraceway or rollers after traveling 10586km.

注：以上的测试数据为样品数据。
Note: The data listed are from samples.

2. PQR 本体结构 /Construction of PQR Series



- 滚动循环统：滑块、滑轨、端盖、回流模组、同步联结器、滚柱
- 润滑系统 : 油嘴、油管接头
- 防尘系统 : 刮油片、底面尘封防尘片、滑轨螺栓盖、金属刮板

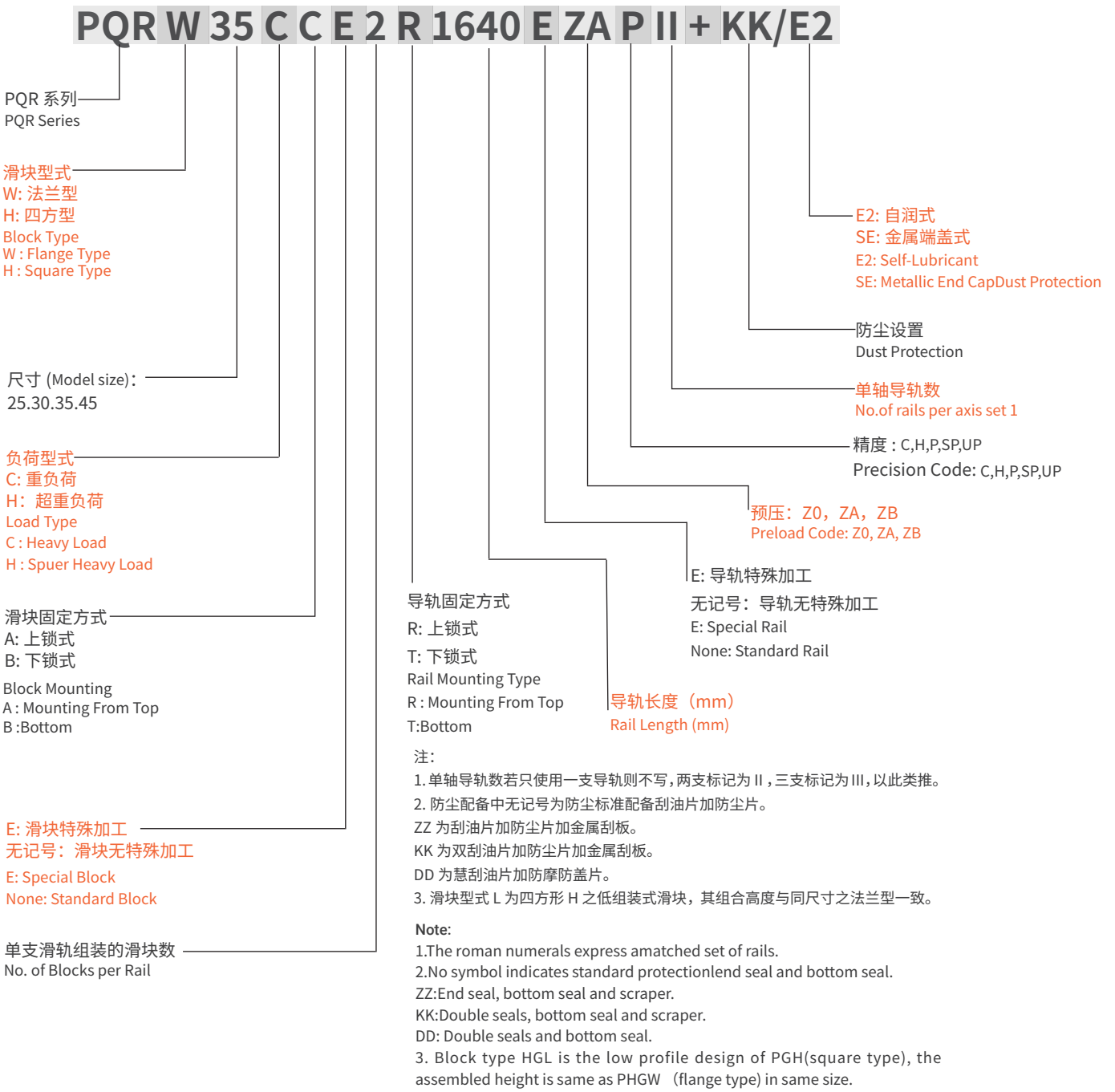
- Rolling circulation system: Block, Rail, End cap, Circulation path, rollers and the SynchMotion.
- Lubrication system: Grease Nipple and Piping Joint.
- Dust protection system: End seal, Bottom Seal, Bolt Cap, Double Seals and Scraper.

3. 产品规格说明 /Model Number of PQR series

PQR 系列分为非互换性及互换性型两种直线导轨，两者规格尺寸相同，主要差异点在于互换性型之滑块、滑轨可单独互换使用，较便利，但其组合精度无法达到非互换性型之超精密级以上的精度，不过由于 PYG 互换性型之组合精度目前已达到一定的水准，对不需配对安装线性滑轨的客户而言，是一项便利的选择。线性滑轨的产品规格型号主要标明线性滑轨尺寸、型式、精度等级、预压等规格要求，以利订货时双方对产品的确认。

PQR series linear guides are classified into non-interchangeable and interchangeable types. The sizes of these two types are the same as one another. The main difference is that the interchangeable type of blocks and rails can be freely exchanged and they can maintain p-class accuracy. Because of strict dimensional control, the interchangeable type linear guideways are a wise choice for customers when rails do not need to be matched for an axis. The model number of the PQR series identifies the size, type, accuracy class, preload class, etc.

(1) 非互换性线性滑轨产品型号 /Non-interchangeable type



注：

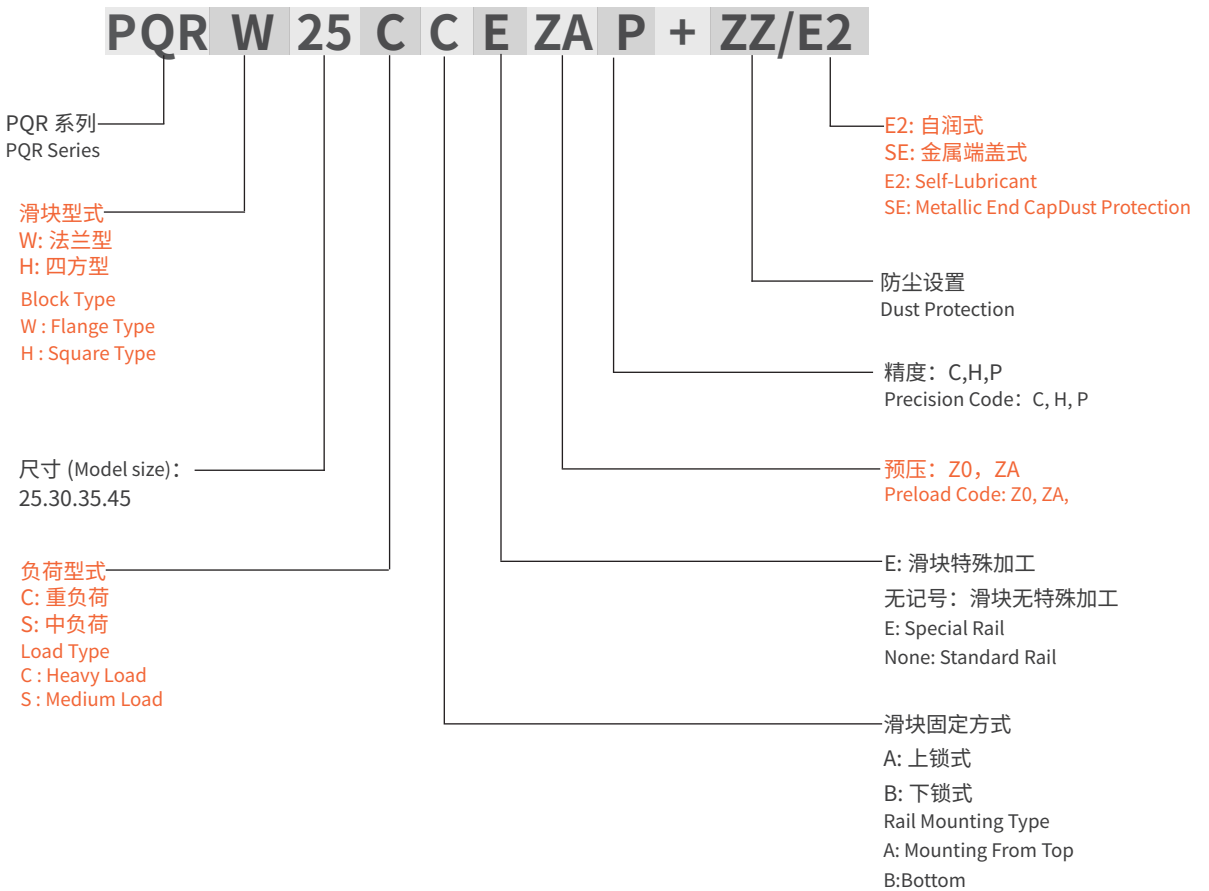
1. 单轴导轨数若只使用一支导轨则不写，两支标记为 II，三支标记为 III，以此类推。
2. 防尘配备中无记号为防尘标准配备刮油片加防尘片。
ZZ 为刮油片加防尘片加金属刮板。
KK 为双刮油片加防尘片加金属刮板。
DD 为慧刮油片加防摩防盖片。
3. 滑块型式 L 为四方形 H 之低组装式滑块，其组合高度与同尺寸之法兰型一致。

Note:

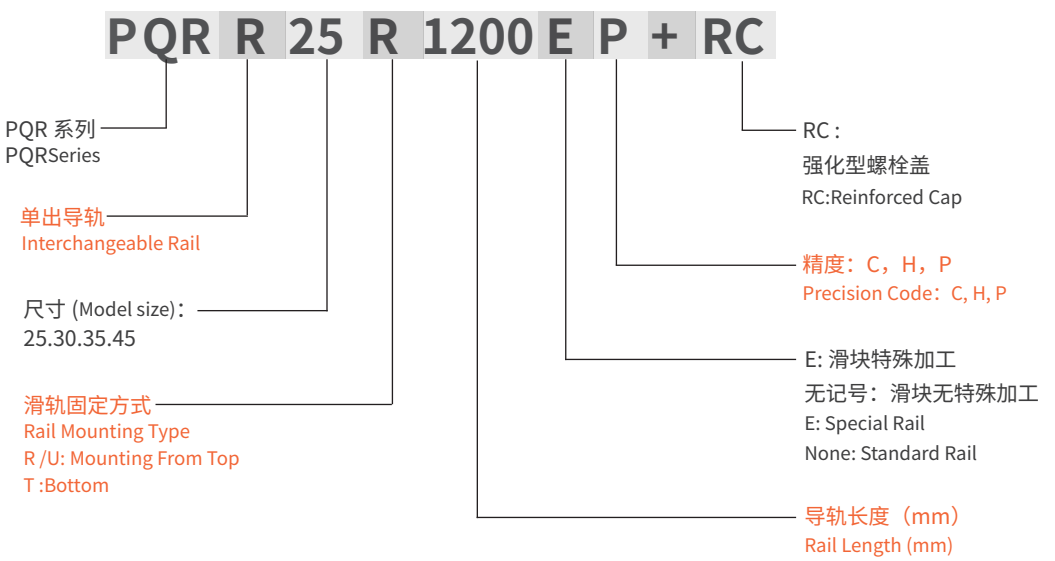
1.The roman numerals express amatched set of rails.
2.No symbol indicates standard protectionlend seal and bottom seal.
ZZ:End seal, bottom seal and scraper.
KK:Double seals, bottom seal and scraper.
DD: Double seals and bottom seal.
3. Block type HGL is the low profile design of PGH(square type), the assembled height is same as PHGW （flange type) in same size.

(2) 互换性直线导轨产品型号 /Interchangeable type

- 互换型滑块产品型号 /Model Number of PHG Block



- 互换型导轨产品型号 / Model Number of PHG Rail



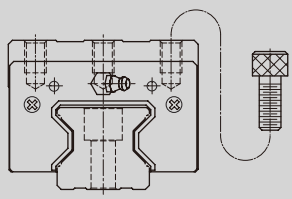
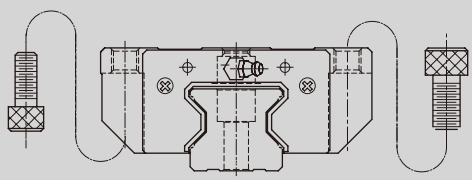
4. PQR 系列型式 /PQR Types

（1）滑块型式 /Block types

PQR 系列提供法兰型及四方型两种直线导轨，法兰型滑块在法兰的部位有加工安装螺丝孔可供安装，对于下锁的安装方式也可适用，其直线导轨组合高度低，承靠面积大，适用于承受力距负载的场所。四方型滑块宽度较小，适合有安装空间限制的设备，滑块上方安装螺丝孔可配合安装。

PYG PQR series offers two types of guide blocks, flange and square type. Because of the low assembly height and large mounting surface, the flange type is excellent for heavy moment load applications.

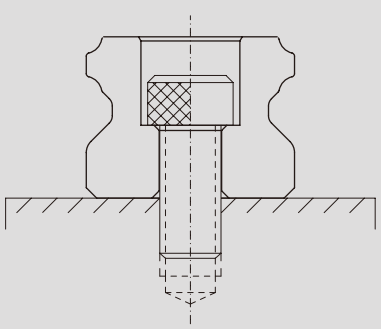
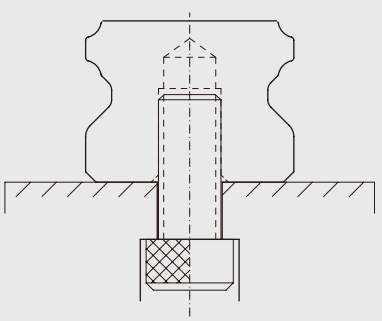
表格 2-4-3 滑块形式
Table 2-4-3 BlockTypes

型号 Type	规格 Model	形状 Shape	高度尺寸 Height (mm)	滑轨长度 Rail Length (mm)	应用设备 Main Application(mm)
四方型 Square	PQRH-CA PQRH-HA		34 ⇩ 70	100 ⇩ 4000	• 自动化装置 • 重型搬运设备 • CNC 加工机 • 重切削加工机 • CNC 磨床 • 射出型机 • 放电加工机 • 大型龙门机床 • 高刚性重负荷需求的工作机械 • Automation Systems • Transportation equipment • CNC machining centers • Heavy duty cutting machines • CNC grinding machines • Injection molding machines • Plano millers • Devices requiring high rigidity • Devices requiring high load capacity • Electric discharge machines
法兰型 Square	PQRW-CC PQRW-HC		30 ⇩ 60	100 ⇩ 4000	

（2）滑块型式 /Block types

除了一般上锁式螺栓孔滑轨外，PYG 亦提供下锁式螺孔滑轨，方便客户安装使用。
Besides the standard top mounting type, PYG also offers bottom mounting type rails.

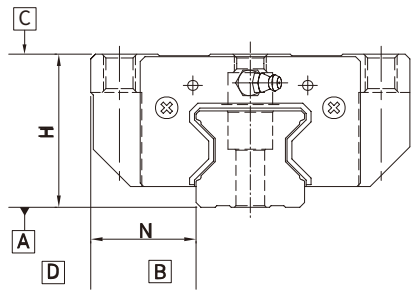
表格 2-4-4 滑轨型式
Table 2-4-4 Rail Types

上锁式螺栓孔 Mounting from Top	下锁式螺丝孔 Mounting from Bottom
	

5. 精度等级 / Accuracy Classes

PQR 系列线性滑轨的精度，分为高、精密、超精密、超高精密共四级，客户可依设备精度需求选用精度。

The accuracy of PQR series can be classified high (H), precision (P), super precision (SP),ultra precision (UP), five classes. Please choose the class by referring the accuracy of applied equipment.



（1）非互换性直线导轨精度 /Accuracy of non-interchangeable guides

表 2-4-5 组合件精度表 /Accuracy Standard

单位 /Unit（mm）

型号 /Item	PQR-25,30,35			
精度等级 Accuracy Classes	高级（H） High（H）	精密级（P） Precision（P）	超精密级（SP） Super Precision(SP)	超高精密级（UP） Ultra Precision（UP）
高度 H 的容许尺寸误差 Dimensional tolerance of height H	± 0.04	0 - 0.04	0 -0.02	0 -0.01
宽度 N 的容许尺寸误差 Dimensional tolerance of width N	± 0.04	0 -0.04	0 -0.02	0 -0.01
成对高度 H 的相互误差 Variation of height H	0.015	0.007	0.005	0.003
成对宽度 N 的相互误差 Variation of width N	0.015	0.007	0.005	0.003
滑块 C 面对滑轨 A 面的行走平行度 Running parallelism of block surface C to surface A	行走平行度（见表格 2-4-11） See Table 2-4-11			
滑块 D 面对滑轨 B 面的行走平行度 Running parallelism of block surface D to surface B	行走平行度（见表格 2-4-11） See Table 2-4-11			

表 2-4-6 组合件精度表 /Accuracy Standard

单位 /Unit（mm）

型号 /Item	PQR-45			
精度等级 Accuracy Classes	高级（H） High（H）	精密级（P） Precision（P）	超精密级（SP） Super Precision(SP)	超高精密级（UP） Ultra Precision（UP）
高度 H 的容许尺寸误差 Dimensional tolerance of height H	± 0.05	0 - 0.05	0 -0.03	0 -0.02
宽度 N 的容许尺寸误差 Dimensional tolerance of width N	± 0.05	0 -0.05	0 -0.03	0 -0.02
成对高度 H 的相互误差 Variation of height H	0.015	0.007	0.005	0.003
成对宽度 N 的相互误差 Variation of width N	0.02	0.01	0.007	0.005
滑块 C 面对滑轨 A 面的行走平行度 Running parallelism of block surface C to surface A	行走平行度（见表格 2-4-11） See Table 2-4-11			
滑块 D 面对滑轨 B 面的行走平行度 Running parallelism of block surface D to surface B	行走平行度（见表格 2-4-11） See Table 2-4-11			

（2）互换性直线导轨精度 /Accuracy of interchangeable guides

表 2-4-7 单出件精度表 /Accuracy Standard

单位 /Unit（mm）

型号 /Item	PQR-20	
精度等级 Accuracy Classes	高级（H） High（H）	精密级（P） Precision（P）
高度 H 的容许尺寸误差 Dimensional tolerance of height H	± 0.03	± 0.015
宽度 N 的容许尺寸误差 Dimensional tolerance of width N	± 0.03	± 0.015
成对高度 H 的相互误差 Variation of height H	0.01	0.006
成对宽度 N 的相互误差 Variation of width N	0.01	0.006
滑块 C 面对滑轨 A 面的行走平行度 Running parallelism of block surface C to surface A	行走平行度（见表格 2-4-11） See Table 2-4-11	
滑块 D 面对滑轨 B 面的行走平行度 Running parallelism of block surface D to surface B	行走平行度（见表格 2-4-11） See Table 2-4-11	

表 2-3-9 单出件精度表 /Accuracy Standard

单位 /Unit（mm）

型号 /Item	PQR-25,30,35	
精度等级 Accuracy Classes	高级（H） High（H）	精密级（P） Precision（P）
高度 H 的容许尺寸误差 Dimensional tolerance of height H	± 0.04	± 0.02
宽度 N 的容许尺寸误差 Dimensional tolerance of width N	± 0.04	± 0.02
成对高度 H 的相互误差 Variation of height H	0.015	0.007
成对宽度 N 的相互误差 Variation of width N	0.015	0.007
滑块 C 面对滑轨 A 面的行走平行度 Running parallelism of block surface C to surface A	行走平行度（见表格 2-4-11） See Table 2-4-11	
滑块 D 面对滑轨 B 面的行走平行度 Running parallelism of block surface D to surface B	行走平行度（见表格 2-4-11） See Table 2-4-11	

表 2-3-9 单出件精度表 /Accuracy Standard

单位 /Unit（mm）

型号 /Item	PQR-45	
精度等级 Accuracy Classes	高级（H） High（H）	精密级（P） Precision（P）
高度 H 的容许尺寸误差 Dimensional tolerance of height H	± 0.05	± 0.025
宽度 N 的容许尺寸误差 Dimensional tolerance of width N	± 0.05	± 0.025
成对高度 H 的相互误差 Variation of height H	0.015	0.007
成对宽度 N 的相互误差 Variation of width N	0.02	0.01
滑块 C 面对滑轨 A 面的行走平行度 Running parallelism of block surface C to surface A	行走平行度（见表格 2-4-11） See Table 2-4-11	
滑块 D 面对滑轨 B 面的行走平行度 Running parallelism of block surface D to surface B	行走平行度（见表格 2-4-11） See Table 2-4-11	

（3）行走平行度精度 /Accuracy of running parallelism

表 2-4-11 行走平行度精度 /Accuracy of running parallelism

单位 /Unit（mm）

滑轨长度 /Rall Length (mm)	精度等级 /Accuracy (μm)			
	H	P	SP	UP
~ 100	7	3	2	2
100 ~ 200	9	4	2	2
200 ~ 300	10	5	3	2
300 ~ 500	12	6	3	2
500 ~ 700	13	7	4	2
700 ~ 900	15	8	5	3
900 ~ 1,100	16	9	6	3
1,100 ~ 1,500	18	11	7	4
1,500 ~ 1,900	20	13	8	4
1,900 ~ 2,500	22	15	10	5
2,500 ~ 3,100	25	18	11	6
3,100 ~ 3,600	27	20	14	7
3,600 ~ 4,000	28	21	15	7

6. 预压力 /Preload

（1）预压力定义 /Definition

预压力是预先给予滚柱负荷力，亦即加大滚柱直径，利用滚柱与滚道之间负向间隙给予预压，此举能提高直线导轨的刚性及消除间隙；PRG 系列直线导轨提供三种标准预压。

A preload can be applied to each guides using oversized rollers. Generally, a linear motion guides has negative clearance between the raceway and rollers to improve stiffness and maintain high precision. The PRG series linear guides offers three standard preloads for various applications and conditions.

表 2-1-12 预压等级 /Preload classes

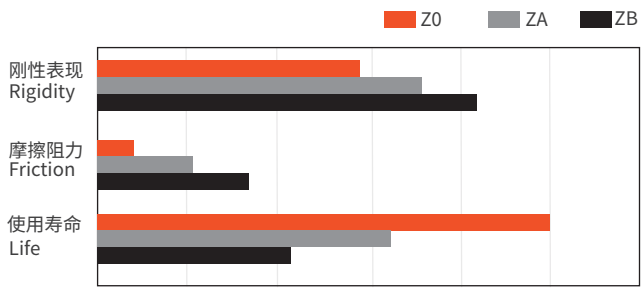
预压等级 Class	标记 Code	预压力 Preload	适用范围 Examples of Application
轻预压 Light Preload	Z0	0.02~0.04C	负荷方向固定且冲击小，精度要求低。Certain load direction, low impact, low precision required.
中预压 Medium Preload	ZA	0.07C~0.09C	刚性需求且轻负荷，高精度要求。High rigidity required, high precision required.
重预压 Heavy Preload	ZB	0.12C~0.14C	高刚性需求，且有振动与冲击之使用环境。Super high rigidity required, with vibration and impact

注：预压力 C 为动额定负荷

Note: The "C" in the preload column denotes basic dynamic load rating.

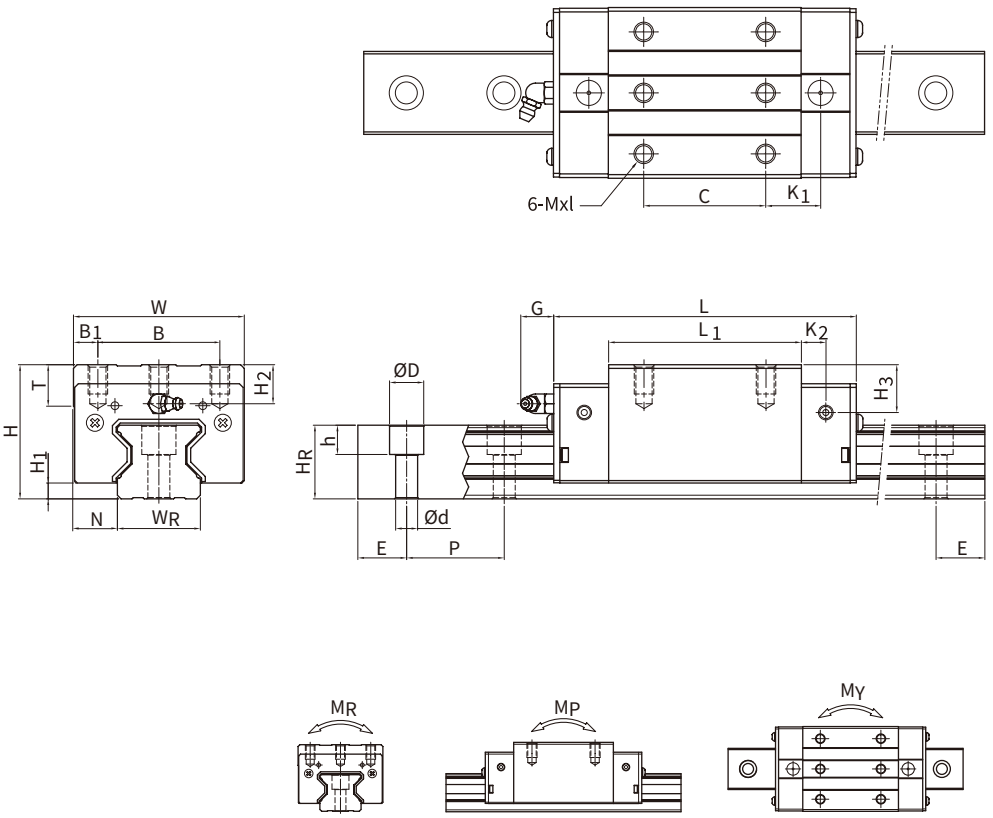
右图为直线导轨不同预压条件下之刚性表现、摩擦阻力与使用寿命关系图，客户可依设备刚性与使用寿命需求选用适当的预压等级，但小规格建议选用中预压以下预压，以避免预压选用过重而降低其寿命。

The figure shows the relationship between the rigidity, friction and nominal life. A preload no larger than ZA would be recommended for smaller model sizes to avoid over-preload affecting the life of the guides.



7.PQR 系列直线导轨尺寸表 /Dimensions for PYG PQR Series

（1）PQRH-CA/PQRH-HA



型号 Model No.	组件尺寸 Dimensions of Assembly (mm)			滑块尺寸 Dimensions of Block(mm)												滑轨尺寸（mm） Dimensions of Rail (mm)							滑轨的固定螺栓尺寸 Mounting Bolt for Rail	基本动额定负荷 Basic Dynamic load Rating	基本静额定负荷 Basic Static Load Rating	容许静力矩 Static Rated Moment			重量 Weight	
	H	H_1	N	W	B	B_1	C	L_1	L	K_1	K_2	G	Mxl	T	H_2	H_3	W_R	H_R	D	h	d	P	E	(mm)	C（kN）	C_0（kN）	M_R kN-m	M_P kN-m	M_Y kN-m	滑块 kg	滑轨 kg/m
PQRH 25CA	40	5.5	12.5	48	40	6.5	40	55	96	21.5	7.25	12	M_{6x8}	9.5	10.2	10	23	23.6	11	9	7	30	20	M_{6x20}	38.5	54.4	0.722	0.627	0.627	0.60	3.08
PQRH 25HA							50	81	112.9	21.5															44.7	65.3	0.867	0.907	0.907	0.74	
PQRH 30CA	45	6	16	60	40	10	40	71	113	23.5	8	12	M_{8x10}	9.5	9.5	10.3	28	28	14	12	9	40	20	M_{8x25}	51.5	73.0	1.284	0.945	0.945	0.89	4.41
PQRH 30HA							60	93	131.8	24.5															64.7	95.8	1.685	1.63	1.63	1.15	
PQRH 35CA	55	6.5	18	70	50	10	50	82	131	22.5	10	12	M_{8x12}	12	16	19.6	34	30.2	14	12	9	40	20	M_{8x25}	77	94.7	1.955	1.331	1.331	1.56	6.06
PQRH 35HA							72	106.5	151.5	25.25															95.7	126.3	2.606	2.335	2.335	2.04	
PQRH 45CA	70	8	20.5	86	60	13	60	106	153.2	31	10	12.9	M_{10x17}	16	20	24	45	38	20	17	14	52.5	22.5	M_{12x35}	123.2	156.4	3.959	2.666	2.666	3.16	9.97
PQRH 45HA							80	139.5	187	37.9															150.8	208.6	5.278	4.694	4.694	4.10	

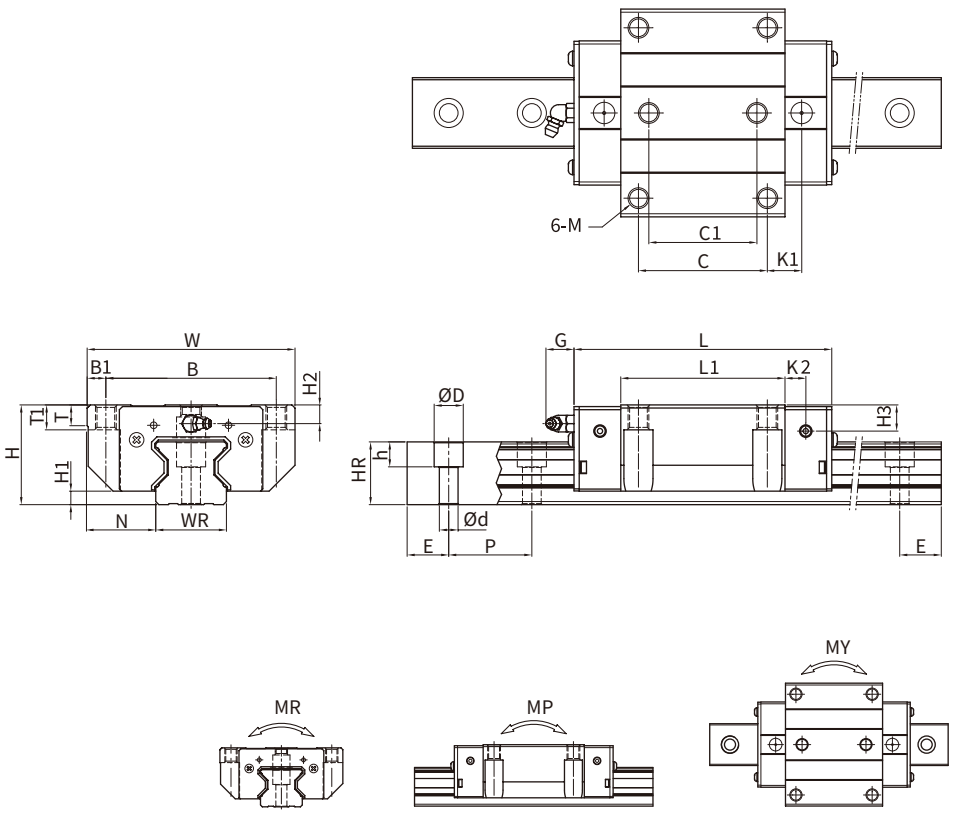
注：1. 1kgf=9.81N

2. 此为 C_{100R} 的理论动额定负荷，若有需要 $C_{50R\ 转换}$公式：$C_{50R} = 1.23 \times C_{100R}$

Note：1. 1kg=9.81N

2. The theoretical dynamic rated load is C100R, if necessary C50R conversion formula is as follows : C50R = 1.23 x C100R

(2) PQRW-CC/PQRW-HC



型号 Model No.	组件尺寸 Dimensions of Assembly (mm)			滑块尺寸 Dimensions of Block(mm)															滑轨尺寸（mm） Dimensions of Rail (mm)								滑轨的固定螺栓尺寸 Mounting Bolt for Rail	基本动额定负荷 Basic Dynamic load Rating	基本静额定负荷 Basic Static Load Rating	容许静力矩 Static Rated Moment			重量 Weight	
	H	H_1	N	W	B	B_1	C	C_1	L_1	L	K_1	K_2	G	M	T	T_1	H_2	H_3	W_R	H_R	D	h	d	P	E	(mm)	C (kN)	C_0 (kN)	M_R kN-m	M_P kN-m	M_Y kN-m	滑块 kg	滑轨 kg/m
PQRW 25CC	36	5.5	23.5	70	57	6.5	45	40	66	97.9	16.5	7.25	12	M8	9.5	10	6.2	6	23	23.6	11	9	7	30	20	M_{6x20}	38.5	54.4	0.722	0.627	0.627	0.71	3.08
PQRW 25HC									81	112.9	24																44.7	65.3	0.867	0.907	0.907	0.90	
PQRW 30CC	42	6	31	90	72	9	52	44	71	113	17.5	8	12	M10	9.5	10	6.5	7.3	28	28	14	12	9	40	20	M_{8x25}	51.5	73.0	1.284	0.945	0.945	1.15	4.41
PQRW 30HC									93	131.8	28.5																64.7	95.8	1.685	1.63	1.63	1.51	
PQRW 35CC	48	6.5	33	100	82	9	62	52	82	131	16.5	10	12	M10	12	13	9	12.6	34	30.2	14	12	9	40	20	M_{8x25}	77	94.7	1.955	1.331	1.331	1.74	6.06
PQRW 35HC									106.5	151.5	30.25																95.7	126.3	2.606	2.335	2.335	2.38	
PQRW 45CC	60	8	37.5	120	100	10	80	60	106	153.2	21	10	12.9	M12	14	15	10	14	45	38	20	17	14	52.5	22.5	M_{12x35}	123.2	156.4	3.959	2.666	2.666	3.41	9.97
PQRW 45HC									139.8	187	37.9																150.8	208.6	5.278	4.694	4.694	4.54	

注：1. 1kgf=9.81N

2. 此为 C_{100R} 的理论动额定负荷，若有需要 $C_{50R\ 转换}$ 公式：$C_{50R} = 1.23 \times C_{100R}$

Note: 1. 1kg=9.81N

2. The theoretical dynamic rated load is C100R, if necessary C50R conversion formula is as follows : C50R = 1.23 x C100R

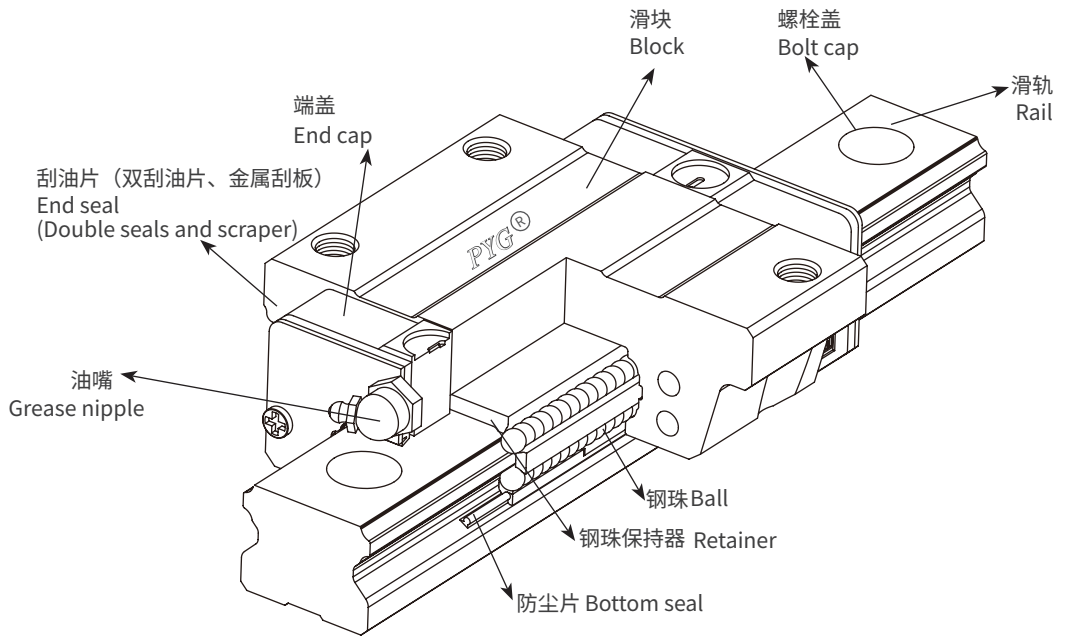
2-5 PEG 系列—低组装滚珠直线导轨
PEG SERIES -LOW PROFLE BALL TYPE LINEAR GUIDES

1. PEG 系列线性滑轨特点 / Features of the PEG Series Linear Guides

PEG 系列使用四列钢珠承受负荷设计，使其具备高性、高负荷的特性，同时具备四方向等负载特色、及自动调心的功能，可吸收安装面的装配误差，得到高精度的诉求；加上降低组合高度及缩短滑块长度，非常适合高速自动化产业机械及空间要求的小型设备使用。滑块上设有钢珠保持器以防止钢珠脱落，此设计不仅方便客户安装线性滑轨，当取下滑块时亦不会有钢珠脱落的情形发生，且在精度允许下具备互换性。

The design of the PEG series offers a low profile, high load capacity, and high rigidity. it also features an equal loadrating in all four directions and self-aligning capability to absorb installation-error, allowing for higher accuracies.Additionally, the lower assembly height and the shorter length make the EG series more suitable for high-speedautomation machines and applications where space is limited.The retainer is designed to hold the balls in the block even when it is removed from the rail.

2.PEG 本体结构 /Construction of PEG Series



- 滚动循环系统：滑块、滑轨、端盖、钢珠、钢珠保持器
- 润滑系统：油嘴、油管接头
- 防尘系统：刮油片、底面尘封防片、滑轨螺栓盖、金属刮板

- Rolling circulation system: Block, rail, end cap and retainer.
- Lubrication system: Grease nipple and piping Joint.
- Dust protection system: End seal, bottom seal,cap and scraper.

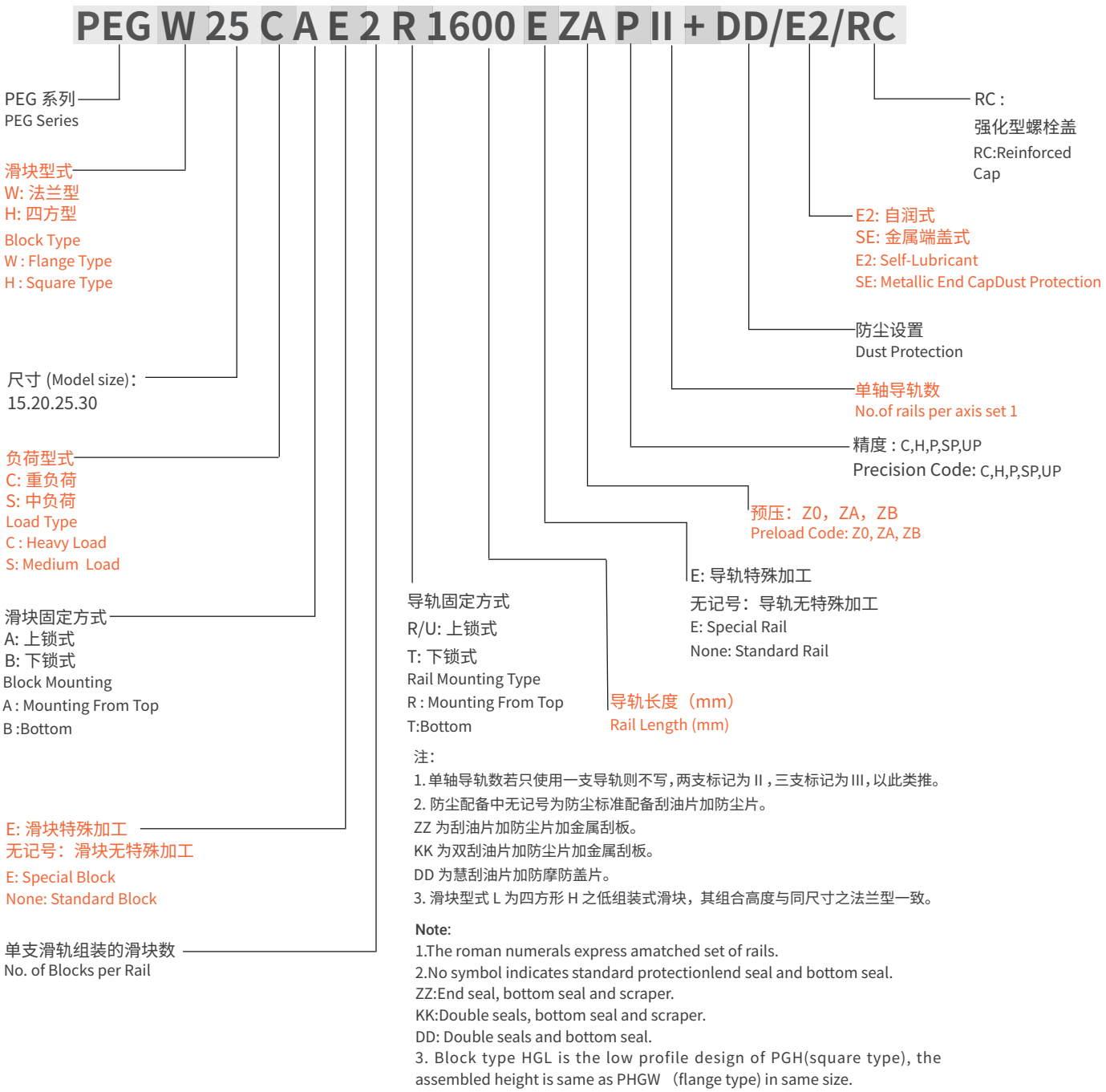
3. 产品规格说明 /Model Number of PEG Series

PEG 系列分为非互换性及互换性型两种直线导轨，两者规格尺寸相同，主要差异点在于互换性型之滑块、滑轨可单独互换使用，较便利，但其组合精度无法达到非互换性型之超精密级以上的精度，不过由于 PYG 互换性型之组合精度曰前已达到一定的水准，对不需配对安装直线导轨的客户而言，是一项便利的选择。直线导轨的产品规格型号主要标明直线导轨尺寸、型式、精度等级、预压等规格要求，以利订货时双方对产品的确认。

PEG series linear guides are classifed into non-interchangeable and interchangeable types. The sizes of these twctypes are the same as one another. The main difference is that the interchangeable type of blocks and rails can befreely exchanged and they can maintain P-class accuracy. Because of strict dimensional control, the interchangeable type linear guides are a wise cholce for customers when ralls do not need to be matched for an axis. the model number of the P EG series identifies the size, type, accuracy class, preload class, etc.

PEG 系列低组装型滚珠直线导轨 /PEG Series Heavy Load Ball Type

(1) 非互换性线性滑轨产品型号 /Non-interchangeable type



注：

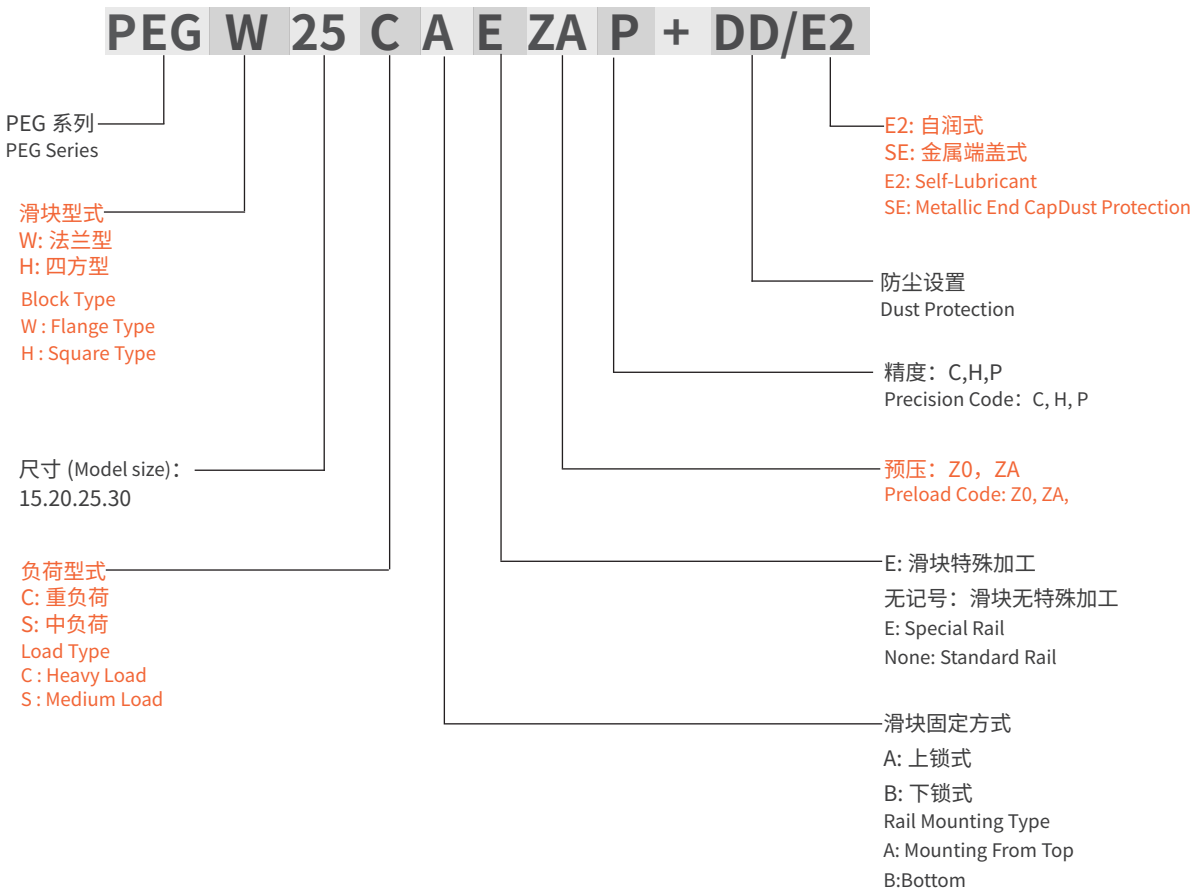
1. 单轴导轨数若只使用一支导轨则不写，两支标记为 II，三支标记为 III，以此类推。
2. 防尘配备中无记号为防尘标准配备刮油片加防尘片。
ZZ 为刮油片加防尘片加金属刮板。
KK 为双刮油片加防尘片加金属刮板。
DD 为慧刮油片加防摩防盖片。
3. 滑块型式 L 为四方形 H 之低组装式滑块，其组合高度与同尺寸之法兰型一致。

Note:

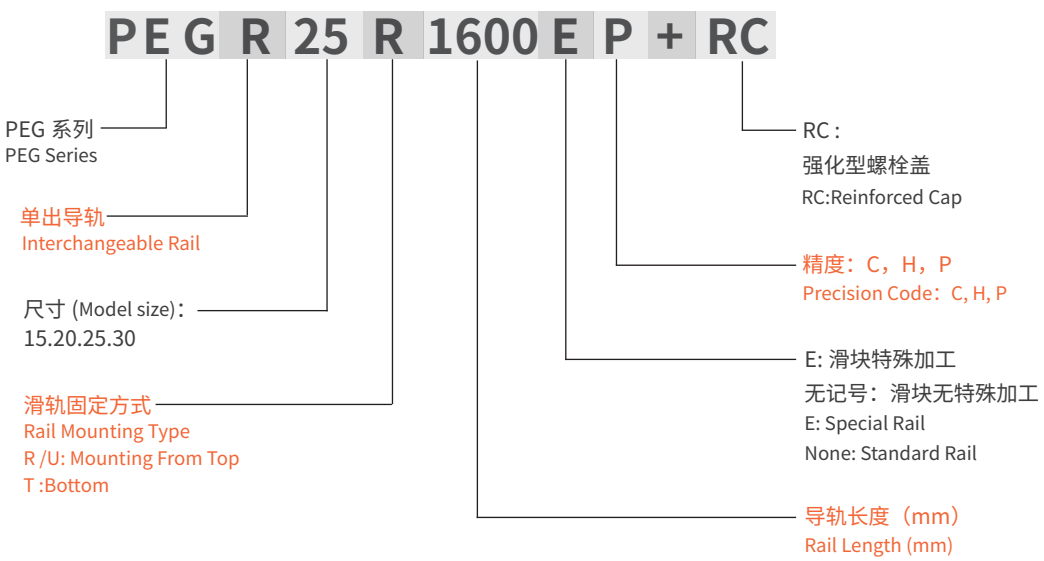
1.The roman numerals express amatched set of rails.
2.No symbol indicates standard protectionlend seal and bottom seal.
ZZ:End seal, bottom seal and scraper.
KK:Double seals, bottom seal and scraper.
DD: Double seals and bottom seal.
3. Block type HGL is the low profile design of PGH(square type), the assembled height is same as PHGW （flange type) in same size.

(2) 互换性直线导轨产品型号 /Interchangeable type

- 互换型滑块产品型号 /Model Number of PHG Block



- 互换型导轨产品型号 / Model Number of PHG Rail

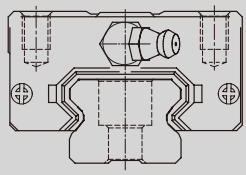
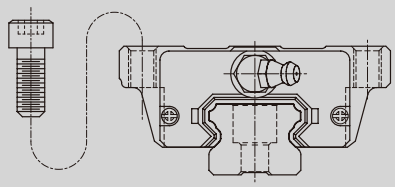


4. PEG 系列型式 /PEG Types

（1）滑块型式 /Block types

PYG 提供法兰型及四方型两种直线导轨。
PYG offers two types of linear guides, flange and square types.

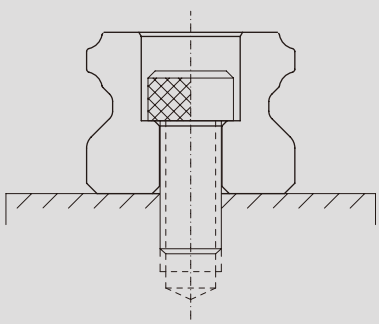
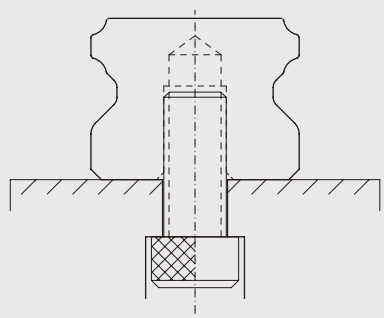
表格 2-5-1 滑块形式
Table 2-5-1 BlockTypes

型号 Type	规格 Model	形状 Shape	高度尺寸 Height (mm)	滑轨长度 Rail Length (mm)	应用设备 Main Application(mm)
四方型 Square	PEGH-SA PEGH-CA		24 ⇩ 48	24 ⇩ 4000	• 自动化装置 • 高速运输设备 • 精密测量仪器 • 半导体设备 • Automation devices • High-speed transportation equipment • Precision measuring equipment • Semiconductor manufacturing equipment
法兰型 Flange	PEGW-SA PEGW-CA		24 ⇩ 48	10 ⇩ 4000	

（2）滑块型式 /Block types

除了一般上锁式螺栓孔滑轨外，PYG 亦提供下锁式螺孔滑轨，方便客户安装使用。
Besides the standard top mounting type, PYG also offers bottom mounting type rails.

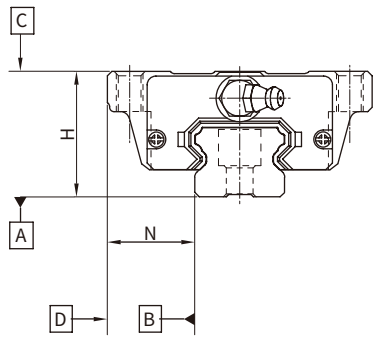
表格 2-5-2 滑轨型式
Table 2-5-2 Rail Types

上锁式螺栓孔 Mounting from Top	下锁式螺丝孔 Mounting from Bottom
	

5. 精度等级 / Accuracy Classes

PEG 系列线性滑轨的精度，分为普通型、高、精密、超精密、超高精密共四级，客户可依设备精度需求选用精度。

The accuracy of the EG series can be classified into 5 classes: normal(C), high(H), precision(P), super precision(SP), and ultra precision(UP). Choose the class by referencing the accuracy of selected equipment.



（1）非互换性直线导轨精度 /Accuracy of non-interchangeable guides

表 2-5-3 组合件精度表 /Accuracy Standards　　单位 /Unit（mm）

型号 /Item	PEG-15,20				
精度等级 Accuracy Classes	普通级（C） Normal（C）	高级（H） High（H）	精密级（P） Precision（P）	超精密级（SP） Super Precision(SP)	超高精密级（UP） Ultra Precision（UP）
高度 H 的容许尺寸误差 Dimensional tolerance of height H	± 0.1	± 0.03	0 - 0.03	0 -0.015	0 -0.008
宽度 N 的容许尺寸误差 Dimensional tolerance of width N	± 0.1	± 0.03	0 -0.03	0 -0.015	0 -0.008
成对高度 H 的相互误差 Variation of height H	0.02	0.01	0.006	0.004	0.003
成对宽度 N 的相互误差 Variation of width N	0.02	0.01	0.006	0.004	0.003
滑块 C 面对滑轨 A 面的行走平行度 Running parallelism of block surface C to surface A	行走平行度（见表格 2-5-11） See Table 2-5-11				
滑块 D 面对滑轨 B 面的行走平行度 Running parallelism of block surface D to surface B	行走平行度（见表格 2-2-11） See Table 2-2-11				

表 2-5-4 组合件精度表 /Accuracy Standards　　单位 /Unit（mm）

型号 /Item	PEG-25,30,35				
精度等级 Accuracy Classes	普通级（C） Normal（C）	高级（H） High（H）	精密级（P） Precision（P）	超精密级（SP） Super Precision(SP)	超高精密级（UP） Ultra Precision（UP）
高度 H 的容许尺寸误差 Dimensional tolerance of height H	± 0.1	± 0.04	0 - 0.04	0 -0.02	0 -0.01
宽度 N 的容许尺寸误差 Dimensional tolerance of width N	± 0.1	± 0.04	0 -0.04	0 -0.02	0 -0.01
成对高度 H 的相互误差 Variation of height H	0.02	0.015	0.007	0.005	0.003
成对宽度 N 的相互误差 Variation of width N	0.03	0.015	0.007	0.005	0.003
滑块 C 面对滑轨 A 面的行走平行度 Running parallelism of block surface C to surface A	行走平行度（见表格 2-5-7） See Table 2-5-7				
滑块 D 面对滑轨 B 面的行走平行度 Running parallelism of block surface D to surface B	行走平行度（见表格 2-5-7） See Table 2-5-7				

（2）互换性直线导轨精度 /Accuracy of interchangeable guides

表 2-5-5 单出件精度表 /Accuracy Standard　　单位 /Unit（mm）

型号 /Item	PEG-15,20		
精度等级 Accuracy Classes	普通级（C） Normal（C）	高级（H） High（H）	精密级（P） Precision（P）
高度 H 的容许尺寸误差 Dimensional tolerance of height H	± 0.1	± 0.03	± 0.015
宽度 N 的容许尺寸误差 Dimensional tolerance of width N	± 0.1	± 0.03	± 0.015
成对高度 H 的相互误差 Variation of height H	0.02	0.01	0.006
成对宽度 N 的相互误差 Variation of width N	0.02	0.01	0.006
滑块 C 面对滑轨 A 面的行走平行度 Running parallelism of block surface C to surface A	行走平行度（见表格 2-5-7） See Table 2-5-7		
滑块 D 面对滑轨 B 面的行走平行度 Running parallelism of block surface D to surface B	行走平行度（见表格 2-5-7） See Table 2-5-7		

表 2-5-6 单出件精度表 /Accuracy Standard

单位 /Unit（mm）

型号 /Item	PEG-25,30,35		
精度等级 Accuracy Classes	普通级（C） Normal（C）	高级（H） High（H）	精密级（P） Precision（P）
高度 H 的容许尺寸误差 Dimensional tolerance of height H	± 0.1	± 0.04	± 0.02
宽度 N 的容许尺寸误差 Dimensional tolerance of width N	± 0.1	± 0.04	± 0.02
成对高度 H 的相互误差 Variation of height H	0.02	0.015	0.007
成对宽度 N 的相互误差 Variation of width N	0.03	0.015	0.007
滑块 C 面对滑轨 A 面的行走平行度 Running parallelism of block surface C to surface A	行走平行度（见表格 2-2-11） See Table 2-2-11		
滑块 D 面对滑轨 B 面的行走平行度 Running parallelism of block surface D to surface B	行走平行度（见表格 2-2-11） See Table 2-2-11		

（3）行走平行度精度 /Accuracy of running parallelism

表 2-5-7 行走平行度精度 /Accuracy of running parallelism

单位 /Unit（mm）

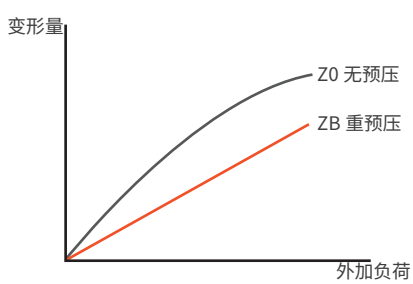
滑轨长度 /Rall Length (mm)	精度等级 /Accuracy (μm)			
	H	P	SP	UP
~ 100	7	3	2	2
100 ~ 200	9	4	2	2
200 ~ 300	10	5	3	2
300 ~ 500	12	6	3	2
500 ~ 700	13	7	4	2
700 ~ 900	15	8	5	3
900 ~ 1,100	16	9	6	3
1,100 ~ 1,500	18	11	7	4
1,500 ~ 1,900	20	13	8	4
1,900 ~ 2,500	22	15	10	5
2,500 ~ 3,100	25	18	11	6
3,100 ~ 3,600	27	20	14	7
3,600 ~ 4,000	28	21	15	7

6. 预压力 /Preload

（1）预压力定义 /Definition

预压力是预先给予钢珠负荷力，亦即加大钢珠直径，利用钢珠与珠道之间负向间隙给予预压，此举能提高导轨的刚性及消除间隙；以右图来解释，提高预压力可增加直线导轨刚性，但小规格建议选用轻预压以下预压，以避至因预压选用过重降低其使用寿命。

A preload can be applied to each guides. Oversizedballs are used. Generally, a linear motion guides has a negative clearance between groove and balls inorder to improve stiffness and maintain high precision.The fiqure shows the load is multiplied by the preload the rigidity is doubled and the deflection is reduced by one half. The preload no larger than ZA would be recommended for the model size under PEG20 to avoidan over-preload affecting the guide's life.



（2）预压等级 /Preload classes

PEG 系列线性滑轨提供三种标预压，可依据用途选择适当预压力。
PEG offers three classes of standard preload for various applications and conditions.

表 2-5-8 预压等级 /Preload classes

预压等级 Class	标记 Code	预压力 Preload	使用条件 Condition	适用范围 Examples of Application
无预压 Light Preload	Z0	0~0.02C	负荷方向固定且冲整小，精度要求低 Certain load direction,low impact ,low precision required	搬送装置，自动包装机，自动化产业机械，一般工业机械的 XY 轴，焊接，熔断机，工具交换装置。 Transportation devices, auto-packing machines,X-Y axis for general industrial machines, welding machines,welders
中预压 Medium Preload	ZA	0.03C~0.05C	轻负荷且要求高精度 High precision required	一般工业机械的 Z 轴，放电加工机，NC 车床，精密 XY 平台，测定器，机械加工中心，立式加工中心工业用机器人，自动涂装机，各种高速材料供给装置。 Machining centers,grinding industrial machines, EDM, NC lathes, Precision X-Y tables,measuring equipment
重预压 Heavy Preload	ZB	0.06C~0.08C	刚性要求，且有振动，冲击之使用环境 High rigidity required, with vibration and impact	机械加工中心，磨床，NC 更床，立式或卧式铣床，机床的 Z 轴，重切削加工机。 Machining centers,grinding machines ,NC lathes horizontal and vertical milling machines, Z axis of machine tools, Heavy cutting machines

等级 Class	互换性导轨（单出件） Interchangeable Guides	非互换性导轨（组合件） Non-Interchangeable Guides
预压等级	Z0，ZA	Z0，ZA，ZB

注：预压力 C 为动额定负荷
Note: The ''C'' in the preload column denotes basic dynamic load rating.

（3）预压力 /Stiffness performance

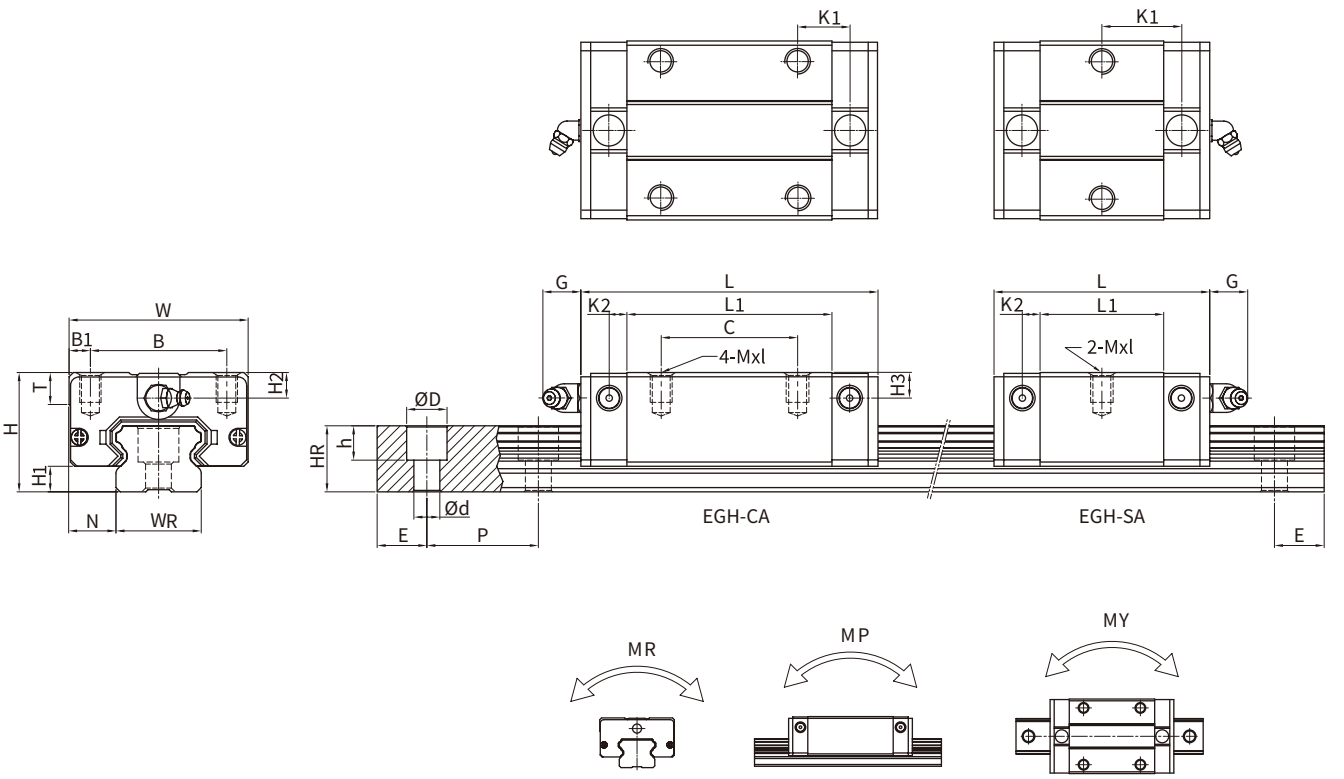
不同的预压力呈现不一样的滑块刚性，下表为各尺寸的滑块副性值。
Stiffness depends on preload. The following table shows stiffness value of each size.

表 2-5-9 PEG 系列径向刚性 /Stiffness performance

负荷型式 Load type	系列 / 尺寸 Series/Size	不同预压力的刚性表现（N/μm） Stiffness(N/μm)		
		Z0	ZA	ZB
中负荷 Medium load	PEG 15S	87	186	246
	PEG 20S	114	267	369
	PEG 25S	138	307	415
	PEG 30S	166	335	447
	PEG 35S	189	369	492
重负荷 Heavy load	PEG 15C	141	323	429
	PEG 20C	181	444	615
	PEG 25C	219	510	668
	PEG 30C	265	555	745
	PEG 35C	307	615	846

7.PEG 系列直线导轨尺寸表 /Dimensions for PYG PEG Series

（1）PEGH-SA/PEGH-CA

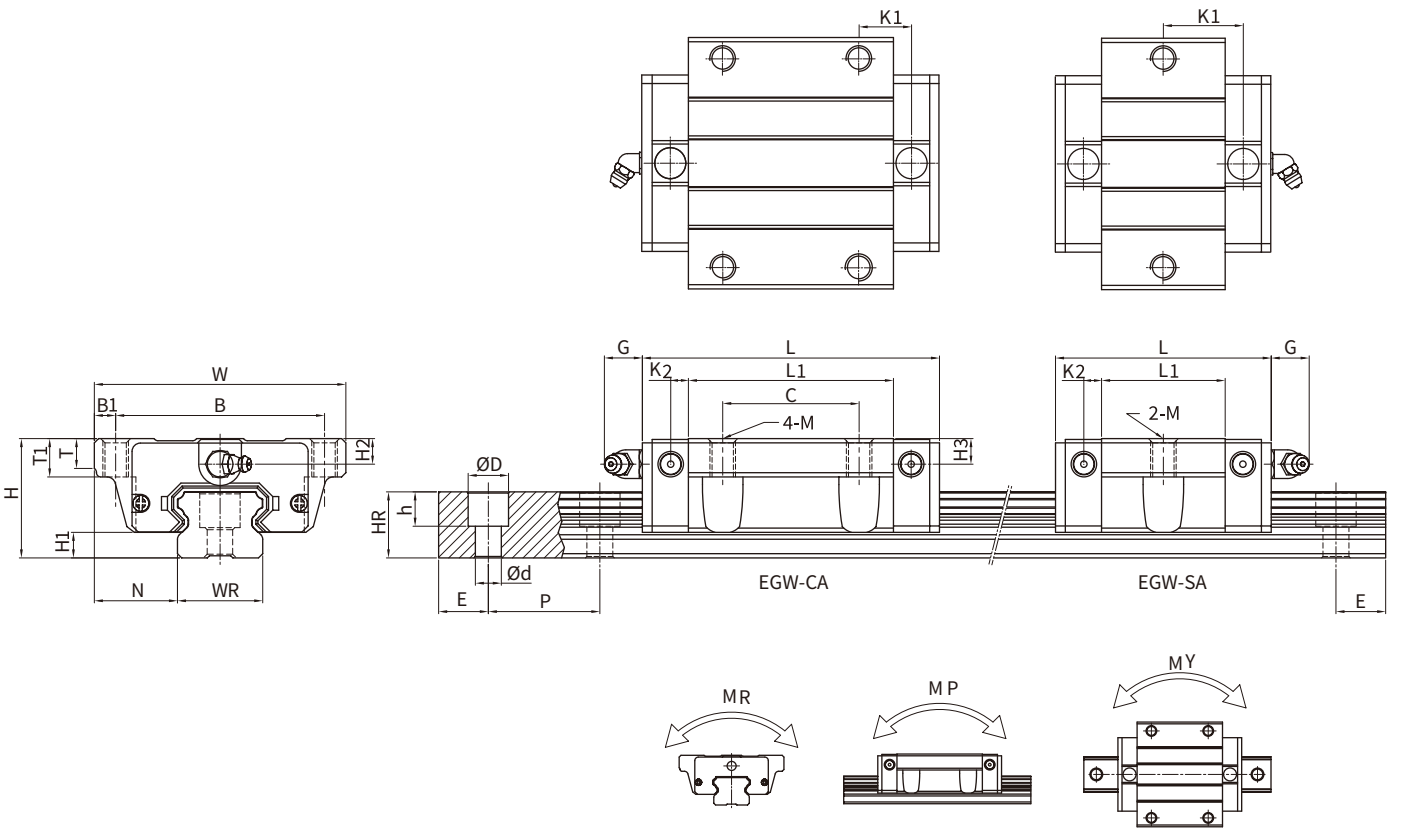


型号 Model No.	组件尺寸 Dimensions of Assembly (mm)			滑块尺寸 Dimensions of Block(mm)												滑轨尺寸（mm） Dimensions of Rail (mm)						滑轨的固定螺栓尺寸 Mounting Bolt for Rail	基本动额定负荷 Basic Dynamic load Rating	基本静额定负荷 Basic Static Load Rating	容许静力矩 Static Rated Moment			重量 Weight	
	H	H_1	N	W	B	B_1	C	L_1	L	K_1	K_2	G	Mxl	T	H_2	H_3	W_R	H_R	D	h	d	P	E	(mm)	C (kN)	C_0 (kN)	M_R kN-m	M_P kN-m	M_Y kN-m	滑块 kg	滑轨 kg/m
PEGH15SA	24	4.5	9.5	34	26	6	–	23.1	40.1	14.8	3.5	5.7	M_{4x6}	6	5.5	6	15	12.5	6	4.5	3.5	60	20	M_{3x16}	5.35	9.40	0.08	0.04	0.04	0.09	1.25
PEGH15CA							26	39.8	56.8	10.15															7.83	16.19	0.13	0.10	0.10	0.15	
PEGH20SA	28	6	11	42	32	5	–	29	50	18.75	4.15	12	M_{5x7}	7.5	6	6	20	15.5	9.5	8.5	6	60	20	M_{8x25}	7.23	12.74	0.13	0.06	0.06	0.15	2.08
PEGH20CA							32	48.1	69.1	12.3															10.31	21.13	0.22	0.16	0.16	0.24	
PEGH25SA	33	7	12.5	48	35	6.5	–	35.5	59.1	21.9	4.55	12	M_{6x9}	8	8	8	23	18	11	9	7	60	20	M_{8x25}	11.40	19.50	0.23	0.12	0.12	0.25	2.67
PEGH25CA							35	59	82.6	16.15															16.27	32.40	0.38	0.32	0.32	0.41	
PEGH30SA	42	10	16	60	40	10		41.5	69.5	26.75	6	12	M_{8x12}	9	8	9	28	23	11	9	7	80	20	M_{12x35}	16.42	28.10	0.40	0.21	0.21	0.45	4.35
PEGH30CA							40	70.1	98.1	21.05															23.70	47.46	0.68	0.55	0.55	0.76	

注：1. 1kgf=9.81N

Note：1. 1kg=9.81N

（2）PEGW-SA/PEGW-CA



型号 Model No.	组件尺寸 Dimensions of Assembly (mm)			滑块尺寸 Dimensions of Block(mm)													滑轨尺寸（mm） Dimensions of Rail (mm)							滑轨的固定螺栓尺寸 Mounting Bolt for Rail	基本动额定负荷 Basic Dynamic load Rating	基本静额定负荷 Basic Static Load Rating	容许静力矩 Static Rated Moment			重量 Weight	
	H	H_1	N	W	B	B_1	C	L_1	L	K_1	K_2	G	M	T	T_1	H_2	H_3	W_R	H_R	D	h	d	P	E	(mm)	C（kN）	C_0（kN）	M_R kN-m	M_P kN-m	M_Y kN-m	滑块 kg	滑轨 kg/m
PEGW15SA	24	4.5	18.5	52	41	5.5	—	23.1	40.1	14.8	3.5	5.7	M5	5	7	5.5	6	15	12.5	6	4.5	3.5	60	20	M_{3x16}	5.35	9.40	0.08	0.04	0.04	0.12	1.25
PEGW15CA							26	39.8	56.8	10.15																7.83	16.19	0.13	0.10	0.10	0.21	
PEGW20SA	28	6	19.5	59	49	5	—	29	50	18.75	4.15	12	M6	7	9	6	6	20	15.5	9.5	8.5	6	60	20	M_{5x16}	7.23	12.74	0.13	0.06	0.06	0.19	2.08
PEGW20CA							32	48.1	69.1	12.5																10.31	21.13	0.22	0.16	0.16	0.32	
PEGW25SA	33	7	25	73	60	6.5	—	35.5	59.1	21.9	4.55	12	M8	7.5	10	8	8	23	18	11	9	12	60	20	M_{6x20}	11.40	19.50	0.23	0.12	0.12	0.35	2.67
PEGW25CA							35	59	82.6	16.15																16.27	126.3	2.606	2.335	2.335	2.38	
PEGW30SA	42	10	31	90	72	9	—	41.5	69.5	26.75	6	12	M10	7	10	8	9	28	23	11	9	7	80	20	M_{6x25}	16.42	28.10	0.40	0.21	0.21	0.62	4.35
PEGW30CA							40	70.1	98.1	21.05																23.70	47.46	0.68	0.55	0.55	1.04	

注：1. 1kgf=9.81N

Note：1. 1kg=9.81N

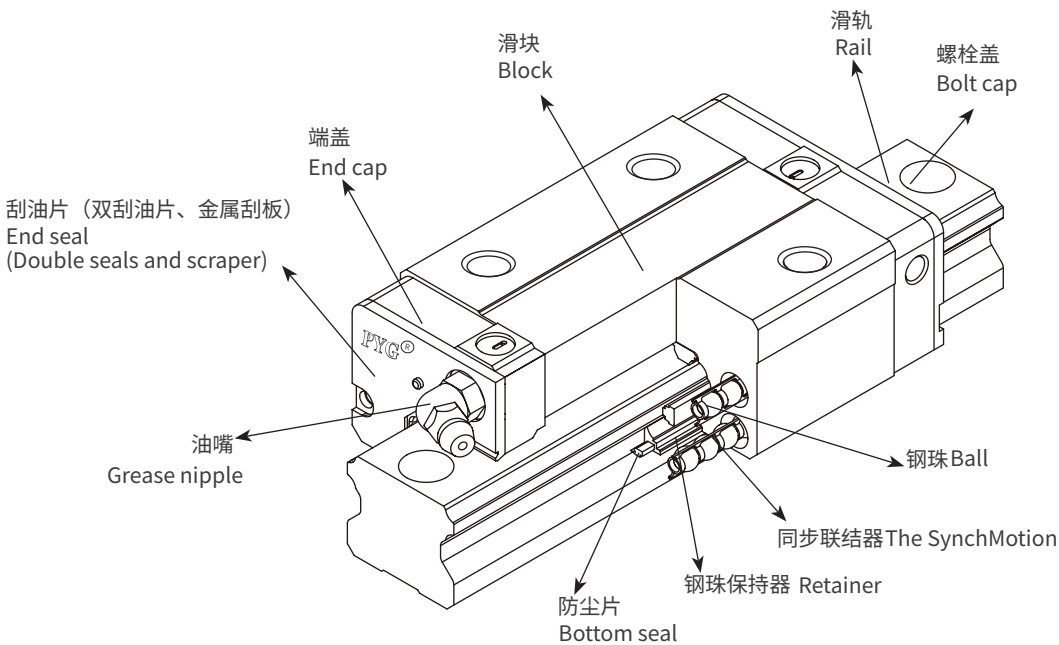
2-6 PQE 系列—低组装静音式滚珠直线导轨
PQE SERIES -LOW PROFLE SILENT TYPE LINEAR GUIDES

1. PQE 系列线性滑轨特点 / Features of the PQE Series Linear Guides

PYG PQE 系列静音式低组装型滚珠线性滑轨，乃基于四列式单圆弧牙型接触设计，降低组合高度与缩短滑块长度，非常适合高速自动化产业机械及空间要求的小型设备使用。采用 SynchMotion™ 技术的 QE 系列直线导轨搭载具储油功能的同步联结器，可有效降低运转时噪音、提升运转平顺性、寿命与润滑效率。具有更广泛的产业应用性，更适用于高速、宁静与低发尘需求的高科技产业。

The development of PYG-PQE linear guides is based on a four-row circular-arc contact. The PYG-PQE series linear guides with SynchMotion™ Technology offers smooth movement, superior lubrication, quieter operation and longer running life. Therefore the PYG-PQE linear guides has broad industrial applicability. In the hightech industry where high speed, low noise, and reduced dust generation is required, the PYG-PQE series is interchangeable with the PYG-PQE series.

2.PQE 本体结构 /Construction of PQESeries

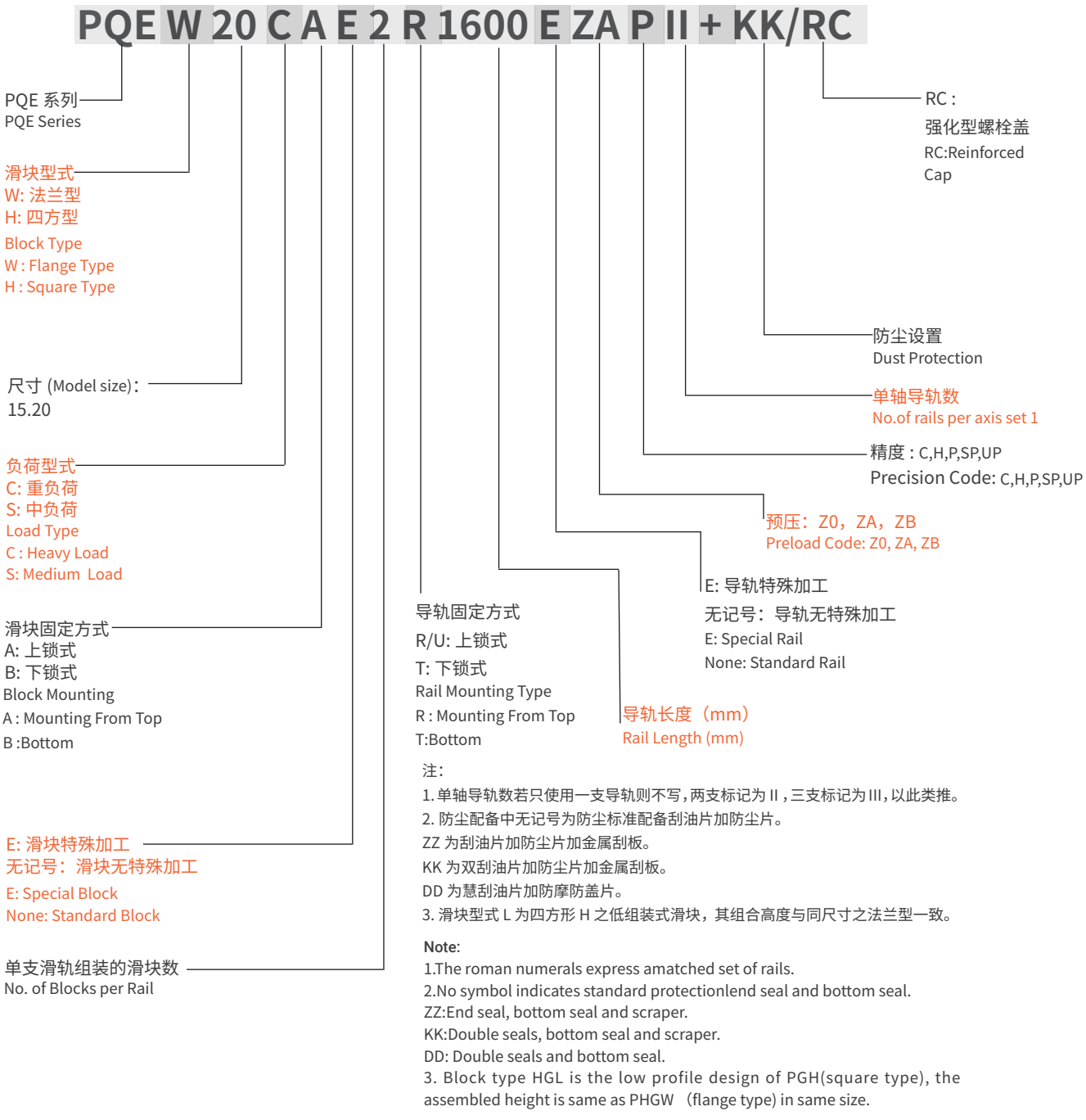


3. 产品规格说明 /Model Number of PQE Series

PQE 系列分为非互换性及互换性两种直线导轨，两者规格尺寸相同，主要差异点在于互换性型之滑块、滑轨可单出互换使用，较便利，但其组合精度无法达到非互换型所拥有的超高精度等级。不过由于 PYG 在制造上有良好的尺寸控制及严格的质量要求，互换性型之组合精度目前已达到一定的水准，对不需配对安装线性滑轨的客户而言，是一项很好的选择。PQE 系列与 PEG 系列滑轨共享，客户无需为了选用静音式产品而重新设计安装尺寸，如此更加提升了 QE 系列的应用性与可互换性。

PQE series guides can be classified into non-interchangeable and interchangeable types. The sizes are identical. The main difference is that the interchangeable blocks and rails can be freely exchanged. Because of dimensional control, the interchangeable type linear guideway is a perfect choice for the client when rails do not need to be paired for an axis. And since the PQE and PEG share the identical rails, the customer does not need to redesign when choosing the PQE series. Therefore the PYG-PQE linear guideway has increased applicability.

(1) 非互换性线性滑轨产品型号 /Non-interchangeable type



注：

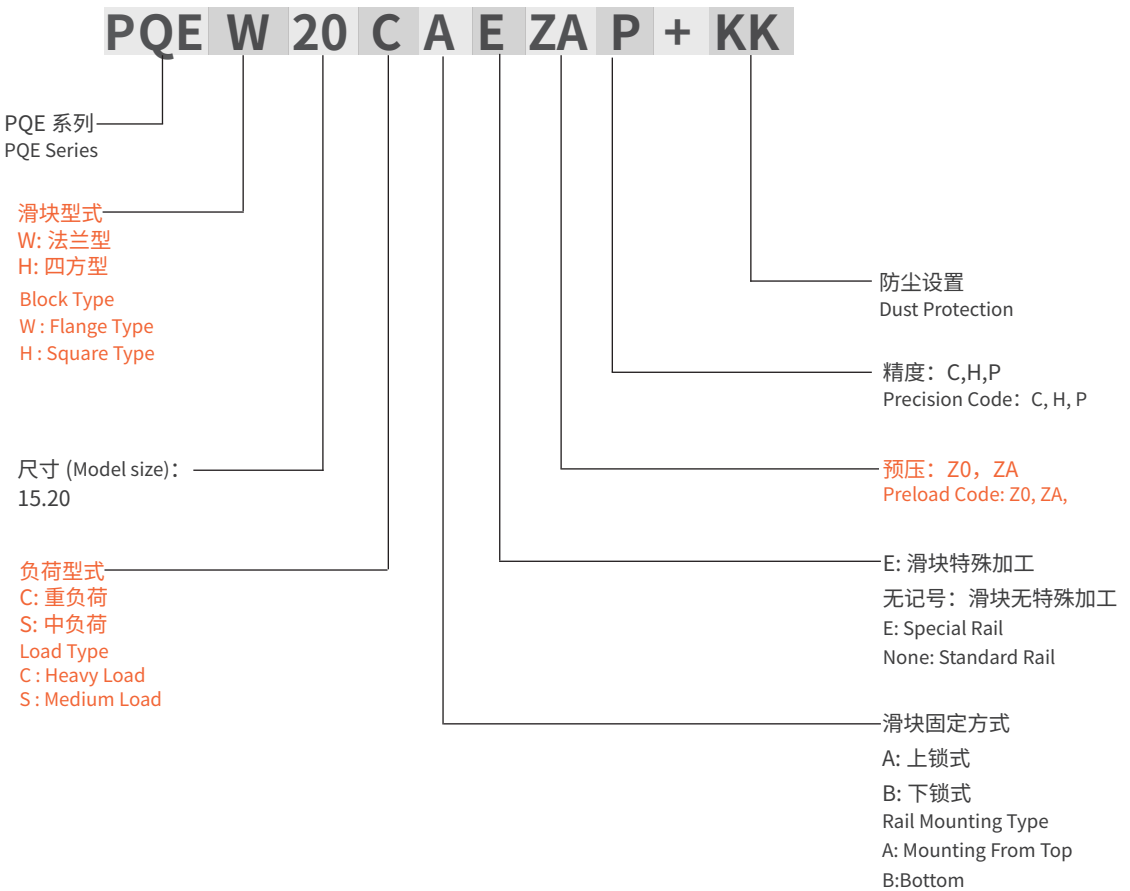
1. 单轴导轨数若只使用一支导轨则不写，两支标记为 II，三支标记为 III，以此类推。
2. 防尘配备中无记号为防尘标准配备刮油片加防尘片。
ZZ 为刮油片加防尘片加金属刮板。
KK 为双刮油片加防尘片加金属刮板。
DD 为慧刮油片加防摩防盖片。
3. 滑块型式 L 为四方形 H 之低组装式滑块，其组合高度与同尺寸之法兰型一致。

Note:

1.The roman numerals express amatched set of rails.
2.No symbol indicates standard protectionlend seal and bottom seal.
ZZ:End seal, bottom seal and scraper.
KK:Double seals, bottom seal and scraper.
DD: Double seals and bottom seal.
3. Block type HGL is the low profile design of PGH(square type), the assembled height is same as PHGW （flange type) in same size.

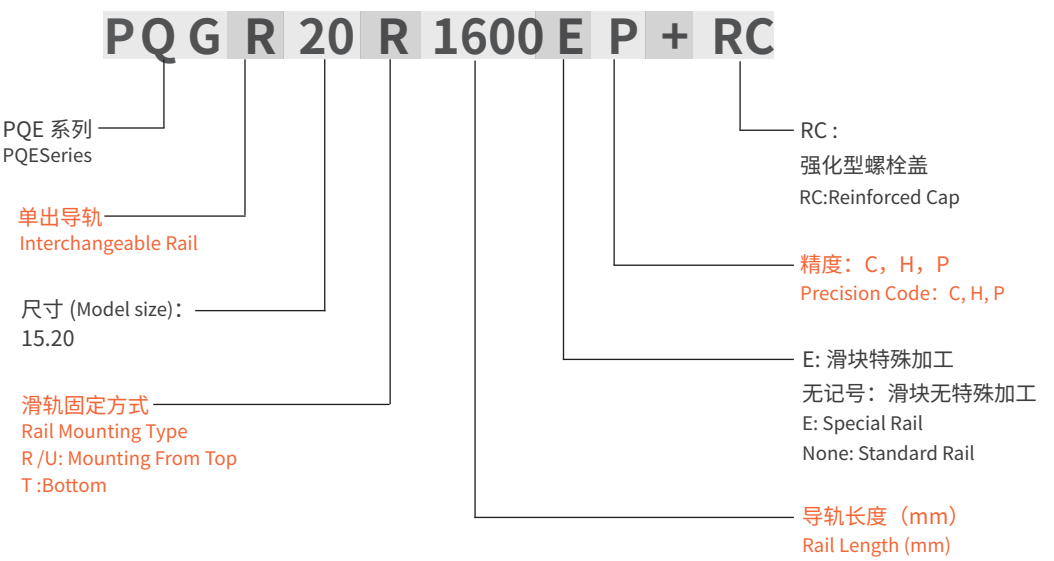
(2) 互换性直线导轨产品型号 /Interchangeable type

- 互换型滑块产品型号 /Model Number of PHG Block



- 互换型导轨产品型号 / Model Number of PHG Rail

（与 PEG 系列共用 /PQE and PEG share the identical rails）

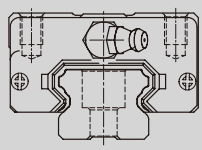
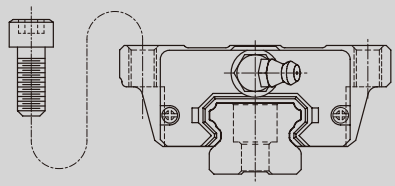


4. PQE 系列型式 /PQE Types

（1）滑块型式 /Block types

PYG 提供法兰型及四方型两种直线导轨。
PYG offers two types of linear guides, flange and square types.

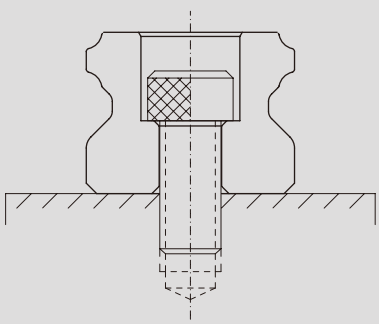
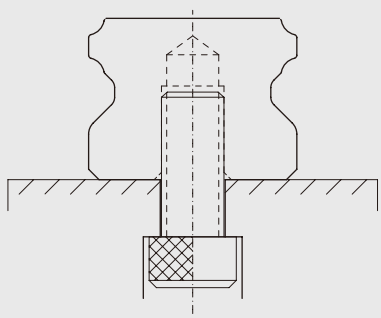
表格 2-6-1 滑块形式
Table 2-6-1 BlockTypes

型号 Type	规格 Model	形状 Shape	高度尺寸 Height (mm)	滑轨长度 Rail Length (mm)	应用设备 Main Application(mm)
四方型 Square	PQEH-SA PQEH-CA		24 ⇩ 48	100 ⇩ 4000	• 自动化装置 • 高速运输设备 • 精密测量仪器 • 半导体设备 •Automation devices •High-speed transportation equipment •Precision measuring equipment •Semiconductor manufacturing equipment
法兰型 Flange	PQEW-SA PQEW-CA		24 ⇩ 48	100 ⇩ 4000	

（2）滑块型式 /Block types

除了一般上锁式螺栓孔滑轨外，PYG 亦提供下锁式螺孔滑轨，方便客户安装使用。
Besides the standard top mounting type, PYG also offers bottom mounting type rails.

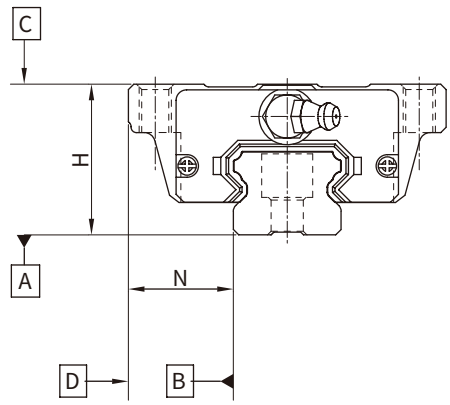
表格 2-6-2 滑轨型式
Table 2-6-2 Rail Types

上锁式螺栓孔 Mounting from Top	下锁式螺丝孔 Mounting from Bottom
	

5. 精度等级 /Accuracy Classes

PQE 系列线性滑轨的精度，分为普通级、高、精密、超精密、超高精密共四级，客户可依设备精度需求选用精度。

The accuracy of the EG series can be classified into 5 classes: normal(C), high(H), precision(P), super precision(SP), and ultra precision(UP). Choose the class by referencing the accuracy of selected equipment.



（1）非互换性直线导轨精度 /Accuracy of non-interchangeable guides

表 2-6-3 组合件精度表 /Accuracy Standards　　单位 /Unit（mm）

型号 /Item	PQE-15,20				
精度等级 Accuracy Classes	普通级（C） Normal（C）	高级（H） High（H）	精密级（P） Precision（P）	超精密级（SP） Super Precision(SP)	超高精密级（UP） Ultra Precision（UP）
高度 H 的容许尺寸误差 Dimensional tolerance of height H	± 0.1	± 0.03	0 - 0.03	0 -0.015	0 -0.008
宽度 N 的容许尺寸误差 Dimensional tolerance of width N	± 0.1	± 0.03	0 -0.03	0 -0.015	0 -0.008
成对高度 H 的相互误差 Variation of height H	0.02	0.01	0.006	0.004	0.003
成对宽度 N 的相互误差 Variation of width N	0.02	0.01	0.006	0.004	0.003
滑块 C 面对滑轨 A 面的行走平行度 Running parallelism of block surface C to surface A	行走平行度（见表格 2-6-11） See Table 2-6-11				
滑块 D 面对滑轨 B 面的行走平行度 Running parallelism of block surface D to surface B	行走平行度（见表格 2-6-11） See Table 2-6-11				

表 2-6-4 组合件精度表 /Accuracy Standards　　单位 /Unit（mm）

型号 /Item	PQE-25,30,35				
精度等级 Accuracy Classes	普通级（C） Normal（C）	高级（H） High（H）	精密级（P） Precision（P）	超精密级（SP） Super Precision(SP)	超高精密级（UP） Ultra Precision（UP）
高度 H 的容许尺寸误差 Dimensional tolerance of height H	± 0.1	± 0.04	0 - 0.04	0 -0.02	0 -0.01
宽度 N 的容许尺寸误差 Dimensional tolerance of width N	± 0.1	± 0.04	0 -0.04	0 -0.02	0 -0.01
成对高度 H 的相互误差 Variation of height H	0.02	0.015	0.007	0.005	0.003
成对宽度 N 的相互误差 Variation of width N	0.03	0.015	0.007	0.005	0.003
滑块 C 面对滑轨 A 面的行走平行度 Running parallelism of block surface C to surface A	行走平行度（见表格 2-6-7） See Table 2-6-7				
滑块 D 面对滑轨 B 面的行走平行度 Running parallelism of block surface D to surface B	行走平行度（见表格 2-6-7） See Table 2-6-7				

（2）互换性直线导轨精度 /Accuracy of interchangeable guides

表 2-6-5 单出件精度表 /Accuracy Standard　　单位 /Unit（mm）

型号 /Item	PQE-15,20		
精度等级 Accuracy Classes	普通级（C） Normal（C）	高级（H） High（H）	精密级（P） Precision（P）
高度 H 的容许尺寸误差 Dimensional tolerance of height H	± 0.1	± 0.03	± 0.015
宽度 N 的容许尺寸误差 Dimensional tolerance of width N	± 0.1	± 0.03	± 0.015
成对高度 H 的相互误差 Variation of height H	0.02	0.01	0.006
成对宽度 N 的相互误差 Variation of width N	0.02	0.01	0.006
滑块 C 面对滑轨 A 面的行走平行度 Running parallelism of block surface C to surface A	行走平行度（见表格 2-6-7） See Table 2-6-7		
滑块 D 面对滑轨 B 面的行走平行度 Running parallelism of block surface D to surface B	行走平行度（见表格 2-6-7） See Table 2-6-7		

表 2-6-6 单出件精度表 /Accuracy Standard

单位 /Unit（mm）

型号 /Item	PEG-25,30,35		
精度等级 Accuracy Classes	普通级（C） Normal（C）	高级（H） High（H）	精密级（P） Precision（P）
高度 H 的容许尺寸误差 Dimensional tolerance of height H	± 0.1	± 0.04	± 0.02
宽度 N 的容许尺寸误差 Dimensional tolerance of width N	± 0.1	± 0.04	± 0.02
成对高度 H 的相互误差 Variation of height H	0.02	0.015	0.007
成对宽度 N 的相互误差 Variation of width N	0.03	0.015	0.007
滑块 C 面对滑轨 A 面的行走平行度 Running parallelism of block surface C to surface A	行走平行度（见表格 2-2-11） See Table 2-2-11		
滑块 D 面对滑轨 B 面的行走平行度 Running parallelism of block surface D to surface B	行走平行度（见表格 2-2-11） See Table 2-2-11		

（3）行走平行度精度 /Accuracy of running parallelism

表 2-6-7 行走平行度精度 /Accuracy of running parallelism

单位 /Unit（mm）

滑轨长度 /Rall Length (mm)	精度等级 /Accuracy (μm)			
	H	P	SP	UP
~ 100	7	3	2	2
100 ~ 200	9	4	2	2
200 ~ 300	10	5	3	2
300 ~ 500	12	6	3	2
500 ~ 700	13	7	4	2
700 ~ 900	15	8	5	3
900 ~ 1,100	16	9	6	3
1,100 ~ 1,500	18	11	7	4
1,500 ~ 1,900	20	13	8	4
1,900 ~ 2,500	22	15	10	5
2,500 ~ 3,100	25	18	11	6
3,100 ~ 3,600	27	20	14	7
3,600 ~ 4,000	28	21	15	7

6. 预压力 /Preload

（1）预压力定义 /Definition

预压力是预先给予钢珠负荷力，亦即加大钢珠直径，利用钢珠与珠道之间负向间隙给予预压，此举能提高导轨的刚性及消除间隙；以右图来解释，提高预压力可增加直线导轨刚性，但小规格建议选用轻预压以下预压，以避至因预压选用过重降低其使用寿命。

A preload can be applied to each guides. Oversizedballs are used. Generally, a linear motion guides has a negative clearance between groove and balls inorder to improve stiffness and maintain high precision.The fiqure shows the load is multiplied by the preload the rigidity is doubled and the deflection is reduced by one half. The preload no larger than ZA would be recommended for the model size under PQE20 to avoidan over-preload affecting the guide's life.

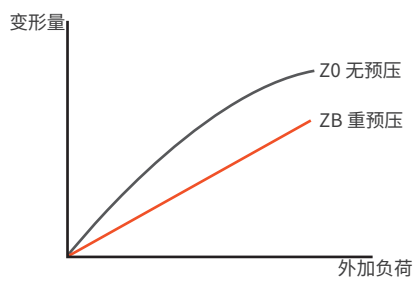


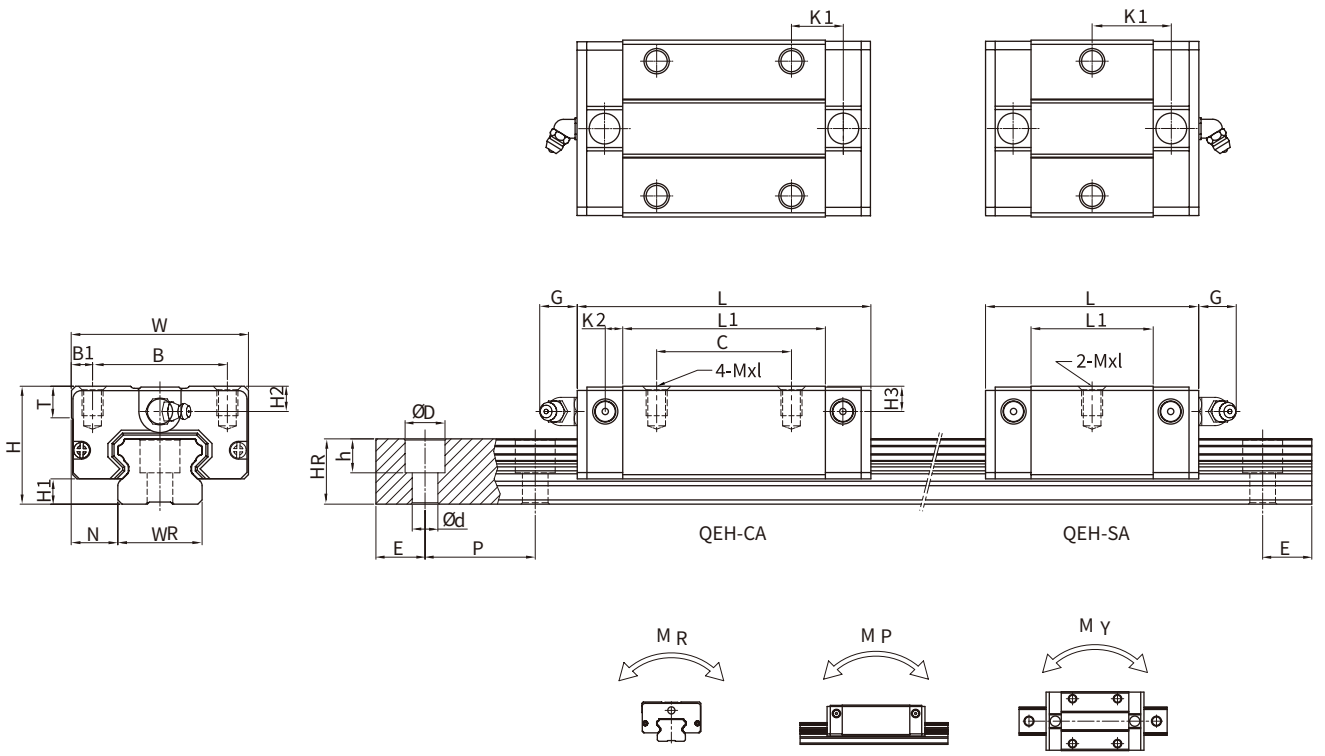
表 2-1-12 预压等级 /Preload classes

预压等级 Class	标记 Code	预压力 Preload	适用范围 Examples of Application
轻预压 Light Preload	Z0	0.02~0.04C	负荷方向固定且冲击小，精度要求低。 Certain load direction, low impact, low precision required.
中预压 Medium Preload	ZA	0.07C~0.09C	刚性需求且轻负荷，高精度要求。 High rigidity required, high precision required.
重预压 Heavy Preload	ZB	0.12C~0.14C	高刚性需求，且有振动与冲击之使用环境。 Super high rigidity required, with vibration and impact

注：预压力 C 为动额定负荷
Note: The "C" in the preload column denotes basic dynamic load rating.

7.PQE 系列直线导轨尺寸表 /Dimensions for PYG PQE Series

（1）PQEH-CA/PQEH-SA

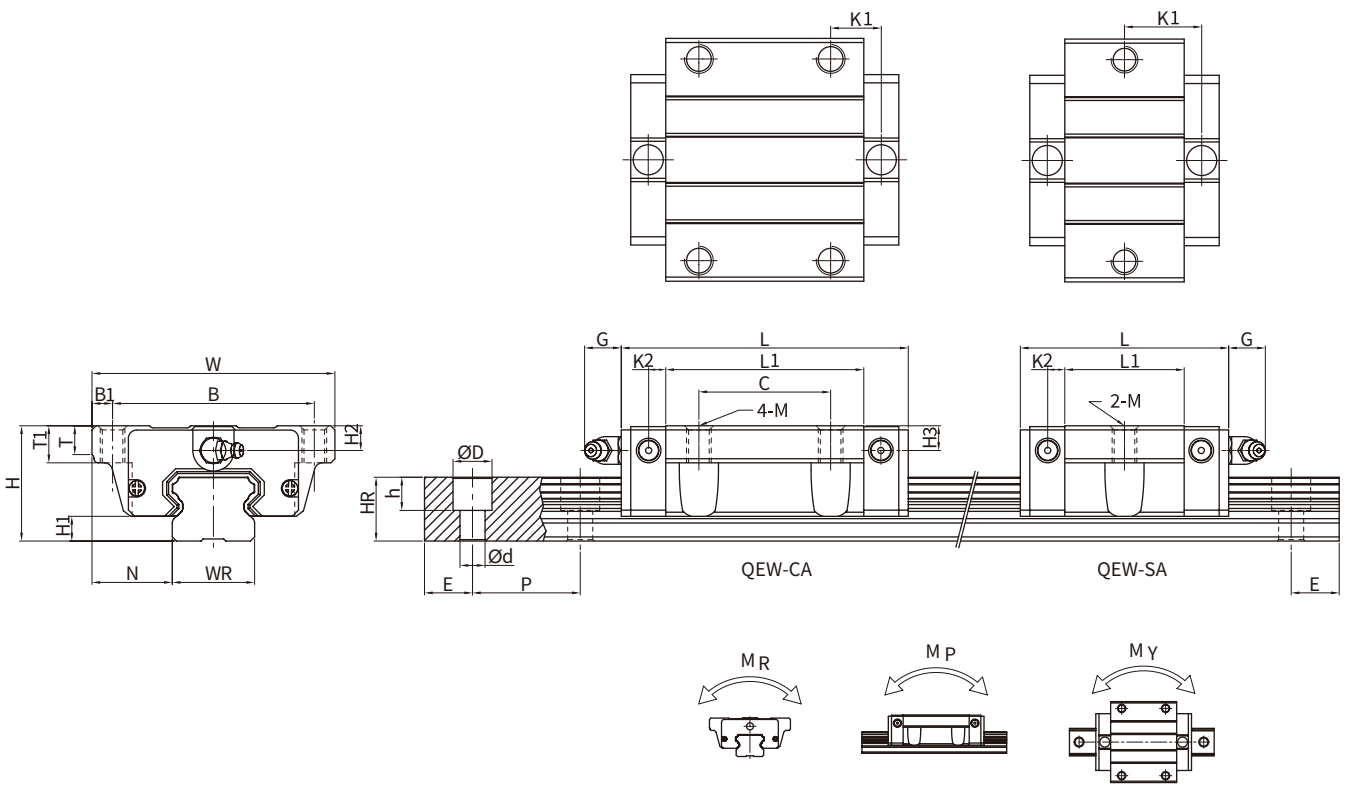


型号 Model No.	组件尺寸 Dimensions of Assembly (mm)			滑块尺寸 Dimensions of Block(mm)												滑轨尺寸（mm） Dimensions of Rail (mm)							滑轨的固定螺栓尺寸 Mounting Bolt for Rail	基本动额定负荷 Basic Dynamic load Rating	基本静额定负荷 Basic Static Load Rating	容许静力矩 Static Rated Moment			重量 Weight	
	H	H_1	N	W	B	B_1	C	L_1	L	K_1	K_2	G	Mxl	T	H_2	H_3	W_R	H_R	D	h	d	P	E	(mm)	C（kN）	C_0（kN）	M_R kN-m	M_P kN-m	M_Y kN-m	滑块 kg	滑轨 kg/m
PQEH15SA	24	4	9.5	34	26	4	–	23.1	40.1	14.8	3.5	5.7	M_{4x6}	6	5.5	6	15	12.5	6	4.5	3.5	60	20	M_{3x16}	8.65	8.78	0.07	0.03	0.03	0.09	1.25
PQEH15CA							26	39.8	56.8	10.15															12.53	15.28	0.12	0.09	0.09	0.15	
PQEH20SA	28	6	11	42	32	5	–	29	50	18.75	4.15	12	M_{5x7}	7.5	6	6.5	20	15.5	9.5	8.5	6	60	20	M_{8x25}	11.57	12.18	0.13	0.05	0.05	0.15	2.08
PQEH20CA							32	48.1	69.1	12.3															16.50	20.21	0.21	0.15	0.15	0.23	

注：1. 1kgf=9.81N

Note：1. 1kg=9.81N

(2) PQEW-CA/PQEW-SA



型号 Model No.	组件尺寸 Dimensions of Assembly (mm)			滑块尺寸 Dimensions of Block(mm)													滑轨尺寸（mm） Dimensions of Rail (mm)							滑轨的固定螺栓尺寸 Mounting Bolt for Rail	基本动额定负荷 Basic Dynamic load Rating	基本静额定负荷 Basic Static Load Rating	容许静力矩 Static Rated Moment			重量 Weight	
																											M_R	M_P	M_Y	滑块	滑轨
	H	H_1	N	W	B	B_1	C	L_1	L	K_1	K_2	G	M	T	T_1	H_2	H_3	W_R	H_R	D	h	d	P	E	(mm)	C (kN)	C_0 (kN)	kN-m	kN-m	kN-m	kg	kg/m
PQEW15SA	24	3	18.5	52	41	5.5	—	23.1	40.1	14.8	3.5	5.7	M5	5	7	5.5	6	15	12.5	6	4.5	3.5	60	20	M_{3x16}	8.56	8.78	0.07	0.03	0.03	0.12	1.25
PQEW15CA							26	39.8	62.2	10.15																12.53	15.28	0.12	0.09	0.09	0.21	
PQEW20SA	28	46	19.5	42	49	5	—	29	50	18.75	4.15	12	M6	7	9	6	6	20	15.5	9.5	8.5	6	60	20	M_{5x16}	11.57	12.18	0.13	0.05	0.05	0.19	2.08
PQEW20CA							32	51.8	76.7	12.5																16.50	20.21	0.21	0.15	0.15	0.31	

注：1. 1kgf=9.81N

Note：1. 1kg=9.81N

2-7 PMG 系列—微小型滚珠直线导轨
PMG SERIES -MINIATURE LINEAR GUIDES

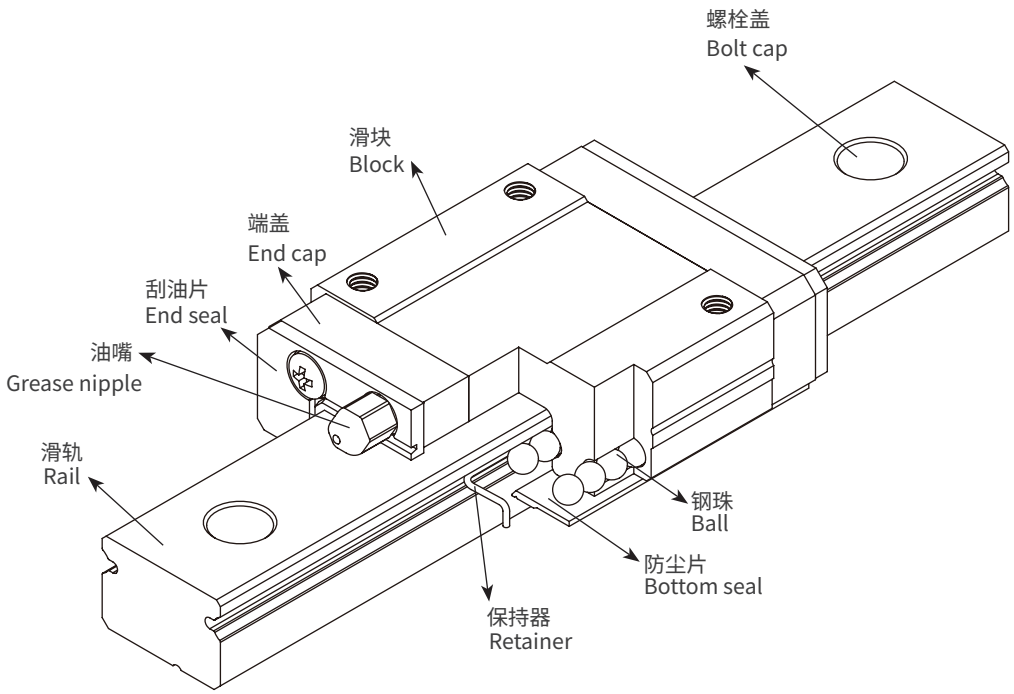
1. PMG 系列线性滑轨特点 / Features of the PMG Series Linear Guides

1. 体积小、轻量化，特别适合小型化设备使用。
2. 采用哥德型四点接触设计，可承受各方向负荷，具备刚性强，精度高等特性。
3. 有钢珠保持器设计之规格，在精度允许下具备互换性。

Design features of narrow type miniature guides- MGN:

1. Tiny and light weight, suitable for miniature equipment.
2. Gothic arch contact design can sustain loads from all directions and offer high rigidity and high accuracy.
3. Specification with ball retainers would avoid ball falling when the blocks are removed from rails.

2.PMG 本体结构 /Construction of PMG Series



- 滚动循环系统：滑块、滑轨、端盖、钢珠、保持器（3 规格例外）
- 润滑系统：PMG 端盖侧附有油嘴，提供客户注油，而 PMG7、9、12 则于端盖侧，预留注油孔，可将油或油脂打入滑块内部以润滑。
- 防尘系统：刮油片（3 规格选配）、防尘片（9,12,15 规格选配）、螺栓盖（12,15 规格）。

- Rolling circulation system: Block, rail, end cap and retainer.(except size 3)
- Lubrication system: Grease nipple is available for MGN15, lubricated by grease gun.PMG 7, 9, 12 are lubricated by the hole at the side of the end cap.
- Dust protection system: End seal (optional size 3), bottom seal (optional size 9,12,15), cap (size12,15)

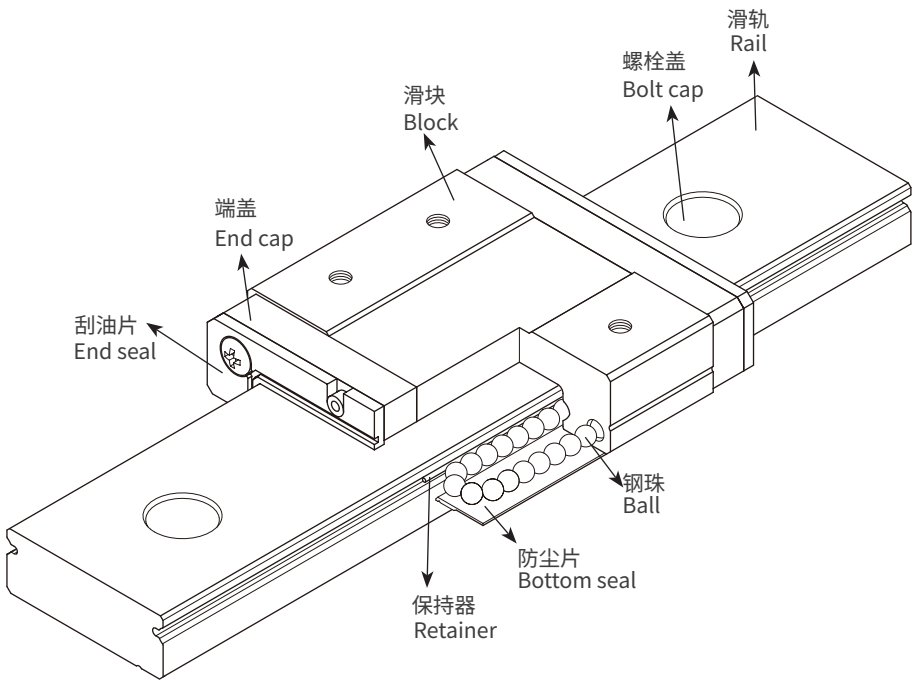
3. PMG 微小型宽幅直线导轨之特点 / Features of the PMG Series Linear Guides

1. 体积小、轻量化，特别适合小型化设备使用。
2. 采用哥德型四点接触设计，可承受各方向负荷，具备刚性强，精度高等特性。
3. 有钢珠保持器设计之规格，在精度允许下具备互换性。

Design features of wide type miniature guideways- MGW:

1. The enlarged width design increases the capacity of moment loading.
2. Gothic arch contact design has high rigidity characteristic in all directions.
3. Specification with ball retainers would avoid ball falling when the blocks are removed from rails.

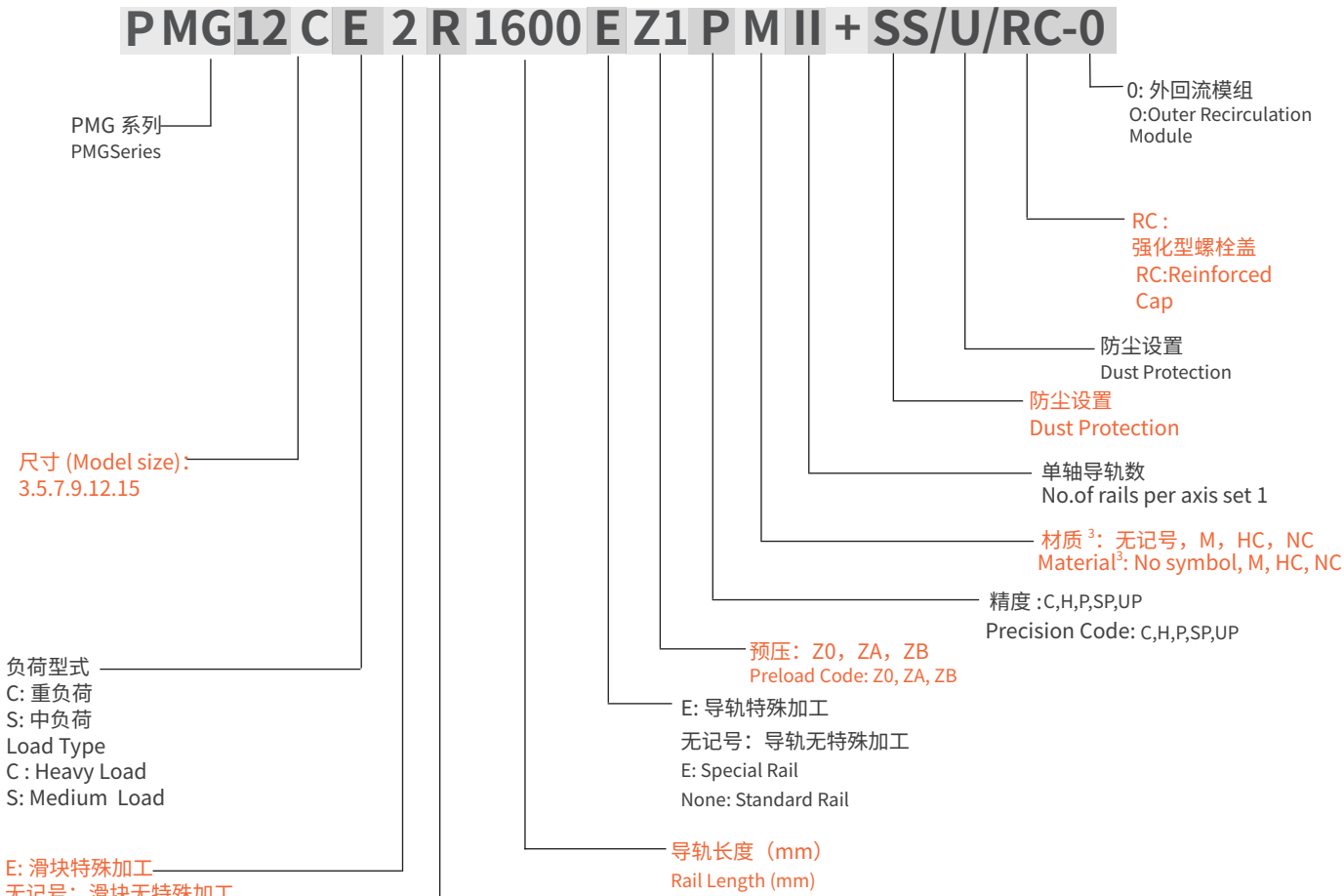
4.PMG 本体结构 /Construction of PMG Series



- 滚动循环系统：滑块、滑轨、端盖、钢珠、保持器（3 规格例外）
- 润滑系统：PMG 14,15 端盖侧附有油嘴，提供客户注油，而 PMG7、9、12 则于端盖侧，预留注油孔，可将油或油脂打入滑块内部以润滑。
- 防尘系统：刮油片、防尘片（9,12,15 规格选配）、螺栓盖（12,14,15 规格）。

- Rolling circulation system: Block, rail, end cap and retainer.(except size 3)
- Lubrication system: Grease nipple is available for PMG 14,15, lubricated by grease gun.PMG 7, 9, 12 are lubricated by the hole at the side of the end cap.
- Dust protection system: End seal, bottom seal (optional size 9,12,15), cap (size12,15)

(1) 非互换性线性滑轨产品型号 /Non-interchangeable type



注：

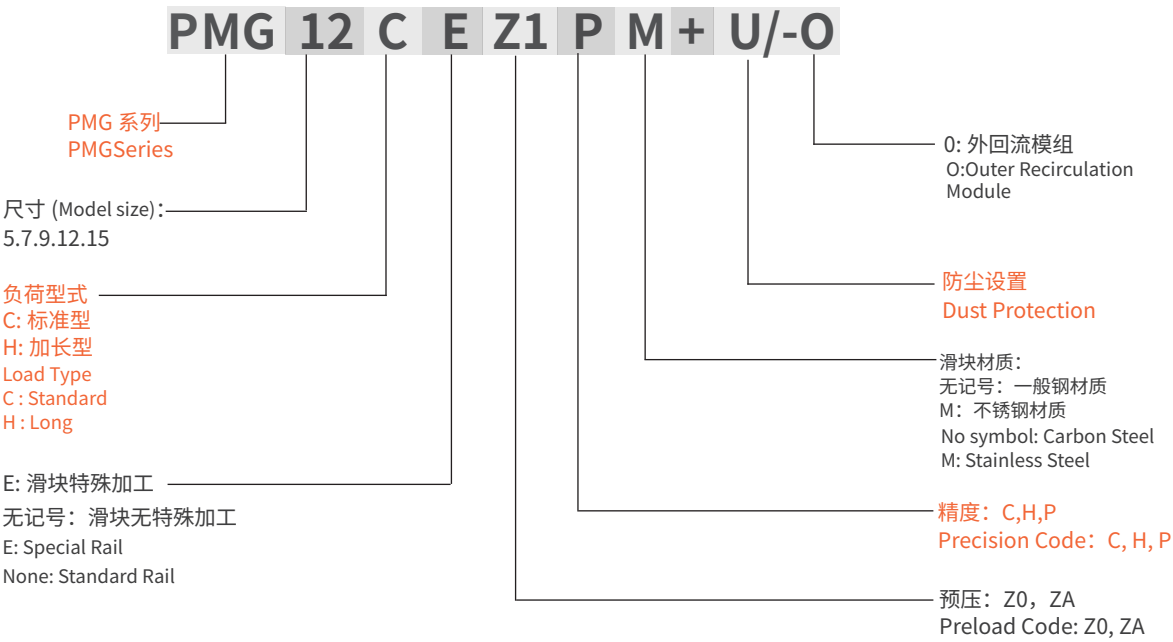
1. 单轴滑轨数若只使用一支滑轨则不写，两支标记为 II，三支标记为III，以此类推。
2. PMG 及 PMG 规格 9,12,14,15 可选用防尘片。
3. 无记号：一般钢材质
M：不锈钢材质
HC：一般钢材质 + 镀硬铬
NC：一般钢材质 +hicoating 处理
4. PMG5 仅有外回流模块设计
5. PMGW2、PMG3 及 PMG14 无外回流设计模块
6. PMG3 防尘配件中无标记为防尘标准不含刮油片，
防尘配备为含刮油片。

Note:

1. Symbol for No. of rails used on the same plane. No symbol indicates single rail in a axis.
2. The bottom seal is available for MGN & MGW 9, 12, 14, 15.
3. No symbol: Carbon Steel
M: Stainless Steel
HC: Carbon Steel+Hard Chrome Treatment
NC: Carbon Steel+hicoating Treatment
4. PMG5 is only supplied with outer recirculation module.
5. PMGW2, PMG3 and PMGW14 are only supplied without outer recirculation module.
6. The end seal is optional for PMGN3, and it's available for SS symbol.

(2) 互换性直线导轨产品型号 /Interchangeable type

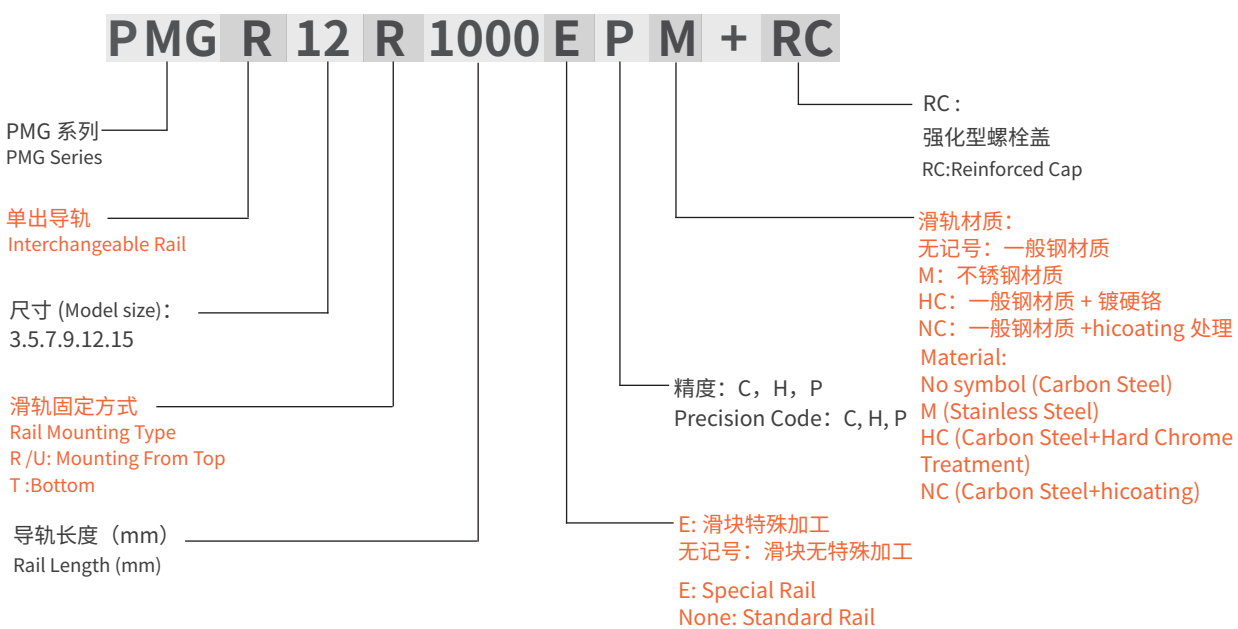
● 单出滑块产品型号 /Interchangeable Block



注：1.PMGN 及 PMGW 规格 9,12,14,15 可选用防尘片。
2.PMG5 仅有外回流模块设计
3.PMG2、PMG3 无提供单出选项
4.PMGW14 无外回流模块设计。

Note: 1. The bottom seal is available for PMGN & PMGW 9, 12, 14, 15.
2. PMG5 is only supplied with outer recirculation module.
3. No interchangeable offer of PMG2 and PMG3.
4. PMGW14 is only supplied without outer recirculation module.

● 单出导轨产品型号 / Interchangeable Rail

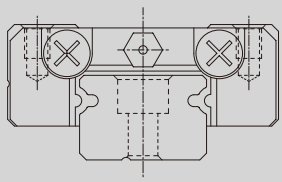
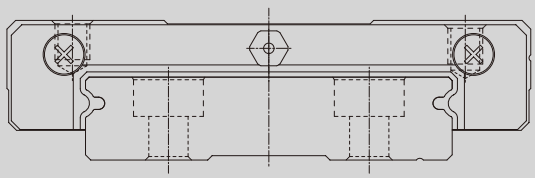


5. PMG 系列型式 /PMG Types

（1）滑块型式 /Block types

PYG 提供法兰型及四方型两种直线导轨。
PYG offers two types of linear guides, flange and square types.

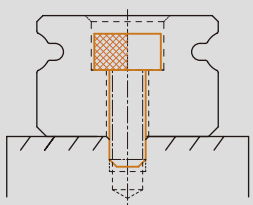
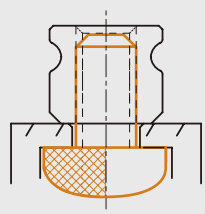
表格 2-7-1 滑块形式
Table 2-7-1 BlockTypes

型号 Type	规格 Model	形状 Shape	高度尺寸 Height (mm)	滑轨长度 Rail Length (mm)	应用设备 Main Application(mm)
标准型 Square	PMGN-C PMGN-H		4 ⇩ 16	100 ⇩ 2000	• 印表机 • 机器手臂 • 电子仪器设备 • 半导体设备 •Printer •Robotics •Precision measure equipment •Semiconductor equipment
宽幅型 Flange	PMGW-C PMGW-H		4.5 ⇩ 16	100 ⇩ 2000	

（2）滑块型式 /Block types

除了一般上锁式螺栓孔滑轨外，PYG 亦提供下锁式螺孔滑轨，方便客户安装使用。
Besides the standard top mounting type, PYG also offers bottom mounting type rails.

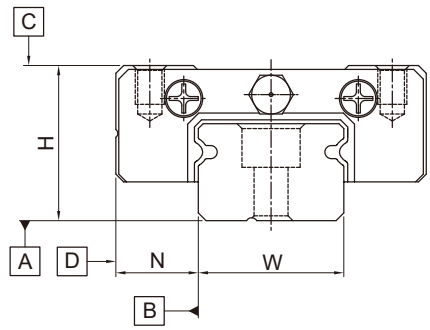
表格 2-7-2 滑轨型式
Table 2-7-2 Rail Types

上锁式螺栓孔 Mounting from Top	下锁式螺丝孔 Mounting from Bottom
	

6. 精度等级 / Accuracy Classes

PMGN 及 PMGW 系列小型滑轨的精度，分为普通、高、精密级共三级，客户可依设备精度需求选用适合精度。

The accuracy of PMGN/PMGW series can be classified into three classes: normal (C), high (H), precision (P). Choices for different accuracy classes are available according to various requirements.



（1）非互换性线性滑轨精度 /Accuracy of non-interchangeable guides

组合高度 H 测量是以滑块上部基准面中心位置为准，组合宽度 N 测量是以滑块侧边基准面中心位置为准。

The measurement of combination height H is based on the center position of the upper reference plane of the slider, and the measurement of combination width N is based on the center position of the side reference plane of the slider.

表 2-7-3 单出件精度表 /Accuracy Standard　　单位 /Unit（mm）

精度等级 Accuracy Classes	普通级（C） Normal（C）	高级（H） High（H）	精密级（P） Precision（P）
高度 H 的容许尺寸误差 Dimensional tolerance of height H	± 0.04	± 0.02	± 0.01
宽度 N 的容许尺寸误差 Dimensional tolerance of width N	± 0.04	± 0.025	± 0.015
成对高度 H 的相互误差 Variation of height H	0.03	0.015	0.007
成对宽度 N 的相互误差 Variation of width N	0.03	0.02	0.01
滑块 C 面对滑轨 A 面的行走平行度 Running parallelism of block surface C to surface A	行走平行度（见表格 2-7-5） See Table 2-7-5		
滑块 D 面对滑轨 B 面的行走平行度 Running parallelism of block surface D to surface B	行走平行度（见表格 2-7-5） See Table 2-7-5		

（2）互换性直线导轨精度 /Accuracy of interchangeable guides

互换性直线导轨精度在滑块组装于单支滑轨之成对高及宽度精度，同非互换性直线导轨精度，但若组装于不同支滑轨上，因滑轨高度误差，其成对高及宽度精度，比非互换性直线导轨精度稍微逊色，而行走平行度精度则同非互换性直线导轨之精度。

The accuracy of interchangeable linear slide rails is comparable to that of non interchangeable linear slide rails in terms of paired height and width accuracy when the slider is assembled on a single slide rail, but if assembled on different supportsOn the slide rail, due to the height error of the slide rail, its paired height and width accuracy is slightly inferior to that of non interchangeable linear slide rails, while the parallelism accuracy is the same as non interchangeable linear slide rails Accuracy of interchangeable linear slide rails.

表 2-7-4 单出件精度表 /Accuracy Standard　　单位 /Unit（mm）

精度等级 Accuracy Classes		普通级（C） Normal（C）	高级（H） High（H）	精密级（P） Precision（P）
高度 H 的容许尺寸误差 Dimensional tolerance of height H		± 0.04	± 0.02	± 0.01
宽度 N 的容许尺寸误差 Dimensional tolerance of width N		± 0.04	± 0.025	± 0.015
单支成对 One set	高度 H 的相互误差 Variation of height H	0.03	0.015	0.007
	宽度 N 的相互误差 Variation of width N	0.03	0.02	0.01
复数支成对高度 H 的相互误差 Pair Variation of width N (Master Rail)		0.07	0.04	0.02
滑块 C 面对滑轨 A 面的行走平行度 Running parallelism of block surface C to surface A		行走平行度（见表格 2-7-5） See Table 2-7-5		
滑块 D 面对滑轨 B 面的行走平行度 Running parallelism of block surface D to surface B		行走平行度（见表格 2-7-5） See Table 2-7-5		

（3）行走平行度精度 /Accuracy of running parallelism

表 2-7-5 行走平行度精度 /Accuracy of running parallelism

单位 /Unit（mm）

滑轨长度 /Rall Length (mm)	精度等级 /Accuracy (μm)			
	H	P	SP	UP
~ 100	7	3	2	2
100 ~ 200	9	4	2	2
200 ~ 300	10	5	3	2
300 ~ 500	12	6	3	2
500 ~ 700	13	7	4	2
700 ~ 900	15	8	5	3
900 ~ 1,100	16	9	6	3
1,100 ~ 1,500	18	11	7	4
1,500 ~ 1,900	20	13	8	4
1,900 ~ 2,500	22	15	10	5
2,500 ~ 3,100	25	18	11	6
3,100 ~ 3,600	27	20	14	7
3,600 ~ 4,000	28	21	15	7

滑轨 C 对 A、D 对 B 之行走平行度与滑轨精度、长度有关，其值列于下表。
The running parallelism C to A and D to B are related to the rail length.

7. 预压力 /Preload

PMGN/PMGW 系列提供普通间隙、无预压、轻预压三种预压力。
Stiffness depends on preload. The following table shows stiffness value of each size.

表 2-1-12 预压等级 /Preload classes

预压等级 Class	标记 Code	预压力 Preload	适用精度 Accuracy
普通间隙 Light Clearance	ZF	精密间隙 4~10μm	C
无预压 Very Light Preload	Z0	0	C-P
轻预压 Light Preload	Z1	0.02C	C-P

注：预压力 C 为动额定负荷
Note: The "C" in the preload column denotes basic dynamic load rating.

（3）预压力 /Stiffness performance

不同的预压力呈现不一样的滑块刚性，下表为各尺寸的滑块刚性值。
Stiffness depends on preload. The following table shows stiffness value of each size.

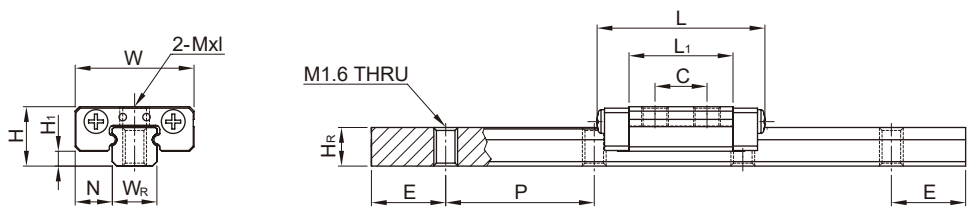
表 2-5-9 PMG 系列径向刚性 /Stiffness performance

负荷型式 Load type	系列 / 尺寸 Series/Size	不同预压力的刚性表现（N/μm）Stiffness(N/μm)		系列 / 尺寸 Series/Size	不同预压力的刚性表现（N/μm）Stiffness(N/μm)	
		Z0	Z1		Z0	Z1
标准型 Standard	PMGN5C-0	20	61	PMGN5C-0	32	85
	PMGN7C	26	73	PMGW7C	44	112
	PMGN9C	38	102	PMGW9C	62	140
	PMGN12C	44	105	PMGW12C	72	148
	PMGN15C	58	126	PMGW15C	85	154
加长型 Long	PMGN5H-O	26	79	-	-	-
	PMGN7H	42	122	PMGW7H	64	168
	PMGN9H	56	153	PMGW9H	81	190
	PMGN12H	70	175	PMGW12H	102	217
	PMGN15H	89	202	PMGW15H	122	235

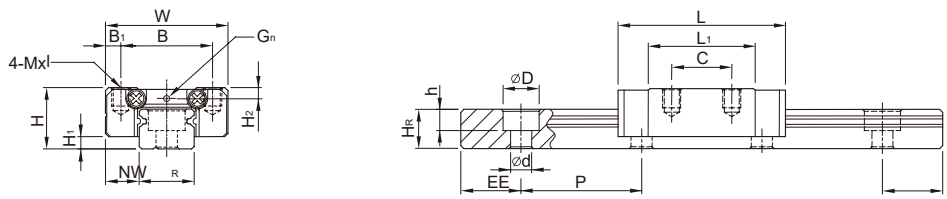
8.PMG 系列直线导轨尺寸表 /Dimensions for PYG PMG Series

(1) PMGN-C/PMGN-H

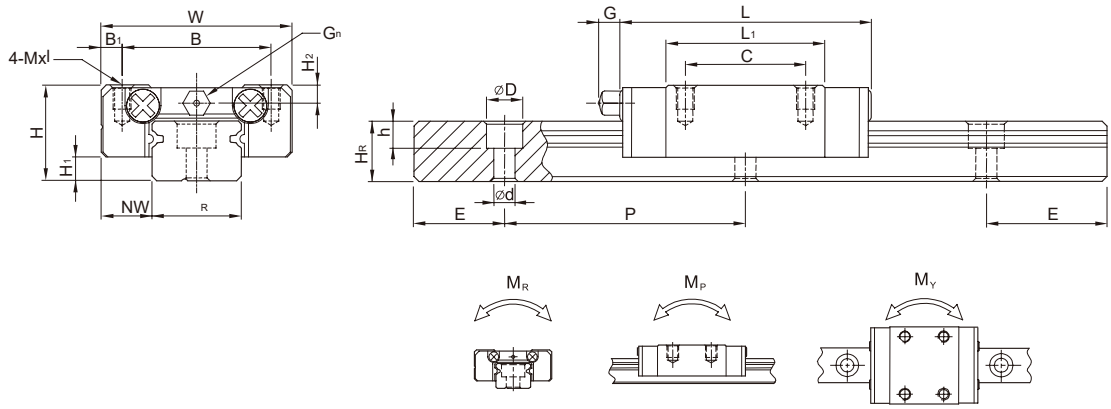
PMGN3



PMGN7 PMGN9 PMGN12



PMGN15



型号 Model No.	组件尺寸 Dimensions of Assembly (mm)			滑块尺寸 Dimensions of Block(mm)									滑轨尺寸（mm） Dimensions of Rail (mm)							滑轨的固定螺栓尺寸 Mounting Bolt for Rail	基本动额定负荷 Basic Dynamic load Rating	基本静额定负荷 Basic Static Load Rating	容许静力矩 Static Rated Moment			重量 Weight	
	H	H_1	N	W	B	B_1	C	L_1	L	G	G_n	MxI	H_2	W_R	H_R	D	h	d	P	E	(mm)	C (kN)	C_0 (kN)	M_R kN-m	M_P kN-m	M_Y kN-m	滑块 kg	滑轨 kg/m
PMGN 3C	4	1	2.5	8	-	-	3.5	7	11.3	-	-	$M_{1.6x1.3}$	-	3	2.6	M1.6THRU			10	5	$M_{1.6}$	0.29	0.44	0.7	0.5	0.5	0.001	0.05
PMGN 3H							5.5	11	15.3			$M_{2x1.3}$										0.39	0.68	1.0	1.3	1.3	0.002	
PMGN 7C	8	1.5	5	17	12	2.5	8	13.5	22.5	-	ϕ1.2	$M_{2x2.5}$	1.5	7	4.8	4.2	2.3	2.4	15	5	M_{2x6}	0.98	1.24	4.70	2.84	2.84	0.010	0.22
PMGN 7H							13	21.8	30.8													1.37	1.96	7.64	4.80	4.80	0.015	
PMGN 9C	10	2	5.5	20	15	2.5	10	18.9	28.9	-	ϕ1.4	M_{3x3}	1.8	9	6.5	6	3.5	3.5	20	7.5	M_{3x8}	1.86	2.55	11.76	7.35	7.35	0.016	0.38
PMGN 9H							16	29.9	39.9													2.55	4.02	19.60	18.62	18.62	0.026	
PMGN 12C	13	3	7.5	27	20	3.5	15	21.7	34.7	-	ϕ2	$M_{3x3.5}$	2.5	12	8	6	4.5	3.5	25	10	M_{3x8}	2.84	3.92	25.48	13.72	13.72	0.034	0.65
PMGN 12H							20	32.4	45.4													3.72	5.88	38.22	36.26	36.26	0.054	
PMGN 15C	16	4	8.5	32	25	3.5	20	26.7	42.1	4.5	M3	M_{3x4}	3	15	10	6	4.5	3.5	40	15	M_{3x10}	4.61	5.59	45.08	21.56	21.56	0.059	1.06
PMGN 15H							25	43.4	58.8													6.37	9.11	73.50	57.82	57.82	0.092	

注：1. 1kgf=9.81N

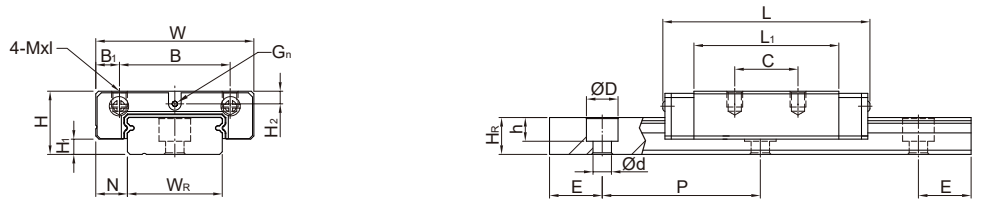
2.PMG3 之滑块不可超出滑轨。如需将滑块自滑轨上卸下，请务必将滑块保持在所附之夹轨上。

Note：1. 1kg=9.81N

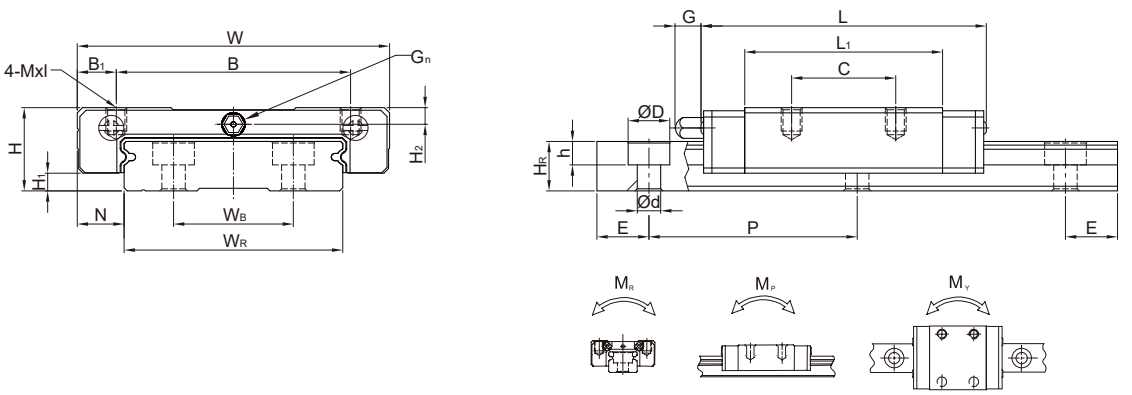
2. PMG3 blocks should not be removed from the rail. If removing the blocks is necessary, the blocks shoud be kept on the block inserts.

(2) PMGW-C / PMGW-H

PMGW5 PMGW7 PMGW9 PMGW12



PMGW15



型号 Model No.	组件尺寸 Dimensions of Assembly (mm)			滑块尺寸 Dimensions of Block(mm)										滑轨尺寸（mm） Dimensions of Rail (mm)								滑轨的固定螺栓尺寸 Mounting Bolt for Rail	基本动额定负荷 Basic Dynamic load Rating	基本静额定负荷 Basic Static Load Rating	容许静力矩 Static Rated Moment			重量 Weight	
	H	H_1	N	W	B	B_1	C	L_1	L	G	G_n	MxI	H_2	W_R	W_B	H_R	D	h	d	P	E	(mm)	C (kN)	C_0 (kN)	M_R kN-m	M_P kN-m	M_Y kN-m	滑块 kg	滑轨 kg/m
PMGW 3C	4.5	1	3	12	-	6	4.5	9.6	15	-	Φ0.5	M2-THRU	0.65	6	-	2.9	3.6	1.5	2.4	15	5	M2	0.29	0.44	0.7	0.5	0.5	0.001	0.13
PMGW 3H							8	14.2	19.6														0.39	0.68	1.0	1.3	1.3	0.002	
PMGW 7C	9	1.9	5.5	25	19	3	10	21	31.2	-	Φ1.2	M3x3	1.85	14	-	5.2	6	3.2	3.5	30	10	M3×6	1.37	2.06	15.70	7.14	7.14	0.020	0.51
PMGW 7H							19	30.8	41														1.77	3.14	23.45	15.53	15.53	0.029	
PMGW 9C	12	2.9	6	30	21	4.5	12	27.5	39.3	-	Φ1.2	M3x3	2.4	18	-	7	6	4.5	3.5	30	10	M3×8	2.75	4.12	40.12	18.96	18.96	0.040	0.91
PMGW 9H					23	3.5	24	38.5	50.7														3.43	5.89	54.54	34.00	34.00	0.057	
PMGW 12C	14	3.4	8	40	28	6	15	31.3	46.1	-	Φ1.2	M3x3.6	2.8	24	-	8.5	8	4.5	4.5	40	15	M4×8	3.92	5.59	70.34	27.80	27.80	0.071	1.49
PMGW 12H							28	45.6	60.4														5.10	8.24	102.70	57.37	57.37	0.103	
PMGW 15C	16	3.4	9	60	45	7.5	20	38	54.8	5.2	M3	M4x4.2	3.2	42	23	9.5	8	4.5	4.5	40	15	M4×10	6.77	9.22	199.34	56.66	56.66	0.143	1.98
PMGW 15H							35	57	73.8														8.93	13.38	299.01	122.60	122.60	0.215	

注：1. 1kgf=9.81N 2.PMG3 之滑块不可超出滑轨。如需将滑块自滑轨上卸下，请务必将滑块保持在所附之夹轨上。
Note：1. 1kg=9.81N 2. PMG3 blocks should not be removed from the rail. If removing the blocks is necessary, the blocks shoud be kept on the block inserts.

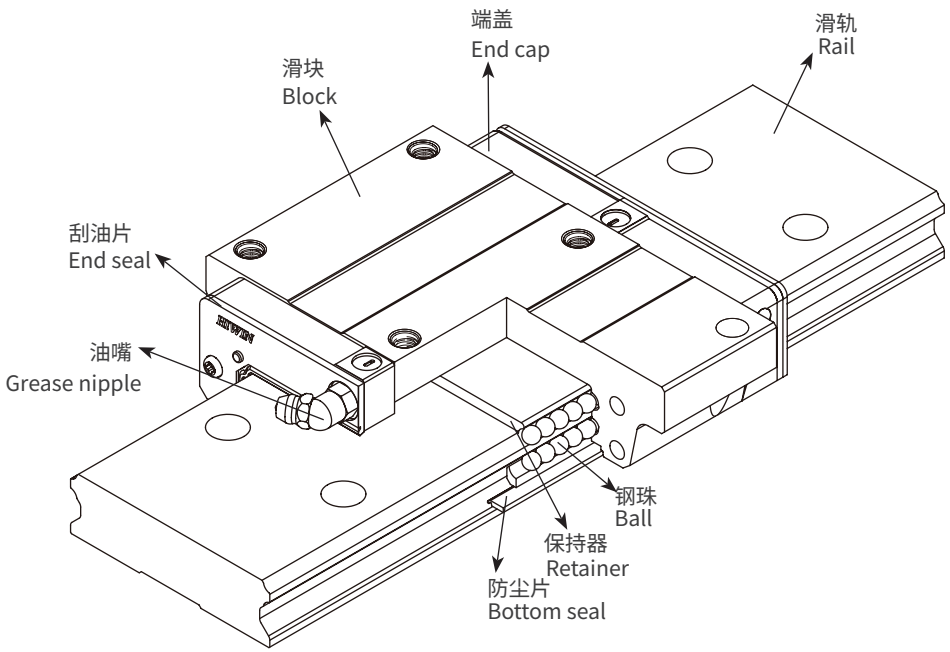
2-8 PWE 系列—宽幅型滚珠直线导轨
PWE SERIES -WIDE RAIL BALL LINEAR GUIDES

1. PWE 系列线性滑轨特点 / Features of the PWE Series Linear Guides

PWE 系列，采用四列钢珠承受负荷设计，借由 45 度的接触角度设计，具备四方向等负载特色、及自动调心的功能，可吸收安装面的装配误差，得到高精度的诉求。同时，增大线轨宽度及降低了组合高度，实现超高扭转阻抗，在环境有要求空间限制时，或有大力矩作用的需求下，可采用单轴的方式使用。

The PWE series features equal load ratings in the radial, reverse radial and the lateral direction with contact points at 45 degrees. This along with the wide rail, allows the guide to be rated for high loads, moments and rigidity. By design, it has a self-aligning capacity that can absorb most installation errors and can meet high accuracy standards. The ability to use a single rail and to have the low profile with a low center of gravity is ideal where space is limited and/or high moments are required.

2.PWE 本体结构 /Construction of PWE Series



- 滚动循环系统：滑块、滑轨、端盖、钢珠、钢珠保持器
- 润滑系统：油嘴、油管接头
- 防尘系统：刮油片、底面尘封防片、滑轨螺栓盖、金属刮板

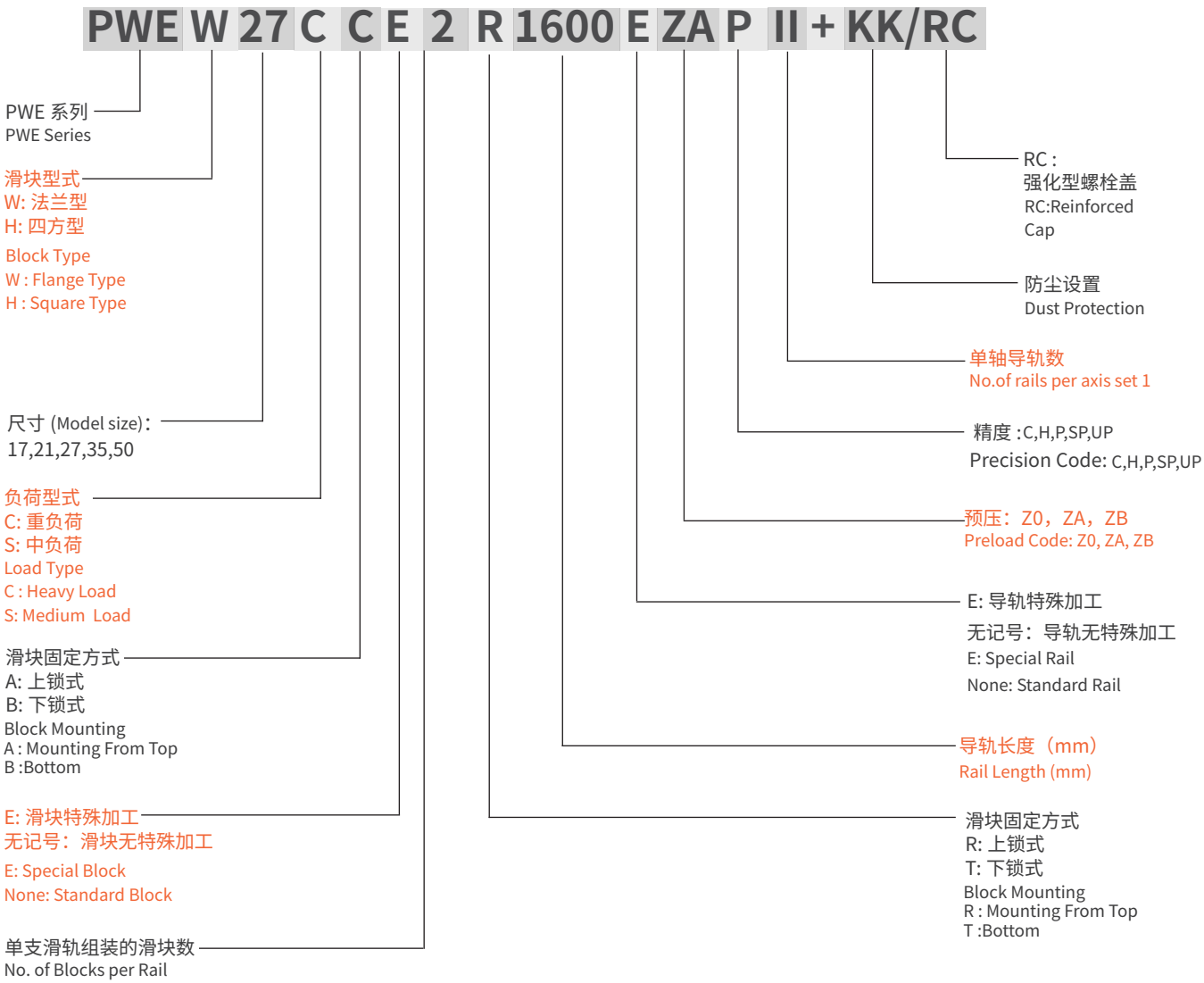
- Rolling circulation system: Block, rail, end cap and retainer.
- Lubrication system: Grease nipple and piping Joint.
- Dust protection system: End seal, bottom seal,cap and scraper.

3. 产品规格说明 /Model Number of PQE Series

PWE 系列分为非互换性及互换性型两种导轨，两者规格尺寸相同，主要差异点在于互换性型之滑块、滑轨可单独互换使用，较便利，但其组合精度无法达到非互换性型之超精密级以上的精度，不过由于 HIWIN 互换性型之组合精度目前已达到一定的水准，对不需配对安装直线导轨的客户而言，是一项便利的选择。直线导轨的产品规格型号主要标明直线导轨尺寸、型式、精度等级、预压等规格要求，以利订货时双方对产品的确认。

PWE series linear guides are classified into non-interchangeable and interchangeable types. The sizes of these two types are the same as one another. The main difference is that the interchangeable type of blocks and rails can be freely exchanged and they can maintain P-class accuracy. Because of strict dimensional control, the interchangeable type linear guides are a wise choice for customers when rails do not need to be matched for an axis. The model number of the PWE series identifies the size, type, accuracy class, preload class, etc.

(1) 非互换性线性滑轨产品型号 /Non-interchangeable type



注：

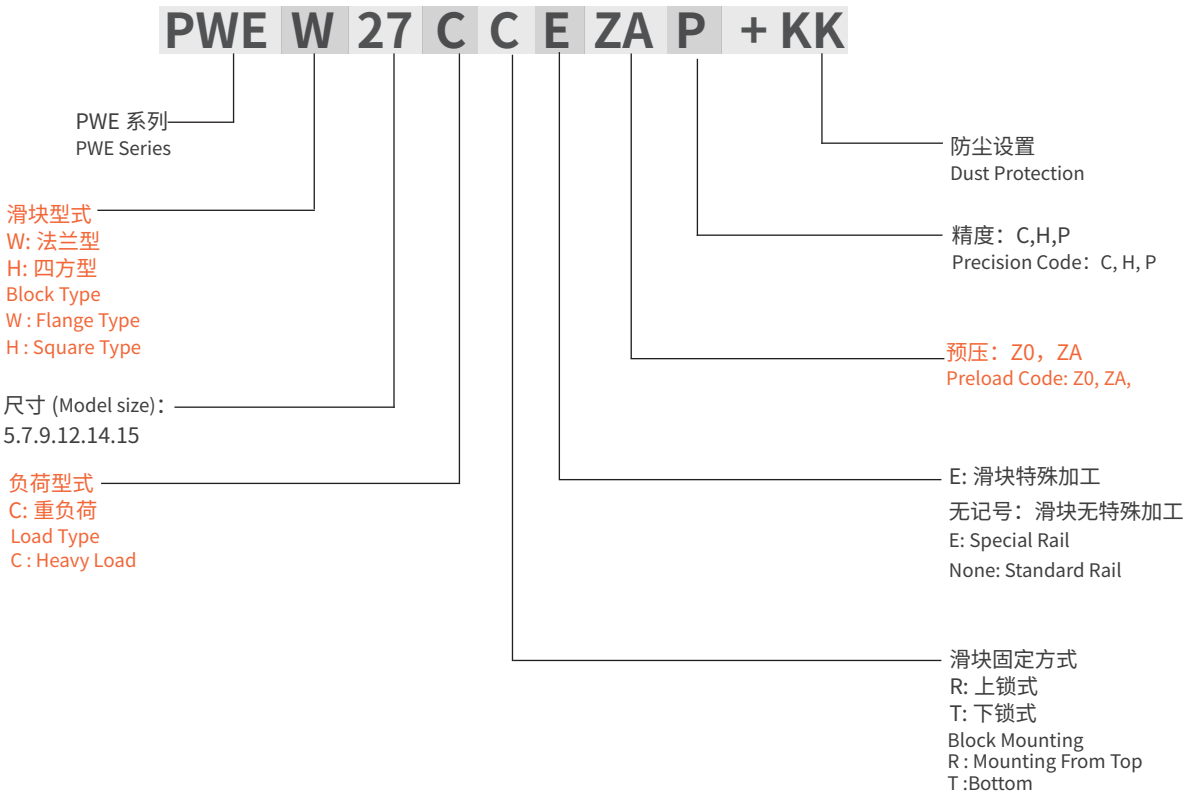
1. 单轴导轨数若只使用一支导轨则不写，两支标记为 II，三支标记为 III，以此类推。
2. 防尘配备中无记号为防尘标准配备刮油片加防尘片。
ZZ 为刮油片加防尘片加金属刮板。
KK 为双刮油片加防尘片加金属刮板。
DD 为慧刮油片加防摩防盖片。
3. 滑块型式 L 为四方形 H 之低组装式滑块，其组合高度与同尺寸之法兰型一致。

Note:

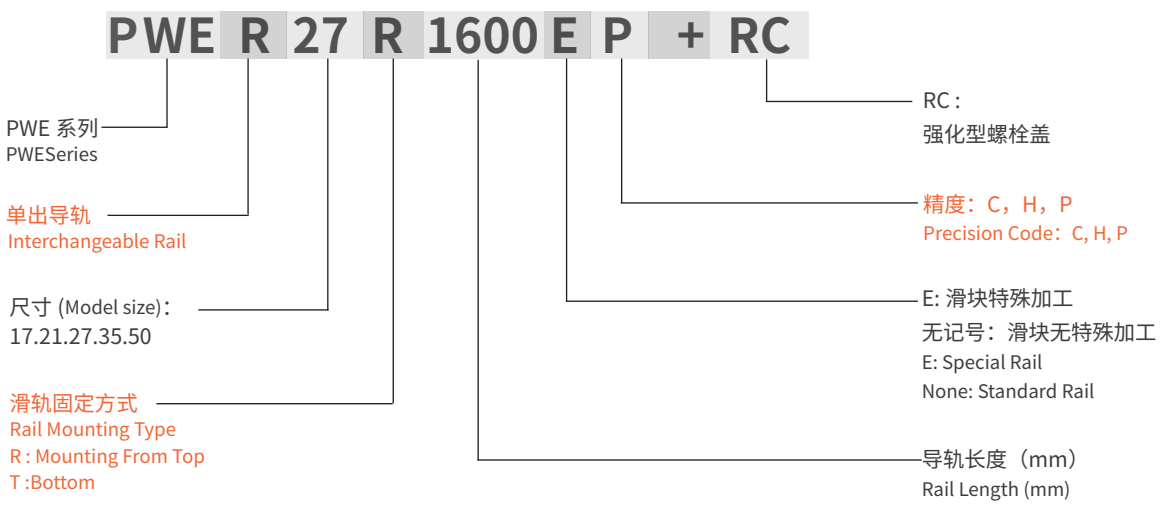
1.The roman numerals express amatched set of rails.
2.No symbol indicates standard protectionlend seal and bottom seal.
ZZ:End seal, bottom seal and scraper.
KK:Double seals, bottom seal and scraper.
DD: Double seals and bottom seal.
3. Block type HGL is the low profile design of PGH(square type), the assembled height is same as PHGW （flange type) in same size.

(2) 互换性直线导轨产品型号 /Interchangeable type

- 互换型滑块产品型号 /Interchangeable Block



- 互换型滑轨产品型号 / Interchangeable Rail

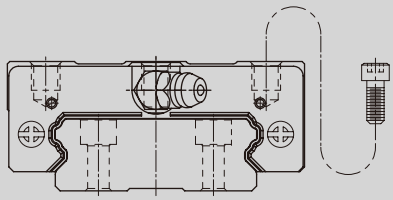
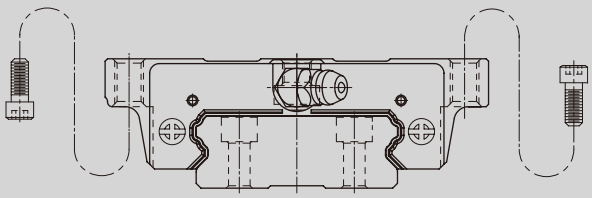


4. PWE 系列型式 /PWE Types

（1）滑块型式 /Block types

PYG 提供法兰型及四方型两种直线导轨。
PYG offers two types of linear guides, flange and square types.

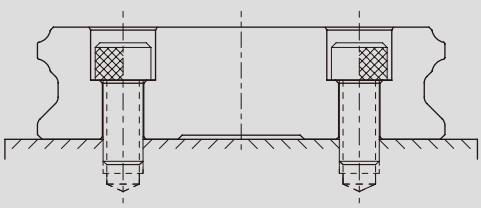
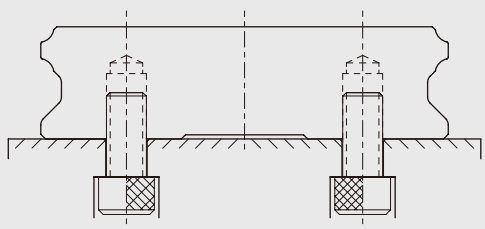
表格 2-8-1 滑块形式
Table 2-8-1 BlockTypes

型号 Type	规格 Model	形状 Shape	高度尺寸 Height (mm)	滑轨长度 Rail Length (mm)	应用设备 Main Application(mm)
四方型 Square	PWEH-CA		21 ⇩ 50	100 ⇩ 4000	• 自动化装置 • 高速运输设备 • 精密测量仪器 • 半导体设备 • 塑料瓶拉吹设备 • 单轴机器人机械手臂 • 单轴承受力矩的设备 • Automation devices • High-speed transportation equipment • Precision measuring equipment • Semiconductor manufacturing equipment • Blow Moulding machines • Single Axis RobotRobotics • Single Axis Equipment with • High Anti-rolling Requirement
法兰型 Flange	PWEW-CC		17 ⇩ 50	100 ⇩ 4000	

（2）滑块型式 /Block types

除了一般上锁式螺栓孔滑轨外，PYG 亦提供下锁式螺孔滑轨，方便客户安装使用。
Besides the standard top mounting type, PYG also offers bottom mounting type rails.

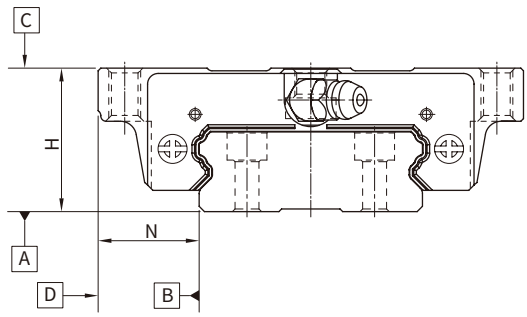
表格 2-8-2 滑轨型式
Table 2-8-2 Rail Types

上锁式螺栓孔 Mounting from Top	下锁式螺丝孔 Mounting from Bottom
	

5. 精度等级 / Accuracy Classes

PWE 系列线性滑轨的精度，分为普通型、高、精密、超精密、超高精密共四级，客户可依设备精度需求选用精度。

The accuracy of the EG series can be classified into 5 classes: normal(C), high(H), precision(P), super precision(SP), and ultra precision(UP). Choose the class by referencing the accuracy of selected equipment.



（1）非互换性直线导轨精度 /Accuracy of non-interchangeable guides

单位 /Unit（mm）

表 2-8-3 组合件精度表 /Accuracy Standards

型号 /Item	PWE-17,21					PWE-27,35				
精度等级 Accuracy Classes	普通级 (C)	高级 (H)	精密级 (P)	超精密级 (SP)	超高精密级 (UP)	普通级 (C)	高级 (H)	精密级 (P)	超精密级 (SP)	超高精密级 (UP)
高度 H 的容许尺寸误差 Dimensional tolerance of height H	± 0.1	± 0.03	0 - 0.03	0 -0.015	0 -0.008	± 0.1	± 0.04	0 - 0.04	0 -0.02	0 -0.01
宽度 N 的容许尺寸误差 Dimensional tolerance of width N	± 0.1	± 0.03	0 -0.03	0 -0.015	0 -0.008	± 0.1	± 0.04	0 -0.04	0 -0.02	0 -0.01
成对高度 H 的相互误差 Variation of height H	0.02	0.01	0.006	0.004	0.003	0.02	0.015	0.007	0.005	0.003
成对宽度 N 的相互误差 Variation of width N	0.02	0.01	0.006	0.004	0.003	0.03	0.015	0.007	0.005	0.003
滑块 C 面对滑轨 A 面的行走平行度 Running parallelism of block surface C to surface A	行走平行度（见表格 2-8-5） See Table 2-8-5									
滑块 D 面对滑轨 B 面的行走平行度 Running parallelism of block surface D to surface B	行走平行度（见表格 2-8-5） See Table 2-8-5									

型号 /Item	PWE-50				
精度等级 Accuracy Classes	普通级（C） Normal（C）	高级（H） High（H）	精密级（P） Precision（P）	超精密级（SP） Super Precision(SP)	超高精密级（UP） Ultra Precision（UP）
高度 H 的容许尺寸误差 Dimensional tolerance of height H	± 0.1	± 0.05	0 - 0.05	0 -0.03	0 -0.02
宽度 N 的容许尺寸误差 Dimensional tolerance of width N	± 0.1	± 0.05	0 -0.05	0 -0.03	0 -0.02
成对高度 H 的相互误差 Variation of height H	0.03	0.015	0.007	0.005	0.003
成对宽度 N 的相互误差 Variation of width N	0.03	0.015	0.010	0.007	0.005
滑块 C 面对滑轨 A 面的行走平行度 Running parallelism of block surface C to surface A	行走平行度（见表格 2-8-5） See Table 2-8-5				
滑块 D 面对滑轨 B 面的行走平行度 Running parallelism of block surface D to surface B	行走平行度（见表格 2-8-5） See Table 2-8-5				

（2）互换性直线导轨精度 /Accuracy of interchangeable guides

表 2-8-4 单出件精度表 /Accuracy Standards

单位 /Unit（mm）

型号 /Item	PWE-17,21			PWE-27,35			PWE-50		
精度等级 Accuracy Classes	普通级 (C)	高级 (H)	精密级 (P)	普通级 (C)	高级 (H)	精密级 (P)	普通级 (C)	高级 (H)	精密级 (P)
高度 H 的容许尺寸误差 Dimensional tolerance of height H	± 0.1	± 0.03	± 0.015	± 0.1	± 0.04	± 0.02	± 0.1	± 0.05	± 0.025
宽度 N 的容许尺寸误差 Dimensional tolerance of width N	± 0.1	± 0.03	± 0.015	± 0.1	± 0.04	± 0.02	± 0.1	± 0.05	± 0.025
成对高度 H 的相互误差 Variation of height H	0.02	0.01	0.02	0.015	0.015	0.007	0.03	0.015	0.007
成对宽度 N 的相互误差 Variation of width N	0.02	0.01	0.03	0.015	0.015	0.007	0.03	0.02	0.01
滑块 C 面对滑轨 A 面的行走平行度 Running parallelism of block surface C to surface A	行走平行度（见表格 2-8-5） See Table 2-8-5								
滑块 D 面对滑轨 B 面的行走平行度 Running parallelism of block surface D to surface B	行走平行度（见表格 2-8-5） See Table 2-8-5								

（3）行走平行度精度 /Accuracy of running parallelism

表 2-8-5 行走平行度精度 /Accuracy of running parallelism　　单位 /Unit（mm）

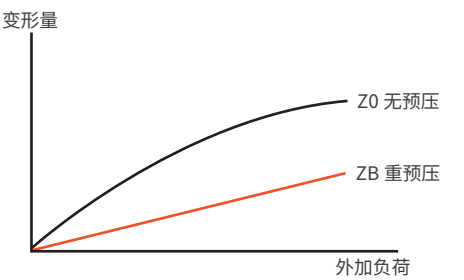
滑轨长度 /Rall Length (mm)	精度等级 /Accuracy (μm)				
	C	H	P	SP	UP
~ 100	12	7	3	2	2
100 ~ 200	14	9	4	2	2
200 ~ 300	15	10	5	3	2
300 ~ 500	17	12	6	3	2
500 ~ 700	20	13	7	4	2
700 ~ 900	22	15	8	5	3
900 ~ 1,100	24	16	9	6	3
1,100 ~ 1,500	26	18	11	7	4
1,500 ~ 1,900	28	20	13	8	4
1,900 ~ 2,500	31	22	15	10	5
2,500 ~ 3,100	33	25	18	11	6
3,100 ~ 3,600	36	27	20	14	7
3,600 ~ 4,000	37	28	21	15	7

6. 预压力 /Preload

（1）预压力定义 /Definition

预压力是预先给予钢珠负荷力，亦即加大钢珠直径，利用钢珠与珠道之间负向间隙给予预压，此举能提高导轨的刚性及消除间隙；以右图来解释，提高预压力可增加直线导轨刚性，但小规格建议选用轻预压以下预压，以避至因预压选用过重降低其使用寿命。

A preload can be applied to each guides. Oversizedballs are used. Generally, a linear motion guides has a negative clearance between groove and balls inorder to improve stiffness and maintain high precision.The fiqure shows the load is multiplied by the preload the rigidity is doubled and the deflection is reduced by one half. The preload no larger than ZA would be recommended for the model size under PQE20 to avoidan over-preload affecting the guide's life.



（2）预压等级

PWE 系列直线导轨提供三种标准预压，可依据用途选择适当预压力。

表 2-8-6 预压等级 /Preload classes

预压等级 Class	标记 Code	预压力 Preload	使用条件 Examples of Application
普通间隙 Light Clearance	Z0	0~0.02C	负荷方向固定且冲击小，精度要求低。 Certain load direction, low impact, low precision required.
无预压 Very Light Preload	ZA	0.03C~0.05C	刚性需求且轻负荷，高精度要求。 High rigidity required, high precision required.
轻预压 Light Preload	ZB	0.06C~0.08C	高刚性需求，且有振动与冲击之使用环境。 Super high rigidity required, with vibration and impact.

等级 Class	互换性导轨（单出件）	非互换性导轨（单出件）
预压等级 Class	Z0，ZA	Z0，ZA，ZB

注：预压力 C 为动额定负荷　Note: The "C" in the preload column denotes basic dynamic load rating.

（3）预压力 /Stiffness performance

不同的预压力呈现不一样的滑块刚性，下表为各尺寸的滑块副性值。

Stiffness depends on preload. The following table shows stiffness value of each size.

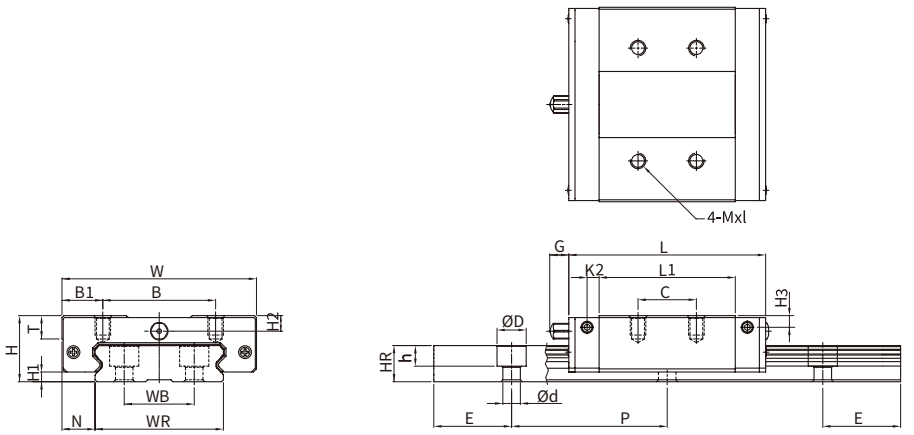
表 2-8-7 PEG 系列径向刚性 /Stiffness performance

负荷型式 Load type	系列 / 尺寸 Series/Size	不同预压力的刚性表现（N/μm） Stiffness(N/μm)		
		Z0	ZA	ZA
重负荷 Heavy load	PWE 17C	130	342	469
	PWE 21C	153	368	497
	PWE 27C	188	476	651
	PWE 35C	285	607	804
	PWE 50C	429	758	1042

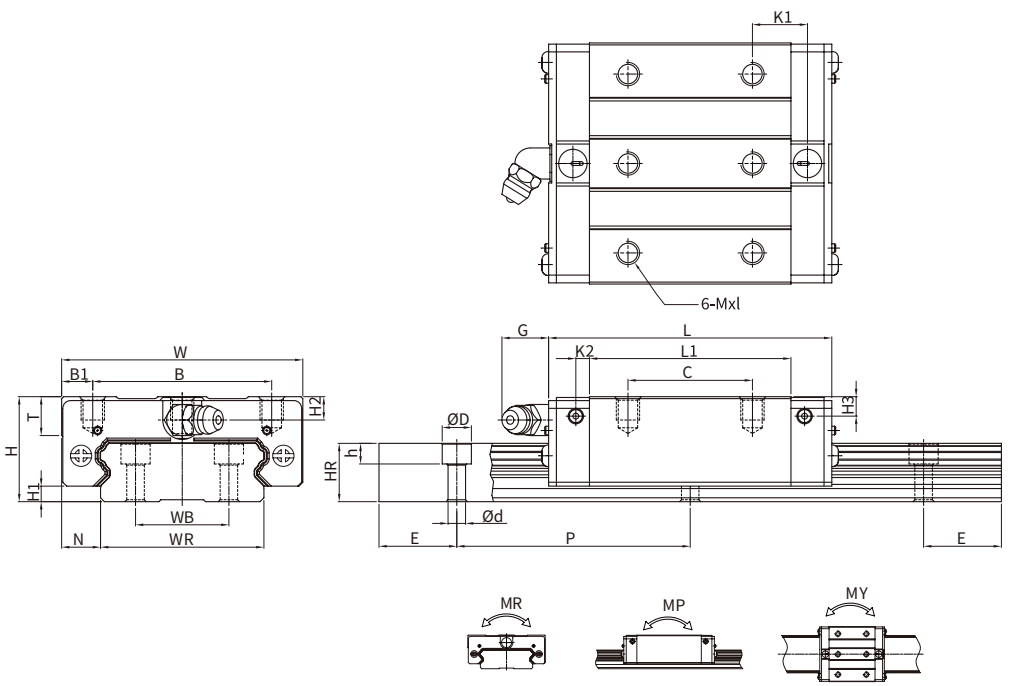
7.PWE 系列直线导轨尺寸表 /Dimensions for PYG PWE Series

（1）PWEH-CA

PWEH17CA
PWEH21CA



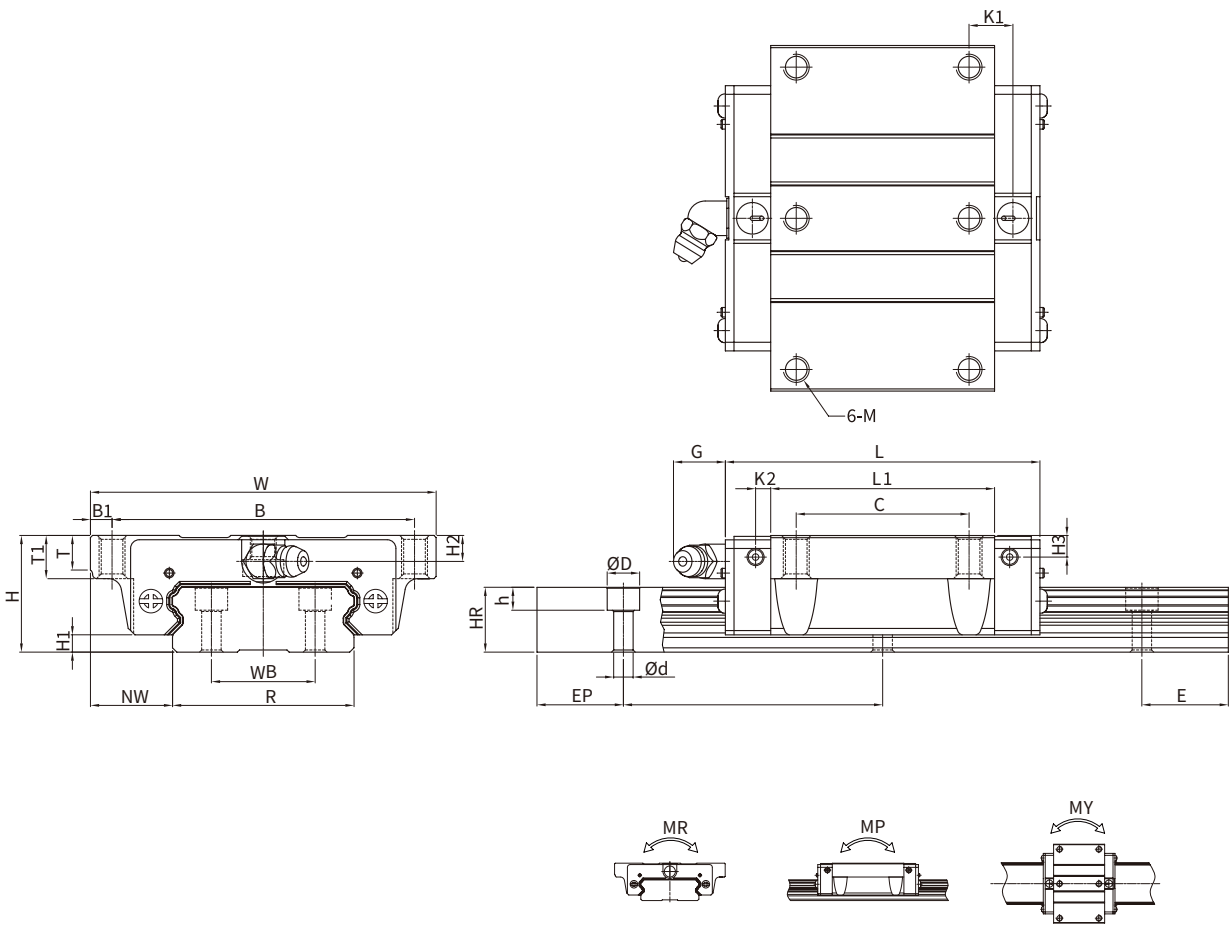
PWEH27CA
PWEH35CA
PWEH50CA



型号 Model No.	组件尺寸 Dimensions of Assembly (mm)			滑块尺寸 Dimensions of Block(mm)													滑轨尺寸（mm） Dimensions of Rail (mm)								滑轨的固定螺栓尺寸 Mounting Bolt for Rail	基本动额定负荷 Basic Dynamic load Rating	基本静额定负荷 Basic Static Load Rating	容许静力矩 Static Rated Moment			重量 Weight	
	H	H_1	N	W	B	B_1	C	L_1	L	K_1	K_2	G	Mxl	T	H_2	H_3	W_R	W_B	H_R	D	h	d	P	E	(mm)	C（kN）	C_0（kN）	M_R kN-m	M_P kN-m	M_Y kN-m	滑块 kg	滑轨 kg/m
PWEH17CA	17	2.5	8.5	50	29	10.5	15	35	50.6	-	3.1	4.9	M4x5	6	4	3	33	18	9.3	7.5	5.3	4.5	40	15	M4x12	5.23	9.64	0.15	0.062	0.062	0.12	2.2
PWEH21CA	21	3	8.5	54	31	11.5	19	41.7	59	14.68	3.65	12	M5x6	8	4.5	4.2	37	22	11	7.5	5.3	4.5	50	15	M4x12	7.21	13.7	0.23	0.10	0.10	0.20	3.0
PWEH27CA	27	6	10	62	46	8	—	32	51.8	72.8	14.15	3.5	M6x6	10	6	5	42	24	15	7.5	6	4.5	60	20	M4x16	12.4	21.6	0.42	0.17	0.17	0.35	4.7
PWEH35CA	35	4	15.5	100	76	12	50	77.6	102.6	18.35	5.25	12	M8x8	13	8	6.5	69	40	19	11	9	7	80	20	M6x20	29.8	49.4	1.48	0.67	0.67	1.1	9.7
PWEH50CA	50	7.5	20	130	100	15	65	112	140	28.05	6	112	M10x15	19.5	12	10.5	90	60	24	14	12	9	80	20	M8x25	61.52	97.1	4.03	1.96	1.96	3.16	15.5

注：1. 1kgf=9.81N
Note：1. 1kg=9.81N

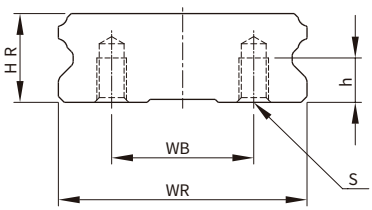
(2) PWEW-CC

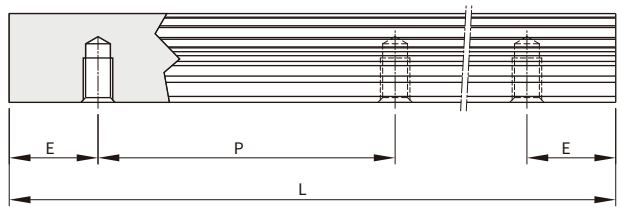


型号 Model No.	组件尺寸 Dimensions of Assembly (mm)			滑块尺寸 Dimensions of Block(mm)														滑轨尺寸（mm） Dimensions of Rail (mm)							滑轨的固定螺栓尺寸 Mounting Bolt for Rail	基本动额定负荷 Basic Dynamic load Rating	基本静额定负荷 Basic Static Load Rating	容许静力矩 Static Rated Moment			重量 Weight	
	H	H_1	N	W	B	B_1	C	L_1	L	K_1	K_2	G	M	T	T_1	H_2	H_3	W_R	W_B	H_R	D	h	d	P	E	(mm)	C (kN)	C_0 (kN)	M_R kN-m	M_P kN-m	M_Y kN-m	滑块 kg	滑轨 kg/m
PWEH17CC	17	2.5	13.5	60	53	3.5	26	35	50.6	-	3.1	4.9	M4	5.3	6	4	3	33	18	9.3	7.5	5.3	4.5	40	15	M4x12	5.23	9.64	0.15	0.062	0.062	0.12	2.2
PWEH21CC	21	3	15.5	68	60	4	29	41.7	59	9.68	3.65	12	M5	7.3	8	4.5	4.2	37	22	11	7.5	5.3	4.5	50	15	M4x12	7.21	13.7	0.23	0.10	0.10	0.20	3.0
PWEH27CC	27	4	19	80	70	5	40	51.8	72.8	10.15	3.5	12	M6	8	10	6	5	42	24	15	7.5	5.3	4.5	60	20	M4x16	12.4	21.6	0.42	0.17	0.17	0.35	4.7
PWEH35CC	35	4	25.5	120	107	6.5	60	77.6	102.6	13.35	5.25	12	M8	11.2	14	8	6.5	69	40	19	11	9	7	80	20	M6x20	29.8	49.4	1.48	0.67	0.67	1.1	9.7
PWEH50CC	50	7.5	36	162	144	9	80	112	140	20.55	6	12.9	M10	14	18	12	10.5	90	60	24	14	12	9	80	20	M8x25	61.52	97.1	4.03	1.96	1.96	3.16	15.5

注：1. 1kgf=9.81N
Note：1. 1kg=9.81N

8.PWER-T 下锁式导轨尺寸表 / Dimensions for PWE Series



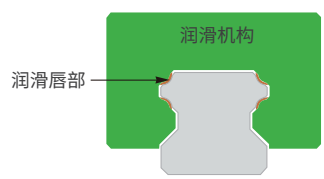


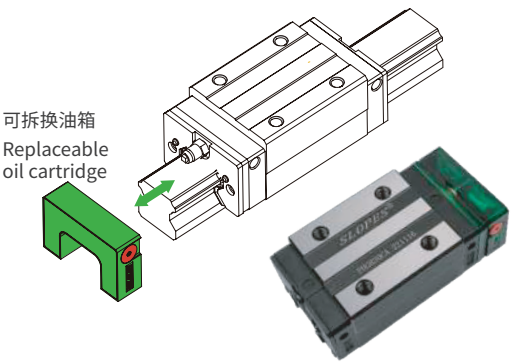
型号 Model No.	滑轨尺寸（mm） Dimensions of Rail (mm)							重量 Weight
	W_R	W_B	H_R	S	h	P	E	(kg/m)
PWER17T	33	18	9.3	M4×0.7P	6	40	15	33
PWER21T	37	22	11	M4×0.7P	7	50	15	37
PWER27T	42	24	15	M5×0.8P	7.5	60	20	42
PWER35T	69	40	19	M6×1P	12	80	20	69
PWER50T	90	60	24	M8×1.25P	15	80	20	90

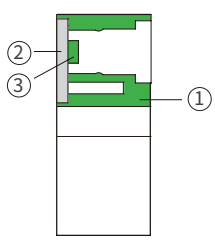
2-9 自润式直线导轨
SELF-LUBRICATED LINEAR GUIDES

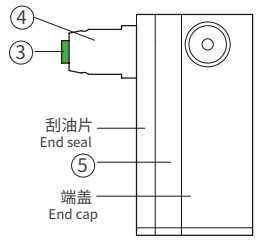
1. 自润式直线导轨特点 / Features of the self-lubricated linear guides

自润式直线导轨，在端盖与刮油片之间带有润滑机构，滑块最外端备有可拆换式油箱，其构造如图所示。借由可拆换油箱提供润滑油至润滑构，由润滑构润滑滑轨珠槽。油箱内含导油元件，其特定的立状使滑块在任意置或油量较少时均能接触到润滑油，而将油箱内之润滑油徽底吸出使用。
Self-lubricating linear guides contains a lubricator between the end cap and end seal. Outside of the block is equipped with a replaceable oil cartridge, the configuration of which is listed below.Lubrication oil flows from the replaceable oil cartridge to the lubricator and then lubricates grooves of rails. The Oil cartridge comprises a oil conductor with 3D structure that enables the lubricator to contact oil despite that blocks are placed at a random position , and thus the lubrication oil inside the oil cartridge can be used up via capillary action.









构成诸元件：
1. 拆换式油箱 4. 连接器
2. 油箱盖 5. 润滑机构
3. 导油元件

Configuration of the self-lubricant apparatus
1. Oil cartridge
2. Cartridge cover
3. Oil conductor
4. Connector
5. Lubricator

2. 自润式线性滑轨特性 /Feature of self-lubricated linear guides type

(1) 节省成本：无需润滑管路系统与设备及减少油品成本。
Cost reduction: Save costs by reducing oil usage and maintenance.

表 2-9-1

项目	集中润滑	自润式滑块
润滑管路设备 /Lubricant device	$ XXX	无 /-
润滑管路设计安装 /Design and installation of lubricant device	$ XXX	无 /-
润滑油成本 /Cost of oil purchase	0.3 c.c. / 小时 x 8 小时 / 天 x 280 天 / 年 x 5 年 = 3360 cc x 每 cc 成本 = $ XXX 0.3cc / hr x 8hrs / day x 280 days / year x 5 year = 3360 cc x cost / cc = $ XXX	10 cc（五年一万公里）x 每 cc 成本 = $ XX 10 cc(5 years10000km) x cost/cc= $ XX
换油成本 /Cost of refillin	3~5 次 / 年 x 5 年 x 每次成本 =$ XXX 3~5 times / year x 5year x cost / time = $ XXX	无 /-
废油处理成本 /Waste oil disposal	3~5 小时 / 次 x 3~5 次 / 年 x 5 年 x 每次成本 = $ XXX 3~5hrs / time x 3~5times / year x 5year x cost / time = $ XXX	无 /-

(2) 清洁环保：无油品外漏污染与强制润滑时油品外溅之余，适合对清洁度要求较高的环境保护使用。
(3) 维护容易且长期使用：对正常使用者而言，在一般寿命内几乎不需任何维护工作。
(4) 使用安装灵活：滑块任意摆向均能正常润滑，无安装方向限制。
(5) 拆装方便：卡式油箱设计，可以在机台上轻易拆换，进一步延长寿命。
(6) 可选用相应的润滑油：可拆换式油箱可依据线性滑轨使用环境的不同装填适当的润滑油。
(7) 特殊环境使用：如粉尘环境、暴露在恶劣天气环境和用水环境等，配合滑块封入油脂（grease）使用可达到更佳的润滑效果。
(2) Clean and environmentally friendly: Optimized oil usage prevents leaking, making it the ideal solution for clean working environments.
(3) Long last and low maintenance: Self-lubricating block is maintenance free in most applications.
(4) No installed limitations: The linear guideway can be lubricated by E2 self-lubricating module irrespective of mounting directions.
(5) Easy to be assembled and dismantled: The cartridge can be added or removed from the block even when the guides is installed on a machine.
(6) Different oils can be selected: The replaceable oil cartridge can be refilled with any approved lubrication oil depending on different requirements.
(7) Applications for special environments: Sealing grease into the block leads to better lubrication effects, especially in dusty, dirty, or wet environments.

3. 应用范围 /Applications

(1) 自动化设备
(2) 产业机械：塑料、印刷、造纸、纺织、食品、木工等等。
(3) 电子机械：半导体机械、机械手臂、X-Y 平台、测量设备。
(4) 其他：医疗设备、搬运输送机械、建筑设备。
(1) Automation machinery
(2) Manufacturing Machines : Plastic injection, printing, paper making, textile machines, food processing machines, wood working machines, and so on.
(3) Electronic Machinery : Semiconductor equipment, robotics, X-Y table, measuring and inspecting equipment.
(4) Others : Medical equipment, transporting equipment, construction equipment.

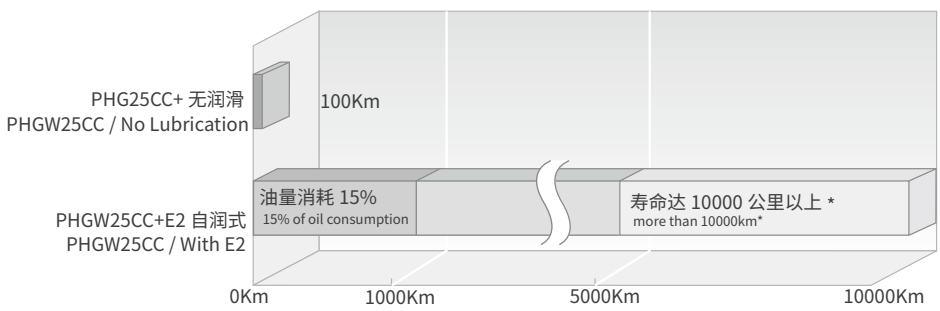
4. 选用注记 /Specification

(1) 自润式线性滑轨选用于规格后加注 /E2
例如：PHGW25CC2R1600ZAPII + ZZ / E2

(1) Add "/ E2" after the specification of linear guides
Ex. HGW25CC2R1600ZAPII + ZZ / E2

5. 性能测试 /Lubrication Capability

(1) 轻负荷寿命试验 / Life testing with light load



线性滑轨寿命距离 /Service Life(km)

• 寿命里程数依各产品规格适用之油箱容量而不同
Depending on different specifications

表 2-9-2

规格 /Model No.	PHGW25CC
速率 /Speed	60m/min
行程 /Stroke	1500mm
荷重 /Load	500kgf

（2）润滑油之特性 /Characteristic of lubricationg oil

可拆换式油箱于出厂时已经装入黏度等级为 ISO VG680 的润滑油，此润滑油是以合成碳氢（PAO）为基础油的全合成润滑油，具有如下的特性：

- 与基础油为矿物油、合成碳氢、酯油的油脂（grease）兼容。
- 合成基础油，高温氧化安定性佳。
- 高黏度指数，在极高或极低温的操作环境下均有卓越的性能。
- 低流体牵引系数，可减低动力消耗。
- 抗腐蚀及防锈。

※ 相同黏度等级的润滑油亦可加入可拆换式油箱，但必须注意润滑油的兼容性。

(2) Characteristic of lubricationg oil

The standard oil is a fully synthetic lubricant with a main constituent, synthetic hydrocarbons (PAO). The viscosity class of the oil is 680 (ISO VG680). Its characteristics are as follows.

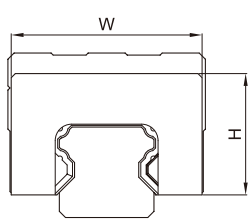
- Compatible with lubrication grease of which the base oil is synthetic hydrocarbon oil, mineral oil or ester oil.
- Synthetic oil with superb high temperature thermal/oxidation resistance.
- High viscosity index to provide outstanding performance in service applications at extremely high and low temperatures.
- Low traction coefficient to reduce power consumption.
- Anti-corrosion and rust-proof.

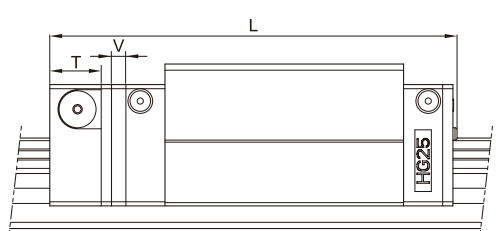
※Lubricants with the same viscosity class can also be used; however, their compatibility should be taken into consideration.

6. 使用温度范围 /Temperature Range for Application

本产品的使用温度为 -10℃至 50℃，需超出此范围请与鹏银联系。

The application temperature for this product is -10℃ ~ 50℃ . Please contact with PENGYIN for further discussion and information if the temperature is out of this range.



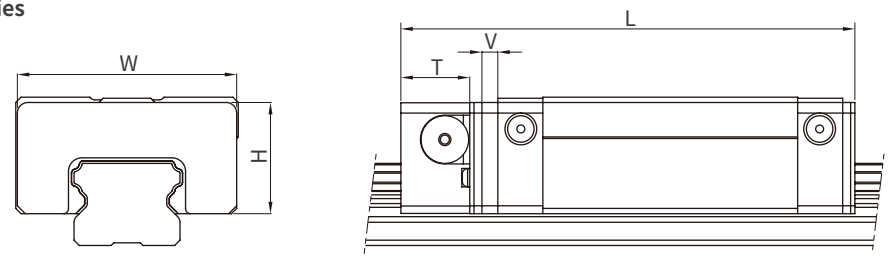


(1)PHG 系列 /PHG Series

型号 Model No.	自润模组尺寸 /Self-lubricated linear guides							
	W	H	T	V	L			
					SS	ZZ	DD	KK
PHG15C	32.4	19.5	12.5	3.0	75.4 (75.6)	82.5 (82.7)	82.0 (82.2)	89.1 (89.3)
PHG20C	43.0	24.4	13.5	3.5	93.5 (94.4)	97.5 (98.5)	98.5 (99.4)	102.5 (103.5)
PHG20H					108.2 (109.1)	112.2 (113.2)	113.2 (114.1)	117.2 (118.2)
PHG25C	46.4	29.5	13.5	3.5	100.0 (100.5)	104.0 (105.0)	105.0 (105.5)	109.0 (110.0)
PHG25H					120.6 (121.1)	124.6 (125.6)	125.6 (126.1)	129.6 (130.6)
PHG30C	58.0	35.0	13.5	3.5	112.9 (113.9)	120.4 (121.4)	120.3 (121.3)	127.8 (126.8)
PHG30H					135.9 (136.9)	143.4 (144.4)	143.3 (144.3)	150.8 (149.8)
PHG35C	68.0	38.5	13.5	3.5	127.9 (128.9)	135.4 (136.4)	135.3 (136.3)	142.8 (143.8)
PHG35H					153.7 (154.7)	161.2 (162.2)	161.1 (162.1)	168.6 (169.6)
PHG45C	82.0	49.0	16.0	4.5	157.2 (157.2)	166.5 (166.5)	167.2 (167.2)	176.5 (176.5)
PHG45H					189.0 (189.0)	198.3 (198.3)	199.0 (199.0)	208.3 (208.3)
PHG55C	97.0	55.5	16.0	4.5	183.9 (183.9)	193.6 (193.6)	194.3 (194.3)	204.0 (204.0)
PHG55H					222.0 (222.0)	231.7 (231.7)	232.4 (232.4)	242.1 (242.1)
PHG65C	121.0	69.0	16.0	4.5	219.2 (219.2)	224.7 (224.7)	228.2 (228.2)	233.7 (233.7)
PHG65H					278.6 (278.6)	284.1 (284.1)	287.6 (287.6)	293.1 (293.1)

注： （）为滑块最大长度，包含螺丝、刮油片唇部等。
Note : The marking of “( )” denotes the maximum block length with screws, lips of end seals, etc.

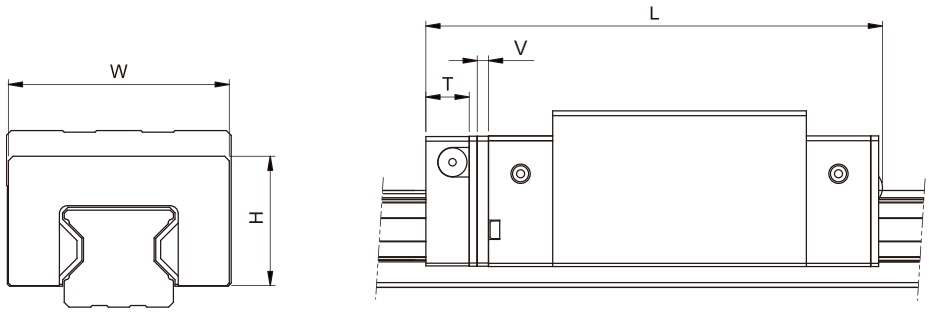
(2)PEG 系列 /PEG Series



型号 Model No.	自润模组尺寸 /Self-lubricated linear guides							
	W	H	T	V	L			
					SS	ZZ	DD	KK
PEG15S	33.3	18.7	11.5	3.0	54.6 (55.8)	56.2 (58.4)	58.6 (59.8)	60.2 (62.4)
PEG15C					71.3 (72.5)	72.9 (75.1)	75.3 (76.5)	76.9 (79.1)
PEG20S	41.3	20.9	13.0	3.0	66.0 (68.0)	67.6 (70.6)	70.0 (72.0)	71.6 (74.6)
PEG20C					85.1 (87.1)	86.7 (89.7)	89.1 (91.1)	90.7 (93.7)
PEG25S	47.3	24.9	13.0	3.0	75.1 (77.1)	77.1 (80.1)	79.1 (81.1)	81.1 (84.1)
PEG25C					98.6 (100.6)	100.6 (103.6)	102.6 (104.6)	104.6 (107.6)
PEG30S	59.3	31.0	13.0	3.0	85.5 (87.5)	87.5 (90.5)	89.5 (91.5)	91.5 (94.5)
PEG30C					114.1 (116.1)	116.1 (119.1)	118.1 (120.1)	120.1 (123.1)
PEG35S	68.0	33.5	13.0	3.0	91.0 (93.0)	94.0 (97.0)	95.0 (97.0)	98.0 (101.0)
PEG35C					124.0 (126.0)	127.0 (130.0)	128.0 (130.0)	131.0 (134.0)

注： （）为滑块最大长度，包含螺丝、刮油片唇部等。
Note : The marking of “( )” denotes the maximum block length with screws, lips of end seals, etc.

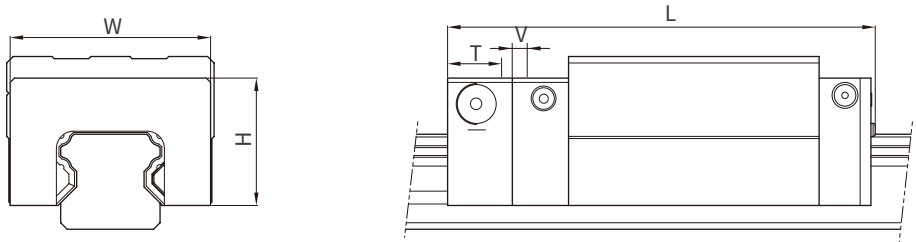
(3)PRG 系列 /PRG Series



型号 Model No.	自润模组尺寸 /Self-lubricated linear guides							
	W	H	T	V	L			
					SS	ZZ	DD	KK
PRG20C	43.4	24.2	12.5	3.5	102 (103.2)	104.0 (106.2)	106.4 (107.6)	108.4 (110.6)
PRG20H					122 (123.2)	124.0 (126.2)	126.4 (127.6)	128.4 (130.6)
PRG25C	46.8	29.2	13.5	3.5	114.9 (116.7)	116.9 (119.9)	119.3 (121.1)	121.3 (124.3)
PRG25H					131.4 (133.2)	133.4 (136.4)	135.8 (137.6)	137.8 (140.8)
PRG30C	58.8	34.9	13.5	3.5	126.8 (128.6)	129.8 (132.8)	131.6 (133.4)	134.6 (137.6)
PRG30H					148.8 (150.6)	151.8 (154.8)	153.6 (155.4)	156.6 (159.6)
PRG35C	68.8	40.3	13.5	3.5	141 (143.7)	144.0 (148.0)	146.0 (148.7)	149.0 (153.0)
PRG35H					168.5 (171.2)	171.5 (175.5)	173.5 (176.2)	176.5 (180.5)
PRG45C	83.8	50.2	16.0	4.5	173.7 (175.3)	176.7 (180.7)	180.9 (182.5)	183.9 (187.9)
PRG45H					207.5 (209.1)	210.5 (214.5)	214.7 (216.3)	217.7 (221.7)
PRG55C	97.6	58.4	16.0	4.5	204.2 (205.8)	207.2 (211.2)	211.4 (213)	214.4 (218.4)
PRG55H					252.5 (254.1)	255.5 (259.5)	259.7 (261.3)	262.7 (266.7)
PRG65C	121.7	76.1	16.0	4.5	252.5 (254.5)	255.5 (260.5)	261.3 (263.3)	264.3 (269.3)
PRG65H					315.5 (317.5)	318.5 (323.5)	324.3 (326.3)	327.3 (332.3)

注： （）为滑块最大长度，包含螺丝、刮油片唇部等。
Note : The marking of “( )” denotes the maximum block length with screws, lips of end seals, etc.

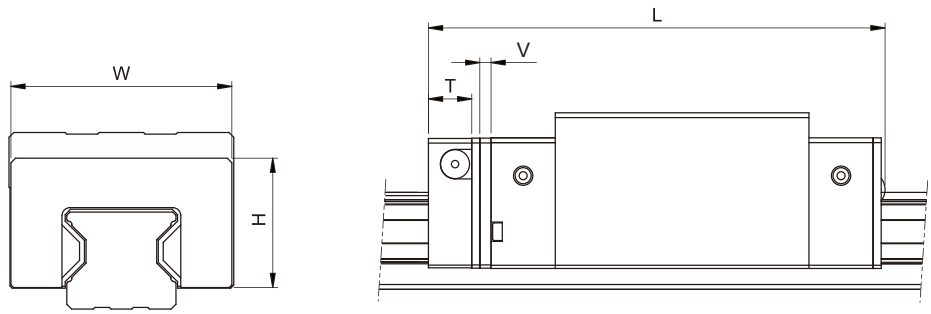
(4)PQH 系列 /PQH Series



型号 Model No.	自润模组尺寸 /Self-lubricated linear guides							
	W	H	T	V	L			
					SS	ZZ	DD	KK
PQH15C	32.4	19.5	12.5	3.0	75.4 (75.6)	82.5 (82.7)	82.0 (82.2)	88.8 (89.3)
PQH20C	43.0	24.4	13.5	3.5	93.1 (94.2)	97.5 (98.5)	98.1 (99.2)	102.5 (103.5)
PQH20H					107.8(108.9)	111.9 (113.2)	112.8(113.9)	116.9 (118.2)

注： （）为滑块最大长度，包含螺丝、刮油片唇部等。
Note : The marking of “( )” denotes the maximum block length with screws, lips of end seals, etc.

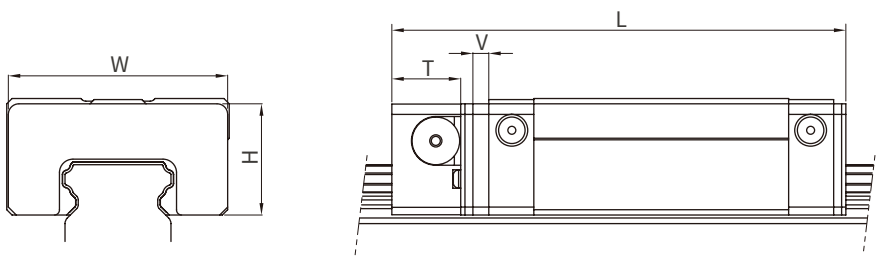
(5)PQR 系列 /PQR Series



型号 Model No.	自润模组尺寸 /Self-lubricated linear guides							
	W	H	T	V	L			
					SS	ZZ	DD	KK
PQR25C	46.8	29.2	13.5	3.5	114.9 (116.7)	116.9 (119.9)	119.3 (121.1)	121.3 (124.3)
PQR25H					129.9 (116.7)	131.9 (134.9)	134.3 (136.1)	136.3 (139.3)
PQR30C	58.8	34.9	13.5	3.5	126.8 (128.6)	129.8 (132.8)	131.6 (133.4)	134.6 (137.6)
PQR30H					148.8 (150.6)	151.8 (154.8)	153.6 (155.4)	156.6 (159.6)
PQR35C	68.8	40.3	13.5	3.5	141.0 (143.7)	144.0 (148.0)	146.0 (148.7)	149.0 (153.0)
PQR35H					168.5 (171.2)	171.5 (175.5)	173.5 (176.2)	176.5 (180.5)
PQR45C	83.8	50.2	16.0	4.5	173.7 (175.3)	176.7 (180.7)	180.9 (182.5)	183.9 (187.9)
PQR45H					207.5 (209.1)	210.5 (214.5)	214.7 (216.3)	217.7 (221.7)

注： （）为滑块最大长度，包含螺丝、刮油片唇部等。
Note : The marking of “( )” denotes the maximum block length with screws, lips of end seals, etc.

(6)PQE 系列 /PQE Series



型号 Model No.	自润模组尺寸 /Self-lubricated linear guides							
	W	H	T	V	L			
					SS	ZZ	DD	KK
PQR25C	33.3	18.7	11.5	3.0	54.6 (55.8)	56.2 (58.4)	58.6 (59.8)	60.2 (62.4)
PQR25H					71.3 (72.5)	72.9 (75.1)	75.3 (76.5)	76.9 (79.1)
PQR30C	41.3	20.9	13.0	3.0	66.0 (68.0)	67.6 (70.6)	70.0 (72.0)	71.6 (74.6)
PQR30H					85.1 (87.1)	86.7 (89.7)	89.1 (91.1)	90.7 (93.7)

注： （）为滑块最大长度，包含螺丝、刮油片唇部等。
Note : The marking of “( )” denotes the maximum block length with screws, lips of end seals, etc.

2-10 表面涂层系列直线导轨
SURFACE COATING LINEAR GUIDES

1. 产品说明 / General Information

（1）应用特点 / Features

镀铬是一种在金属表面进行的一种处理方式，能够有效防止直线导轨在一些特殊的工作环境中，如潮湿易腐蚀，从而影响导轨的精度，我们会在滑块和滑轨的表面增加一层厚度约 2 ～ 3um 的镀铬层，其中亮铬和黑铬是一种最为常见的表面处理方式。

Chrome plating is a kind of treatment method on the metal surface, which can effectively prevent the linear guide in some special working environment, such as wet corrosion, thus affecting the accuracy of the guide rail, we will add a layer of chrome plating layer of about 2 ~ 3um thickness on the surface of the slider and the slide rail, of which bright chromium and black chromium is one of the most common surface treatment methods.

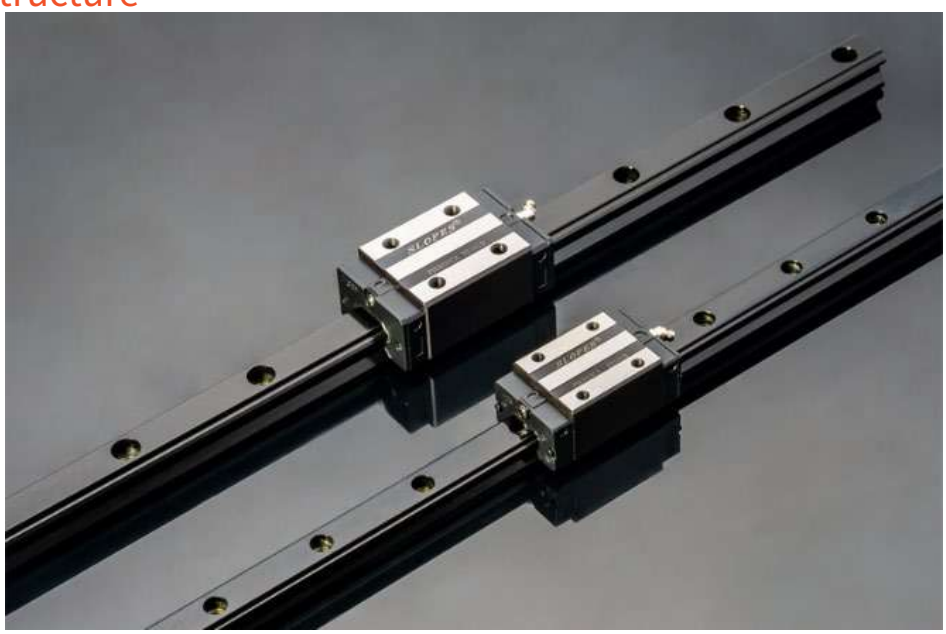
（2）用途 / Applications

适用于潮湿，腐蚀的工作环境

Suitable for humid, corrosive working environment

2. 本体结构 / Structure

(1) 黑铬
Black chrome



(2) 亮铬
Sliver chrome

2-11 耐高温系列直线导轨
SURFACE COATING LINEAR GUIDES

1. 产品说明 /General Information

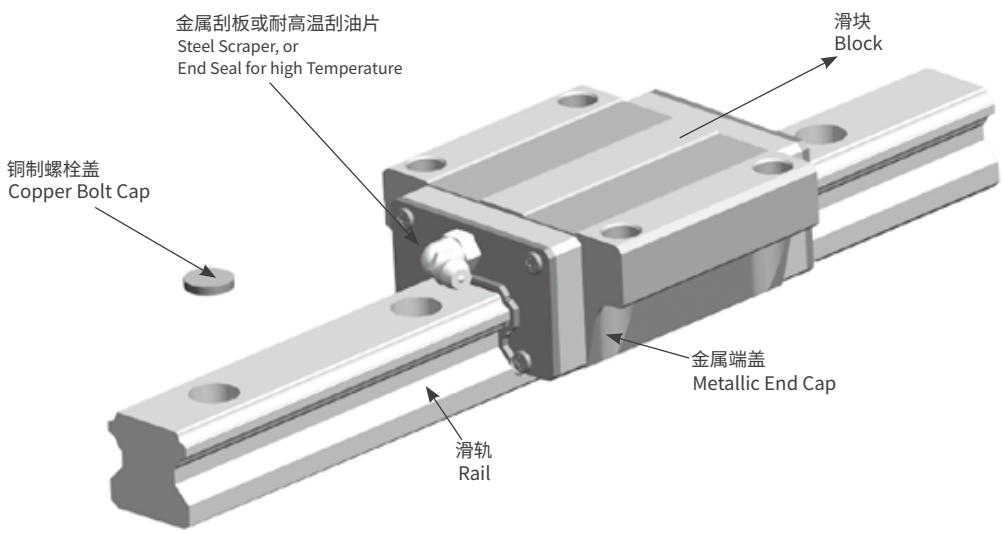
（1）应用特点 / Features

- 全配件采金属件（若有需要刮油片亦可选用耐高温橡胶之材质）。
- 可耐高温，其耐热温度近达 150° C。
- Use of Metallic parts; (if end seal is needed, the high-temperature rubber in end seal is available).
- Excellent temperature resistance; service temperature under 150 ° C.

（2）用途 /Applications

- 扩散炉、熔接机等半导体制造设备。
- 热处理设备。
- 真空环境用途（无塑料、橡胶等制品之气体释出）。
- Heat treatment equipment,
- Applications using vacuums (no vapor dispersion from plastic or rubber)
- Welding equipment.

2. 本体结构 / Structure



3. 选用注记 /Specification

（1）SE 型式—金属端盖式选用于规格后加注 /SE

例如：PHGW25CA2R1000Z0PII / SE

(1)Add “/ SE” after the specification of linear guides

Ex. HGW25CA2R1000Z0PII + ZZ / SE

4. 螺栓盖规格 /Dimensions of Bolt Cap

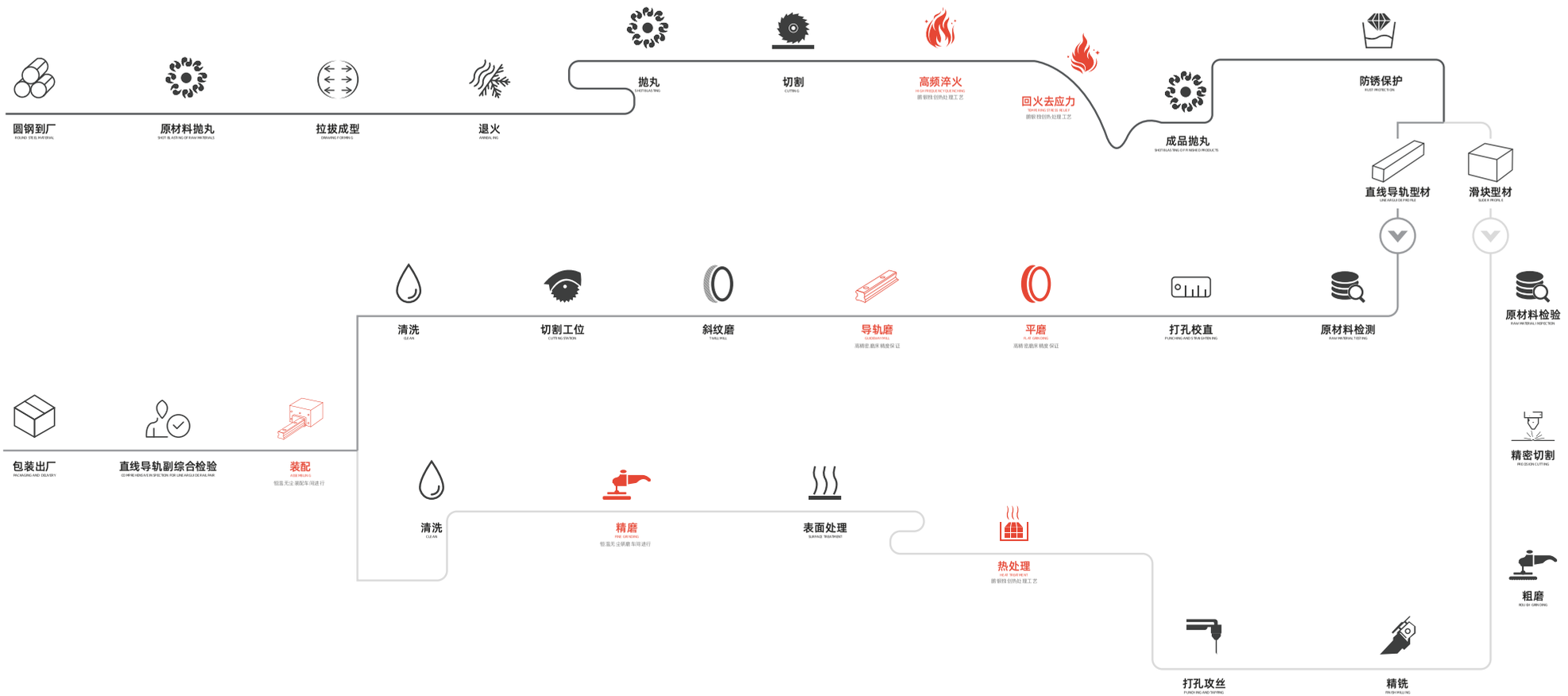
表 2-11-1 螺栓盖规格 Table 2-14-1 Dimensions of Copper Bolt Cap

公称型号 Item	安装螺丝 Bolt Size	主要尺寸 /Diameter (mm)		公称型号 Item	安装螺丝 Bolt Size	主要尺寸 /Diameter (mm)	
		D	H			D	H
PQR25C	M3	6.15	1.2	C8-S	M8	14.22	3.5
PQR25H	M4	7.65	1.2	C12-S	M12	20.15	4
PQR30C	M5	9.65	2.5	C14-S	M14	23.25	4
PQR30H	M6	11.22	2.8	C16-S	M16	26.20	4

表 2-11-2 不锈钢制螺栓盖规格 Table 2-14-1 Dimensions of Stainless Bolt Cap

公称型号 Item	安装螺丝 Bolt Size	主要尺寸 /Diameter (mm)		公称型号 Item	安装螺丝 Bolt Size	主要尺寸 /Diameter (mm)	
		D	H			D	H
PQR25C	M3	6.15	1.2	C8-S	M8	14.22	3.5
PQR25H	M4	7.65	1.2	C12-S	M12	20.25	4
PQR30C	M5	9.65	2.5	C14-S	M14	23.25	4
PQR30H	M6	11.22	2.8	C16-S	M16	26.20	4

鹏銀精密®


圆钢到厂
原材料抛丸
拉拔成型
退火
抛丸
切割
高频淬火
回火去应力
成品抛丸
防锈保护
直线导轨型材
滑块型材
原材料检验
清洗
切割工位
斜纹磨
导轨磨
平磨
打孔校直
原材料检测
包装出厂
直线导轨副综合检验
装配
精密切割
清洗
精磨
表面处理
热处理
粗磨
打孔攻丝
精铣

<0.003mm

量产行走精度<0.003mm的直线导轨副

浙江鹏银科技发展有限公司

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