



WOITOP



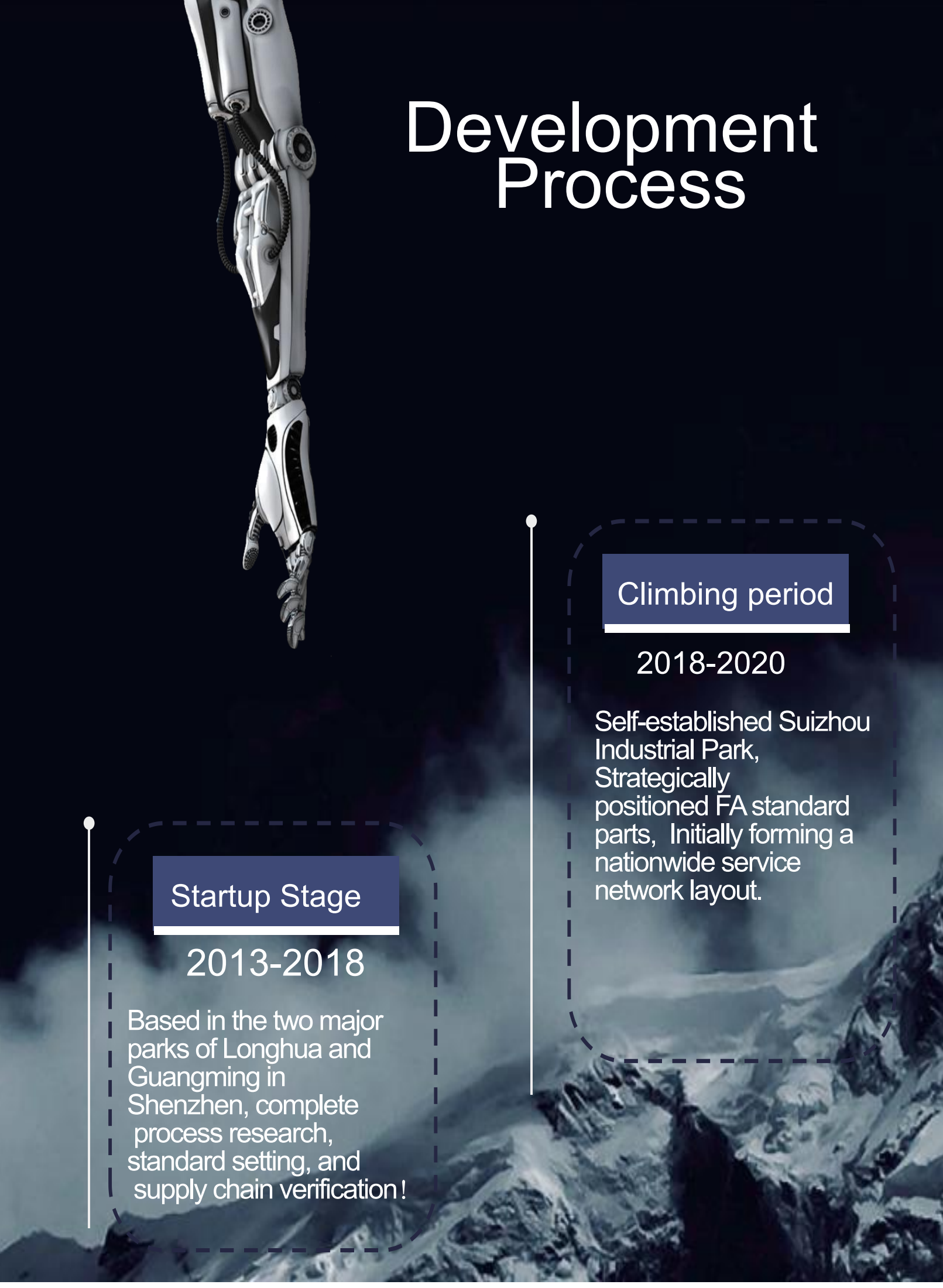
Guide rail product catalogue

Company Profile





Shenzhen Tianyi Intelligent Technology Co., Ltd. was established in December 2013. It mainly engages in the research and development, production, sales and service of FA (Factory Automation) precision parts (such as pneumatic components, rolling functional components, high-precision adjustment platforms, four-axis robots, aluminum profiles, industrial robots, industrial control modules, transmitters and sensors), fixtures and automated equipment (lines) for tooling and inspection. By integrating technological innovation, the company's FA (Factory Automation) precision standard parts business helps customers achieve value through its products, making industries more automated and production sites more pleasant. Based on application scenarios, the company's current focus in the tooling and inspection fixtures and automated equipment business is on two major application fields: consumer electronics such as smart phones and wearable devices, and automotive electronics. The company plans to gradually expand its capabilities and serve more application fields in FA factory automation. With a strategic focus on FA precision standard parts and intelligent equipment, it aims to achieve scale through speed and become a leading brand in the industry, contributing to the upgrading of China's industry and the realization of the "Made in China 2025" and "Industry 4.0" blueprints.



Development Process

Startup Stage

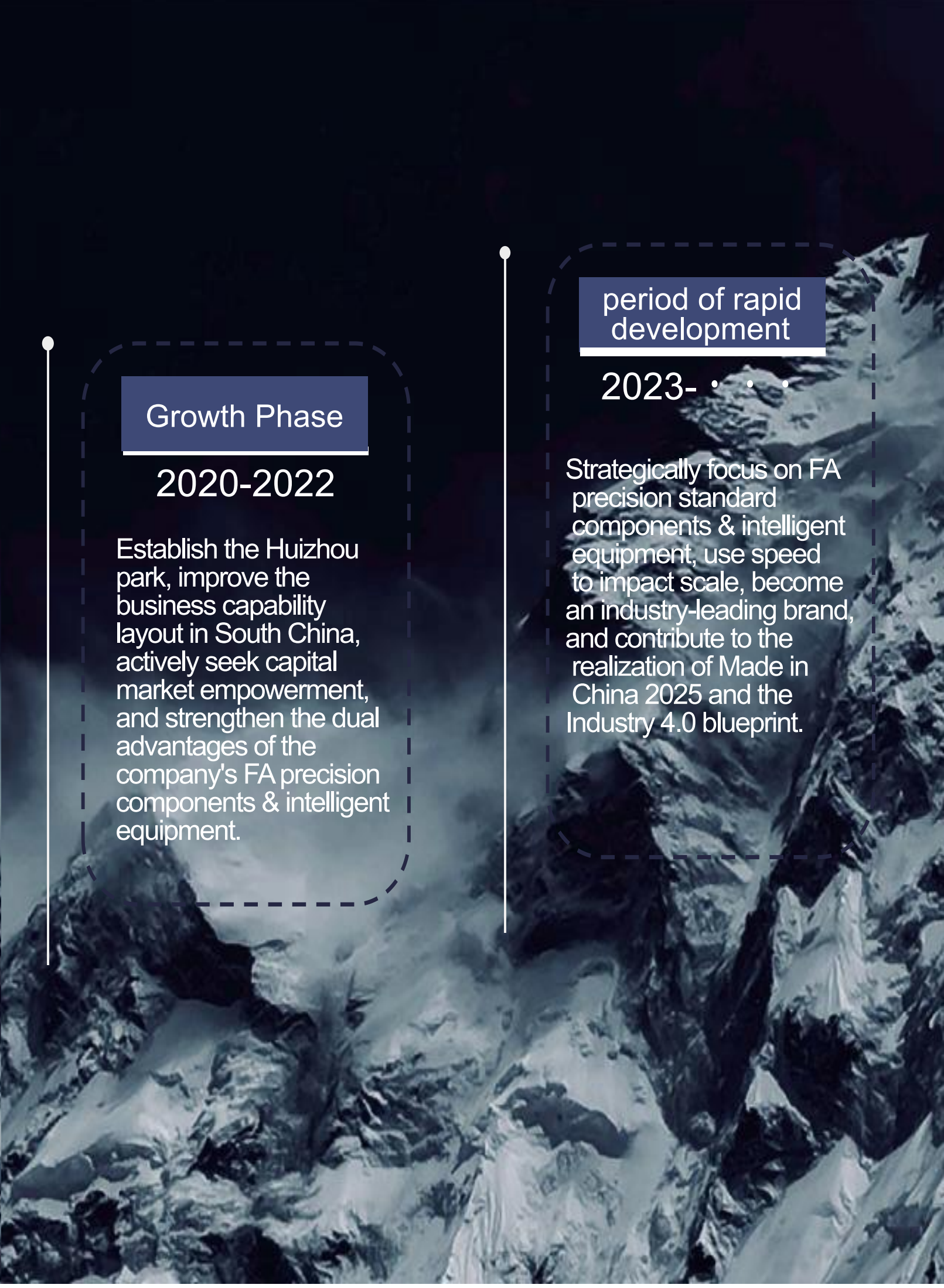
2013-2018

Based in the two major parks of Longhua and Guangming in Shenzhen, complete process research, standard setting, and supply chain verification!

Climbing period

2018-2020

Self-established Suizhou Industrial Park, Strategically positioned FA standard parts, Initially forming a nationwide service network layout.



Growth Phase

2020-2022

Establish the Huizhou park, improve the business capability layout in South China, actively seek capital market empowerment, and strengthen the dual advantages of the company's FA precision components & intelligent equipment.

period of rapid
development

2023- . . .

Strategically focus on FA precision standard components & intelligent equipment, use speed to impact scale, become an industry-leading brand, and contribute to the realization of Made in China 2025 and the Industry 4.0 blueprint.

Heavy-duty ball linear guide WHG series

P21



Slider type	Guide rail size mm	Load type	Slider Fixing method	Guide rail Fixing method
Flange type Square type Square type (low)	15	Heavy load Overload	Lockable type Bottom-lockable type Top and bottom lockable type	Lockable type Bottom-lock type
	20			
	25			
	30			
	35			
	45			
	55			
	65			

Low-assembly type ball linear guide WEG series

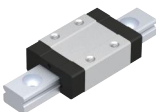
P43



Slider type	Guide rail size mm	Load type	Slider Fixing method	Guide rail Fixing method
Flange type Square type	15	Heavy load Overload	Lockable type Bottom-lockable type Top and bottom lockable type	Lockable type Bottom-lock type
	20			
	25			
	30			
	35			

Micro-miniature ball linear guide rails, WG series

P60



Type	Guide rail size mm	Load type	Material
Standard type Wide type Positioning hole type	5	Standard type Extended type Short type	General steel material Stainless steel material
	7		
	9		
	12		
	15		

Cross Roller Slide WVR Series

P72



Model number	Type	Guide rail material	Retainer material	Roller material
WVRT	Threaded abutment	440C	SUS304	GCr15
WVRT-A	Abutment installation hole type			

Cross Roller Slide WVR Series

P72



Model number	Type	Guide rail material	Retainer material	Roller material
WVRU	Standard type	440C	SUS304	GCr15

Cross Roller Guide - WV Series

P82



Model number	Type	Guide rail material	Retainer material	Roller material
WVR	Roller type	440C	SUS304	GCr15
WVB	Ball type			

MEMO

Linear guide rail

Preface

Linear guide systems are a type of rolling guidance. Through the infinite rolling circulation of steel balls between the slider and the guide rail, the load platform can easily perform linear motion with high precision along the guide rail. Compared with traditional sliding guidance, the friction coefficient of rolling guidance can be reduced to 1/50 of the original. Due to the significant reduction in starting friction, there is relatively less ineffective motion, and thus it can easily achieve μm -level feed and positioning. In addition, the design of the restraint unit between the slider and the guide rail enables the linear guide to simultaneously withstand loads in all directions such as up, down, left, and right. These listed features are not comparable to traditional sliding guidance. Therefore, if the machine can be combined with a ball screw and use a linear guide for guidance, it will surely greatly improve the accuracy and mechanical efficiency of the equipment.

Basic Information

1-1 Advantages and Characteristics of Linear Guide Rails

1-1-1 Advantages

(1) High positioning accuracy

When linear guides are used as linear guidance, due to the rolling friction of the linear guides, the friction coefficient is reduced to 1/50 of that of sliding guidance, and the difference between dynamic and static friction forces also becomes very small. Therefore, when the bed moves, there will be no slipping phenomenon, and positioning accuracy at the μm level can be achieved.

(2) Low wear ensures long-term maintenance of accuracy.

The traditional sliding guide is inevitably affected by the backflow of the oil film, resulting in poor movement accuracy of the platform. Moreover, due to insufficient lubrication during movement, the contact surface of the running track wears out, seriously affecting the accuracy. However, the wear of the rolling guide is very small, so the machine tool can maintain accuracy for a long time.

(3) Suitable for high-speed operation and significantly reducing the required driving horsepower of the machine.

Due to the extremely low friction when the linear guide moves, only a small amount of power is needed to operate the bed, especially when the bed operates in a frequent back-and-forth manner, which can significantly reduce the power consumption of the machine. Moreover, because the heat generated by friction is small, it is suitable for high-speed operation.

(4) It can withstand loads from all directions simultaneously, including up, down, left and right.

Due to the special restraint structure design of the linear guide, it can simultaneously withstand loads from the top, bottom, left and right directions. Unlike sliding guides, which can only bear relatively light lateral loads in the parallel contact surface direction, this can easily lead to poor operating accuracy of the machine.

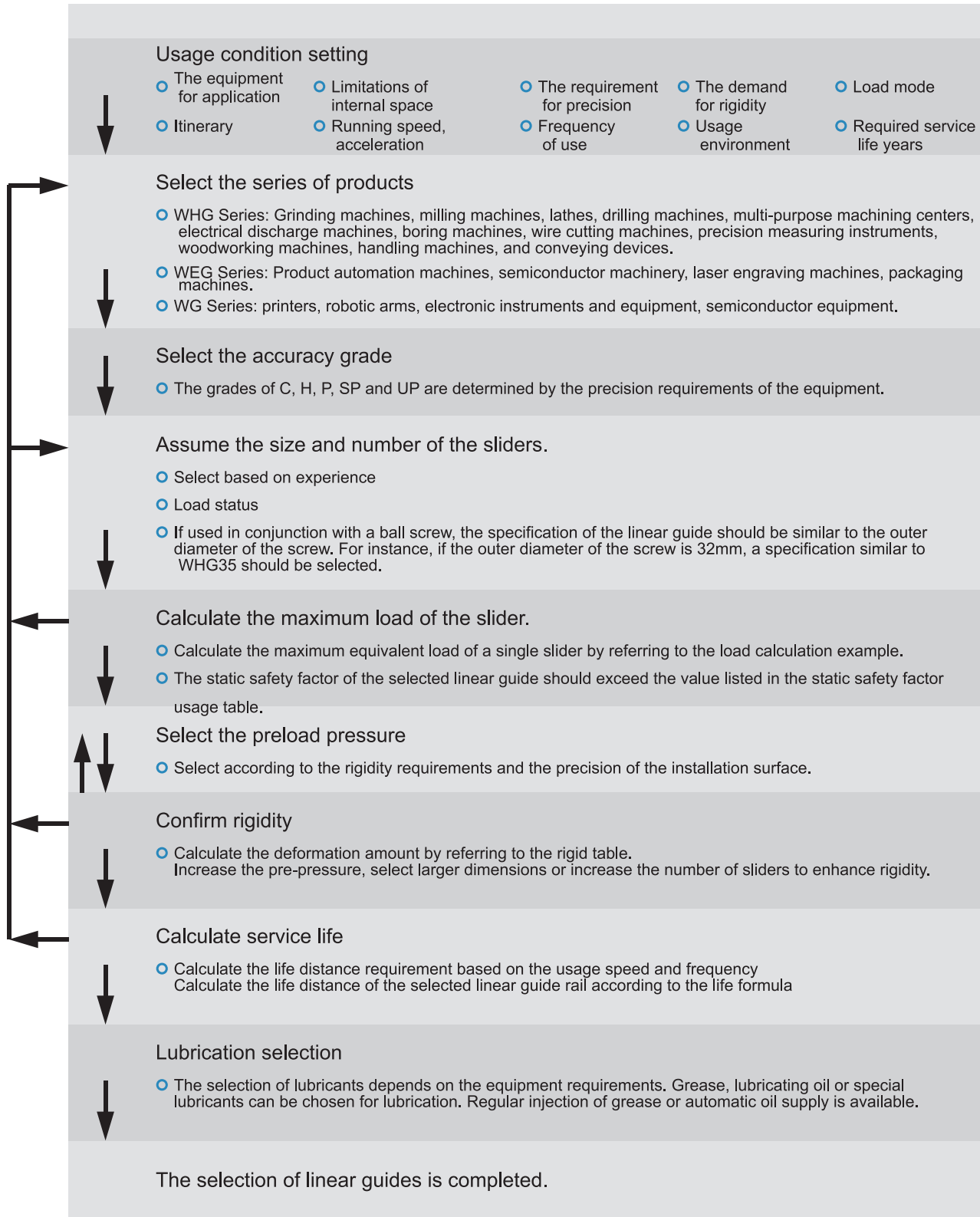
(5) Easy to assemble and interchangeable.

When assembling, just mill or grind the assembly surface of the guide rail on the machine bed, and then fix the guide rail and slider to the machine bed respectively according to the recommended steps with the specified torque. This can reproduce the high precision during processing. For the traditional sliding guide, the running track needs to be scraped, which is both time-consuming and laborious. Moreover, if the machine accuracy is poor, it needs to be scraped again. The linear guide has interchangeability. The slider or guide rail or even the linear guide set can be replaced separately, and the machine can regain high-precision guidance.

(6) The lubrication structure is simple.

If the sliding guide is insufficiently lubricated, it will cause direct metal-to-metal friction and wear on the bed. However, it is not easy to ensure adequate lubrication for the sliding guide, which requires drilling holes at appropriate positions on the bed for oil supply. In contrast, linear guides are equipped with oil nozzles on the sliders, allowing for direct injection of grease using an oil gun or connection to a dedicated oil pipe fitting for automatic lubrication by an oil supply machine.

1-2. Selection criteria



1-3 Rated load

1-3-1 Basic static rated load

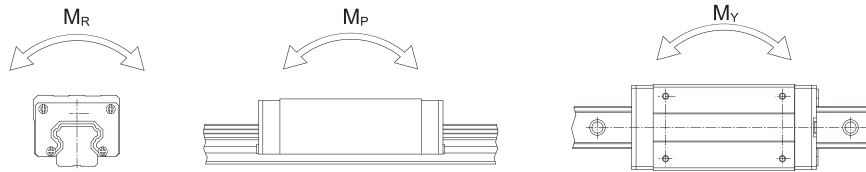
(1) The definition of basic static rated load (C_0)

If the linear guide is subjected to excessive load or significant impact load while at rest or in motion, it will cause local permanent deformation on the contact surface of the raceway and the steel balls. When the permanent deformation exceeds a certain limit, it will affect the smoothness of the linear guide's movement. The basic static load rating is the maximum load that allows this permanent deformation. According to the definition, it is the static load at which the total permanent deformation of the steel balls and the raceway surface at the contact point under the maximum stress is exactly one ten-thousandth of the steel ball's diameter when the load direction and magnitude remain unchanged. The values of the basic static load ratings are detailed in the specification and dimension tables. Users can refer to the tables to select the appropriate linear guide, but it is necessary to note that the maximum static load that the selected linear guide is subjected to during operation must not exceed its basic static load rating.

The values of the basic static rated load are detailed in the specification and dimension tables. Users can refer to the tables to select the appropriate linear guide, but it must be noted that the maximum static load the selected linear guide is subjected to during operation must not exceed its basic static rated load.

(2) Definition of Allowable Static Moment (M_0)

When the steel balls in the slider subjected to the maximum stress reach the static rated load as defined above, the torque carried by the slider at this time is called the static rated torque. In the movement of linear guides, it is defined in the three directions of M_R , M_P , and M_Y :



(3) Static safety factor

When linear guides are used in slow motion or with a low actuation frequency, the static safety factor must be considered. Depending on different usage conditions, different safety factors must be taken into account when calculating the static load, especially when the guide is subjected to impact loads, a larger safety factor should be adopted.

Table 1: Application of Static Safety Factor

Load conditions	f_{SL} , f_{SM} lower limit
General operating condition	1.0~3.0
Impact and vibration during operation	3.0~5.0

$$f_{SL} = \frac{C_0}{P} \quad \text{Or perhaps} \quad f_{SM} = \frac{M_0}{M} \quad \dots \dots \dots \text{Eq.1.1}$$

f_{SL} : Static safety factor

f_{SM} : Static safety factor (moment load)

C_0 : Basic static rated load (kN)

M_0 : Basic static rated load (kN·m)

P : Working load (kN)

M : Static moment load (kN·m)

1-3-2 Basic dynamic rated load

(1) The definition of the basic dynamic rated load (C)

The basic dynamic load rating is used for the life calculation of linear guides when they bear loads and perform rolling motion. It is defined as the maximum load at which the rated life of the linear guide is 50 km (100 km for rolling type linear guides) under the condition that the direction and magnitude of the load remain unchanged. This value is detailed in the specification and dimension tables, and users can use this value to estimate the rated life of the selected linear guide in advance.

1-4 The service life of linear guides

1-4-1 lifespan

When the linear guide bears a load and moves, the raceway surface and the steel balls are constantly subjected to cyclic stress. Once the critical value of rolling fatigue is reached, fatigue damage will begin to occur at the contact surface, and fish-scale-like thin flakes will start to peel off on some parts of the surface. This phenomenon is called surface spalling. The definition of life is the total running distance until surface spalling occurs on the raceway surface and the steel balls due to material fatigue.

1-4-2 Rated service life

The lifespan of linear guides has significant variability. Even products from the same batch, when used under the same motion conditions, will have different lifespans. This is mostly attributed to inherent variations in the fatigue characteristics of the materials themselves. Therefore, to define the lifespan of linear guides, the rated lifespan is generally used as a benchmark. It is defined as the total running distance that 90% of a batch of the same products can achieve without surface spalling when operated under the same conditions and rated load, one by one.

1-4-3 The calculation of lifespan

The lifespan of linear guides varies depending on the actual working load they bear. The service life can be estimated based on the basic dynamic load rating of the selected linear guide and the working load.

(1) Without considering the influence of environmental factors, the lifespan is calculated as follows.

$$\text{Ball type: } L = \left(\frac{C}{P} \right)^3 \cdot 50 \text{ km} = \left(\frac{C}{P} \right)^3 \cdot 31 \text{ mile} \quad \text{Eq.1.2}$$

$$\text{Ball type: } L = \left(\frac{C}{P} \right)^{\frac{10}{3}} \cdot 100 \text{ km} = \left(\frac{C}{P} \right)^{\frac{10}{3}} \cdot 62 \text{ mile} \quad \text{Eq.1.3}$$

L: Rated service life

C: Basic dynamic rated load

P: workload

(2) If environmental factors in the application of linear guides are taken into account, their service life will vary with the state of motion, the hardness of the ball track surface and the system temperature.

$$\text{Ball type: } L = \left(\frac{f_h \cdot f_t \cdot C}{f_w \cdot P_c} \right)^3 \cdot 50 \text{ km} = \left(\frac{f_h \cdot f_t \cdot C}{f_w \cdot P_c} \right)^3 \cdot 31 \text{ mile} \quad \text{Eq.1.4}$$

$$\text{Roller type: } L = \left(\frac{f_h \cdot f_t \cdot C}{f_w \cdot P_c} \right)^{\frac{10}{3}} \cdot 100 \text{ km} = \left(\frac{f_h \cdot f_t \cdot C}{f_w \cdot P_c} \right)^{\frac{10}{3}} \cdot 62 \text{ mile} \quad \text{Eq.1.5}$$

L: lifespan

f_h : Hardness coefficient

C: Basic dynamic rated load

f_t : temperature coefficient

P_c : workload

f_w : Load factor

1-4-4 Life expectancy coefficient

(1) Hardness coefficient(f_h)

The hardness of the contact surface of the ball track of the linear guide is required to be HRC 58 to 62 at a certain hardened depth. If the hardness value cannot reach the required level, it will reduce the rated load and service life of the linear guide. At this time, the dynamic and static rated loads are the values listed in the size table multiplied by the corresponding hardness coefficient. The hardness requirement of the linear guide produced by WODTOP is all above HRC 58, so f_h is 1.

Raceway hardness

HRC	60	50	40	30	20	10
f_h	1.0	0.6	0.3	0.2	0.1	0.03

(2)temperature coefficient(f_t)

The system temperature can affect the material of the linear guide. When the temperature exceeds 100°C, the rated load and service life of the linear guide will decrease. At this time, the dynamic and static rated loads are the values listed in the size table multiplied by the corresponding temperature coefficient. Since some accessories are made of plastic and are not resistant to high temperatures, it is recommended that the usage temperature be below 100°C.

Temperature

Temperature (°C)	f_t
100	1.0
150	0.9
200	0.8
250	0.6

(3)Load factor(f_w)

The loads acting on the linear guide rails include not only the self-weight of the device itself, the inertial loads during start-up and stoppage, and the moment loads due to overhang, but also the vibration and shock loads that accompany the movement. Such types of loads are not easy to calculate. Based on experience, it is recommended to multiply the calculated load value by the corresponding load factor according to the load condition and usage speed.

Table 2 Load Coefficient

Load condition	Usage speed	f_w
Weak and smooth	$V \leq 15\text{m/min}$	1~1.2
Minor impact force	$15\text{m/min} < V \leq 60\text{m/min}$	1.2~1.5
Ordinary load capacity	$60\text{m/min} < V \leq 120\text{m/min}$	1.5~2.0
Subjected to impact force and vibration	$V > 12\text{m/min}$	2.0~3.5

1-4-5Conversion of lifespan time

Convert the lifespan distance into lifespan time based on the usage speed and frequency.

$$\text{Ball type: } L_h = \frac{L \cdot 10^3}{V_e \cdot 60} = \frac{\left(\frac{C}{P}\right)^3 \cdot 50 \cdot 10^3}{V_e \cdot 60} \text{ hr} \quad \text{Eq.1.6}$$

$$\text{Roller type: } L_h = \frac{L \cdot 10^3}{V_e \cdot 60} = \frac{\left(\frac{C}{P}\right)^{10} \cdot 100 \cdot 10^3}{V_e \cdot 60} \text{ hr} \quad \text{Eq.1.7}$$

L_h : Life span(hr)

L : lifespan(km)

V_e : operating speed(m/min)

C/P : Load ratio

1-5workload

1-5-1Workload calculation

The calculation method of the working load will vary depending on the actual force distribution situation, such as the position of the center of gravity of the object being carried, the position of the applied force, and the acceleration during start-up and stoppage when in operation, as well as inertial forces, all of which affect the load calculation. Therefore, when using linear guides, various load conditions must be carefully considered to calculate the most accurate load value.

(1) Load borne by a single slider

Table 3 Example of Load Calculation

Linear guide configuration diagram	Stress distribution diagram	Load per individual slider
		$P_1 = \frac{W}{4} + \frac{F}{4} + \frac{F \cdot a}{2c} + \frac{F \cdot b}{2d}$ $P_2 = \frac{W}{4} + \frac{F}{4} + \frac{F \cdot a}{2c} + \frac{F \cdot b}{2d}$ $P_3 = \frac{W}{4} + \frac{F}{4} + \frac{F \cdot a}{2c} + \frac{F \cdot b}{2d}$ $P_4 = \frac{W}{4} + \frac{F}{4} + \frac{F \cdot a}{2c} + \frac{F \cdot b}{2d}$
		$P_1 = \frac{W}{4} + \frac{F}{4} + \frac{F \cdot a}{2c} + \frac{F \cdot b}{2d}$ $P_2 = \frac{W}{4} + \frac{F}{4} + \frac{F \cdot a}{2c} + \frac{F \cdot b}{2d}$ $P_3 = \frac{W}{4} + \frac{F}{4} + \frac{F \cdot a}{2c} + \frac{F \cdot b}{2d}$ $P_4 = \frac{W}{4} + \frac{F}{4} + \frac{F \cdot a}{2c} + \frac{F \cdot b}{2d}$
		$P_1 = P_2 = \frac{W}{4} + \frac{F \cdot l}{2d}$ $P_3 = P_4 = \frac{W}{4} + \frac{F \cdot l}{2d}$
		$P_1 \sim P_4 = \frac{W \cdot h}{2d} + \frac{F \cdot l}{2d}$
		$P_1 \sim P_4 = \frac{W \cdot h}{2c} + \frac{F \cdot l}{2c}$ $P_{t1} = P_{t3} = \frac{W}{4} + \frac{F}{4} + \frac{F \cdot k}{2d}$ $P_{t2} = P_{t4} = \frac{W}{4} + \frac{F}{4} + \frac{F \cdot k}{2d}$

Note: W:weight P_n :Load (radial and anti-radial of slider) $n=1\sim4$

F:external force P_{tn} :Load (slider lateral) $n=1\sim4$

a,b,k:The distance from the external force to the geometric center

c:Guide rail span

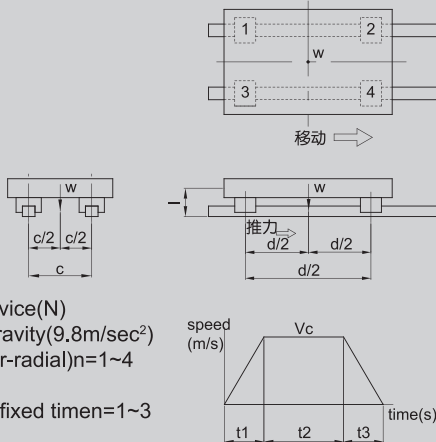
d:Slider span

l: Distance from the external force to the driving source

h:The distance from the center of gravity to the driving source

(2) Inertial force load

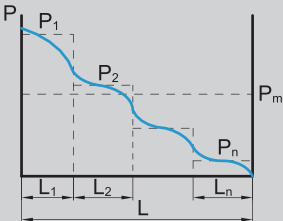
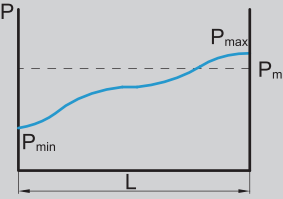
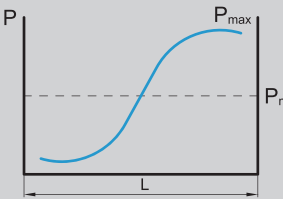
Table 4 Example of Inertial Force Load Calculation

An example considering acceleration and deceleration	The force acting on a single slider
 F: Drive thrust(N) W: The weight of the device(N) g: acceleration due to gravity(9.8m/sec²) P_n: Load (radial, counter-radial)n=1~4 V_c: speed t_n: Constant speed at a fixed timen=1~3 c、d、l: distance	- constant speed $P_1 \sim P_4 = \frac{W}{4}$ - accelerate $P_1 = P_3 = \frac{W}{4} + \frac{1}{2} \cdot \frac{W}{g} \cdot \frac{V_c}{t_1} \cdot \frac{l}{d}$ $P_2 = P_4 = \frac{W}{4} - \frac{1}{2} \cdot \frac{W}{g} \cdot \frac{V_c}{t_1} \cdot \frac{l}{d}$ - slow down $P_1 = P_3 = \frac{W}{4} - \frac{1}{2} \cdot \frac{W}{g} \cdot \frac{V_c}{t_3} \cdot \frac{l}{d}$ $P_2 = P_4 = \frac{W}{4} + \frac{1}{2} \cdot \frac{W}{g} \cdot \frac{V_c}{t_3} \cdot \frac{l}{d}$

1-5-2 Average load calculation

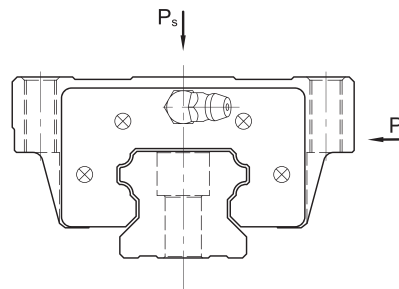
During operation, the load on the slider is not always uniform. For instance, in the case of a conveying device, it bears the additional weight of the goods when moving forward but only its own weight when returning. The load changes in a stepwise manner. Therefore, it is necessary to calculate the average load during operation to determine the lifespan. The average load is defined as the equivalent load value that results in the same lifespan under varying load conditions.

Table 5 Example of Average Load Calculation

Types of load variations	Average load-bearing capacity
Stepwise change 	$P_m = \sqrt[3]{1/L(P_1^3 \cdot L_1 + P_2^3 \cdot L_2 + \dots + P_n^3 \cdot L_n)}$ P_m: average load P_n: Variable load L : Total running distance L_n: The operating distance under P_n load
Monotonic variation 	$P_m = 1/3(P_{min} + 2 \cdot P_{max})$ P_m : average load P_{min} : Minimum load P_{max} : Maximum load
Sinusoidal variation 	$P_m = 0.65 \cdot P_{max}$ P_m : average load P_{max} : Maximum load

1-5-3Equivalent load calculation in two directions

WODTOP linear guides can withstand loads in the up, down, left and right directions. Therefore, when using linear guides, they may simultaneously be subjected to vertical loads (P_s) and lateral loads (P_l). The equivalent load (P_e) can be calculated according to the following formula.



WHG/WEGSeries

$$P_e = P_s + P_l \quad \text{Eq.1.5}$$

WGSeries

$$\text{When } P_s > P_l \quad P_e = P_s + 0.5 \cdot P_l \quad \text{Eq.1.6}$$

$$\text{When } P_l > P_s \quad P_e = P_l + 0.5 \cdot P_s \quad \text{Eq.1.7}$$

1-5-4Example of Calculating the Service Life of Linear Guide Rails

Based on experience, select the type and specification of the linear guide rail, and then estimate the maximum working load of a single slider according to the actual usage conditions. Calculate the load ratio of the dynamic rated load to the working load to predict its service life.

Table 6 Example of Life Span Calculation

Specifications for the Use of Linear Guides	Equipment dimensions	Processing conditions
Type: WHGH30CA C: 37.74kN C ₀ : 52.19kN Preloading: Z0	d: 600mm c: 400mm h: 200mm l: 250mm	The weight of the device itself(W): 15kN Drilling force(F): 1kN System temperature: Room temperature Load status: Normal load
- Calculation of load-bearing capacity of slider $P_1 \sim P_4 = + \frac{W \cdot h}{2d} - \frac{F \cdot l}{2d} = + \frac{15 \times 200}{2 \times 600} - \frac{1 \times 250}{2 \times 600} = 2.29(\text{kN})$ $P_{\max} = P_1 \sim P_4 = 2.29(\text{kN})$ - Because Z0 pre-press is selected, therefore $P_c = P_{\max} = 2.29(\text{kN})$ Note: If heavier pre-pressing (ZA, ZB) is chosen, although the rigidity will be enhanced, its service life will be reduced. - Calculation of lifespan L $L = \left(\frac{f_r \cdot x_f \cdot C}{f_w \cdot P_c} \right)^3 \times 50 = \left(\frac{1 \times 1 \times 37.74}{2 \times 2.29} \right)^3 \times 50 = 30,258(\text{km})$		

1-6frictional force

Linear guides use steel balls for rolling guidance, so their friction can be reduced to 1/50 of that of traditional sliding guidance. Especially, the static friction is very small and not much different from the dynamic friction, thus no idling or slippage will occur and micron-level motion accuracy can be achieved. Generally speaking, the friction coefficient of linear guides is about 0.004. The resistance of the oil scraper varies depending on the specifications, and the values are listed in the friction force section of each specification.

$$F = \mu \cdot W + S$$

Eq.1.8

F : frictional force(kN)

S : Resistance of oil scraper blade(kN)

μ : Coefficient of friction

W : Vertical load during movement(kN)

1-7Preload and Rigidity Performance

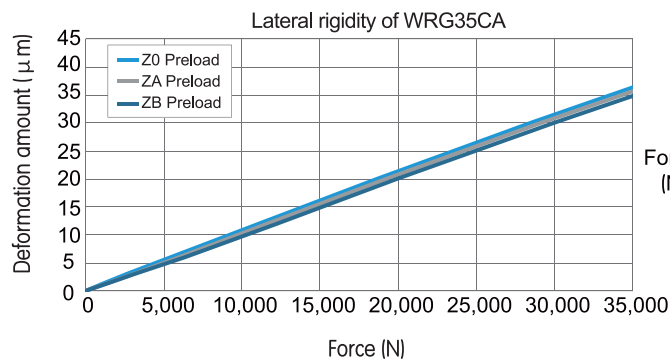
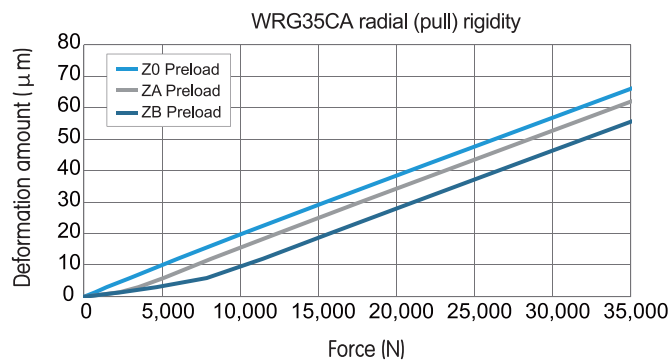
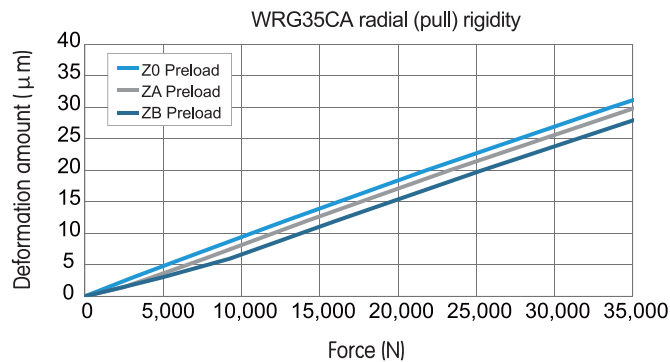
In the field of linear motion of rolling elements, increasing preload can effectively enhance the rigidity of the slider, but it will affect the rated life of the slider. The definition of rigidity is shown in the following formula. The preload grades of HIWIN sliders are classified into three levels: light preload Z0, medium preload ZA, and heavy preload ZB. Each preload grade presents different rigidity performance. The better the rigidity, the lower the deformation of the slider. The following figure is an example.

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

δ : Deformation amount(μm)

P : exert force(N)

K : rigidity(N/ μm)



1-8 Lubrication

If linear guides are not properly lubricated, the friction of the rolling parts will increase. Over time, this will become the main cause of shortened service life. Lubricants provide the following functions:

- Reduce the friction of the rolling part, prevent burning and lower the wear.
- An oil film formed between the rolling surfaces can extend the rolling fatigue life.
- Prevent rusting.

1-8-1 Lubricating grease (GREASE)

Each set of linear guide rails is equipped with a lubricating ball groove track. Although the lubricating grease is less likely to be lost, to avoid insufficient lubrication due to grease loss, it is recommended that customers replenish the lubricating grease once when the running distance reaches 100 km. At this time, a grease gun can be used to inject the grease into the slider through the oil nozzle attached to the slider. The lubricating grease is suitable for applications where the speed does not exceed 60 m/min and there is no requirement for cooling effect.

$$T = \frac{100 \cdot 1000}{V_s \cdot 60} \text{ hr} \quad \text{Eq.1.9}$$

T : Oil injection frequency(hour)

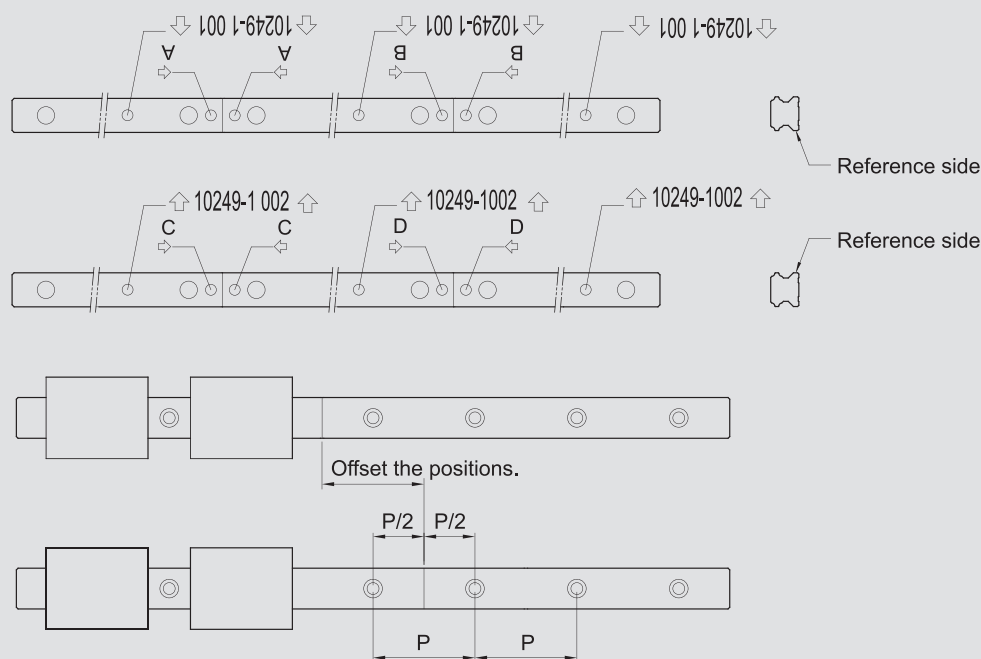
V_s : speed(m/min)

1-8-2 Lubricating oil (OIL)

It is recommended that customers use lubricating oil with a viscosity of approximately 30 to 150 cSt to lubricate linear guides. WODTOP can install oil pipe connectors at the original oil drain port according to customer requirements. Therefore, customers only need to connect the pre-installed oil pipe of the machine to the oil pipe connector. The consumption of lubricating oil is faster than that of lubricating grease. When using it, it is necessary to pay attention to whether the oil supply is sufficient. Insufficient lubrication can easily cause abnormal wear of the linear guide and reduce its service life. It is recommended to apply oil at a frequency of approximately 0.3 cm³/hr. Customers can use it as appropriate based on their usage conditions. Lubricating oil is suitable for various load and speed conditions, but it is not suitable for high-temperature lubrication due to its volatility.

1-9 Guide rail joint piece

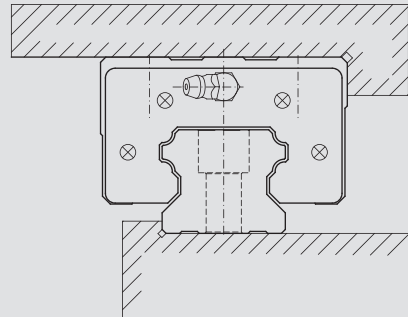
When installing the guide rail spacers, they must be installed in the order indicated on the guide rail to ensure the accuracy of the linear guide rail. It is also recommended that the positions of the paired guide rail spacers be staggered to avoid accuracy problems at the connection point of the bed and the spacer due to differences in the guide rails.



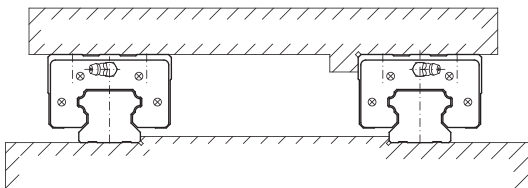
Configuration of 1-10 Linear Guides

Linear guides can withstand loads in the up, down, left and right directions. Therefore, linear guide sets can be configured according to the structure of the machine and the direction of the working load.

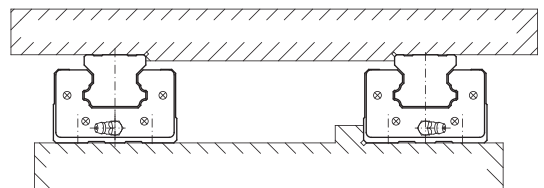
Each single guide rail is equipped with a support surface.



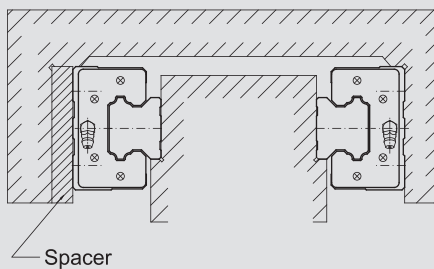
Two-track slider movement configuration



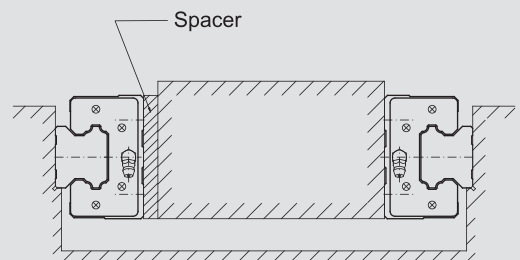
Two-track slider movement configuration



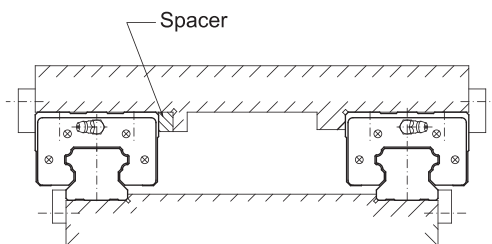
Relative two-track configuration



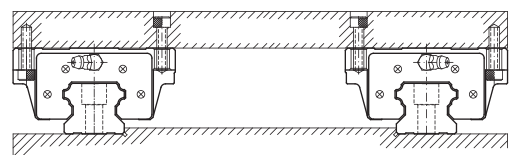
Back-to-back double-rail configuration



Comprehensive fixed configuration



The WHGW type slider assembly bolts are configured in different directions.



1-11 Installation of linear guides

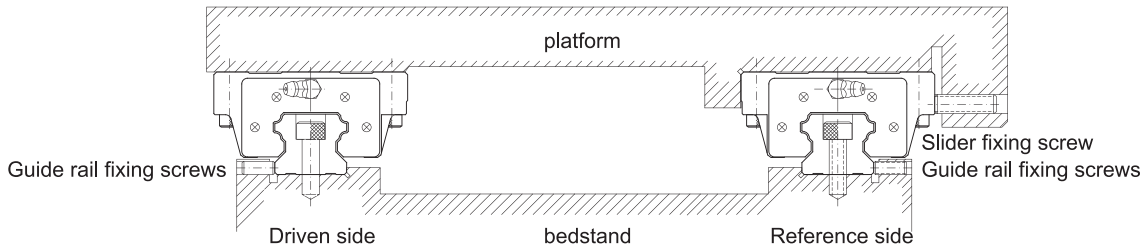
The installation method of linear guides must be determined based on the usage conditions of the machine, such as the degree of vibration and shock force, the required travel accuracy, and the limitations of the machine.

1-11-1 The reference rail and the driven rail

When non-interchangeable linear guides are used in pairs, it is necessary to pay attention to the differences between the reference rail and the driven rail. The precision of the reference surface on the side of the reference rail is higher than that of the driven rail, and it can be used as the installation support surface of the bed. There is a mark of "MA" engraved on the reference rail, as shown in the figure.

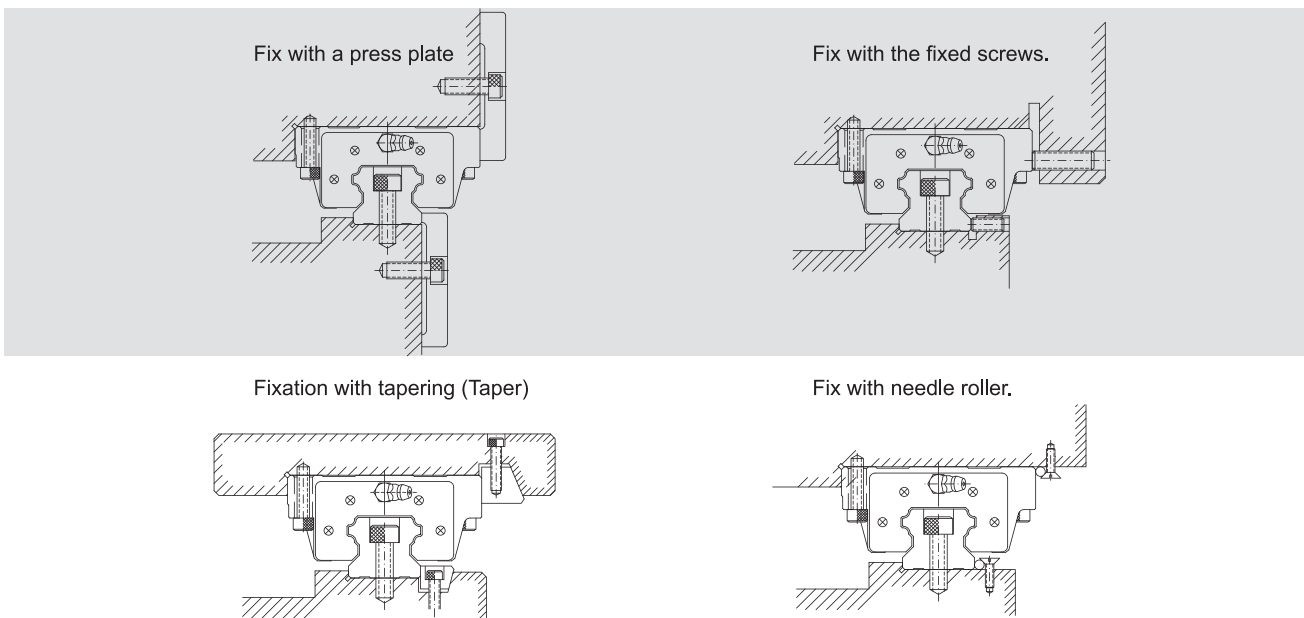


1-11-2 The bedplate is subject to vibration and impact forces, and requires high rigidity and high-precision installation.



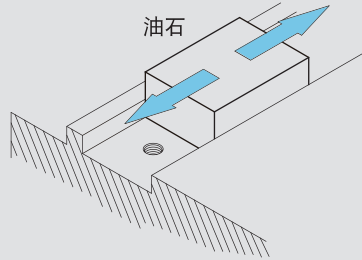
(1) Fixed method

When the bed is subjected to vibration or impact force, the guide rails and sliders may deviate from their original fixed positions, affecting accuracy. To prevent such situations, it is recommended to use the four fixing methods listed in the following figure to fix the guide rails and sliders, ensuring the operating accuracy of the machine.

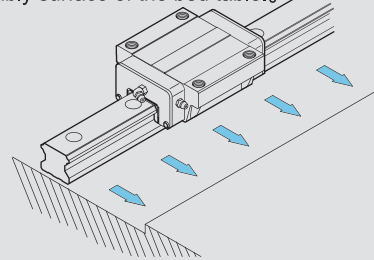


(2)Guide rail installation

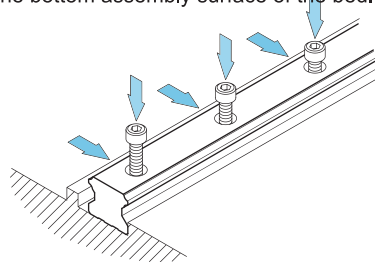
1 Clean the dirt off the assembly surface of the bedplate.



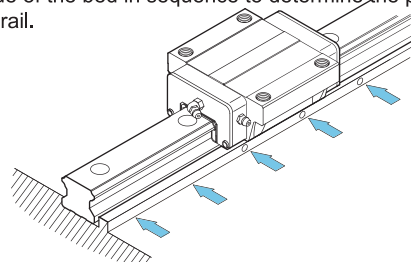
2 Place the linear guide smoothly on the bed table and let the reference surface on the side of the guide rest against the assembly surface of the bed table.



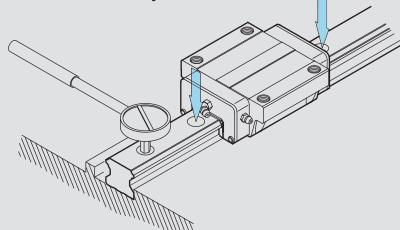
3 Test-fit the assembly screws to confirm that the bolt holes match, and roughly fix the bottom reference surface of the guide rail to the bottom assembly surface of the bed.



4 Use the lateral fixing screws to press the reference surface on the side of the guide rail against the assembly surface on the side of the bed in sequence to determine the position of the guide rail.

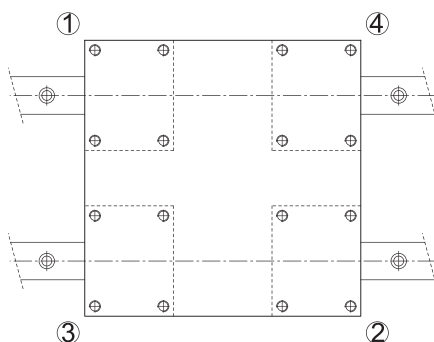


5 Use a torque wrench to tighten the assembly screws in sequence with a specific torque, pressing the bottom reference surface of the guide rail tightly against the bottom assembly surface of the bed.



6 Install the remaining paired guide rails according to steps 1 to 5.

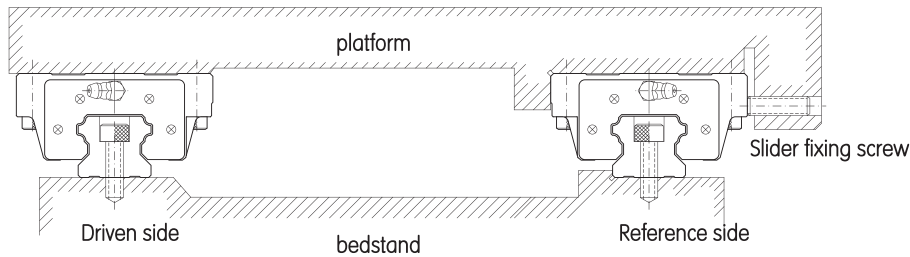
(3)Slider installation



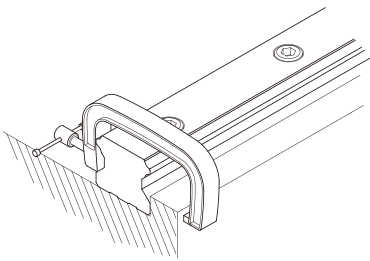
- Fix the bearing platform roughly onto the slider using assembly screws.
- Use the fixed screws to firmly attach the reference surface on the side of the slider to the assembly surface on the side of the platform to determine the position of the slider.
- Tighten the assembly screws to secure the bearing platform onto the slider in the diagonal sequence of 1 to 4.

1-11-3 Installation of guide rails without lateral fixing screws

In the installation example without fixed screws, to ensure the parallelism between the driven side guide rail and the reference side guide rail, the guide rails can be installed as shown below, while the installation of the sliders is the same as in the aforementioned example.



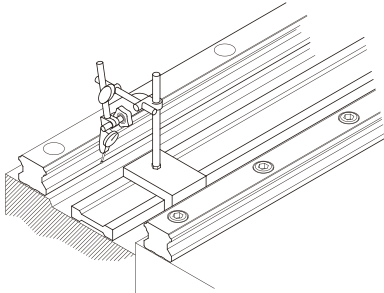
(1) Installation of the reference side guide rail



Clamping method with a vise

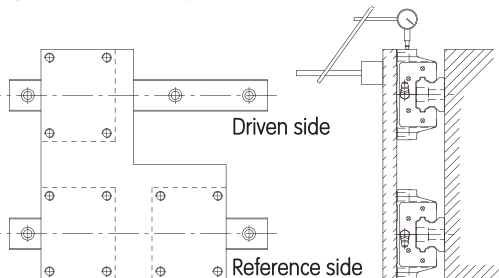
First, roughly fix the bottom reference surface of the guide rail to the bottom assembly surface of the bed using assembly screws. Then, use a vise to tightly press the side reference surface of the guide rail against the side assembly surface of the bed to determine the position of the guide rail. After that, use a torque wrench to lock the fixing screws in sequence with a certain torque, and tightly press the bottom reference surface of the guide rail against the bottom assembly surface of the bed.

(2) Installation of the driven side guide rail



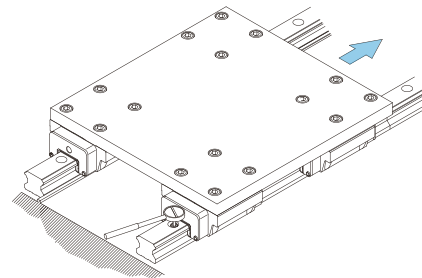
Straight-line block gauge method

Place the straight block gauge between the two guide rails, and use a dial indicator to calibrate the straight block gauge to be parallel to the side reference surface of the reference side guide rail. Then, calibrate the driven side guide rail based on the straight block gauge, starting from one end of the guide rail and sequentially tighten the assembly screws with a specific torque.



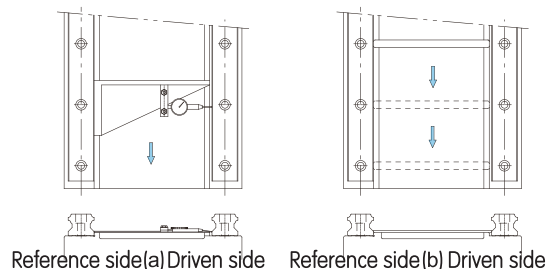
Mobile platform method

Fix the two sliders on the reference side on a measuring platform, while only install one slider on the driven side. Neither the guide rails nor the sliders on the bed and platform have been fastened yet. Use a dial indicator attached to the top surface of the slider on the driven side to measure the side reference surface of the slider on the driven side. Start calibrating from one end of the guide rail and lock the assembly screws in sequence with a specific torque.



The method of imitating the reference side guide rail

Fix the two sliders of the reference side linear guide and one slider of the driven side linear guide to the platform. Then, roughly fix the driven side guide rail and its other slider to the bed and the platform respectively. Move the platform based on the reference side guide rail, starting from one end of the guide rail. While confirming the rolling resistance of the driven side linear guide rail, sequentially tighten the assembly screws with a specific torque.

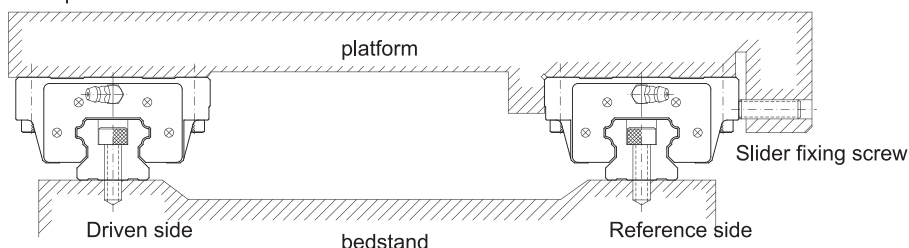


Professional tool method

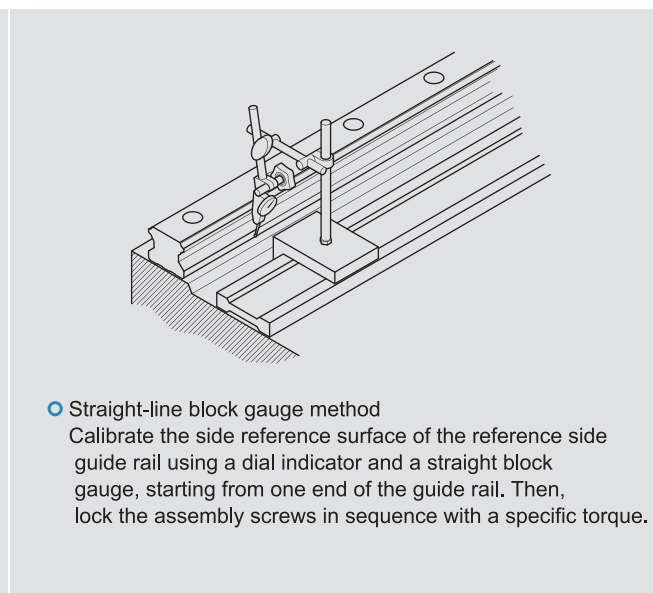
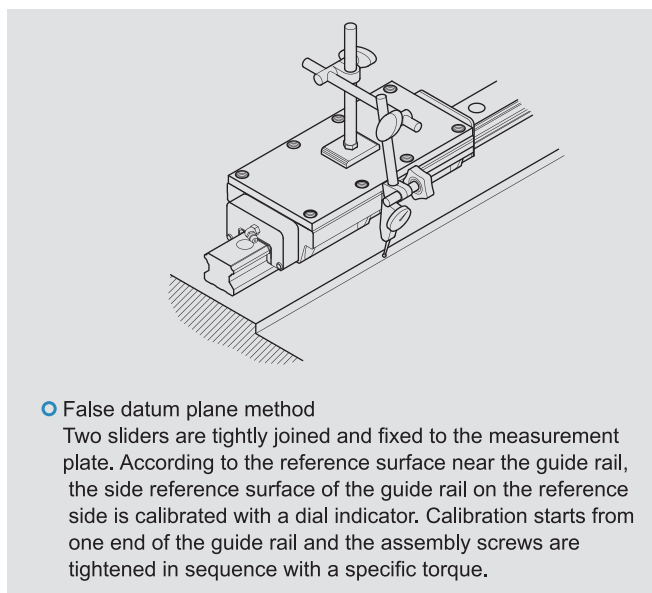
Use a dedicated tool to determine the position of the driven side guide rail and then lock the assembly screws in sequence with a specific torque.

1-11-4 Installation of guide rails without lateral positioning mounting surfaces

In the installation example without lateral positioning assembly surfaces, to ensure the parallelism between the driven side guide rail and the reference side guide rail, the guide rails can be installed as shown below, while the installation of the sliders is the same as in the aforementioned examples.



(1) Installation of the reference side guide rail

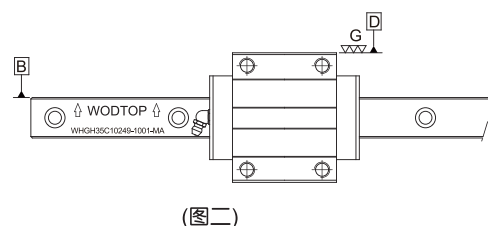
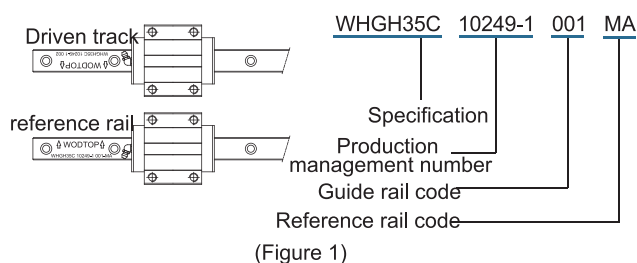


(2) Installation of the driven side guide rail

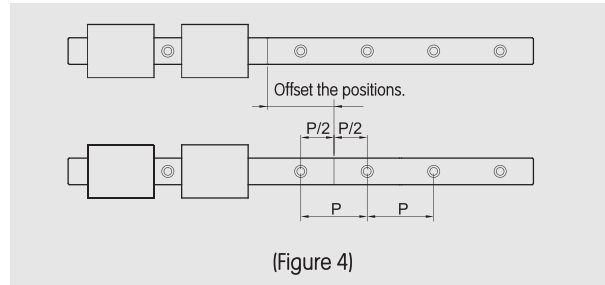
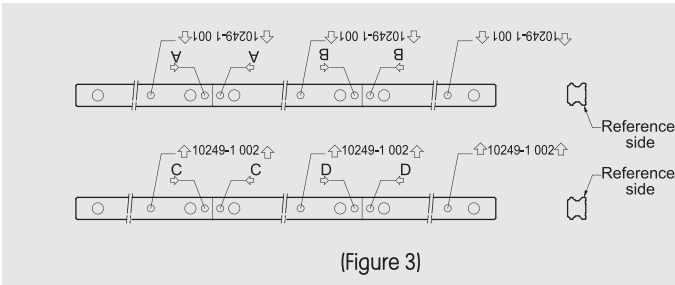
It is the same as the method listed in the example of installation without lateral fixing screws.

1-11-5 Installation Precautions for Linear Guide Rails

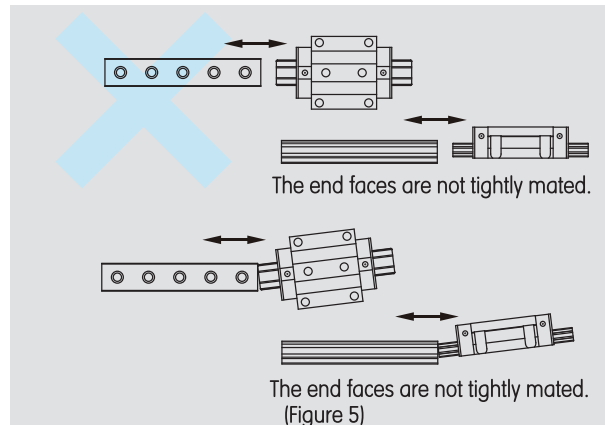
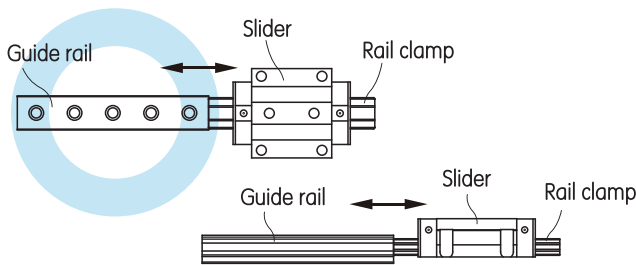
- Before shipment, all linear guide products are coated with an appropriate amount of anti-rust oil. Before installation and use, please wipe off the anti-rust oil on the guide rail first, and then move the slider.
- Confirm the reference rail and the driven rail:
When non-interchangeable linear guides are used in pairs, it is necessary to pay attention to the differences between the reference rail and the driven rail. The precision of the reference surface on the side of the reference rail is higher than that of the driven rail, and it can be used as the installation support surface of the bed. There is a mark of "MA" on the reference rail. Moreover, when two rails are used in pairs, the reference rail is numbered as an odd number, while the driven rail is numbered as an even number. Please install them in sequence according to the symbol indication (for example: 001 and 002 in pairs, 003 and 004 in pairs...), as shown in Figure 1. If multiple rails are installed, please follow this analogy.
- Confirm the installation reference plane: The reference plane of the guide rail is the side (B) indicated by the arrow next to the "WODTOP" marking; while the reference plane of the slider is the smooth surface (D) that has been ground. (As shown in Figure 2)



4. Rail coupling parts: When installing the rail couplings, they must be installed in the order indicated on the rail to ensure the accuracy of the linear guide. The coupling marks are on the upper surface of the coupling end. Please join the two ends with the same coupling marks together, as shown in Figure 3. It is also recommended that the positions of the paired rail couplings be staggered to avoid accuracy problems at the coupling point due to differences in the rails, as shown in Figure 4.



5. When installing linear guides, do not remove the sliders unless necessary. If it is necessary to remove or install the sliders from the guide rails, please use the attached rail clamps (usage method as shown in Figure 5).



6. When installing linear guides, do not interchange the sliders of non-interchangeable types, as this may affect accuracy.

7. When installing linear guides, please use a torque wrench and tighten the bolts in sequence according to the recommended torque provided by our company to ensure the straightness of the guide rail.

1-11-6 Precautions for the Maintenance of Linear Guide Rails

1. The standard products of linear guides have been filled with high-quality lubricants (lubricating oil or soap-based grease) in the sliders before shipment. After installation and trial operation but before formal operation, please lubricate the sliders again. When lubricating, please use the same type of soap-based lubricant.
2. The standard products of linear guides are coated with anti-rust oil around the surface before shipment. If the guide rails are cleaned during installation, please apply a layer of appropriate lubricating oil around the surface of the guide rails again when the machine equipment is fully installed (please use compatible lubricants).
3. Since the slider of the linear guide is composed of many plastic parts, please avoid contact or immersion with organic solvents when cleaning to prevent product damage.
4. Foreign objects entering the slider is one of the causes of slider failure and damage, and should be avoided.
5. Disassembling the components of the linear guide rail at will may cause foreign objects to enter the slider or reduce the accuracy of the linear guide rail. Do not disassemble the linear guide rail at will.
6. Improperly inclined linear guides may cause the slider to slide out of the guide due to its own weight. Please keep the linear guide in a horizontal position when moving it.
7. Dropping or colliding with the linear guide may damage its normal function. Please avoid causing improper dropping or collision to the linear guide.
8. For use in special environments, please apply appropriate surface treatment or contact WODTOP.
9. The allowable ambient temperature range for self-lubricating linear guides (E2 type) is -10°C to 50°C ; while for linear guides with metal end caps (SE type), the maximum allowable ambient temperature is 150°C . In addition, the maximum allowable ambient temperature for general linear guides is 100°C .
10. For other detailed explanations, please refer to the technical catalog. If you have any other questions or problems in use, please contact WODTOP.

Product series

To serve customers and meet their diverse product demands, in addition to the WHG series that is applicable to the general machine tool industry, we have also developed the WEG series, which is more suitable for the automation industry, as well as the WGN/WGM series, which are suitable for the micro-mechanical semiconductor industry.

(1) Series type

Table 7 Series Type Summary Table

Series	Combined height	Load type	Square-shaped	Flange type		
			Lockable type	Lockable type	Locking type	Top and bottom locking type
WHG	Tall type	Heavy load	WHGH-CA	-	-	-
		Excessive load	WHGH-HA	-	-	-
	Low-profile type	Heavy load	WHGL-CA	WHGW-CA	WHGW-CB	WHGW-CC
		Excessive load	WHGL-HA	WHGW-HA	WHGW-HB	WHGW-HC
WEG	Low-profile type	Medium load	WEGH-SA	WEGW-SA	WEGW-SB	-
		Heavy load	WEGH-CA	WEGW-CA	WEGW-CB	-
WGN	-	Standard type	WGN-S	-	-	-
		Extended type	WGN-H	-	-	-
WGW	-	Standard type	WGW-S	-	-	-
		Extended type	WGW-H	-	-	-

(2) Series accuracy grades

Table 8 Series Type Summary Table

Series	Non-interchangeable linear guide rails					Interchangeable linear guide rails		
	Ordinary (C)	Tall (H)	Interchangeable linear guide rails (P)	ultra-precision (SP)	ultra-precision (UP)	Ordinary (C)	Tall (H)	Precision (P)
WHG	●	●	●	●	●	●	●	●
WEG	●	●	●	●	●	●	●	●
WGN	●	●	●	-	-	●	●	●
WGW	●	●	●	-	-	●	●	●

(3) Series accuracy grades

Table 9 Series Pre-press Level Master Table

Series	Non-interchangeable linear guide rails			Interchangeable linear guide rails		
	Common clearance (Z0)	Light preloading (ZA)	Pre-compression in the middle (ZB)	Light preloading (Z0)	Light preloading (ZA)	
WHG	●	●	●	●	●	
WEG	●	●	●	●	●	

Series	Non-interchangeable linear guide rails			Interchangeable linear guide rails		
	Common clearance (Z0)	Light preloading (ZA)	Pre-compression in the middle (ZB)	Common clearance (ZF)	No preloading (Z0)	Light preloading (Z1)
WHG	●	●	●	●	●	●
WEG	●	●	●	●	●	●

(4) Various mechanical application accuracy grades

Purpose		Axial position	Precision grade				
			C	H	P	SP	UP
CNC machine tools	lathe	X			●	●	●
		Z			●	●	
	Milling machine, boring machine	X				●	●
		Y			●	●	
	Integrated processing machine	Z			●	●	
		X			●	●	●
		Y			●	●	●
	Tooling grinding machine	Z			●	●	
		X					●
		Y					●
	Drilling machine	Z					●
		X			●		
		Y			●		
	Grinding machine	Z		●	●		
		X				●	●
		Y			●	●	
	Electrical discharge machining machine	X			●	●	
		Y			●	●	
		Z			●		
	Wire cutting machine	X				●	
		Y				●	
		U			●	●	
		V			●	●	
	Laser processing machine	X			●		
		Y			●		
General machinery	High-speed punch press	X		●	●		
		Y		●	●		
	Special-purpose machine			●	●	●	
	Woodworking machine		●	●			
	Precision mechanical arm				●	●	
	Mechanical Arm (General Grade)		●	●	●		
	Three-dimensional measuring machine					●	●
	Traditional machinery				●		
	Conveyor system		●	●	●		
	X-Y table				●	●	●
	Linear actuator		●	●	●		
	Aerospace load gears			●	●		
	Wing surface controller			●	●		
	valve		●	●			
	Power steering gear			●			
	Glass grinding machine				●	●	
	Surface grinding machine				●		
	Induction heat treatment		●	●			
	Semiconductor equipment				●	●	●
	All-electric injection molding machine		●	●	●		

The WHG series linear guide rails are four-row single arc tooth contact linear guide rails, which integrate the optimized structural design of ultra-heavy load precision linear guide rails. Compared to other linear guide rails, they enhance load and rigidity capabilities; they feature four-direction equal load characteristics and automatic self-alignment functionality, allowing them to absorb assembly errors from the installation surface, thus achieving high precision requirements. The concepts of high precision, high load, high rigidity, and precision have become the trend in the development of industrial products worldwide. The WODTOP four-row ultra-heavy load linear guide rail is a product developed based on this concept.

1、Features of WHG series linear guides

(1)Automatic self-aligning capability

The DF [45°-45°] combination from the arc groove absorbs the deviations during installation through the elastic deformation of the rigid beads and the transfer of contact points. This allows for automatic self-alignment capabilities, resulting in high precision and stable smooth movement, even if there are some deviations in the installation surface.

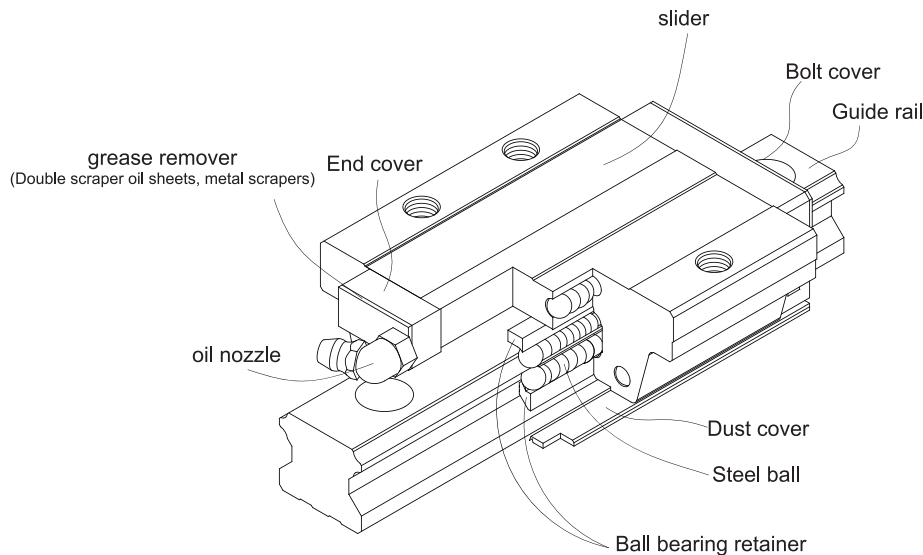
(2)Interchangeable

Due to strict control over production manufacturing precision, the dimensions of the linear guide rails can be maintained at a certain level, and the design of the slider includes a retainer to prevent the steel balls from falling out. Therefore, some series have interchangeable precision, allowing customers to purchase guide rails or sliders as needed, and also to store the guide rails and sliders separately to reduce storage space.

(3)All directions have high rigidity.

By using a four-column arc groove and a 45-degree contact angle with four rows of steel balls, the steel balls achieve an ideal two-point contact structure, capable of withstanding loads from both vertical and horizontal directions; if necessary, pre-pressure can be applied to increase rigidity.

2、WHG Ontology structure

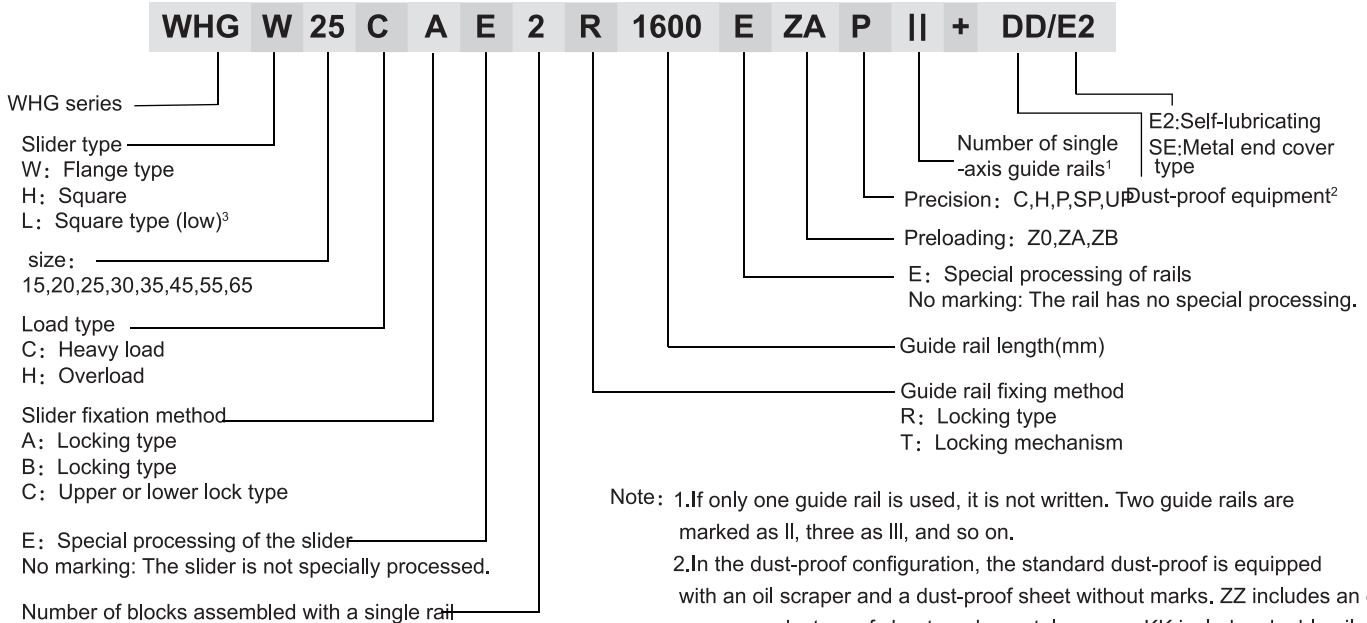


- Rolling loop system: slider, guide rail, end cap, steel balls, steel ball retainer
- Lubrication system: oil nozzle, oil pipe joint
- Dust protection system: oil scraper, bottom sealing dust cover, guide rail bolt cover, metal scraper

3、Product Specification Description

The WHG series is divided into two types of linear guide rails: non-interchangeable and interchangeable. Both have the same specifications and dimensions, but the main difference is that the sliding blocks and rails of the interchangeable type can be used interchangeably, making it more convenient. However, the assembly accuracy of the interchangeable type cannot reach the ultra-high precision of the non-interchangeable type. Nonetheless, due to WODTOP's excellent dimensional control and strict quality requirements in manufacturing, the assembly accuracy of the interchangeable type has currently reached a certain level. For customers who do not require paired installation of linear guide rails, this is a great choice. The product specifications and model numbers of linear guide rails primarily indicate the dimensions, types, accuracy levels, pre-pressure, and other specifications required, to facilitate confirmation of the product by both parties when ordering.

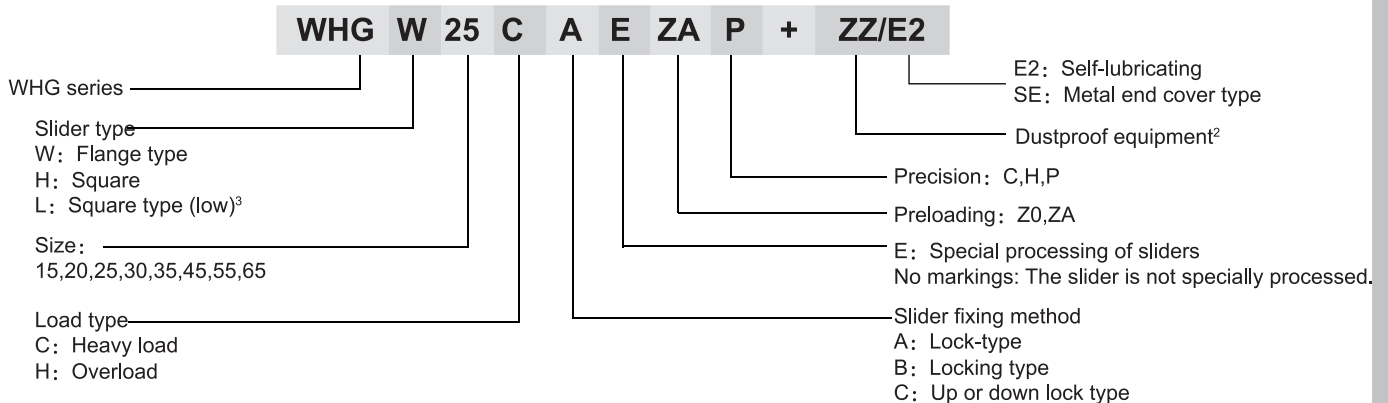
(1)Non-interchangeable linear guide rail product model



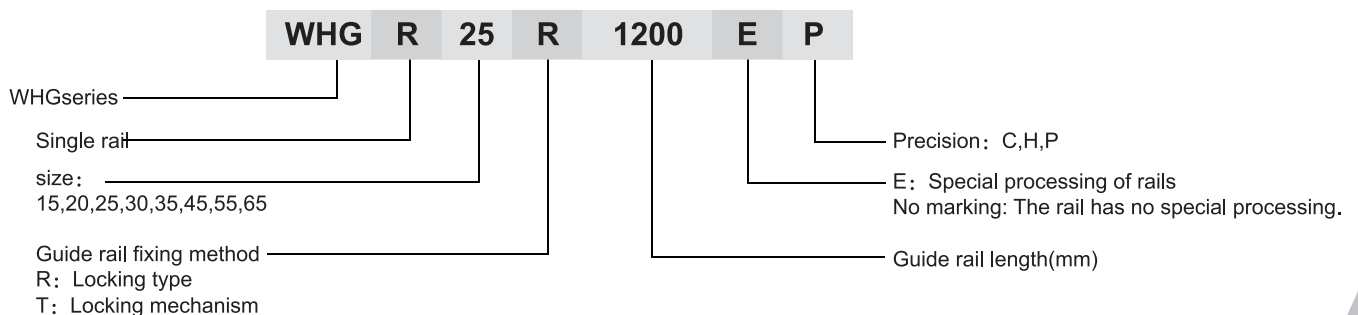
Note: 1.If only one guide rail is used, it is not written. Two guide rails are marked as II, three as III, and so on.
2.In the dust-proof configuration, the standard dust-proof is equipped with an oil scraper and a dust-proof sheet without marks. ZZ includes an oil scraper, a dust-proof sheet, and a metal scraper. KK includes double oil scrapers, a dust-proof sheet, and a metal scraper. DD includes double oil scrapers and a dust-proof sheet.
3.The slider type L is a low assembly slider in a square shape H, and its combination height is consistent with that of the flange type of the same size.

(2)Interchangeable linear guide rail product models

○ Interchangeable slider product model



○ Interchangeable rail product model

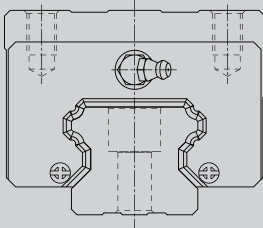
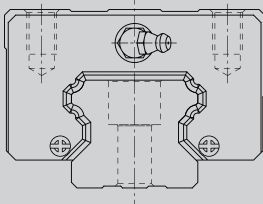
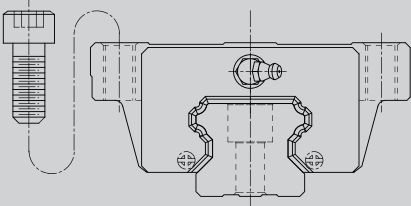
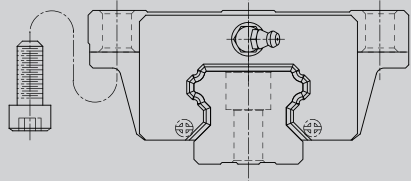
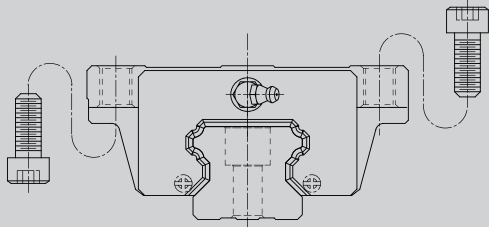


4、WHG series type

(1)Slider type

WODTOP offers two types of linear guides: flange type and square type. The square type linear guides are divided into H-type and L-type, with the L-type being a low-assembly linear guide of the H-type. Its combined height is consistent with that of the flange type linear guide.

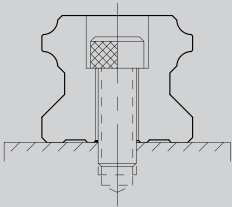
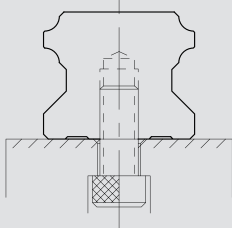
Table 1-1 Slider Type

Model	Specification	shape	Height dimensions (mm)	Guide rail length (mm)	Application device
Square	WHGH-CA WHGH-HA		28 ↓ 90	100 ↓ 4000	○ Machining Center ○ Machine tool ○ Precision machining machine ○ Heavy cutting machine tool ○ Marble cutting machine ○ grinder ○ Injection molding machine ○ Punching machine ○ automation device ○ transportation equipment ○ Measuring instrument
	WHGL-CA WHGL-HA		24 ↓ 70	100 ↓ 4000	
Flange type	WHGW-CA WHGW-HA		24 ↓ 90	100 ↓ 4000	
	WHGW-CB WHGW-HB		24 ↓ 90	100 ↓ 4000	
	WHGW-CC WHGW-HC		24 ↓ 90	100 ↓ 4000	

(2)Guide rail type

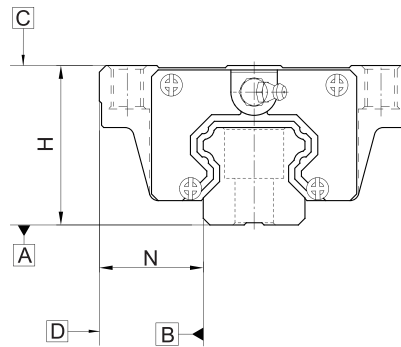
In addition to the standard lock-type bolt hole guide rails, WODTOP also offers under-lock screw hole guide rails for the convenience of customer installation and use.

Table 1-2 Guide Type

Locking bolt hole	Locking screw hole
	

5、WHG series accuracy levels

The accuracy of the WHG series linear guide rails is divided into five levels: ordinary, high, precision, ultra-precision, and ultra-high precision. Customers can choose the accuracy according to the precision requirements of their equipment.



(1)Non-interchangeable linear guide rail precision

Table 1-3 Assembly Precision Table

Unit: mm

Model	WHG-15,20				
Accuracy level	Regular level (C)	Advanced (H)	Precision level (P)	Ultra Precision Level(C(SP))	Ultra high precision grade(UP)
Allowable size error of height H	± 0.1	± 0.03	0 -0.03	0 -0.015	0 -0.008
Permissible dimensional tolerance of width N	± 0.1	± 0.03	0 -0.03	0 -0.015	0 -0.008
Mutual error of paired height H	0.02	0.01	0.006	0.004	0.003
Mutual errors of paired width N	0.02	0.01	0.006	0.004	0.003
The traveling parallelism of slider C facing the surface of guide rail A.	Walking parallelism (see Table 1-11)				
The traveling parallelism of slider D facing the surface of guide rail B.	Walking parallelism (see Table 1-11)				

Table 1-4 Assembly Precision Table

Unit: mm

Model	WHG-25,30,35				
Accuracy level	Regular level (C)	Advanced (H)	Precision level (P)	Ultra Precision Level(C(SP))	Ultra high precision grade(UP)
Permissible dimensional tolerance of height H	± 0.1	± 0.04	0 -0.04	0 -0.02	0 -0.01
Permissible size tolerance of width N	± 0.1	± 0.04	0 -0.04	0 -0.02	0 -0.01
Mutual error of paired height H	0.02	0.015	0.007	0.005	0.003
Mutual errors of paired width N	0.03	0.015	0.007	0.005	0.003
The traveling parallelism of slider C facing the surface of guide rail A.	Walking parallelism (see Table 1-11)				
The traveling parallelism of slider D facing the surface of guide rail B.	Walking parallelism (refer to Table 1-11)				

Table 1-5 Assembly Precision Table

Unit: mm

Model	WHG-45,55				
Accuracy level	Regular level (C)	Advanced (H)	Precision level (P)	Ultra Precision LevelC(SP)	Ultra high precision grade(UP)
Permissible dimensional tolerance of height H	±0.1	±0.05	0 -0.05	0 -0.03	0 -0.02
Permissible size tolerance of width N	±0.1	±0.05	0 -0.05	0 -0.03	0 -0.02
Mutual error of paired height H	0.03	0.015	0.007	0.005	0.003
Mutual errors of paired width N	0.03	0.02	0.01	0.007	0.005
The traveling parallelism of slider C facing the surface of guide rail A.	Walking parallelism (see Table 1-11)				
The traveling parallelism of slider D facing the surface of guide rail B.	Walking parallelism (refer to Table 1-11)				

Table 1-6 Assembly Precision TableC

Unit: mm

Model	WHG-65				
Accuracy level	Regular level (C)	Advanced (H)	Precision level (P)	Ultra Precision LevelC(SP)	Ultra high precision grade(UP)
Permissible dimensional tolerance of height H	±0.1	±0.07	0 -0.07	0 -0.05	0 -0.03
Permissible size tolerance of width N	±0.1	±0.07	0 -0.07	0 -0.05	0 -0.03
Mutual error of paired height H	0.03	0.02	0.01	0.007	0.005
Mutual errors of paired width N	0.03	0.025	0.015	0.01	0.007
The traveling parallelism of slider C facing the surface of guide rail A.	Walking parallelism (see Table 1-11)				
The traveling parallelism of slider D facing the surface of guide rail B.	Walking parallelism (refer to Table 1-11)				

(2)Interchangeable linear guide rail accuracy

Table 1-7 Single Item Precision Table

Unit: mm

Model	WHG-15,20		
Accuracy level	Regular level (C)	Advanced (H)	Precision level (P)
Permissible dimensional tolerance of height H	±0.1	±0.03	±0.015
Permissible size tolerance of width N	±0.1	±0.03	±0.015
Mutual error of paired height H	0.02	0.01	0.006
Mutual errors of paired width N	0.02	0.01	0.006
The traveling parallelism of slider C facing the surface of guide rail A.	Walking parallelism (see Table 1-11)		
The traveling parallelism of slider D facing the surface of guide rail B.	Walking parallelism (refer to Table 1-11)		

Table 1-8 Single Item Precision Table

Unit: mm

Model	WHG-25,30,35		
Accuracy level	Regular level (C)	Advanced (H)	Precision level (P)
Permissible dimensional tolerance of height H	±0.1	±0.04	±0.02
Permissible size tolerance of width N	±0.1	±0.04	±0.02
Mutual error of paired height H	0.02	0.015	0.007
Mutual errors of paired width N	0.03	0.015	0.007
The traveling parallelism of slider C facing the surface of guide rail A.	Walking parallelism (see Table 1-11)		
The traveling parallelism of slider D facing the surface of guide rail B.	Walking parallelism (refer to Table 1-11)		

Table 1-9 Single Piece Accuracy Table

Unit: mm

Model	WHG-45,55		
Accuracy level	Regular level (C)	Advanced (H)	Precision level (P)
Permissible dimensional tolerance of height H	±0.1	±0.05	±0.025
Permissible size tolerance of width N	±0.1	±0.05	±0.025
Mutual error of paired height H	0.03	0.015	0.007
Mutual errors of paired width N	0.03	0.02	0.01
The traveling parallelism of slider C facing the surface of guide rail A.	Walking parallelism (see Table 1-11)		
The traveling parallelism of slider D facing the surface of guide rail B.	Walking parallelism (refer to Table 1-11)		

Table 1-10 Single Piece Accuracy Table

Unit: mm

Model	WHG-65		
Accuracy level	Regular level (C)	Advanced (H)	Precision level (P)
Permissible dimensional tolerance of height H	±0.1	±0.07	±0.035
Permissible size tolerance of width N	±0.1	±0.07	±0.035
Mutual error of paired height H	0.03	0.02	0.01
Mutual errors of paired width N	0.03	0.025	0.015
The traveling parallelism of slider C facing the surface of guide rail A.	Walking parallelism (see Table 1-11)		
The traveling parallelism of slider D facing the surface of guide rail B.	Walking parallelism (refer to Table 1-11)		

(3) Walking parallelism accuracy

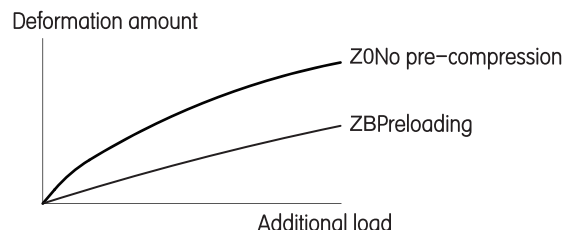
Table 1-11 Walking Parallelism Precision Table

Guide rail length(mm)	Accuracy level(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、pre-stress

(1)Definition of pre-stress

Pre-load is the force applied to the steel balls in advance, which means increasing the diameter of the steel balls and applying pre-load through the negative clearance between the steel balls and the rail. This action can improve the rigidity of the linear guide and eliminate gaps; as explained in the diagram to the right, increasing the pre-load can enhance the rigidity of the linear guide. However, for smaller specifications, it is recommended to use light pre-load to avoid reducing its service life due to excessive pre-load.



(2)Preloading Level

The WHG series linear guides offer three standard preloads, allowing you to choose the appropriate preload based on the application.

Table 1-12 Pre-compression Level

Preloading Level	mark	pre-stress	Terms of use	Scope of use
No pre-pressure	Z0	0~0.02C	The load direction is fixed and the impact is small, with low accuracy requirements.	Conveying devices, automatic packaging machines, automated industrial machinery, general industrial machinery's XY axis, welding machines, fusing machines, tool exchanging devices.
Preloading	ZA	0.05C~0.07C	Light load and high precision requirements	General industrial machinery Z-axis, electric discharge machine, NC lathe, precision XY platform, measuring device, machining center, vertical machining center, industrial robots, automatic coating machine, various high-speed material supply devices.
Heavy Preloading	ZB	0.10C~0.12C	Rigid requirements, and under conditions of vibration and impact.	Machining center, grinding machine, NC lathe, vertical or horizontal milling machine, Z-axis of the machine tool, heavy cutting processing machine

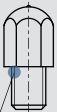
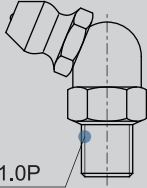
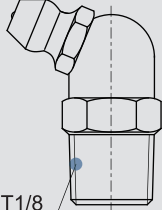
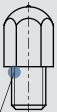
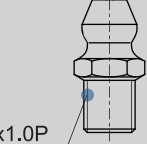
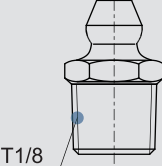
Level	Interchangeable linear rail (single output part)	Non-interchangeable rail track (assembly)
Preloading Level	Z0,ZA	Z0,ZA,ZB

Non-interchangeable rail track (assembly)

7、Lubrication method

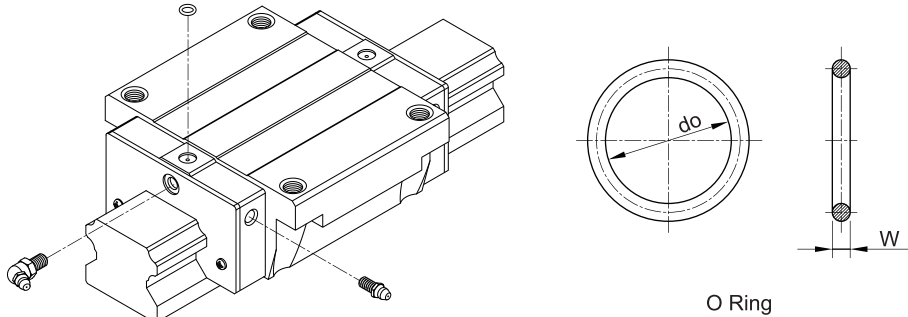
(1)Lubricating grease

○ Nozzle type

 M4x0.7P WHG15	 M6x1.0P WHG20 WHG25 WHG30 WHG35	 PT1/8 WHG45 WHG55 WHG65
 M4x0.7P WHG15	 M6x1.0P WHG20 WHG25 WHG30 WHG35	 PT1/8 WHG45 WHG55 WHG65

Oil nozzle position

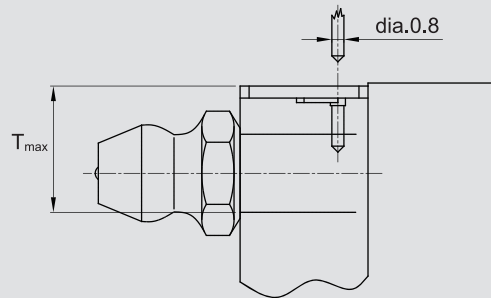
According to customer needs, a grease fitting can be installed at the front or rear end of the slider for manual greasing. The WHG series particularly reserves a side oil hole position on the side of the end cap for installing the grease fitting (usually a straight grease fitting) to provide lateral greasing. It is recommended that the lateral greasing position be on the non-side reference edge, but if there are special requirements, it can also be placed on the side reference edge. If customers have such lateral greasing needs, please contact us. For linear guides that automatically supply lubricating grease using a connecting pipe, the type of connecting pipe can be used to select the appropriate oil pipe joint.



O Ring

Table 1-13 O-Ring Specifications and Maximum Allowable Hole Depth

Specification	O-Ring Specification		Maximum allowable perforation depth T_{max} (mm)
	do(mm)	W(mm)	
WHG15	2.5±0.15	1.5±0.15	3.75
WHG20	4.5±0.15	1.5±0.15	5.7
WHG25	4.5±0.15	1.5±0.15	5.8
WHG30	4.5±0.15	1.5±0.15	6.3
WHG35	4.5±0.15	1.5±0.15	8.8
WHG45	4.5±0.15	1.5±0.15	8.2
WHG55	4.5±0.15	1.5±0.15	11.8
WHG65	4.5±0.15	1.5±0.15	10.8



The single slider is filled with lubricant grease.

Table 1-14 Volume of lubricant grease for a single slider

Specification	Heavy load (cm ³)	Overload (cm ³)	Specification	Heavy load (cm ³)	Overload (cm ³)
WHG15	1	-	WHG35	10	12
WHG20	2	3	WHG45	17	21
WHG25	5	6	WHG55	26	33
WHG30	7	8	WHG65	50	61

Lubrication frequency

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

(2)Lubricating oil

It is recommended to use lubricant with a viscosity of about 30~150 cSt to lubricate linear guides. Customers can inform us if they need oil lubrication, and the linear guides will not be filled with grease before shipment.

Oil pipe joint type

LF-64 WHG15	LF-76 WHG20 WHG25 WHG30 WHG35	LF-78 WHG45 WHG55 WHG65
SF-64 WHG15	LF-86 WHG20 WHG25 WHG30 WHG35	LF-88 WHG45 WHG55 WHG65
	SF-76 WHG20 WHG25 WHG30 WHG35	SF-78 WHG45 WHG55 WHG65
	SF-86 WHG20 WHG25 WHG30 WHG35	SF-88 WHG45 WHG55 WHG65

○Fuel supply rate

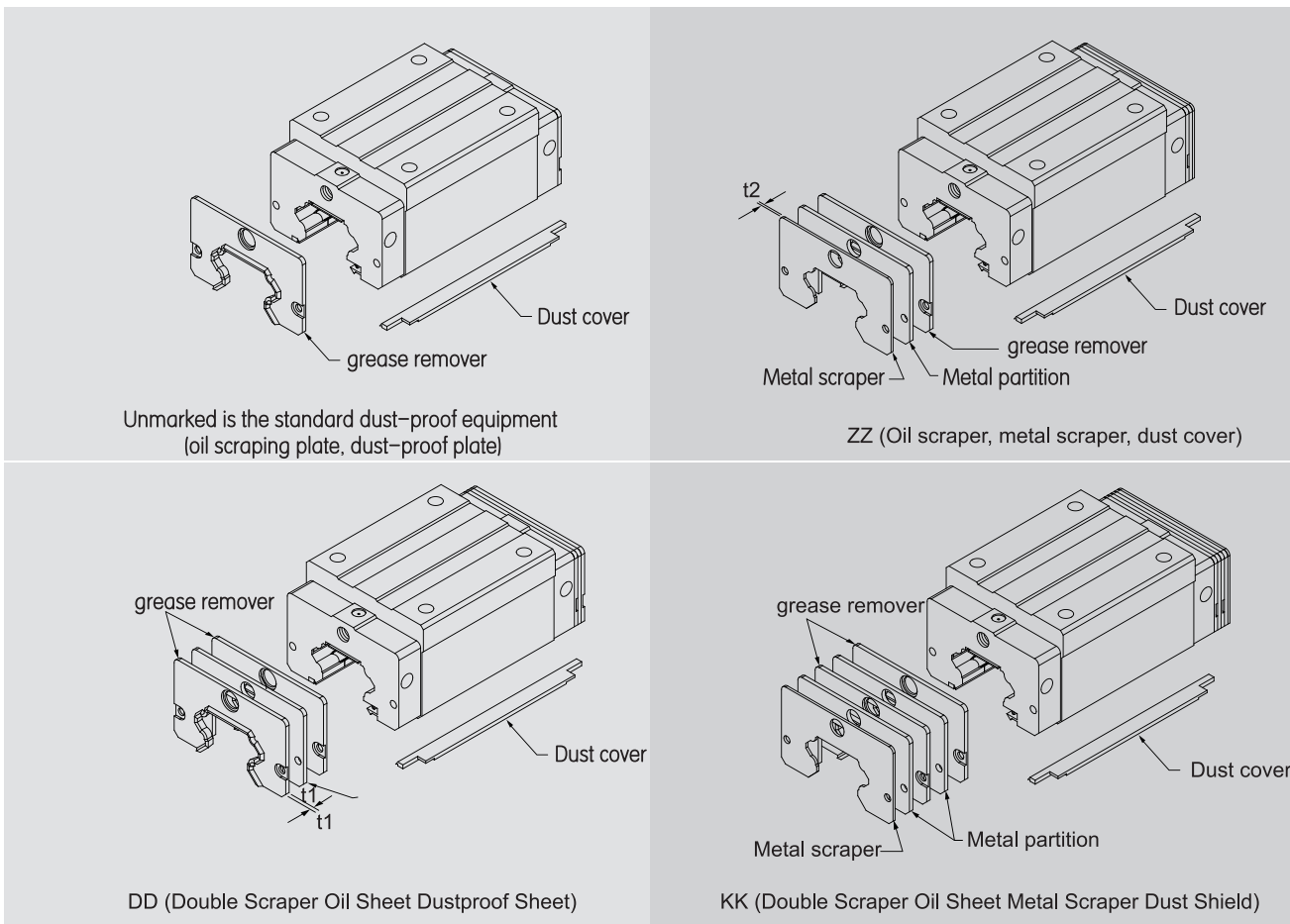
Table 1-15 Fuel Supply Rate

Specification	Fuel supply rate (cm ³ /hr)	Specification	Fuel supply rate (cm ³ /hr)
WHG15	0.2	WHG35	0.3
WHG20	0.2	WHG45	0.4
WHG25	0.3	WHG55	0.5
WHG30	0.3	WHG65	0.6

8、Dust-proof equipment

(1)Standard dustproof equipment code

Generally used in work environments without special requirements. If there is a need for the following dust-proof accessories, please add the code after the product model.



Note: WHG20/WHG25/WHG65 have no metal partition configuration.

(2) Dustproof equipment instructions

● Oil scraper and bottom dust-proof strip

Preventing processed metal shavings or dust particles from entering the slide block can damage the surface of the rail and reduce the lifespan of the linear guide.

● Double-layer oil scraper

Double chip removal effect, even in heavy cutting environments, foreign objects are completely expelled outside the slider.

Table 1-16 Thickness of Oil Scraper Blade

Specification	Increase thickness(t1) (mm)	Specification	Increase thickness(t1) (mm)
WHG15 ES	3	WHG35 ES	3.2
WHG20 ES	3.5	WHG45 ES	4.5
WHG25 ES	3.5	WHG55 ES	4.5
WHG30 ES	3.2	WHG65 ES	6

● Metal scraper

Can isolate high-temperature iron filings or processing sparks, and eliminate large volume impurities.

Table 1-17 Metal Scraper Thickness

Specification	Increase thickness (t2) (mm)	Specification	Increase thickness (t2) (mm)
WHG15 SC	1.5	WHG35 SC	1.5
WHG20 SC	1.5	WHG45 SC	1.5
WHG25 SC	1.5	WHG55 SC	1.5
WHG30 SC	1.5	WHG65 SC	1.5

● Rail bolt cover

To prevent cutting powder or foreign objects from entering the interior of the slide block through the bolt holes and affecting precision, the customer must insert the bolt caps into the bolt holes when installing the guide rails. Each guide rail is supplied with a bolt cap upon leaving the factory.

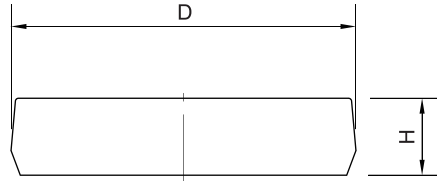


Table 1-18 Guide Rail Bolt Cover

Rail specifications	Install the screws	Diameter (D) (mm)	Thickness (H) (mm)	Rail specifications	Install the screws	Diameter (D) (mm)	Thickness (H) (mm)
WHGR15	M4	7.65	1.1	WHGR35	M8	14.20	3.5
WHGR20	M5	9.65	2.5	WHGR45	M12	20.25	4.5
WHGR25	M6	11.15	2.5	WHGR55	M14	23.25	5.0
WHGR30	M8	14.20	3.5	WHGR65	M16	26.35	5.0

(5) Total length of the dustproof slider code

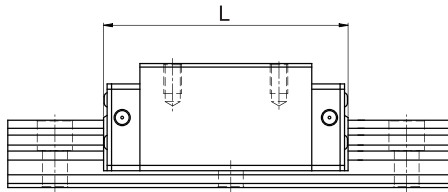


Table 1-19 Total Length of Slider

Unit: mm

Specification	Total length of the slider(L)			
	SS	ZZ	DD	KK
WHG15C	61.4(61.8)	69.0(69.4)	68.0(68.4)	75.6(76.0)
WHG20C	77.5(79.3)	82.5(84.5)	82.5(84.3)	87.5(89.5)
WHG20H	92.2(94.0)	97.2(99.2)	97.5(99.0)	102.2(104.2)
WHG25C	84.0(85.0)	89.0(91.0)	89.0(90.0)	94.0(96.0)
WHG25H	104.6(105.6)	109.6(111.6)	109.6(110.6)	114.6(116.6)
WHG30C	97.4(99.4)	105.4(107.4)	104.8(106.8)	112.8(110.8)
WHG30H	120.4(122.4)	128.4(130.4)	127.8(129.8)	135.8(133.8)
WHG35C	112.4(114.4)	120.4(124.4)	119.8(121.8)	127.8(129.8)
WHG35H	138.2(140.2)	146.2(148.2)	145.6(147.6)	153.6(155.6)
WHG45C	139.4(139.4)	150.0(150.0)	149.4(149.4)	160.0(160.0)
WHG45H	171.2(171.2)	181.8(181.8)	181.2(181.2)	191.8(191.8)
WHG55C	166.7(166.7)	177.1(177.1)	177.1(177.1)	187.5(187.5)
WHG55H	204.8(204.8)	215.2(215.2)	215.2(215.2)	225.5(225.6)
WHG65C	200.2(200.2)	208.2(208.2)	209.2(209.2)	217.2(217.2)
WHG65H	259.6(259.6)	267.6(267.6)	268.6(268.6)	276.6(276.6)

Note: 1. represents the maximum length of the slide block, including screws, oil scraper lip, etc.

9、Frictional force

This resistance value is the maximum resistance of a single oil scraping sheet.

Table 1-20 WHG series oil scraper resistance

Specification	Oil scraper resistanceN(kgf)	Specification	Oil scraper resistanceN(kgf)
WHG15	1.18(0.12)	WHG35	3.04(0.31)
WHG20	1.57(0.16)	WHG45	3.83(0.39)
WHG25	1.96(0.2)	WHG55	4.61(0.47)
WHG30	2.65(0.27)	WHG65	5.79(0.59)

Note: 1kgf=9.81N

10、Installation plane error

The WHG series is an arc two-point contact linear guide, and its auto-aligning feature can absorb slight errors in the installation surface without affecting the smoothness of linear motion. The allowable error values for the installation surface are indicated in the table below:

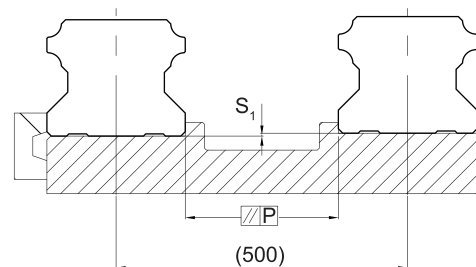


Table 1-21 Allowable Parallelism Tolerance (P)

Unit: mm

Specification	Preloading		
	Z0Preloading	ZAPreloading	ZBPreloading
WHG15	25	18	13
WHG20	25	20	18
WHG25	30	22	20
WHG30	40	30	27
WHG35	50	35	30
WHG45	60	40	35
WHG55	70	50	45
WHG65	80	60	55

Table 1-21 Allowable vertical and horizontal level deviation (S_1)

Unit: mm

Specification	Preloading		
	Z0Preloading	ZAPreloading	ZBPreloading
WHG15	130	85	35
WHG20	130	85	50
WHG25	130	85	70
WHG30	170	110	90
WHG35	210	150	120
WHG45	250	170	140
WHG55	300	210	170
WHG65	350	250	200

Note: Allowable values are proportional to the distance between axes.

11、Installation Precautions

(1) Installation shoulder height and bevel

When installing linear guides, it is crucial to pay attention to the condition of the mounting surface shoulder. If the chamfer is too large or there are protruding areas, it can easily lead to poor accuracy of the linear guide. If the height is too high, it will interfere with the slider. Therefore, if the recommended requirements for the shoulder of the mounting surface can be followed, poor installation accuracy can be eliminated.

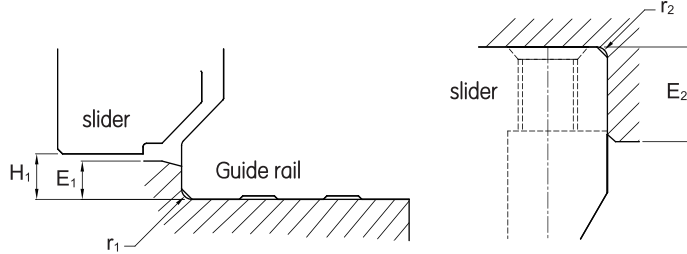


Table 1-23 Shoulder Height and Chamfer

Specification	Maximum radius of the end of the guide rail r_1 (mm)	Maximum corner radius of the slider end r_2 (mm)	Rail end shoulder height E_1 (mm)	Slider end shoulder height E_2 (mm)	Net height of the slider operation H_1 (mm)
WHG15	0.5	0.5	3.0	4.0	4.3
WHG20	0.5	0.5	3.5	5.0	4.6
WHG25	1.0	1.0	5.0	5.0	5.5
WHG30	1.0	1.0	5.0	5.0	6.0
WHG35	1.0	1.0	6.0	6.0	7.5
WHG45	1.0	1.0	8.0	8.0	9.5
WHG55	1.5	1.5	10.0	10.0	13.0
WHG65	1.5	1.5	10.0	10.0	15.0

(2) Torque value of the guide rail assembly screws

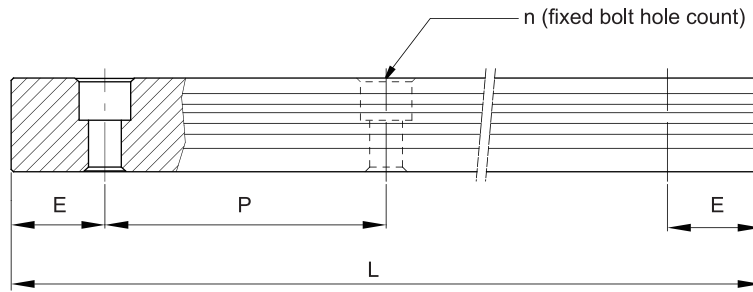
Whether the guide rails are tightly locked to the reference surface affects the accuracy of the linear guide rails significantly. Therefore, to ensure that each screw can be tightened, it is recommended to use the following torque values for assembling the screws.

Table 1-24 Torque Values

Specification	Screw specifications	Torque value N-cm(kgf-cm)		
		Iron material	Casting material	Aluminum alloy material
WHG15	M4x0.7Px16L	392(40)	274(28)	206(21)
WHG20	M5x0.8Px16L	883(90)	588(60)	441(45)
WHG25	M6x1Px20L	1373(140)	921(94)	686(70)
WHG30	M8x1.25Px25L	3041(310)	2010(205)	1470(150)
WHG35	M8x1.25Px25L	3041(310)	2010(205)	1470(150)
WHG45	M12x1.75Px35L	11772(1200)	7840(800)	5880(600)
WHG55	M14x2Px45L	15696(1600)	10500(1100)	7840(800)
WHG65	M16x2Px50L	19620(2000)	13100(1350)	9800(1000)

12. Standard length and maximum length of a single rail

WODTOP has standard lengths of guide rails in stock to meet customer demands. If a customer orders non-standard length guide rails, the end face distance E should preferably not exceed 1/2P to prevent instability at the rear of the guide rails after assembly due to an excessively large dimension of E, which could reduce the accuracy of the linear guide rails.



$$L = (n-1) \times P + 2 \times E \quad \text{Eq.2.1}$$

L: Total length of the rail (mm)

n: Number of bolt holes

P: Bolt hole spacing (mm)

E: Distance from bolt hole to the end face (mm)

Table 1-25 Track Length

Unit: mm

Project	WHG15	WHG20	WHG25	WHG30	WHG35	WHG45	WHG55	WHG65
Standard length L(n)	160(3)	220(4)	220(4)	280(4)	280(4)	570(6)	780(7)	1,270(9)
	220(4)	280(5)	280(5)	440(5)	440(5)	885(9)	1,020(9)	1,570(11)
	280(5)	340(6)	340(6)	600(6)	600(6)	1,200(12)	1,260(11)	2,020(14)
	340(6)	460(8)	460(8)	760(10)	760(10)	1,620(16)	1,500(13)	2,620(18)
	460(8)	640(11)	640(11)	1,000(13)	1,000(13)	2,040(20)	1,980(17)	
	640(11)	820(14)	820(14)	1,640(21)	1,640(21)	2,460(24)	2,580(22)	
	820(14)	1,000(17)	1,000(17)	2,040(26)	2,040(26)	2,985(29)	2,940(25)	
		1,240(21)	1,240(21)	2,520(32)	2,520(32)			
			1,600(27)	3,000(38)	3,000(38)			
Spacing(P)	60	60	60	80	80	105	120	150
Standard Spacing(E _s)	20	20	20	20	20	22.5	30	35
Maximum length of standard end distance	4,000(67)	4,000(67)	4,000(67)	3,960(50)	3,960(50)	3,930(38)	3,900(33)	3,970(27)
Maximum length	4,000	4,000	4,000	4,000	4,000	4,000	4,000	4,000

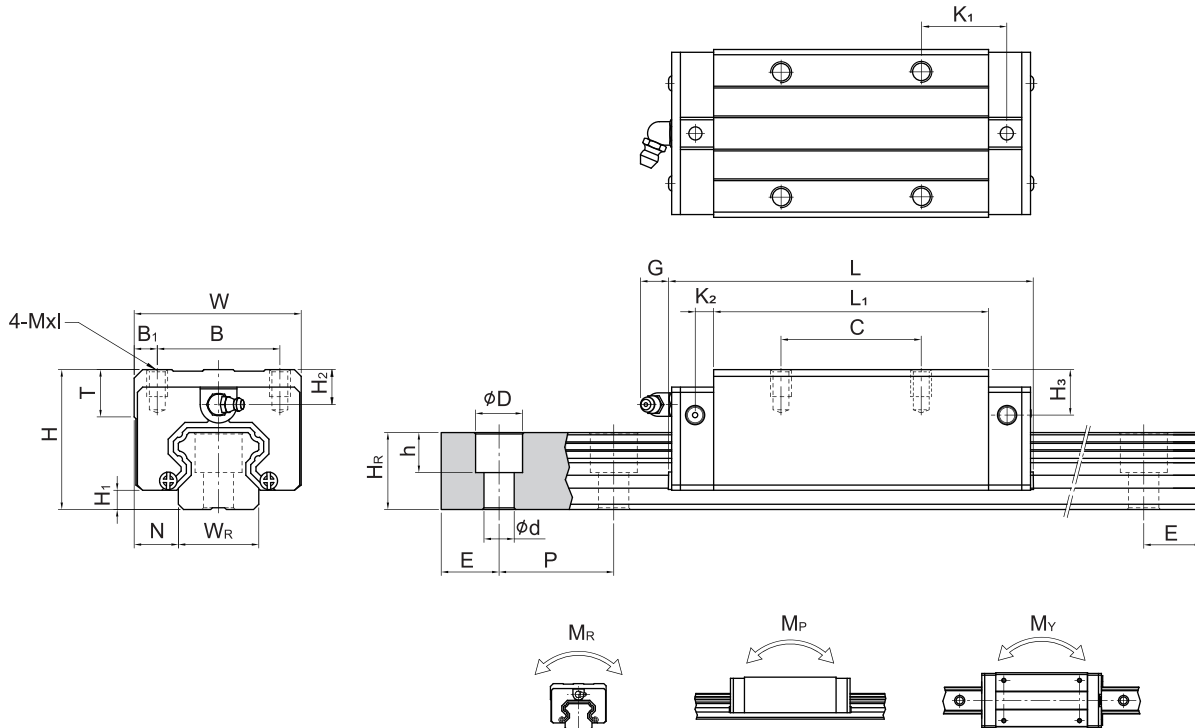
Note: 1. The general tolerance for the E dimension of the guide rail is 0.5 ~ -0.5 mm, while the tolerance for the guide rail threaded components' pitch E dimension is stricter at 0 ~ -0.3 mm.

2. The maximum length of the standard pitch refers to the maximum length of the guide rail when both the left and right pitches are the standard pitch.

3. If the customer requires a different E dimension, please contact WODTOP.

13、WHG series linear guide size table

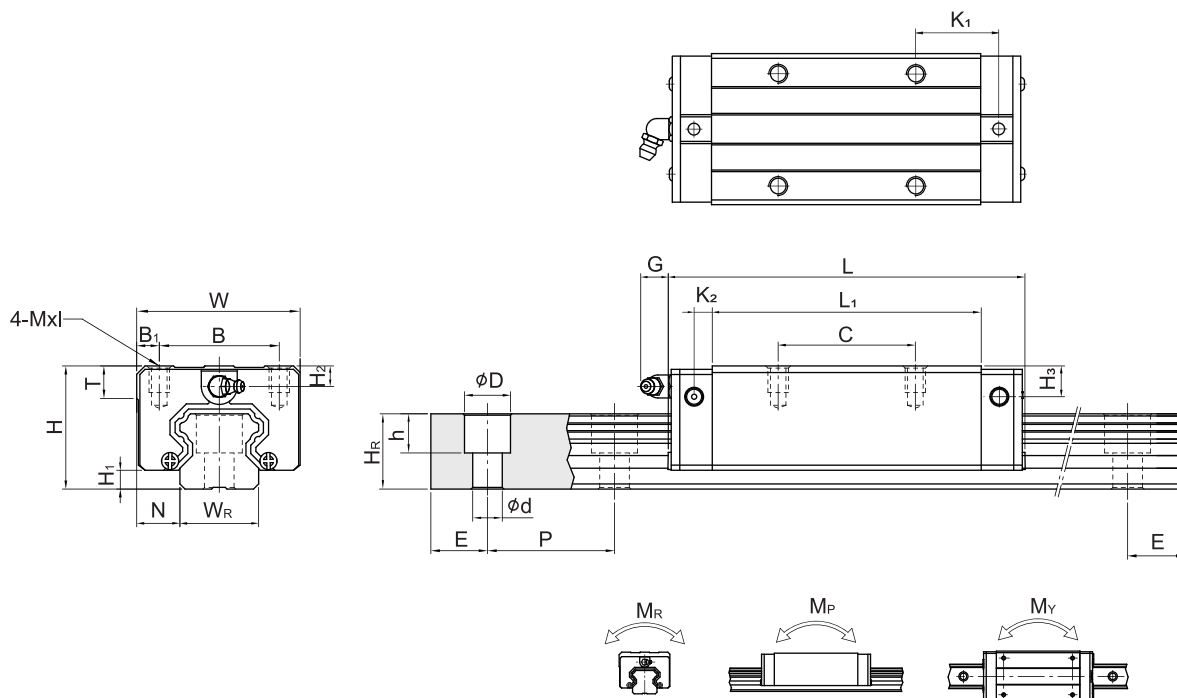
(1)WHGH-CA/WHGH-HA



Model	Component size (mm)			Slider size(mm)													Rail size(mm)										Size of the fixed bolts for the guide rail	Basic dynamic rated load	Basic static rated load	Permissible static moment			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	M _P	M _V	slider	Guide rail			
WHGH 15CA	28	4.3	9.5	34	26	4	26	39.4	61.4	10	4.85	5.3	M4x5	6	7.95	7.7	15	15	7.5	5.3	4.5	60	20	M4x16	14.7	23.47	0.12	0.10	0.10	0.18	1.45			
WHGH 20CA	30	4.6	12	44	32	6	36	50.5	77.5	12.25	6	12	M5x6	8	6	6	20	17.5	9.5	8.5	6	60	20	M5x16	27.1	36.68	0.27	0.20	0.20	0.30	2.21			
WHGH 20HA							50	65.2	92.2	12.6			M6x8	8	10	9	23	22	11	9	7	60	20	M6x20	32.7	47.96	0.35	0.35	0.35	0.39				
WHGH 25CA	40	5.5	12.5	48	35	6.5	35	58	84	15.7	6	12	M6x8	8	10	9	23	22	11	9	7	60	20	M6x20	34.9	52.82	0.42	0.33	0.33	0.51	3.21			
WHGH 25HA							50	78.6	104.6	18.5			M8x10	8.5	9.5	13.8	28	26	14	12	9	80	20	M8x25	42.2	69.07	0.56	0.57	0.57	0.69				
WHGH 30CA	45	6	16	60	40	10	40	70	97.4	20.25	6	12	M8x10	8.5	9.5	13.8	28	26	14	12	9	80	20	M8x25	48.5	71.87	0.66	0.53	0.53	0.88	4.47			
WHGH 30HA							60	93	120.4	21.75			M8x12	10.2	16	19.6	34	29	14	12	9	80	20	M8x25	58.6	93.99	0.88	0.92	0.92	1.16				
WHGH 35CA	55	7.5	18	70	50	10	50	80	112.4	20.6	7	12	M8x12	10.2	16	19.6	34	29	14	12	9	80	20	M8x25	64.6	93.88	1.16	0.81	0.81	1.45	6.30			
WHGH 35HA							72	105.8	138.2	22.5			M10x17	16	18.5	30.5	45	38	20	17	14	105	22.5	M12x35	77.9	122.77	1.54	1.40	1.40	1.92				
WHGH 45CA	70	9.5	20.5	86	60	13	60	97	139.4	23	10	12.9	M10x17	16	18.5	30.5	45	38	20	17	14	105	22.5	M12x35	103.8	146.71	1.98	1.55	1.55	2.73	10.41			
WHGH 45HA							80	128.8	171.2	28.9			M12x18	17.5	22	29	53	44	23	20	16	120	30	M14x45	125.3	191.85	2.63	2.68	2.68	3.61				
WHGH 55CA	80	13	23.5	100	75	12.5	75	117.7	166.7	27.35	11	12.9	M12x18	17.5	22	29	53	44	23	20	16	120	30	M14x45	153.2	211.23	3.69	2.64	2.64	4.17	15.08			
WHGH 55HA							90	155.8	204.8	36.4			M16x20	25	15	15	63	53	26	22	18	150	35	M16x50	184.9	276.23	4.88	4.57	4.57	5.49				
WHGH 65CA	90	15	31.5	126	76	25	70	144.2	200.2	43.1	14	12.9	M16x20	25	15	15	63	53	26	22	18	150	35	M16x50	213.2	287.48	6.65	4.27	4.27	7.00	21.18			
WHGH 65HA							120	203.6	259.6	47.8			M16x20	25	15	15	63	53	26	22	18	150	35	M16x50	277.8	420.17	9.38	7.38	7.38	9.82				

Note: 1 kgf= 9.81N

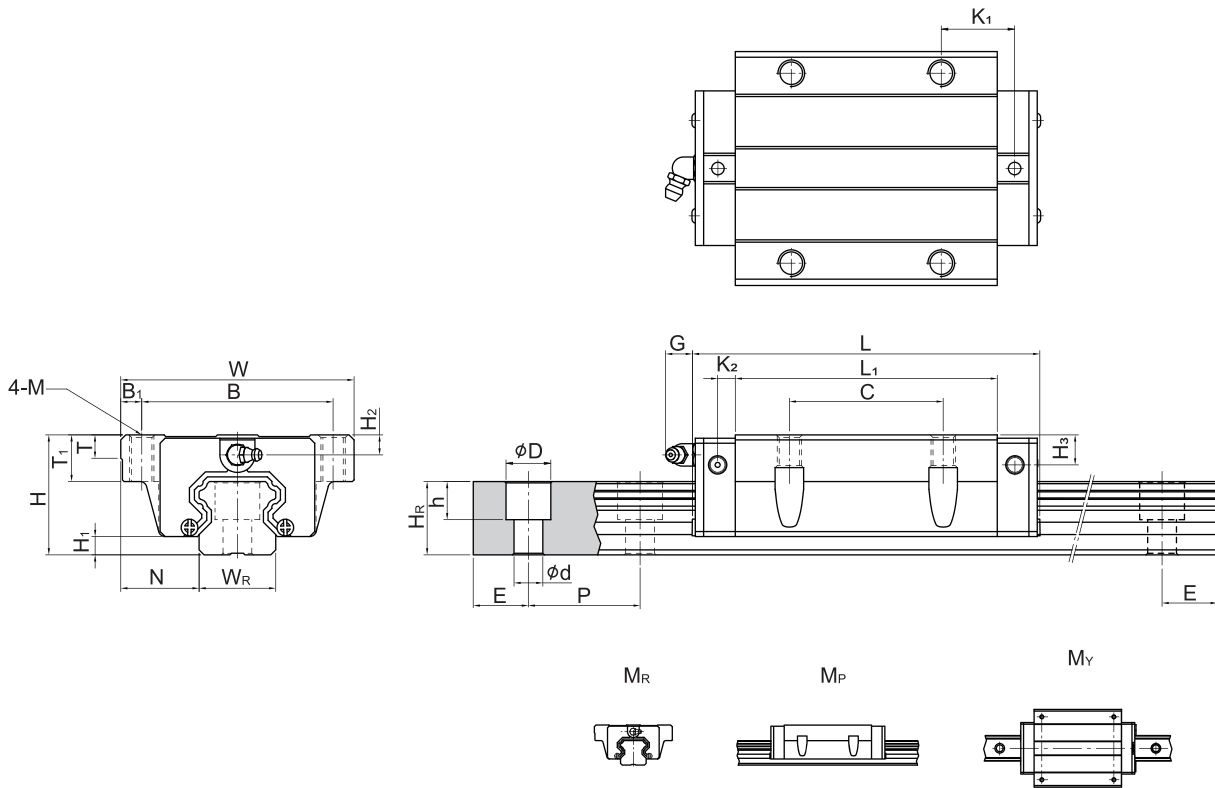
(2)WHGL-CA/WHGL-HA



Model	Component size (mm)			Slider size(mm)															Rail size(mm)							Size of the fixed bolts for the guide rail	Basic dynamic rated load	Basic static rated load	Permissible static moment			Weight	
																													M _R	M _P	M _Y	slider	Guide rail
	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)	kN·m	kN·m	kN·m	kg	kg/m		
WHGL 15CA	24	4.3	9.5	34	26	4	26	39.4	61.4	10	4.85	5.3	M4x4	6	3.95	3.7	15	15	7.5	5.3	4.5	60	20	M4x16	14.7	23.47	0.12	0.10	0.10	0.14	1.45		
WHGL 25CA	36	5.5	12.5	48	35	6.5	35	58	84	15.7	6	12	M6x6	8	6	5	23	22	11	9	7	60	20	M6x20	34.9	52.82	0.42	0.33	0.33	0.42	3.21		
WHGL 25HA							50	78.6	104.6	18.5																						42.2	69.07
WHGL 30CA	42	6	16	60	40	10	40	70	97.4	20.25	6	12	M8x10	8.5	6.5	10.8	28	26	14	12	9	80	20	M8x25	48.5	71.87	0.66	0.53	0.53	0.78	4.47		
WHGL 30HA							60	93	120.421.75																								
WHGL 35CA	48	7.5	18	70	50	10	50	80	112.4	20.6	7	12	M8x12	10.2	9	12.6	34	29	14	12	9	80	20	M8x25	64.6	93.88	1.16	0.81	0.81	1.14	6.30		
WHGL 35HA							72	105.8	138.2	22.5																							
WHGL 45CA	60	9.5	20.5	86	60	13	60	97	139.4	23	10	12.9	M10x17	16	8.5	20.5	45	38	20	17	14	105	22.5	M12x35	103.8	146.71	1.98	1.55	1.55	2.08	10.41		
WHGL 45HA							80	128.8	171.2	28.9																							
WHGL 55CA	70	13	23.5	100	75	12.5	75	117.7	166.727.35		11	12.9	M12x18	17.5	12	19	53	44	23	20	16	120	30	M14x45	153.2	211.23	3.69	2.64	2.64	3.25	15.08		
WHGL 55HA							90	155.8	204.8	36.4																							

Note: 1 kgf= 9.81N

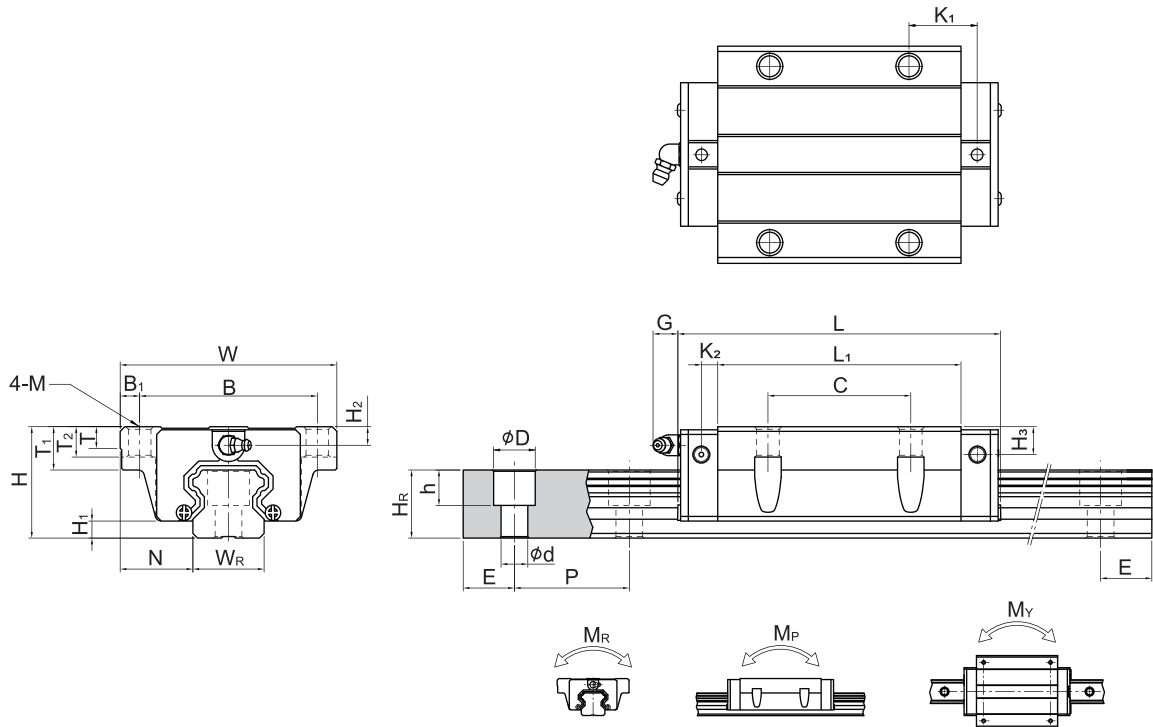
(3)WHGW-CA/WHGW-HA



Model	Component size (mm)			Slider size(mm)															Rail size(mm)							Size of the fixed bolts for the guide rail	Basic dynamic rated load	Basic static rated load	Permissible static moment			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	M _P	M _Y	slider	Guide rail	
WHGW 15CA	24	4.3	16	47	38	4.5	30	39.4	61.4	8	4.85	5.3	M5	6	8.9	3.95	3.7	15	15	7.5	5.3	4.5	60	20	M4x16	14.7	23.47	0.12	0.10	0.10	0.17	1.45	
WHGW 20CA	30	4.6	21.5	63	53	5	40	50.5	77.5	10.25	6	12	M6	8	10	6	6	20	17.5	9.5	8.5	6	60	20	M5x16	27.1	36.68	0.27	0.20	0.20	0.40	2.21	
WHGW 20HA								65.2	92.2	17.6																32.7	47.96	0.35	0.35	0.35	0.52		
WHGW 25CA	36	5.5	23.5	70	57	6.5	45	58	84	10.7	6	12	M8	8	14	6	5	23	22	11	9	7	60	20	M6x20	34.9	52.82	0.42	0.33	0.33	0.51	3.21	
WHGW 25HA								78.6	104.6	21																42.2	69.07	0.56	0.57	0.57	0.80		
WHGW 30CA	42	6	31	90	72	9	52	70	97.4	14.25	6	12	M10	8.5	16	6.5	10.8	28	26	14	12	9	80	20	M8x25	48.5	71.87	0.66	0.53	0.53	1.09	4.47	
WHGW 30HA								93	120.4	25.75																58.6	93.99	0.88	0.92	0.92	1.44		
WHGW 35CA	48	7.5	33	100	82	9	62	80	112.4	14.6	7	12	M10	10.1	18	9	12.6	34	29	14	12	9	80	20	M8x25	64.6	93.88	1.16	0.81	0.81	1.56	6.30	
WHGW 35HA								105.8	138.2	27.5																77.9	122.77	1.54	1.40	1.40	2.06		
WHGW 45CA	60	9.5	37.5	120	100	10	80	97	139.4	13	10	12.9	M12	15.1	22	8.5	20.5	45	38	20	17	14	105	22.5	M12x35	103.8	146.71	1.98	1.55	1.55	2.79	10.41	
WHGW 45HA								128.8	171.2	28.9																125.3	191.85	2.63	2.68	2.68	3.69		
WHGW 55CA	70	13	43.5	140	116	12	95	117.7	166.7	17.35	11	12.9	M14	17.5	26.5	12	19	53	44	23	20	16	120	30	M14x45	153.2	211.23	3.69	2.64	2.64	4.52	15.08	
WHGW 55HA								155.8	204.8	36.4																184.9	276.23	4.88	4.57	4.57	5.96		
WHGW 65CA	90	15	53.5	170	142	14	110	144.2	200.2	23.1	14	12.9	M16	25	37.5	15	15	63	53	26	22	18	150	35	M16x50	213.2	287.48	6.65	4.27	4.27	9.17	21.18	
WHGW 65HA								203.6	259.6	52.8																277.8	420.17	9.38	7.38	7.38	12.89		

Note: 1 kgf= 9.81N

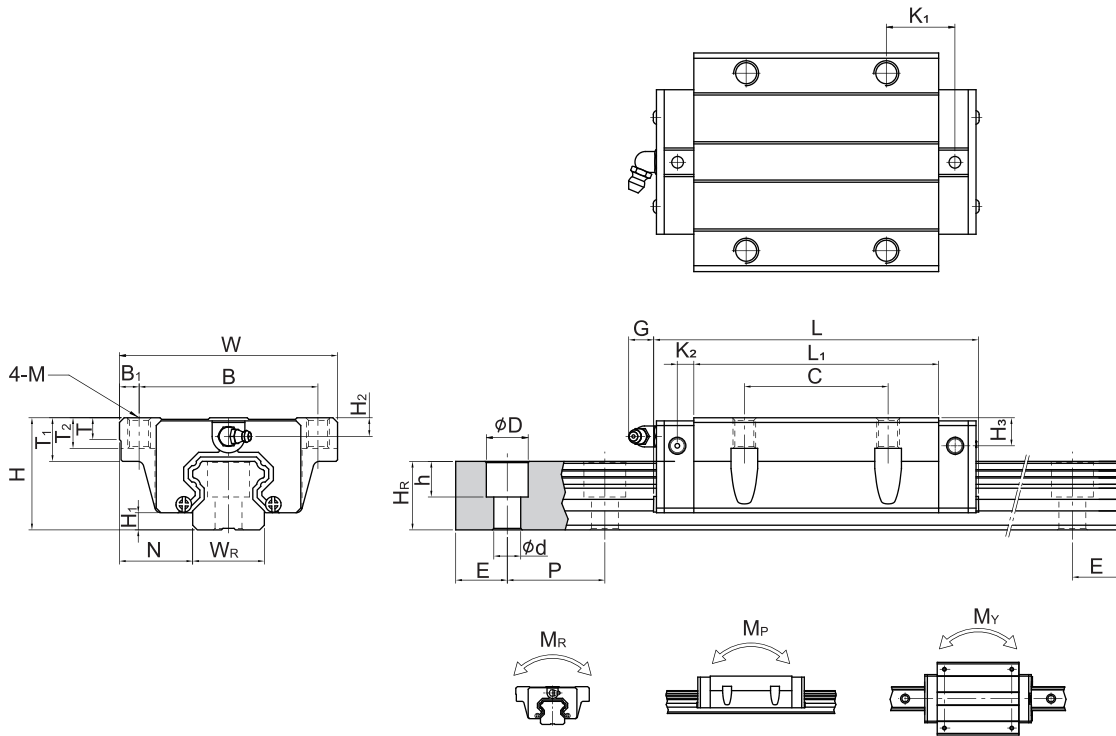
(4)WHGW-CB/WHGW-HB



Model	Component size (mm)			Slider size(mm)															Rail size(mm)								Size of the fixed bolts for the guide rail	Basic dynamic rated load	Basic static rated load	Permissible static moment			Weight	
																														M _R	M _P	M _Y	slider	Guide rail
	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)	kN-m	kN-m	kN-m	kg	kg/m	
WHGW 15CB	24	4.3	16	47	38	4.5	30	39.4	61.4	8	4.85	5.3	ø4.5	6	8.9	6.95	3.95	3.7	15	15	7.5	5.3	4.5	60	20	M4x16	14.7	23.47	0.12	0.10	0.10	0.17	1.45	
WHGW 20CB	30	4.6	21.5	63	53	5	40	50.5	77.5	10.25	6	12	ø6	8	10	9.5	6	6	20	17.5	9.5	8.5	6	60	20	M5x16	27.1	36.68	0.27	0.20	0.20	0.40	2.21	
WHGW 20HB								65.2	92.2	17.6																								
WHGW 25CB	36	5.5	23.5	70	57	6.5	45	58	84	10.7	6	12	ø7	8	14	10	6	5	23	22	11	9	7	60	20	M6x20	34.9	52.82	0.42	0.33	0.33	0.59	3.21	
WHGW 25HB								78.6	104.6	21																								
WHGW 30CB	42	6	31	90	72	9	52	70	97.4	14.25	6	12	ø9	8.5	16	10	6.5	10.8	28	26	14	12	9	80	20	M8x25	48.5	71.87	0.66	0.53	0.53	1.09	4.47	
WHGW 30HB								93	120.4	25.75																								
WHGW 35CB	48	7.5	33	100	82	9	62	80	112.4	14.6	7	12	ø9	10.1	18	13	9	12.6	34	29	14	12	9	80	20	M8x25	64.6	93.88	1.16	0.81	0.81	1.56	6.30	
WHGW 35HB								105.8	138.2	27.5																								
WHGW 45CB	60	9.5	37.5	120	100	10	80	97	139.4	13	10	12.9	ø11	15.1	22	15	8.5	20.5	45	38	20	17	14	105	22.5	M12x35	103.8	146.71	1.98	1.55	1.55	2.79	10.41	
WHGW 45HB								128.8	171.2	28.9																								
WHGW 55CB	70	13	43.5	140	116	12	95	117.7	166.7	17.35	11	12.9	ø14	17.5	26.5	17	12	19	53	44	23	20	16	120	30	M14x45	153.2	211.23	3.69	2.64	2.64	4.52	15.08	
WHGW 55HB								155.8	204.8	36.4																								
WHGW 65CB	90	15	53.5	170	142	14	110	144.2	200.2	23.1	14	12.9	ø16	25	37.5	23	15	15	63	53	26	22	18	150	35	M16x50	213.2	287.48	6.65	4.27	4.27	9.17	21.18	
WHGW 65HB								203.6	259.6	52.8																								

Note: 1 kgf= 9.81N

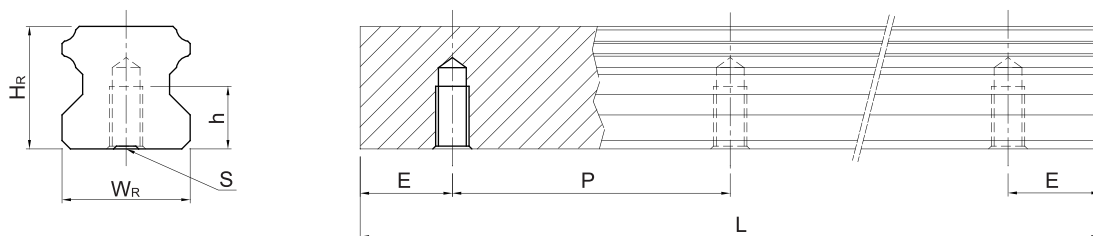
(5)WHGW-CC/WHGW-HC



Model	Component size (mm)			Slider size(mm)															Rail size(mm)										Size of the fixed bolts for the guide rail	Basic dynamic rated load	Basic static rated load	Permissible static moment			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	M _P	M _Y	slider	Guide rail			
WHGW 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	M4x16	14.7	23.47	0.12	0.10	0.10	0.17	1.45			
WHGW 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	M5x16	27.1	36.68	0.27	0.20	0.20	0.40	2.21			
WHGW 20HC								65.2	92.2	17.6																	32.7	47.96	0.35	0.35	0.35	0.52				
WHGW 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	M6x20	34.9	52.82	0.42	0.33	0.33	0.59	3.21			
WHGW 25HC								78.6	104.6	21																	42.2	69.07	0.56	0.57	0.57	0.80				
WHGW 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	M8x25	48.5	71.87	0.66	0.53	0.53	1.09	4.47			
WHGW 30HC								93	120.4	25.75																	58.6	93.99	0.88	0.92	0.92	1.44				
WHGW 35CC	48	7.5	33	100	82	9	62	80	112.4	14.6	7	12	M10	10.1	18	13	9	12.6	34	29	14	12	9	80	20	M8x25	64.6	93.88	1.16	0.81	0.81	1.56	6.30			
WHGW 35HC								105.8	138.2	27.5																	77.9	122.77	1.54	1.40	1.40	2.06				
WHGW 45CC	60	9.5	37.5	120	100	10	80	97	139.4	13	10	12.9	M12	15.1	22	15	8.5	20.5	45	38	20	17	14	105	22.5	M12x35	103.8	146.71	1.98	1.55	1.55	2.79	10.41			
WHGW 45HC								128.8	171.2	28.9																	125.3	191.85	2.63	2.68	2.68	3.69				
WHGW 55CC	70	13	43.5	140	116	12	95	117.7	166.7	17.35	11	12.9	M14	17.5	26.5	17	12	19	53	44	23	20	16	120	30	M14x45	153.2	211.23	3.69	2.64	2.64	4.52	15.08			
WHGW 55HC								155.8	204.8	36.4																	184.9	276.23	4.88	4.57	4.57	5.96				
WHGW 65CC	90	15	53.5	170	142	14	110	144.2	200.2	23.1	14	12.9	M16	25	37.5	23	15	15	63	53	26	22	18	150	35	M16x50	213.2	287.48	6.65	4.27	4.27	9.17	21.18			
WHGW 65HC								203.6	259.6	52.8																	277.8	420.17	9.38	7.38	7.38	12.89				

Note: 1 kgf= 9.81N

(6)WHGR-T Lockable Rail Size Table

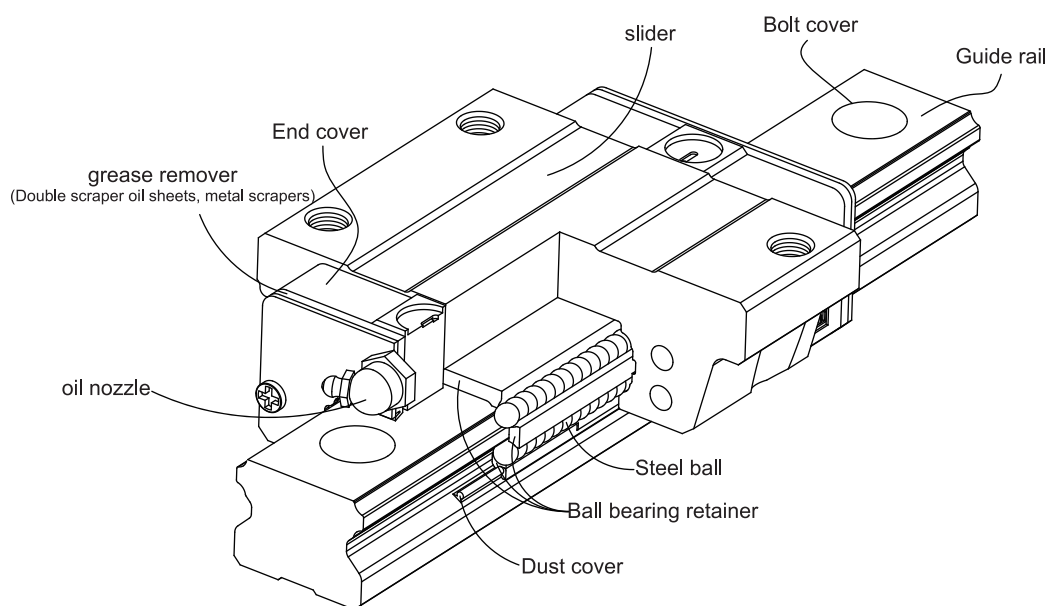


Model	Guide rail dimensions(mm)						Weight (kg/m)
	W _R	H _R	S	h	P	E	
WHGR15T	15	15	M5x0.8P	8	60	20	1.48
WHGR20T	20	17.5	M6x1P	10	60	20	2.29
WHGR25T	23	22	M6x1P	12	60	20	3.35
WHGR30T	28	26	M8x1.25P	15	80	20	4.67
WHGR35T	34	29	M8x1.25P	17	80	20	6.51
WHGR45T	45	38	M12x1.75P	24	105	22.5	10.87
WHGR55T	53	44	M14x2P	24	120	30	15.67
WHGR65T	63	53	M20x2.5P	30	150	35	21.73

1、WEG Features of the WEG series linear guides

The WEG series uses a four-row steel ball bearing design to bear loads, which provides high rigidity and high load capacity. It also has features for equal load distribution in four directions and automatic self-alignment function, allowing it to absorb assembly errors on the installation surface, thus meeting high precision requirements. Additionally, it reduces assembly height and shortens slider length, making it very suitable for the high-speed automation industry and compact equipment with space constraints. The slider is equipped with a steel ball retainer to prevent ball drop; this design not only facilitates customers in installing linear guides but also ensures that there will be no ball drop when the slider is removed. Furthermore, it allows for interchangeability within acceptable precision limits.

2、WEG chassis structure

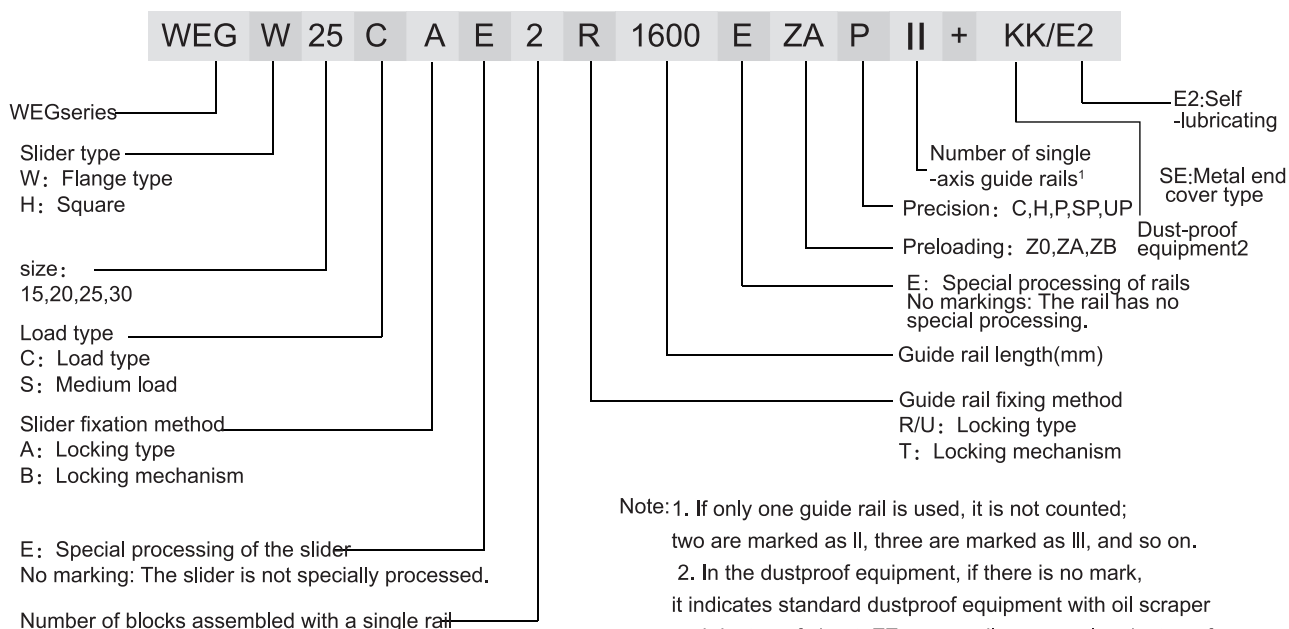


- Rolling loop system: slider, guide rail, end cap, steel balls, steel ball retainer
- Lubrication system: oil nozzle, oil pipe joint
- Dust protection system: oil scraper, bottom sealing dust cover, guide rail bolt cover, metal scraper

3、Product Specification Description

The WEG series is divided into two types of linear guides: non-interchangeable and interchangeable types. Both have the same specifications, but the main difference is that in the interchangeable type, the sliders and guides can be used interchangeably, which is more convenient. However, the assembly precision of the interchangeable type cannot reach the ultra-precision levels of the non-interchangeable type. Nonetheless, since the assembly precision of the WODTOP interchangeable type has now reached a certain standard, it is a convenient choice for customers who do not require paired installation of linear guides. The product specifications primarily indicate the dimensions, type, precision grade, preloading, and other specifications of the linear guides to facilitate confirmation of the products during ordering.

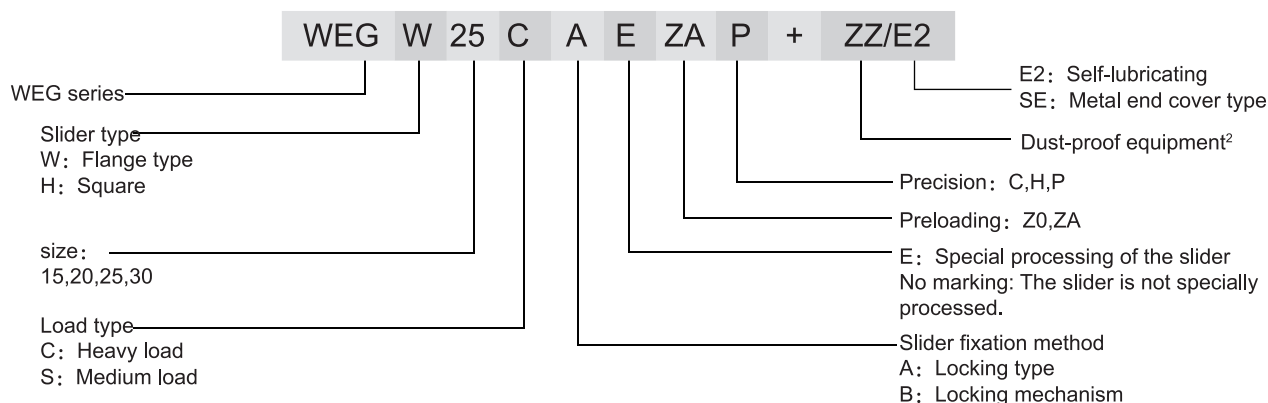
(1)Non-interchangeable linear guide rail product model



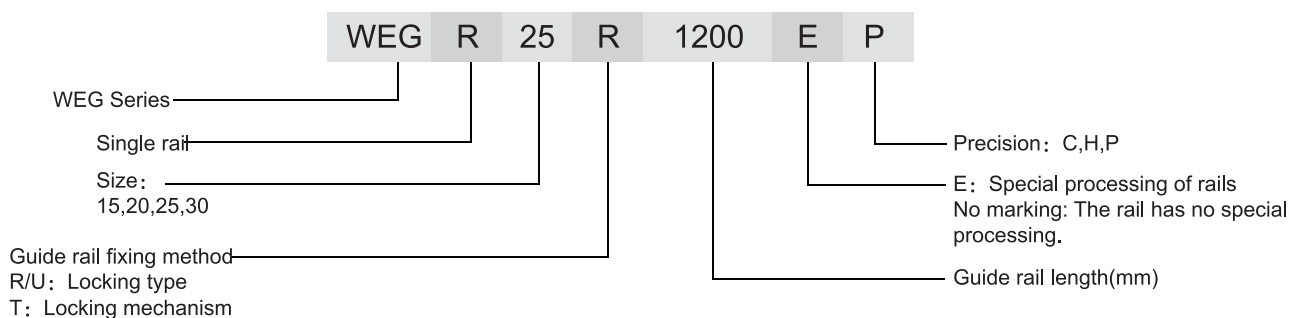
Note: 1. If only one guide rail is used, it is not counted; two are marked as II, three are marked as III, and so on.
2. In the dustproof equipment, if there is no mark, it indicates standard dustproof equipment with oil scraper and dustproof sheet. ZZ means oil scraper plus dustproof sheet plus metal scraper. KK means double oil scrapers plus dustproof sheet plus metal scraper. DD means double oil scrapers plus dustproof sheet.

(2)Interchangeable linear guide rail product model

● Interchangeable slider product model



● Interchangeable rail product model

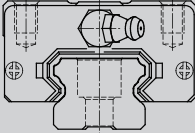
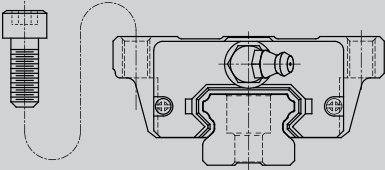
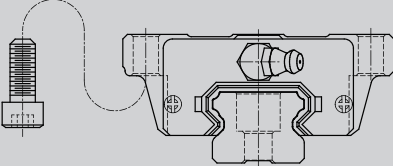


4、WEG series type

(1)Slider type

WODTOP offers two types of linear guides: flange type and square type.

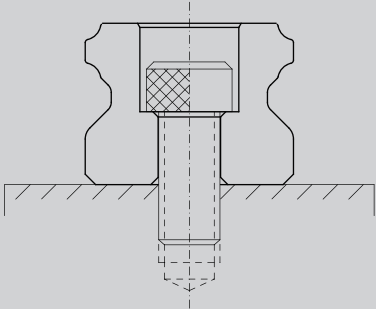
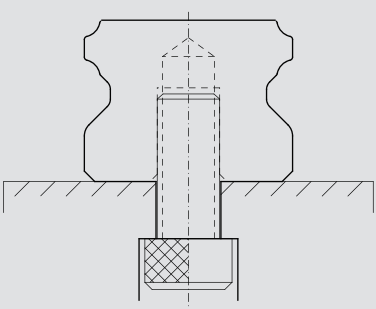
Table 2-1 Slider Type

Model	Specification	shape	Height dimensions (mm)	Guide rail length (mm)	Application device
Square	WEGH-SA WEGH-CA		24	100	○ automation device ○ High-speed transport equipment ○ Precision measuring instruments ○ Semiconductor equipment
			↓	↓	
			48	4000	
Flange type	WEGW-SA WEGW-CA		24	100	
			↓	↓	
			48	4000	
	WEGW-SB WEGW-CB		24	100	
			↓	↓	
			48	4000	

(2)Guide rail type

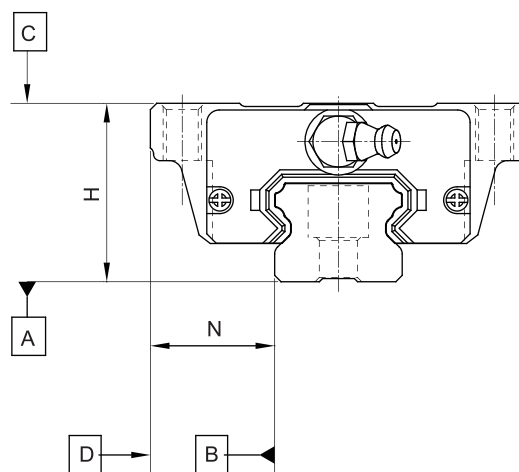
In addition to the standard lock-type bolt hole guide rail, WODTOP also offers a lower lock-type screw hole guide rail, making it convenient for customers to install and use.

Table 2-2 Guide Type

Locking bolt hole	Locking screw hole
	

5. Accuracy level

The accuracy of the WEG series linear guides is divided into five levels: ordinary, high, precision, ultra-precision, and super high precision. Customers can select the accuracy according to their equipment's accuracy requirements.



(1) Non-interchangeable linear guide rail precision

Table 2-3 Assembly Precision Table

Unit: mm

Model	WEG-15,20				
Accuracy level	Basic level (C)	Advanced (H)	Precision level (P)	Ultra Precision Level(SP)	Ultra high precision grade(UP)
Permissible dimensional tolerance of height H	±0.1	±0.03	0 -0.03	0 -0.015	0 -0.008
Permissible dimensional tolerance of width N	±0.1	±0.03	0 -0.03	0 -0.015	0 -0.008
Mutual error of paired height H	0.02	0.01	0.006	0.004	0.003
Mutual errors of paired width N	0.02	0.01	0.006	0.004	0.003
The traveling parallelism of slider C facing the surface of guide rail A.	Walking parallelism (see Table 2-7)				
The traveling parallelism of slider D facing the surface of guide rail B.	Walking parallelism (see Table 2-7)				

Table 2-4 Assembly Precision Table

Unit: mm

Model	WEG-25,30				
Accuracy level	Basic level (C)	Advanced (H)	Precision level (P)	Ultra Precision Level(SP)	Ultra high precision grade(UP)
Permissible dimensional tolerance of height H	±0.1	±0.04	0 -0.04	0 -0.02	0 -0.01
Permissible dimensional tolerance of width N	±0.1	±0.04	0 -0.04	0 -0.02	0 -0.01
Mutual error of paired height H	0.02	0.015	0.007	0.005	0.003
Mutual errors of paired width N	0.03	0.015	0.007	0.005	0.003
The traveling parallelism of slider C facing the surface of guide rail A.	Walking parallelism (see Table 2-7)				
The traveling parallelism of slider D facing the surface of guide rail B.	Walking parallelism (see Table 2-7)				

(2) Interchangeable linear guide rail accuracy

Table 2-5 Single Piece Accuracy Table

Unit: mm

Model	WEG-15,20		
Accuracy level	Basic level (C)	Advanced (H)	Precision level (P)
Permissible dimensional tolerance of height H	±0.1	±0.03	±0.015
Permissible dimensional tolerance of width N	±0.1	±0.03	±0.015
Mutual error of paired height H	0.02	0.01	0.006
Mutual errors of paired width N	0.02	0.01	0.006
The traveling parallelism of slider C facing the surface of guide rail A.	Walking parallelism (see Table 2-7)		
The traveling parallelism of slider D facing the surface of guide rail B.	Walking parallelism (see Table 2-7)		

Table 2-6 Single Piece Accuracy Table

Unit: mm

Model	WEG-25,30		
Accuracy level	Basic level (C)	Advanced (H)	Precision level (P)
Permissible dimensional tolerance of height H	±0.1	±0.04	±0.02
Permissible dimensional tolerance of width N	±0.1	±0.04	±0.02
Mutual error of paired height H	0.02	0.015	0.007
Mutual errors of paired width N	0.03	0.015	0.007
The traveling parallelism of slider C facing the surface of guide rail A.	Walking parallelism (see Table 2-7)		
The traveling parallelism of slider D facing the surface of guide rail B.	Walking parallelism (see Table 2-7)		

(3) Walking parallelism accuracy

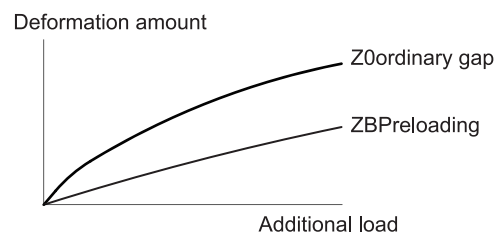
Table 2-7 Walking Parallelism Precision Table

Guide rail length(mm)	Accuracy level(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、pre-stress

(1)Definition of pre-stress

Pre-load is the force applied to the steel balls in advance, which means increasing the diameter of the steel balls and applying pre-load through the negative clearance between the steel balls and the rail. This action can improve the rigidity of the linear guide and eliminate gaps; as explained in the diagram to the right, increasing the pre-load can enhance the rigidity of the linear guide. However, for smaller specifications, it is recommended to use light pre-load to avoid reducing its service life due to excessive pre-load.



(2)Preloading Level

The WEG series linear guides offer three standard preloads, allowing you to choose the appropriate preload based on the application.

Table 2-8 Pre-compression Level

Preloading Level	mark	Pre-stress	Terms of use
ordinary gap	Z0	0~0.02C	The load direction is fixed and the impact is small, with low accuracy requirements.
Light pre-compression	ZA	0.03C~0.05C	Light load and high precision requirements
Preloading	ZB	0.06C~0.08C	Rigid requirements, and the usage environment involves vibrations and impacts.

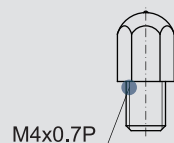
Level	Interchangeable linear rail (single output part)	Non-interchangeable rail track (component)
Preloading Level	Z0,ZA	Z0,ZA,ZB

Note: The preload C is the dynamic rated load.

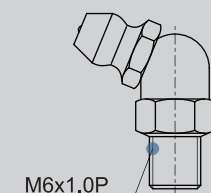
7、Lubrication method

(1)Lubricating grease

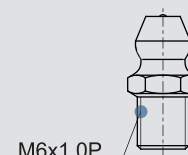
○ Nozzle type



WEG15



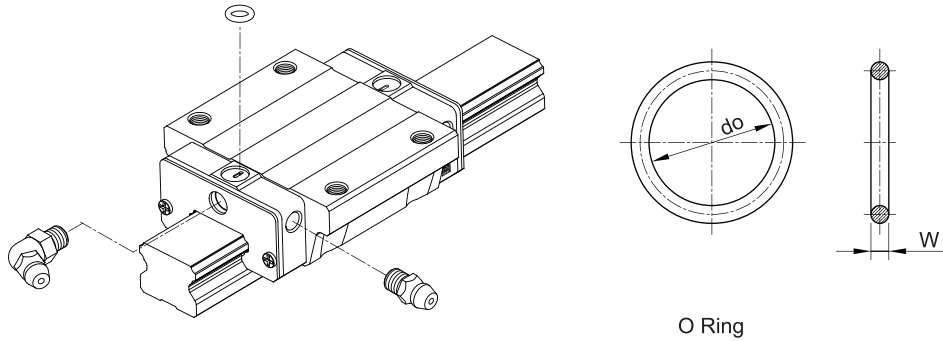
WEG20
WEG25
WEG30



WEG20
WEG25
WEG30

Oil nozzle position

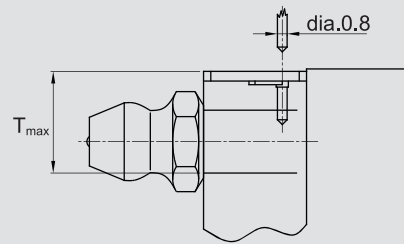
According to customer needs, oil nozzles can be installed at the front or rear end of the slider for manual lubrication. The WEG series specially reserves a side oil hole position on the side of the end cover for installing the oil nozzle (usually a straight oil nozzle), providing lateral lubrication. It is recommended to position the lateral lubrication on the non-side reference edge, but if there are special requirements, it can also be placed on the side reference edge. If customers have the above lateral lubrication needs, please contact us. The WEG series also reserves an upper oil hole position at the top of the end cover. If the customer wishes to supply oil from the top of the end cover, they must use a 0.8mm diameter needle to preheat and puncture the upper hole at the specified position, avoiding using a drill to pierce the upper hole, as debris poses a risk of contaminating the oil channel. For automatic lubrication of linear guides using a connecting pipe, oil pipe connectors can be selected based on the type of connecting pipe.



O Ring

Table 2-9 O-Ring Specifications and Maximum Allowable Hole Depth

Specification	O-Ring Specification		Maximum allowable perforation depth T_{max} (mm)
	do(mm)	W(mm)	
WEG15	2.5±0.15	1.5±0.15	6.9
WEG20	4.5±0.15	1.5±0.15	8.4
WEG25	4.5±0.15	1.5±0.15	10.4
WEG30	4.5±0.15	1.5±0.15	10.4



The single slider is filled with lubricant grease.

Table 2-10 Volume of lubricant grease for a single slider

Specification	Medium load (cm ³)	Heavy load (cm ³)
WEG15	0.8	1.4
WEG20	1.5	2.4
WEG25	2.8	4.6
WEG30	3.7	6.3

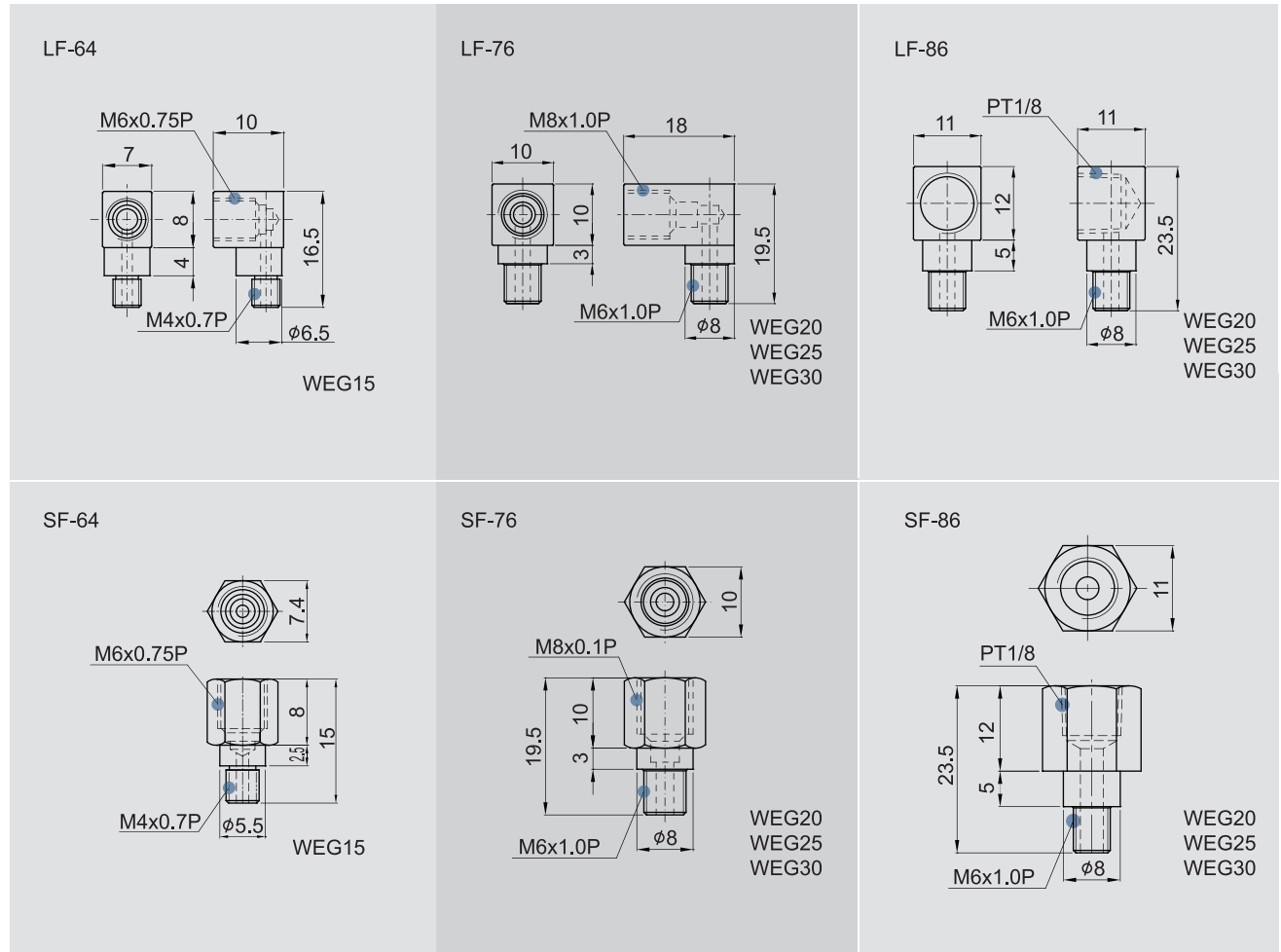
Lubrication frequency

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

(2)Lubricating oil

It is recommended to use lubricant with a viscosity of about 30~150 cSt to lubricate linear guides. Customers can inform us if they need oil lubrication, and the linear guides will not be filled with grease before shipment.

Oil pipe joint type



Fuel supply rate

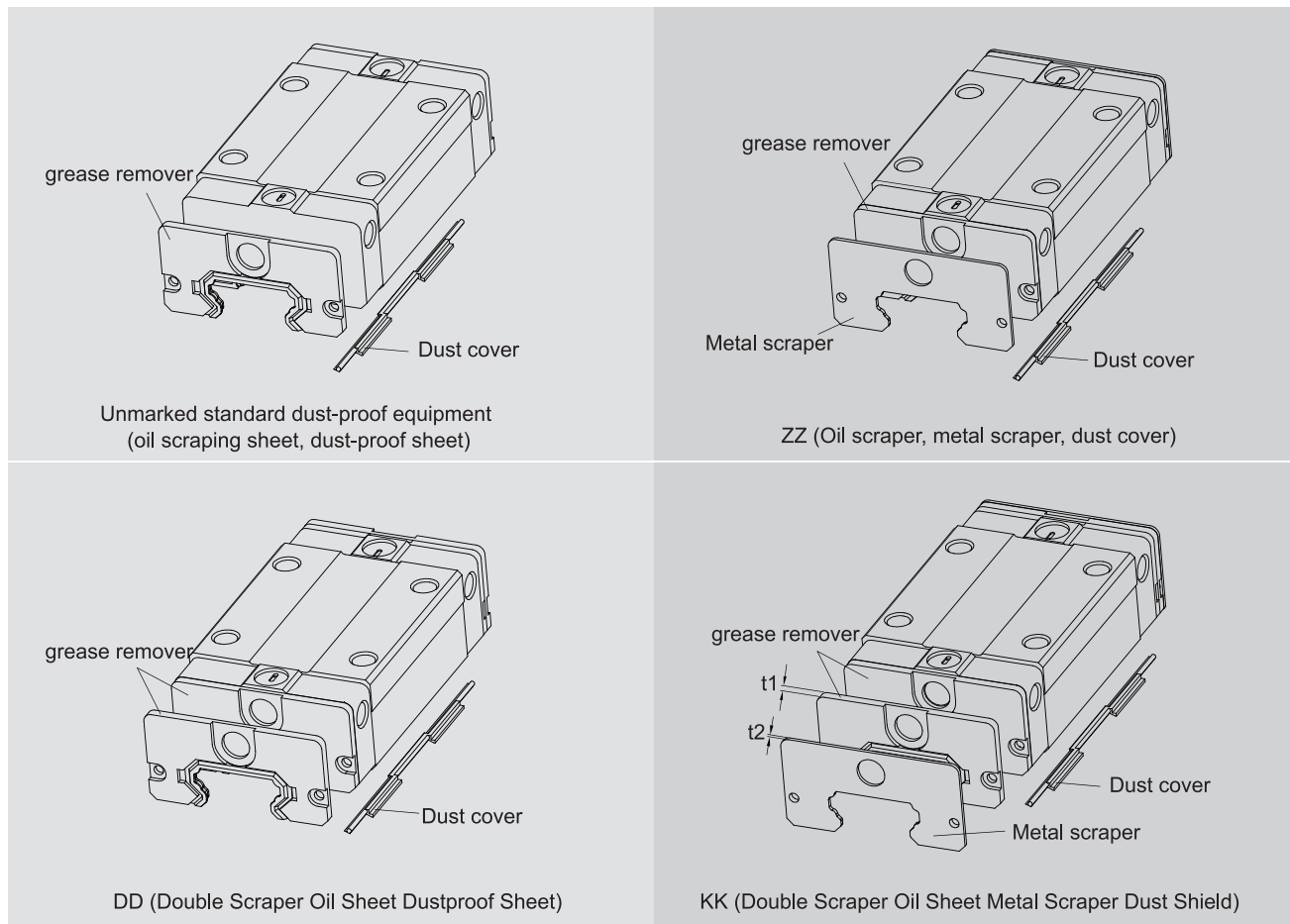
Table 2-11 Fuel Supply Rate

Specification	Fuel supply rate (cm ³ /hr)
WEG15	0.1
WEG20	0.133
WEG25	0.167
WEG30	0.2

8. Dust-proof equipment

(1) Standard dustproof equipment code

If there is a need for the following dust-proof equipment, please add the code after the product model.



(2) Dustproof equipment instructions

- Oil scraper and bottom dust-proof strip
Preventing processed metal shavings or dust particles from entering the slide block can damage the surface of the rail and reduce the lifespan of the linear guide.
- Double-layer oil scraper
Double chip removal effect, even in heavy cutting environments, foreign objects are completely expelled outside the slider.

Table 2-12 Oil Scraper Plate

Specification	Thickness(t1) (mm)
WEG 15 ES	2
WEG 20 ES	2
WEG 25 ES	2
WEG 30 ES	2

● Metal scraper

Can isolate high-temperature iron filings or processing sparks, and eliminate large volume impurities.

Table 2-13 Metal Scraper

Specification	Thickness(t2) (mm)
WEG 15 SC	0.8
WEG 20 SC	0.8
WEG 25 SC	1
WEG 30 SC	1

● Rail bolt cover

To prevent cutting powder or foreign objects from entering the interior of the slide block through the bolt holes and affecting precision, the customer must insert the bolt caps into the bolt holes when installing the guide rails. Each guide rail is supplied with a bolt cap upon leaving the factory.



Table 2-14 Guide Dust Cover

Rail specifications	Install the screws	Diameter(D) (mm)	Thickness(H) (mm)
WEGR15R	M3	6.15	1.2
WEGR20R	M5	9.65	2.5
WEGR25R	M6	11.15	2.5
WEGR30R	M6	11.15	2.5
WEGR15U	M4	7.65	1.1
WEGR30U	M8	14.20	3.5

(3)The total length of the slider for each dust-proof code

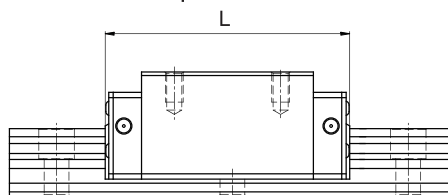


Table 2-15 Total Length of the Slider

Unit: mm

Specification	Total length of the slider(L)			
	SS	ZZ	DD	KK
WEG15S	40.1(42.5)	41.7(46.1)	44.1(46.5)	45.7(50.1)
WEG15C	56.8(59.2)	58.4(62.8)	60.8(63.2)	62.4(66.8)
WEG20S	50.0(54.0)	51.6(57.6)	54.0(58.0)	55.6(61.6)
WEG20C	69.1(73.1)	70.7(76.7)	73.1(77.1)	74.7(80.7)
WEG25S	59.1(63.1)	61.1(67.1)	63.1(67.1)	65.1(71.1)
WEG25C	82.6(86.6)	84.6(90.6)	86.6(90.6)	88.6(94.6)
WEG30S	69.5(73.5)	71.5(77.5)	73.5(77.5)	75.5(81.5)
WEG30C	98.1(102.1)	100.1(106.1)	102.1(106.1)	104.1(110.1)

Note: () is the maximum length of the slider, including screws, oil scraper lip, etc.

9、Frictional force

This resistance value is the maximum resistance of a single oil scraper.

Table 2-16 WEG Series Oil Scraper Resistance

Specification	Oil scraper resistance N(kgf)
WEG15	0.98(0.1)
WEG20	0.98(0.1)
WEG25	0.98(0.1)
WEG30	1.47(0.15)

Note: 1kgf=9.81N

10、Installation plane error

The WHG series is an arc two-point contact linear guide, and its auto-aligning feature can absorb slight errors in the installation surface without affecting the smoothness of linear motion. The allowable error values for the installation plane are indicated in the table below:

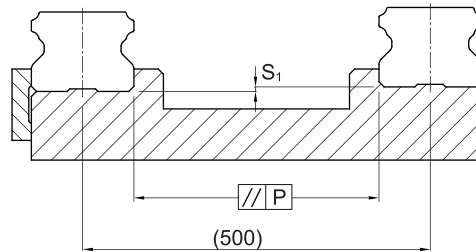


Table 2-17 Allowable Parallelism Tolerance (P)

Unit: mm

Specification	Preloading Level		
	Z0	ZA	ZB
WEG15	25	18	-
WEG20	25	20	18
WEG25	30	22	20
WEG30	40	30	27

Table 2-18 Allowable vertical and horizontal level deviation(S1)

Unit: mm

Specification	Preloading Leve		
	Z0	ZA	ZB
WEG15	130	85	-
WEG20	130	85	50
WEG25	130	85	70
WEG30	170	110	90

Note: Allowable values are proportional to the distance between axes.

11、Installation Precautions

(1) Installation shoulder height and bevel

When installing linear guides, it is essential to pay attention to the condition of the installation face shoulder. If the chamfer is too large or there are protruding areas, it can easily lead to poor accuracy of the linear guide, while too high a height may interfere with the slider. Therefore, if the installation face shoulder can be adjusted according to the recommended requirements, poor installation accuracy can be eliminated.

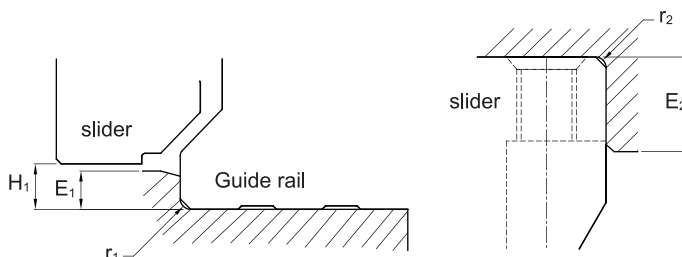


Table 2-19 Shoulder Height and Chamfer

Specification	Maximum radius of the end of the guide rail r ₁ (mm)	Maximum corner radius of the slider end r ₁ (mm)	Rail end shoulder height E ₁ (mm)	Slider endShoulder height E ₂ (mm)	Net height of the slider operation H ₁ (mm)
WEG15	0.5	0.5	2.7	5.0	4.5
WEG20	0.5	0.5	5.0	7.0	6.0
WEG25	1.0	1.0	5.0	7.5	7.0
WEG30	1.0	1.0	7.0	7.0	10.0

(2) Torque value of the guide rail assembly screws

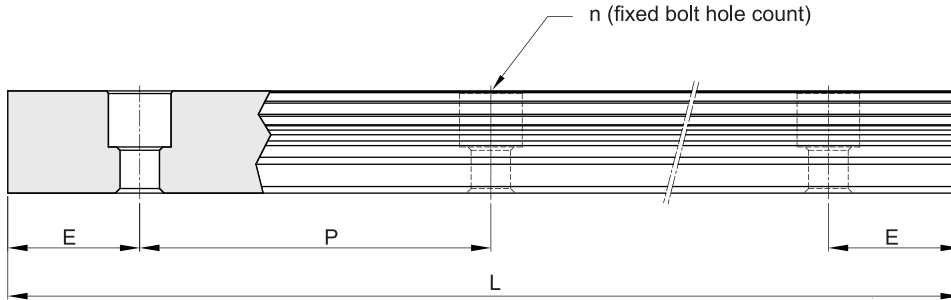
Whether the guide rails are tightly locked to the reference surface affects the accuracy of the linear guide rails significantly. Therefore, to ensure that each screw can be tightened, it is recommended to use the following torque values for assembling the screws.

Table 2-20 Torque Values

Specification	Screw specifications	Torque valueN-cm(kgf-cm)		
		Iron material	Casting material	Aluminum alloy material
WEG15	M3x0.5Px16L	186(19)	127(13)	98(10)
WEG20	M5x0.8Px16L	883(90)	588(60)	441(45)
WEG25	M6x1Px20L	1373(140)	921(94)	686(70)
WEG30	M6x1Px25L	1373(140)	921(94)	686(70)

12. Standard length and maximum length of a single rail

WODTOP has standard length rail inventory to meet customer needs. If customers order non-standard length rails, the dimension of the end face distance E should preferably not exceed 1/2P, to prevent instability at the end of the rail after assembly caused by an oversized dimension E, which would reduce the accuracy of the linear rail.



$$L = (n-1) \times P + 2 \times E \quad \text{Eq.2.1}$$

L: Total length of the rail(mm)

n: Number of bolt holes

P: Bolt hole spacing(mm)

E: Distance from bolt hole to the end face(mm)

Table 2-21 Track Length

Unit: mm

Project	WEGR15	WEGR20	WEGR25	WEGR30
Standard length L(n)	160(3)	220(4)	220(4)	280(4)
	220(4)	280(5)	280(5)	440(6)
	280(5)	340(6)	340(6)	600(8)
	340(6)	460(8)	460(8)	760(10)
	460(8)	640(11)	640(11)	1,000(13)
	640(11)	820(14)	820(14)	1,640(21)
	820(14)	1,000(17)	1,000(17)	2,040(26)
		1,240(21)	1,240(21)	2,520(32)
		1,600(27)	1,600(27)	3,000(38)
Spacing(P)	60	60	60	80
Standard Spacing (Es)	20	20	20	20
Maximum length of standard end distance	4,000(67)	4,000(67)	4,000(67)	3,960(50)
Maximum length	4,000	4,000	4,000	4,000

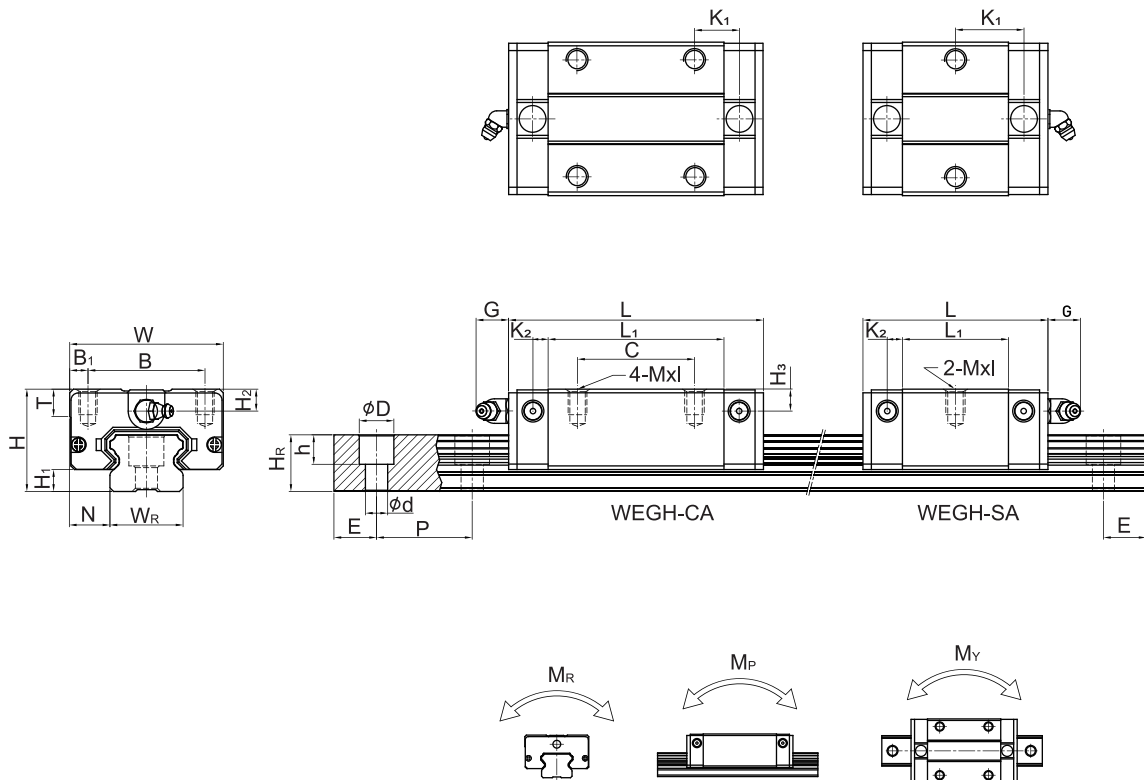
Note: 1. The general tolerance for the E dimension of the guide rail is 0.5 ~ -0.5 mm, while the tolerance for the guide rail threaded components' pitch E dimension is stricter at 0 ~ -0.3 mm.

2. The maximum length of the standard pitch refers to the maximum length of the guide rail when both the left and right pitches are the standard pitch.

3. If the customer requires a different E dimension, please contact WODTOP.

13、WEG Series Linear Guide Size Table

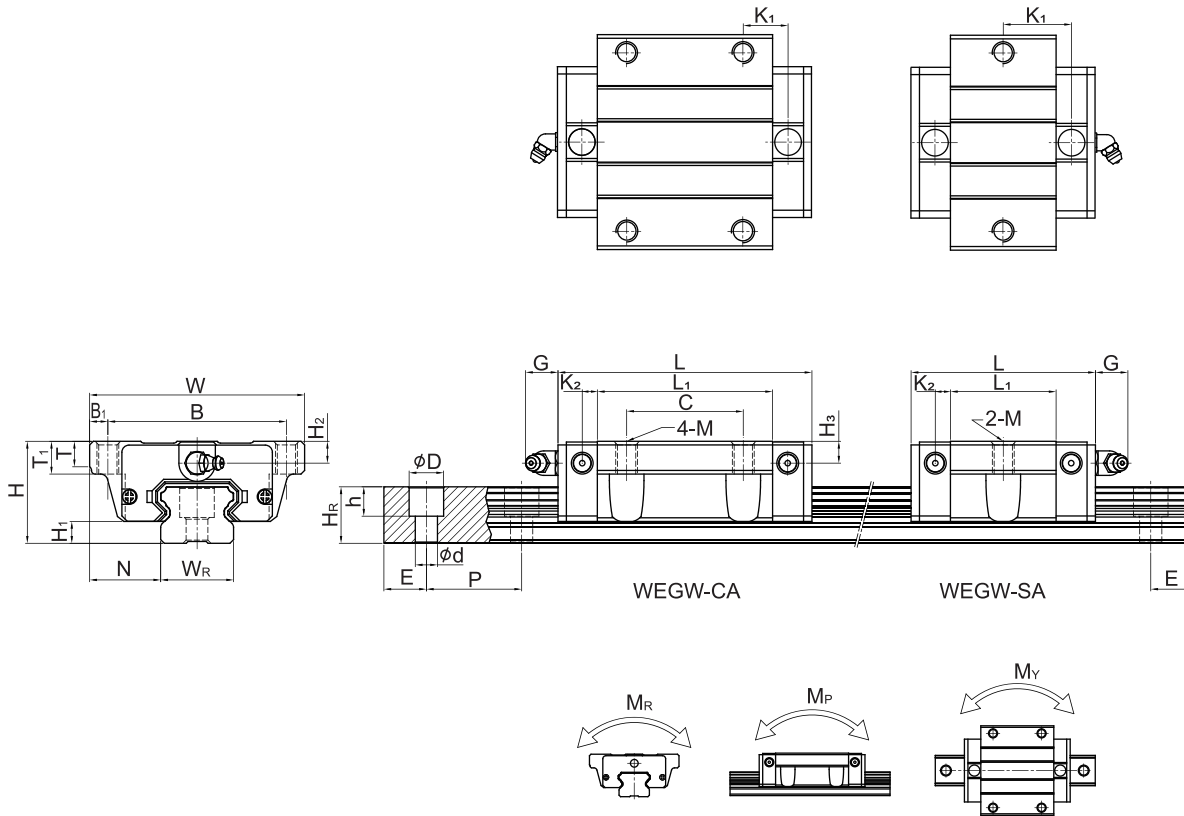
(1)WEGH-SA / WEGH-CA



Model	Component size(mm)			Slider size(mm)														Guide rail dimensions (mm)								Size of the fixed bolt for the guide rail	Basic Motion amount Fixed load	Basic static rated load	Permissible static moment			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	slider kg	Guide rail kg/m		
WEGH15SA	24	4.5	9.5	34	26	4	-	23.1	40.1	14.8	3.5	5.7	M4x6	6	5.5	6	15	12.5	6	4.5	3.5	60	20	M3x16	5.35	9.40	0.08	0.04	0.04	0.09	1.25		
WEGH15CA							26	39.8	56.8	10.15															7.83	16.19	0.13	0.10	0.10	0.15			
WEGH20SA	28	6	11	42	32	5	-	29	50	18.75	4.15	12	M5x7	7.5	6	6	20	15.5	9.5	8.5	6	60	20	M5x16	7.23	12.74	0.13	0.06	0.06	0.15	2.08		
WEGH20CA							32	48.1	69.1	12.3															10.31	21.13	0.22	0.16	0.16	0.24			
WEGH25SA	33	7	12.5	48	35	6.5	-	35.5	59.1	21.9	4.55	12	M6x9	8	8	8	23	18	11	9	7	60	20	M6x20	11.40	19.50	0.23	0.12	0.12	0.25	2.67		
WEGH25CA							35	59	82.6	16.15															16.27	32.40	0.38	0.32	0.32	0.41			
WEGH30SA	42	10	16	60	40	10	-	41.5	69.5	26.75	6	12	M8x12	9	8	9	28	23	11	9	7	80	20	M6x25	16.42	28.10	0.40	0.21	0.21	0.45	4.35		
WEGH30CA							40	70.1	98.1	21.05															23.70	47.46	0.68	0.55	0.55	0.76			

Note: 1 kgf= 9.81N

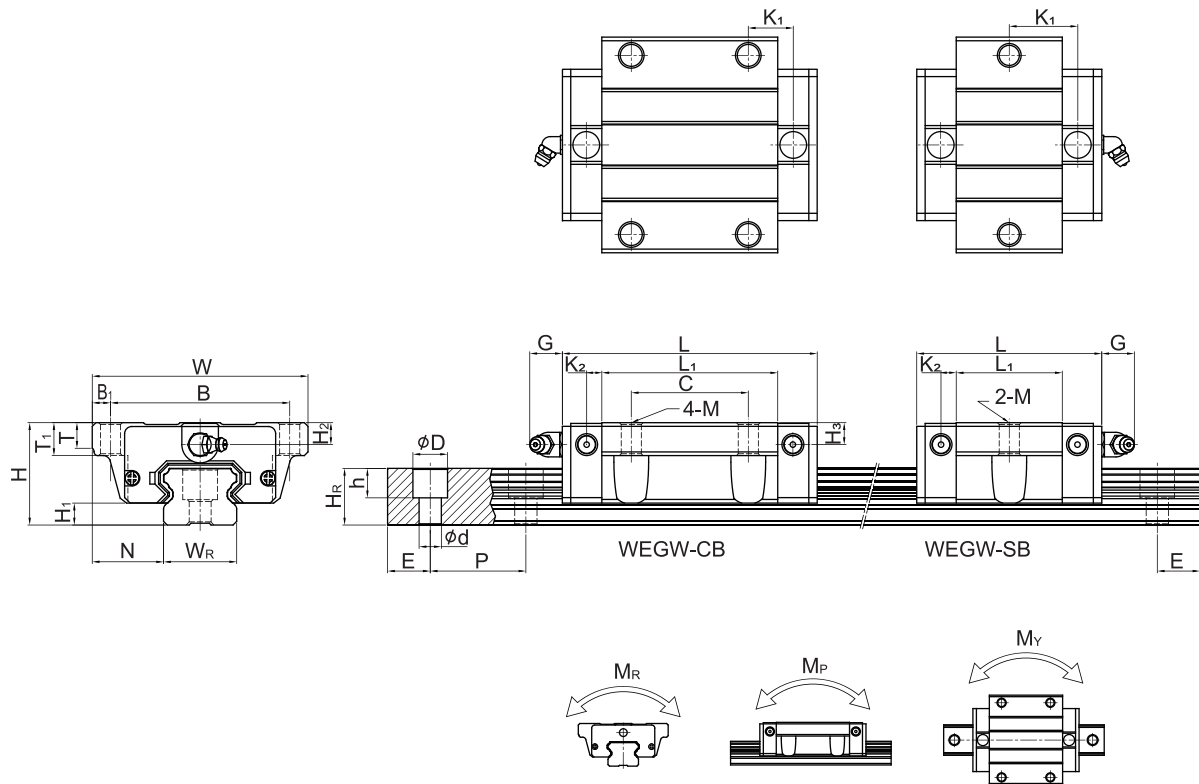
(2)WEGW-SA /WEGW-CA



Model	Component size(mm)			Slider size(mm)															Guide rail dimensions (mm)							Size of the fixed bolt for the guide rail	Basic Motion amount Fixed load	Basic static rated load	Permissible static moment			Weight	
																													M _R	M _P	M _Y	slider	Guide rail
	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	
WEGW15SA	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	M3x16	5.35	9.40	0.08	0.04	0.04	0.12	1.25	
WEGW15CA							26	39.8	56.8	10.15																7.83	16.19	0.13	0.10	0.10	0.21		
WEGW20SA	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	M5x16	7.23	12.74	0.13	0.06	0.06	0.19	2.08	
WEGW20CA							32	48.1	69.1	12.3																10.31	21.13	0.22	0.16	0.16	0.32		
WEGW25SA	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	7	60	20	M6x20	11.40	19.50	0.23	0.12	0.12	0.35	2.67	
WEGW25CA							35	59	82.6	16.15																16.27	32.40	0.38	0.32	0.32	0.59		
WEGW30SA	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	M6x25	16.42	28.10	0.40	0.21	0.21	0.62	4.35	
WEGW30CA							45	70.1	98.1	21.05																23.70	47.46	0.68	0.55	0.55	1.04		
Note: 1 kgf= 9.81N																																	

Note: 1 kgf= 9.81N

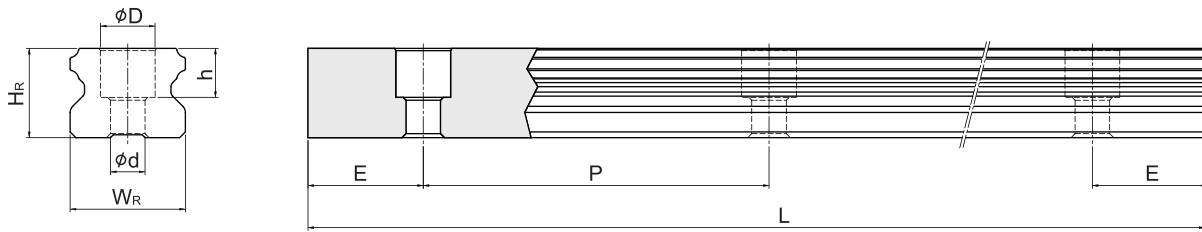
(3)WEGW-SB/WEGW-CB



Model	Component size(mm)			Slider size(mm)														Guide rail dimensions (mm)							Size of the fixed bolt for the guide rail (mm)	Basic Motion amount Fixed load C(kN)	Basic static rated load Co(kN)	Permissible static moment			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)			M _R	M _P	M _Y	slider	Guide rail
WEGW15SB	24	4.5	18.5	52	41	5.5	-	23.1	40.1	14.8	3.5	5.7	φ4.5	5	7	5.5	6	15	12.5	6	4.5	3.5	60	20	M3x16	5.35	9.40	0.08	0.04	0.04	0.12	1.25
WEGW15CB							26	39.8	56.8	10.15																7.83	16.19	0.13	0.10	0.10	0.21	
WEGW20SB	28	6	19.5	59	49	5	-	29	50	18.75	4.15	12	φ5.5	7	9	6	6	20	15.5	9.5	8.5	6	60	20	M5x16	7.23	12.74	0.13	0.06	0.06	0.19	2.08
WEGW20CB							32	48.1	69.1	12.3																10.31	21.13	0.22	0.16	0.16	0.32	
WEGW25SB	33	7	25	73	60	6.5	-	35.5	59.1	21.9	4.55	12	φ7	7.5	10	8	8	23	18	11	9	7	60	20	M6x20	11.40	19.50	0.23	0.12	0.12	0.35	2.67
WEGW25CB							35	59	82.6	16.15																16.27	32.40	0.38	0.32	0.32	0.59	
WEGW30SB	42	10	31	90	72	9	-	41.5	69.5	26.75	6	12	φ9	7	10	8	9	28	23	11	9	7	80	20	M6x25	16.42	28.10	0.40	0.21	0.21	0.62	4.35
WEGW30CB							45	70.1	98.1	21.05																23.70	47.46	0.68	0.55	0.55	1.04	

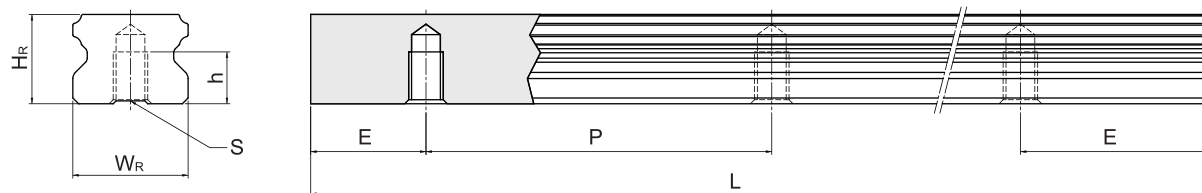
Note: 1 kgf= 9.81N

(4) Locking type (enlarged bolt hole diameter) rail size table



Model	Rail fixing bolt size(mm)	Guide rail dimensions(mm)							Weight (kg/m)
		W _R	H _R	D	h	d	P	E	
WEGR15U	M4x16	15	12.5	7.5	5.3	4.5	60	20	1.23
WEGR30U	M8x25	28	23	14	12	9	80	20	4.23

(5) Locking rail size table

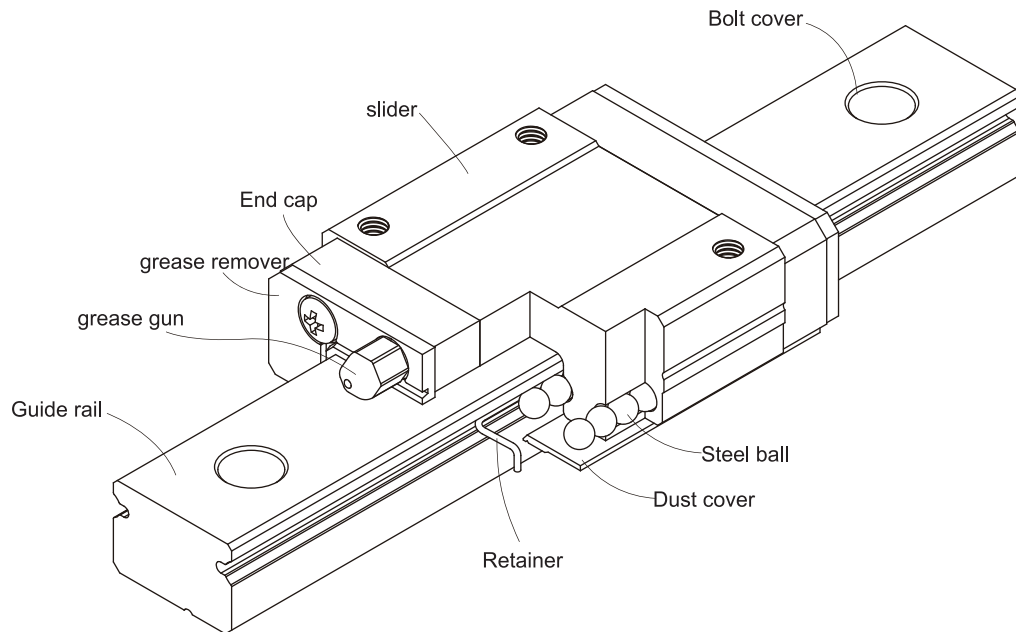


Model	Guide rail dimensions (mm)						Weight (kg/m)
	W _R	H _R	S	h	P	E	
WEGR15T	15	12.5	M5x0.8P	7	60	20	1.26
WEGR20T	20	15.5	M6x1P	9	60	20	2.15
WEGR25T	23	18	M6x1P	10	60	20	2.79
WEGR30T	28	23	M8x1.25P	14	80	20	4.42

1、Characteristics and weight of WGN series linear guide rail

1. Small volume and lightweight, particularly suitable for use in miniature devices.
2. Adopts a Gothic four-point contact design, capable of bearing loads in all directions, with characteristics of high rigidity and high precision.
3. Specifications with a steel ball retainer design, allowing interchangeability within the limits of precision.

2、WGN ontology structure

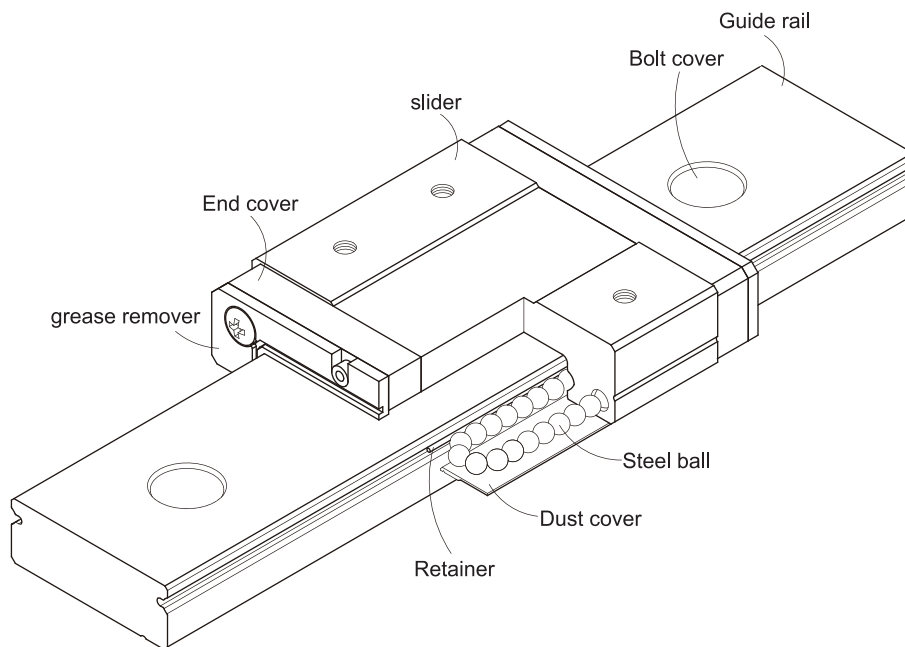


- Rolling loop system: slider, guide rail, end cap, steel balls, retainer (except for 3 specifications)
- Lubrication system: The WGN15 end cover is equipped with an oil nozzle for customers to inject oil, while the WGN7, 9, and 12 have reserved oil injection holes on the side of the end cover, allowing oil or grease to be injected into the slider for lubrication.
- Dustproof system: oil scraping blade (3 specifications available), dustproof sheet (9, 12, 15 specifications available), bolt cover (12, 15 specifications)

3、Features of the WGW series linear guide rail

1. The design of the widened guide rail significantly enhances the torque load capacity and can be used with a single axis.
2. Using a Gothic arch four-point contact design, it can withstand loads from all directions, featuring strong rigidity and high precision.
3. The specifications with a steel ball retainer design have interchangeability within the allowed tolerance.

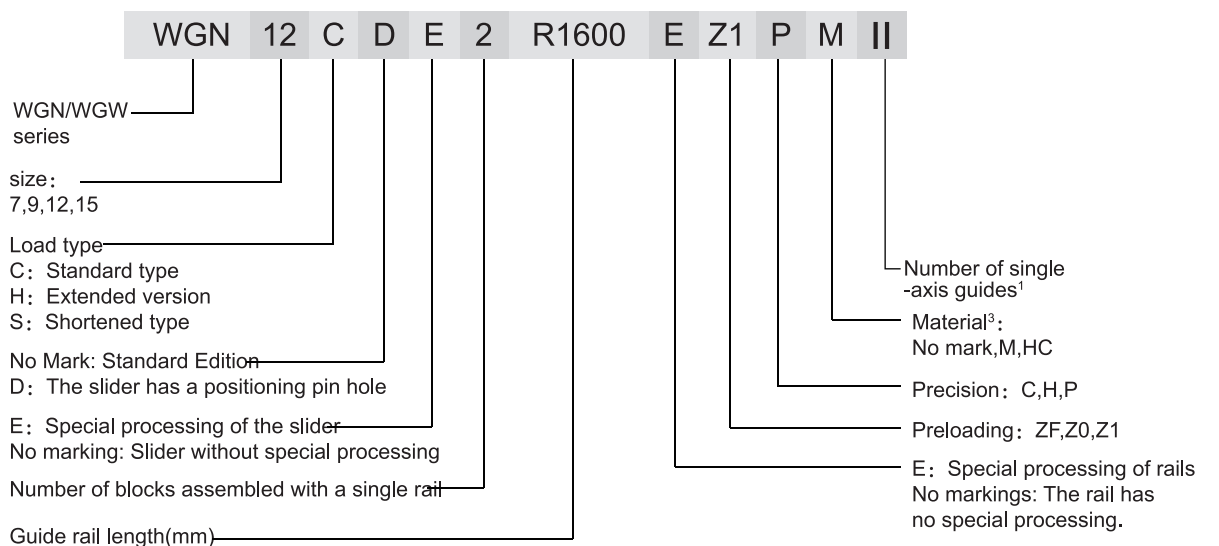
4、WGW ontology structure



- Rolling loop system: slider, guide rail, end cap, steel balls, retainer
- Lubrication System: The end caps of WGW14 and WGW15 are equipped with oil nozzles for customer oil injection, while WGW3, 7, 9, and 12 reserve oil injection holes on the side of the end cap, allowing oil or grease to be injected into the internal slider for lubrication.
- Dustproof system: oil scraper, dustproof plates (options in specifications 9, 12, 14, 15), bolt covers (specifications 12, 14, 15)

5. Product Specification Description

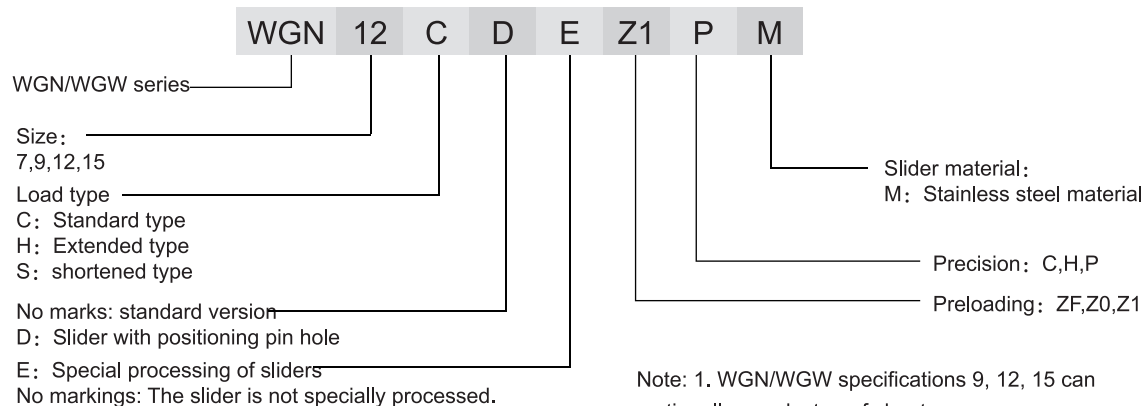
(1)Non-interchangeable linear guide rail product model



Note: 1. If only one guide rail is used, it is not written; two are marked as II, three are marked as III, and so on.
2. No marking: general steel material, chemical nickel plating.
M: stainless steel material, HC: general steel material, hard chrome plating.

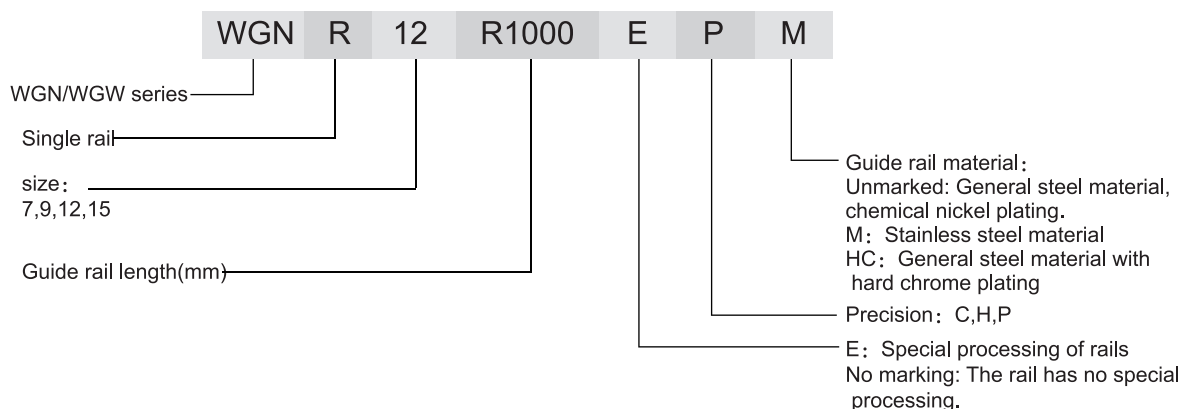
(2)Interchangeable linear guide rail product model

Single slide block product model



Note: 1. WGN/WGW specifications 9, 12, 15 can optionally use dustproof sheets..

Single rail product model

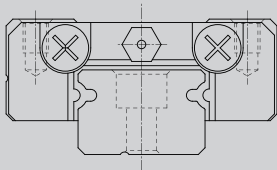
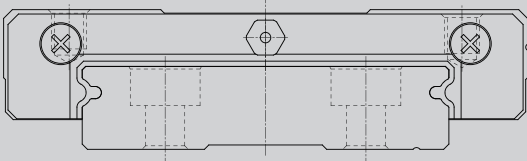


6、WG series type

(1)Slider type

WODTOP offers two types of linear guides: standard and wide, making it easy for customers to choose.

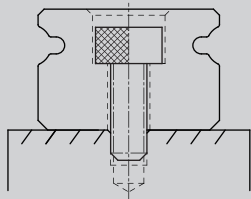
Table 3-1 Slider Type

Type	Specificationshape		Height dimension (mm)	Guide rail length (mm)	Application device
Standard type	WGN-C WGN-H		8	100	○ Printer ○ Robotic arm ○ Electronic instruments and equipment ○ Semiconductor Equipment
			↓	↓	
			16	2000	
Wide type	WGW-C WGW-H		9	100	
			↓	↓	
			16	2000	

(2)Guide rail type

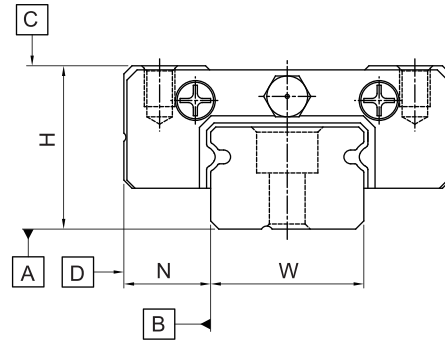
WODTOP provides locking screw hole guides for convenient installation and use by customers.

Table 3-2 Guide Type

Locking bolt hole


7、Accuracy level

The precision of the WGN and WGW series of small guide rails is divided into three levels: ordinary, high, and precision. Customers can choose the appropriate precision based on their equipment accuracy requirements.



(1)Non-interchangeable linear guide rail precision

The measurement of the assembly height H is based on the center position of the reference surface on the upper part of the slider, while the measurement of the assembly width N is based on the center position of the reference surface on the side of the slider.

Table 3-3 Precision Table

Unit: mm

Accuracy level	Regular level (C)	Advanced (H)	Precision grade (P)
Permissible dimensional tolerance of height H	± 0.04	± 0.02	± 0.01
Permissible dimensional tolerance of width N	± 0.04	± 0.025	± 0.015
Mutual error of paired height H	0.03	0.015	0.007
Mutual error of paired width N (reference track)	0.03	0.02	0.01
The traveling parallelism of slider C facing the surface of guide rail A.	Walking parallelism		
The traveling parallelism of slider D facing the surface of guide rail B.	Walking parallelism		

(2)Interchangeable linear guide rail accuracy

The accuracy of interchangeable linear guide rails in terms of paired height and width precision when the sliders are assembled on a single rail is the same as that of non-interchangeable linear guide rails. However, when assembled on different rails, due to height errors of the rails, the paired height and width accuracy is slightly inferior to that of non-interchangeable linear guide rails, while the walking parallelism accuracy is the same as that of non-interchangeable linear guide rails.

Table 3-4 Precision Table for Interchangeable Linear Guides

Unit: mm

Accuracy level	Regular level (C)	Advanced (H)	Precision grade (P)
Permissible dimensional tolerance of height H	± 0.04	± 0.02	± 0.01
Permissible dimensional tolerance of width N	± 0.04	± 0.025	± 0.015
Single pair	Mutual error of height H	0.03	0.015
	Mutual error with a width of N	0.03	0.02
Mutual errors of plural supports paired at height H	0.07	0.04	0.02
The traveling parallelism of slider C facing the surface of guide rail A.	Walking parallelism		
The traveling parallelism of slider D facing the surface of guide rail B.	Walking parallelism		

(3) Walking parallel precision

The walking parallelism of rail C to A and rail D to B is related to the accuracy and length of the rails, and their values are listed in the table below.

Table 3-5 Walking Parallelism

Guide rail length (mm)	Accuracy level (μm)			Guide rail length (mm)	Accuracy level (μm)		
	(C)	(H)	(P)		(C)	(H)	(P)
50 以下	12	6	2	1,000 ~ 1,200	25	18	11
50 ~ 80	13	7	3	1,200 ~ 1,300	25	18	11
80 ~ 125	14	8	3.5	1,300 ~ 1,400	26	19	12
125 ~ 200	15	9	4	1,400 ~ 1,500	27	19	12
200 ~ 250	16	10	5	1,500 ~ 1,600	28	20	13
250 ~ 315	17	11	5	1,600 ~ 1,700	29	20	14
315 ~ 400	18	11	6	1,700 ~ 1,800	30	21	14
400 ~ 500	19	12	6	1,800 ~ 1,900	30	21	15
500 ~ 630	20	13	7	1,900 ~ 2,000	31	22	15
630 ~ 800	22	14	8	2,000 ~	31	22	16
800 ~ 1,000	23	16	9				

8、Pre-stress

The WGN/WGW series offers three types of pre-pressure: standard gap, no pre-pressure, and light pre-pressure.

Table 3-6 Preloading Level

Preloading Level	mark	Pre-stress	Applicable accuracy
ordinary gap	ZF	Precision gap 4~10 μm	C
No pre-compression	Z0	0	C~P
Light pre-compression	Z1	0.02C	C~P

Note: In the pre-stress, C is the dynamic rated load.

9、Installation plane error

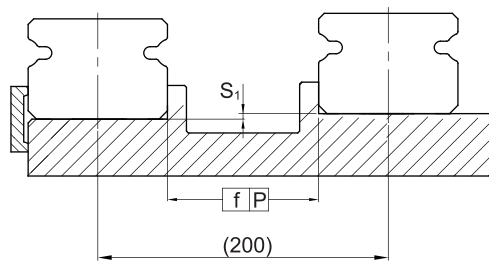


Table 3-8 Allowable Parallelism Tolerance (P)

Unit: μm

Specification	Preloading		
	ZF pre-compression	Z0 preloading	Z1 preloading
WG7	3	3	3
WG9	4	4	3
WG12	9	9	5
WG15	10	10	6

Table 3-9 Allowable Vertical and Horizontal Level Tolerance(S_1)

Unit: μm

Specification	Preloading		
	ZF pre-compression	Z0 preloading	Z1 preloading
WG7	25	25	3
WG9	35	35	6
WG12	50	50	12
WG15	60	60	20

Note: The allowable value is proportional to the distance between the axes.

Table 3-10 Flatness of the Installation Surface

Unit: μm

Specification	Flatness error
WG7	0.025/200
WG9	0.035/200
WG12	0.050/200
WG15	0.060/200

Note: The above values apply to the preloading level of ZF/Z0. If using Z1 level or two or more guide rails (including two), it is recommended to use values below 50% of the above.

10、Installation Precautions

(1) Installation shoulder height and bevel

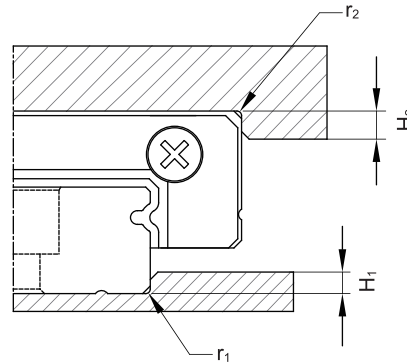


Table 3-11 Shoulder Height and Chamfer

Specification	Maximum fillet radius of the shoulder r_1 (mm)	Maximum fillet radius of the shoulder r_2 (mm)	Guide rail shoulder height H_1 (mm)	Slider shoulder height H_2 (mm)
WGN7	0.2	0.2	1.2	3
WGN9	0.2	0.3	1.7	3
WGN12	0.3	0.4	1.7	4
WGN15	0.5	0.5	2.5	5
WGW7	0.2	0.2	1.7	3
WGW9	0.3	0.3	2.5	3
WGW12	0.4	0.4	3	4
WGW15	0.4	0.8	3	5

(2) Torque value of the guide rail assembly screws

Whether the guide rails are tightly locked to the reference surface affects the accuracy of the linear guide rails significantly. Therefore, to ensure that each screw can be tightened, it is recommended to use the following torque values for assembling the screws.

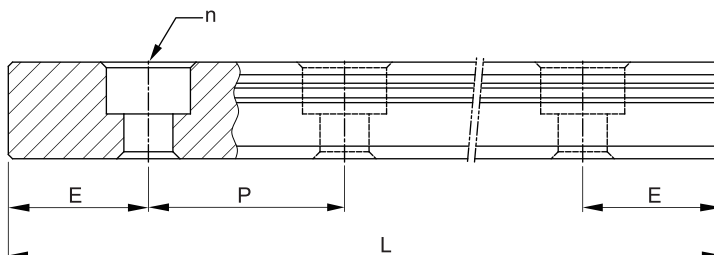
Table 3-12 Torque Values

Specification	Screw specifications	Torque value N·cm(kgf·cm)		
		Iron material	Casting material	Aluminum alloy material
WGN7	M2x0.4Px16L	57(5.9)	39.2(4)	29.4(3)
WGN9	M3x0.5Px8L	186(19)	127(13)	98(10)
WGN12	M3x0.5Px8L	186(19)	127(13)	98(10)
WGN15	M3x0.5Px10L	186(19)	127(13)	98(10)
WGW7	M3x0.5Px6L	186(19)	127(13)	98(10)
WGW9	M3x0.5Px8L	186(19)	127(13)	98(10)
WGW12	M4x0.7Px8L	392(40)	274(28)	206(21)
WGW15	M4x0.7Px10L	392(40)	274(28)	206(21)

Note: 1kgf=9.81N

11、Standard length and maximum length of a single rail

WODTOP has a standard length stock of guide rails to meet customer demands. When customers order non-standard length guide rails, it is advisable that the end face distance E should not exceed 1/2P, to prevent instability at the rear end after assembly due to an excessively large E dimension, which would reduce the accuracy of the linear guide rail. It is also not advisable to use an excessively small E value (less than Emin) to avoid the risk of bolt hole breakage.



$$L=(n-1) \times P+2 \times E \quad \text{Eq.2.4}$$

L: Total length of the rail(mm)

n: Number of bolt holes

P: Bolt hole spacing(mm)

E: Distance from bolt hole to the end face(mm)

Table 3-13 Track Length

Unit: mm

Project	WGNR7	WGNR9	WGNR12	WGNR15	WGWR5	WGWR7	WGWR9	WGWR12	WGWR15
Standard length L(n)	40(3)	55(3)	70(3)	70(2)	50(3)	80(3)	80(3)	110(3)	110(3)
	55(4)	75(4)	95(4)	110(3)	70(4)	110(4)	110(4)	150(4)	150(4)
	70(5)	95(5)	120(5)	150(4)	90(5)	140(5)	140(5)	190(5)	190(5)
	85(6)	115(6)	145(6)	190(5)	110(6)	170(6)	170(6)	230(6)	230(6)
	100(7)	135(7)	170(7)	230(6)	130(7)	200(7)	200(7)	270(7)	270(7)
	130(9)	155(8)	195(8)	270(7)	150(8)	260(9)	230(8)	310(8)	310(8)
		175(9)	220(9)	310(8)	170(9)		260(9)	350(9)	350(9)
		195(10)	245(10)	350(9)			290(10)	390(10)	390(10)
		275(14)	270(11)	390(10)			350(14)	430(11)	430(11)
		375(19)	320(13)	430(11)			500(19)	510(13)	510(13)
			370(15)	470(12)			710(24)	590(15)	590(15)
			470(19)	550(14)			860(29)	750(19)	750(19)
			570(23)	670(17)				910(23)	910(23)
			695(28)	870(22)				1070(27)	1070(27)
Spacing(P)	15	20	25	40	20	30	30	40	40
Standard Spacing(Es)	5	7.5	10	15	5	10	10	15	15
Maximum length of standard end distance	595(40)	1195(60)	1195(80)	1990(50)	250(13)	590(20)	1970(66)	1990(50)	1990(50)
Maximum length	600	1200 ⁵	2000	2000	250 ⁴	600 ⁶	2000	2000	2000

Note: 1. The general tolerance for dimension E of the guide rail is 0.5~0.5mm, while the tolerance for the distance E of the threaded end of the guide rail is stricter at 0~0.3mm.

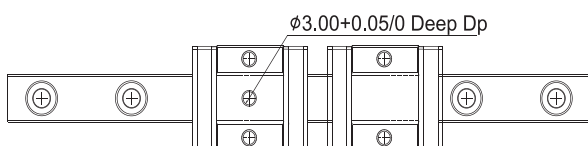
2. The maximum length of the standard distance refers to the maximum length of the guide rail when both the left and right distances are standard distances.

3. WGNR5 and WGWR5 are only available in stainless steel. 4. The maximum length provided for WGNR9 stainless steel guide rails is 1200mm; WGNR9 general steel guide rails provide a maximum length of 1000mm. 5. The maximum length provided for WGWR7 stainless steel guide rails is 600mm; WGWR7 general steel guide rails provide a maximum length of 2000mm. 6. If customers require different E values, please contact WODTOP.

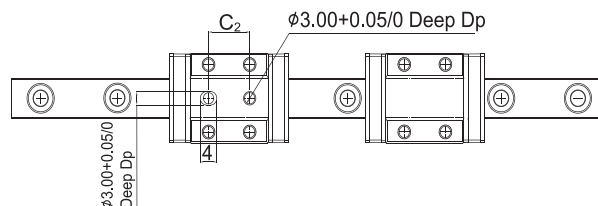
12、WGN/WGW series linear guide rail size table

(1)WGN-S/WGN-C/WGN-H

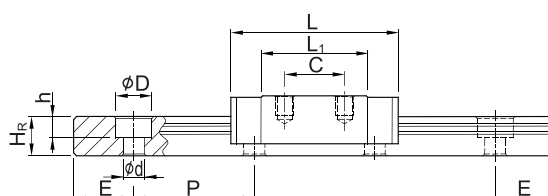
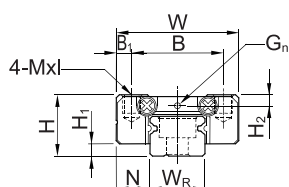
WGN-S,WGN-SD



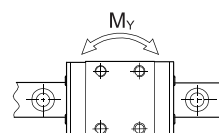
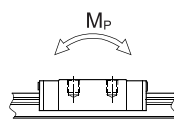
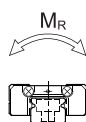
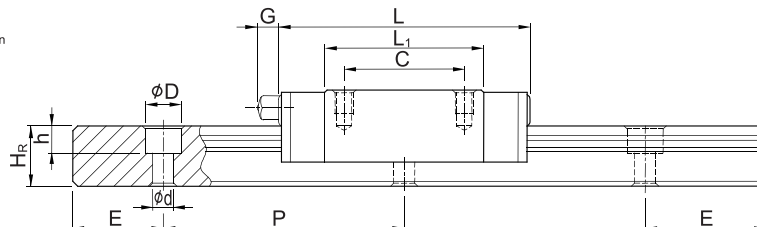
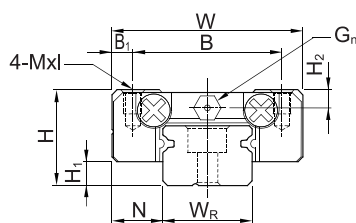
WGN-C,WGN-CD,WGN-H,WGN-HD



WGN7,WGN9,WGN12



WGN15



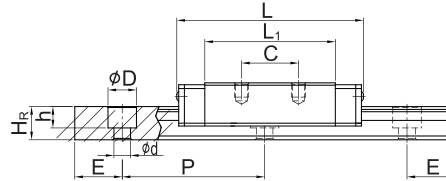
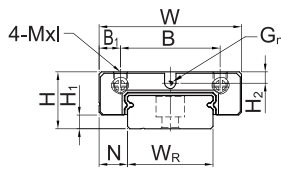
(1)WGN-S/WGN-C/WGN-H

Model	Component size (mm)			Slider size(mm)												Rail size(mm)								The size of the fixed bolts for the rail	Basic dynamic rated load	Basic static rated load	Permissible static moment			Weight	
	H	H ₁	N	W	B	B ₁	C	L ₁	L	G	G _n	MxL	H ₂	C ₂	Dp	W _R	H _R	D	h	d	P	E	(mm)				C(kN)	C ₀ (kN)	M _R kN-m	M _P kN-m	M _V kN-m
WGN 7S	8	1.5	5	17	12	2.5	0	9.8	19	-	φ1.2	M2x2.5	1.5	/	/	7	4.8	4.2	2.3	2.4	15	5	M2x6	0.73	0.88	3.45	2.03	2.03	0.007	0.22	
WGN 7C							8	13.5	22.5															0.98	1.24	4.70	2.84	2.84	0.010		
WGN 7H							13	21.8	30.8															1.37	1.96	7.64	4.80	4.80	0.015		
WGN 7SD							0	9.8	19															0.73	0.88	3.45	2.03	2.03	0.007		
WGN 7CD							8	13.6	22.8															0.97	1.32	5.18	2.82	2.82	0.01		
WGN 7HD							13	21.9	31.1															1.30	2.05	8.05	4.53	4.53	0.015		
WGN 9S	10	2	5.5	20	15	2.5	0	11.9	21.9	-	φ1.4	M3x3	1.8	/	/	9	6.5	6	3.5	3.5	20	7.5	M3x8	1.2	1.3	6.77	4.38	4.38	0.01	0.38	
WGN 9C							10	18.9	28.9															1.86	2.55	11.76	7.35	7.35	0.016		
WGN 9H							16	29.9	39.9															2.55	4.02	19.60	18.62	18.62	0.026		
WGN 9SD							0	11.9	21.9															1.2	1.3	6.77	4.38	4.38	0.01		
WGN 9CD							10	19	29															1.8	2.34	12.19	6.99	6.99	0.016		
WGN 9HD							16	29	39															2.45	3.64	18.95	10.67	10.67	0.025		
WGN 12S	13	3	7.5	27	20	3.5	0	13	27	-	φ2	M3x3.5	2.5	/	/	12	8	6	4.5	3.5	25	10	M3x8	1.92	2.03	13.5	7.53	7.53	0.023	0.65	
WGN 12C							15	21.7	34.7															2.84	3.92	25.48	13.72	13.72	0.034		
WGN 12H							20	32.4	45.4															3.72	5.88	38.22	36.26	36.26	0.054		
WGN 12SD							0	13	27															1.92	2.03	13.5	7.53	7.53	0.022		
WGN 12CD							15	20.6	34.6															2.67	3.25	21.6	11.85	11.85	0.035		
WGN 12HD							20	33.6	47.6															3.54	4.88	32.39	18.34	18.34	0.058		
WGN 15S	16	4	8.5	32	25	3.5	0	18.5	33.1	4.5	M3	M3x4	3	/	/	15	10	6	4.5	3.5	40	15	M3x10	3.5	3.89	32.27	16.97	16.97	0.042	1.06	
WGN 15C							20	26.7	42.1															4.61	5.59	45.08	21.56	21.56	0.059		
WGN 15H							25	43.4	58.8															6.37	9.11	73.50	57.82	57.82	0.092		
WGN 15SD							0	18.5	33.1															3.5	3.89	32.27	16.97	16.97	0.041		
WGN 15CD							20	27.5	42.1															4.65	5.84	48.41	25.23	25.23	0.058		
WGN 15HD							25	45.5	60.1															6.64	9.73	80.68	41.74	41.74	0.01		

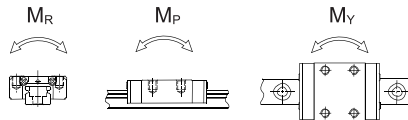
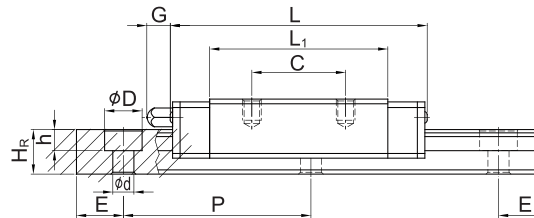
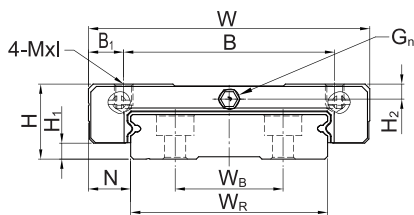
注: 1 kgf= 9.81N

(2)WGW-C /WGW-H

WGW7,WGW9,WGW12



WGW15



Model	Component size (mm)			Slider size(mm)										Rail size(mm)										The size of the fixed bolts for the rail	Basic dynamic rated load	Basic static rated load	Permissible static moment					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	slider kg	Guide rail kg/m	
WGW 7C	9	1.9	5.5	25	19	3	10	21	31.2	-	ø1.2	M3x3	1.85	14	-	5.2	6	3.2	3.5	30	10	M3x6	1.37	2.06	15.70	7.14	7.14	0.020	0.51				
WGW 7H							19	30.8	41														1.77	3.14	23.45	15.53	15.53	0.029					
WGW 9C	12	2.9	6	30	21	4.5	12	27.5	39.3	-	ø1.2	M3x3	2.4	18	-	7	6	3.5	4.5	30	10	M3x8	2.75	4.12	40.12	18.96	18.96	0.040	0.91				
WGW 9H					23	3.5	24	38.5	50.7														3.43	5.89	54.54	34.00	34.00	0.057					
WGW 12C	14	3.4	8	40	28	6	15	31.3	46.1	-	ø1.2	M3x3.6	2.8	24	-	8.5	8	4.5	4.5	40	15	M4x8	3.92	5.59	70.34	27.80	27.80	0.071	1.49				
WGW 12H							28	45.6	60.4														5.10	8.24	102.70	57.37	57.37	0.103					
WGW 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	M4x10	6.77	9.22	199.34	56.66	56.66	0.143	2.86				
WGW 15H							35	57	73.8														8.93	13.38	299.01	122.60	122.60	0.215					

注： 1 kgf= 9.81N

注: 1 kgf= 9.81N

1、Characteristics of the WVR series

The crossed roller unit is a high-precision limited linear motion unit that is installed with crossed roller guides between the workbench and the base. It features high precision, small size, and high rigidity. There are two models of the crossed roller unit: the WVRU type and the miniature WVRT type, which are widely used in the sliding seat part of office equipment and external devices, various measuring instruments, and precision machines such as printed circuit board drilling machines.

(1) Easy to install

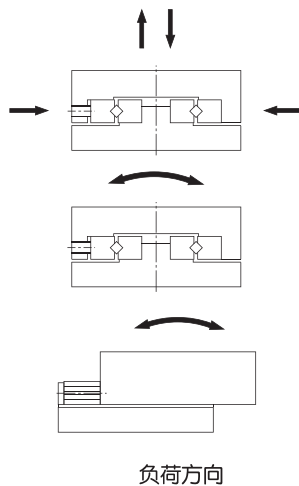
Due to the installation of cross roller guides between the high-precision machined workbench and base, this product only requires bolt installation to achieve a high-precision linear guide mechanism.

(2) Allowable load is large

Because the rollers with large rated loads are assembled together at very short pitches, they form a linear guide mechanism that can bear heavy loads and has high rigidity, resulting in a long service life.

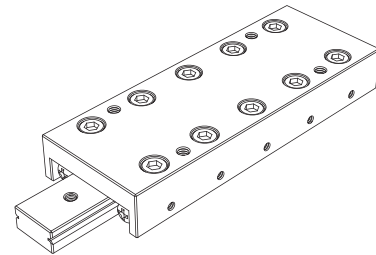
(3) A variety of usage methods

Due to the vertical arrangement of the rollers, the system can evenly bear the loads applied to the worktable from four directions (see the diagram below).

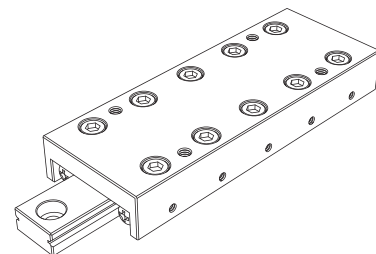


(4) High corrosion resistance

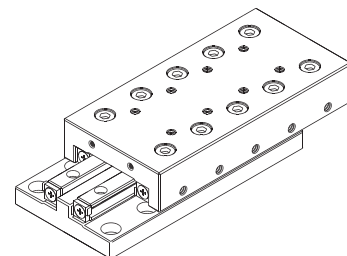
The bases and worktables of the WVRT-M and WVRT-AM models are made of stainless steel. In addition, the tracks, rollers, roller retainers, and screws are also made of stainless steel, providing sufficient corrosion resistance. Moreover, the bases and worktables of the WVRU-M model are made of aluminum.



WVRT type

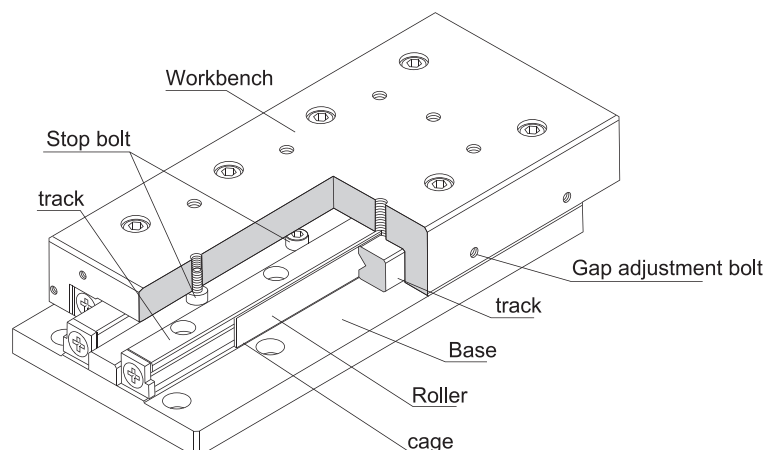


WVRT-A type



WVRU type

2、WVR series structure



3. Rated Load and Rated Life

Rated load in all directions

The rated loads of types WVRT, WVRT-A and WVRU are equal in all four directions (radial, opposite radial and lateral), and their values are recorded in the corresponding dimension tables and denoted as C and C₀.

(2) Static safety factor f_s

When the crossed roller unit is at rest or in operation, it may be subjected to unexpected external forces such as inertial forces caused by vibration, shock, or start-stop. For such load effects, it is necessary to consider its static safety factor.

$$f_s = \frac{C_0}{P_c} \quad \text{或} \quad f_s = \frac{M_0}{M}$$

f_s : Static safety factor

C₀ : Basic static rated load (kN)

M₀ : Static allowable torque (M_A, M_B, M_C)

P_c : Calculated load value (kN)

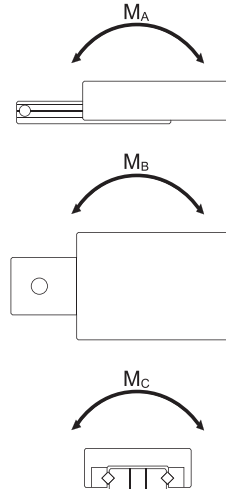
M : Calculated torque value (kN)

Reference value of static safety factor

The lower limit value of the reference value of the static safety factor under each usage condition is shown in Table 1.

Table 1 Benchmark Values of Static Safety Factor (f_s)

Use machinery	Load conditions	The lower limit of f _s
General industrial machinery	When there is no vibration or shock	1~1.3
	When there is vibration or shock	2~3



(3) Calculate the rated life.

At WODTOP, the rated life of the crossed roller unit is defined as 100km. The rated life (L₁₀) can be calculated by the following formula based on the basic dynamic load rating (C) and the load (P_c) acting on the crossed roller unit.

$$L_{10} = \left(\frac{C}{P_c} \right)^{\frac{10}{3}} \times 100 \quad \dots\dots\dots (1)$$

L₁₀ : Static safety factor (km)

C₀ : Basic dynamic rated load (kN)

P_c : Calculated value of radial load (kN)

When comparing the rated life (L₁₀), it is necessary to take into account which of the basic dynamic load ratings is defined as 50 km or 100 km, and convert the basic dynamic load rating as required according to ISO 14728-1. The basic dynamic load rating conversion formula specified in ISO is:

$$C_{100} = \frac{C_{50}}{1.23}$$

C₅₀ : The basic dynamic load rating with a rated life of 50,000 km.

C₁₀₀ : The basic dynamic load rating with a rated life of 100,000 km.

(4) Calculation of Rated Life Considering the Use Conditions

In practical application, due to the fact that vibration and shock are usually present during operation, the load acting on the crossed roller unit constantly changes, making it difficult to accurately grasp. Additionally, the ambient temperature during use can also have a significant impact on the lifespan. Considering these conditions, the rated life (L_{10m}) taking into account the usage conditions can be calculated by the following formula (2).

Considering the coefficient α of the usage conditions

$$\alpha = \frac{f_T}{f_W}$$

α: Coefficient considering the usage conditions

f_T : Temperature coefficient (Refer to the figure1)

f_W : Load factor (Reference Table2)

Rated life L_{10m} considering the usage conditions

$$L_{10m} = \left(\alpha \times \frac{C}{P_c} \right)^{\frac{10}{3}} \times 100 \quad \dots\dots\dots (2)$$

L_{10m} : Rated life considering the conditions of use (km)

C₀ : Basic dynamic rated load (kN)

P_c : Calculated value of radial load (kN)

(4) Calculate the lifespan time.

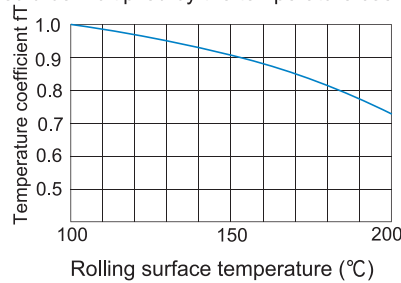
After obtaining the rated life (L_{10}), if the stroke length and the number of reciprocations per minute remain constant, the working life time can be calculated using the following formula.

$$L_h = \frac{L_{10} \times 10^6}{2 \times l_s \times n_1 \times 60}$$

L_h : Rated life considering the conditions of use (h)
 l_s : Basic dynamic rated load (mm)
 n_1 : Calculated value of radial load (min⁻¹)

(5) f_T : Temperature coefficient

If the ambient temperature of the WVRT, WVRT-A or WVRU type exceeds 100°C, the adverse effects of high temperature should be taken into account, and the basic rated load should be multiplied by the temperature coefficient indicated in Figure 1.

Figure 1 Temperature Coefficient (f_T)(6) f_W : Load factor

Generally, mechanical devices that perform reciprocating motion are often accompanied by vibration or shock during operation. It is particularly difficult to accurately calculate the vibration generated at high speeds and all the shocks caused by frequent starts and stops. Therefore, when the actual load acting on the WVRT, WVRT-A or WVRU type cannot be obtained, or when the influence of speed and vibration is significant, please divide the basic dynamic load rating (C) by the load factor obtained empirically in Table 2.

Table 2 Load Coefficient (f_W)

Vibration, shock	Velocity (V)	f_W
tiny	At very low speeds, $V \leq 0.25$ m/s	1~1.2
Little	At low speeds, $0.25 < V \leq 1$ m/ss	1.2~1.5

3. Precision Specifications

The dimensional tolerances of the height (M) and width (W) of the crossed roller units WVRT, WVRT-A or WVRU type, as well as the walking accuracy with respect to the D surface, are all recorded in the size table of each model.°

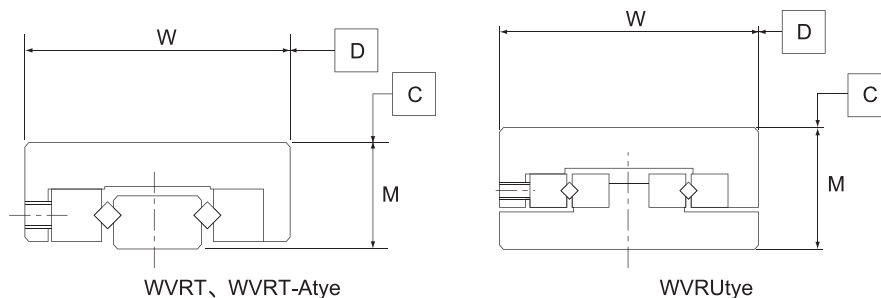
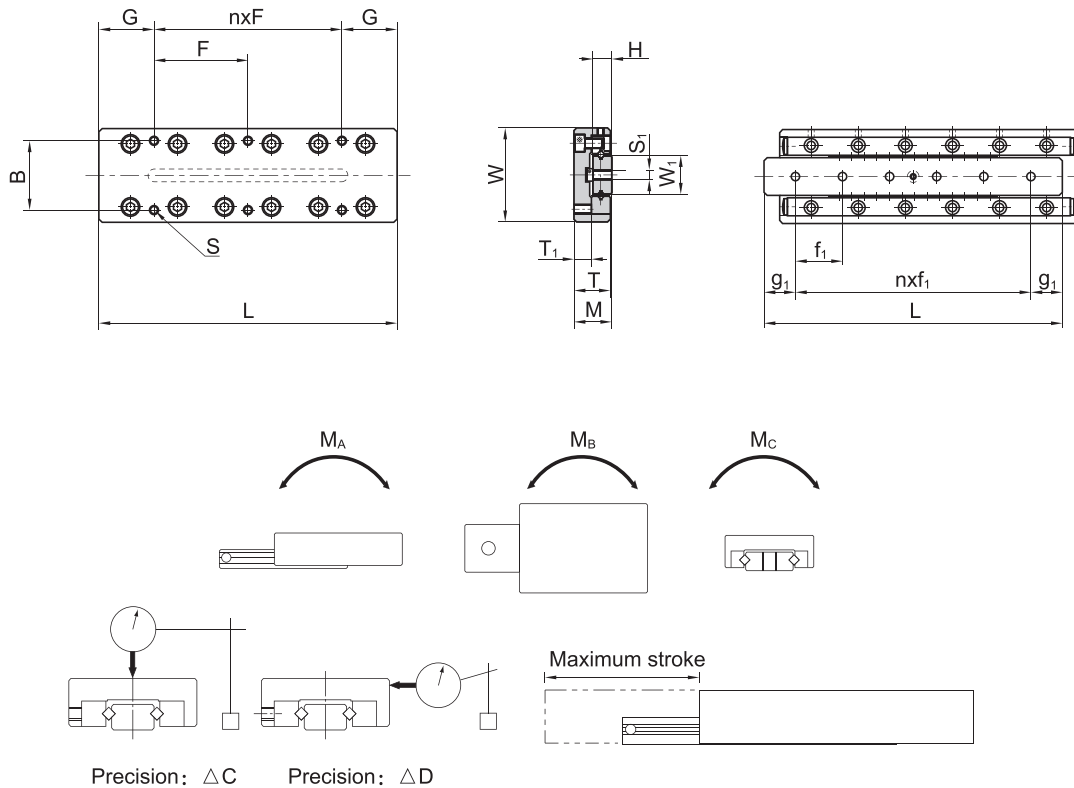


Figure 2 Precision Specifications

4. Miniature WVRT Type (Base Threaded Type)



unit: mm

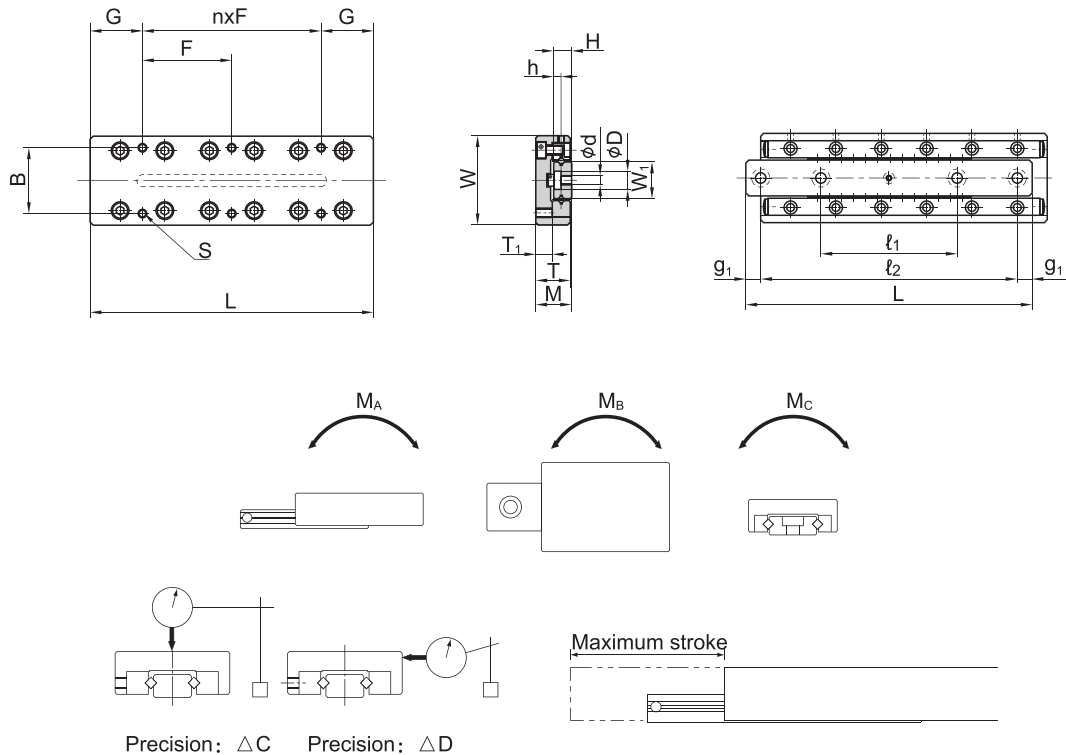
Nominal model	Main dimensions					Workbench surface size				Side dimensions				Base surface dimensions and installation hole positions				Basic rated load		Static allowable torque			Precision μm	
	Maximum stroke	width W ± 0.1	height M ± 0.1	length L	quality g	The position of the threaded holes for the workbench installation				T	T ₁	H	W ₁	S ₁	nxf ₁	g ₁	Roller quantity Z	C kN	C ₀ kN	M _A N·m	M _B N·m	M _C N·m	ΔC	ΔD
						B	nxF	G	S															
WVRT 1025	12	20	8	25	23	14	1x18	3.5	M2.6	7.5	3.5	4	6.7	M2.6	2x7.5	5	5	0.46	0.61	1.52	1.25	2.29	2	4
WVRT 1035	18			35	32		1x28	3.5							2x10	7	7	0.63	0.92	2.62	2.32	3.44		
WVRT 1045	25			45	42		1x20	12.5							3x10	10	10	0.95	1.53	4.14	4.53	5.73		
WVRT 1055	32			55	52		1x30	12.5							4x10	12	12	1.09	1.83	5.92	6.41	6.87		
WVRT 1065	40			65	62		2x20	12.5							5x10	14	14	1.23	2.14	8.08	8.62	8.02		
WVRT 1075	45			75	72		1x30	22.5							6x10	18	18	1.50	2.75	13.3	14.0	10.3		
WVRT 1085	50	30	12	85	82	22	2x30	12.5	M3	11.5	5.5	6	12.2	M3	7x10	20	20	1.63	3.05	16.4	17.2	11.5	2	4
WVRT 2035	18			35	78		1x28	3.5							1x20	5	5	0.84	1.09	4.32	3.55	7.06		
WVRT 2050	30			50	113		1x43	3.5							2x15	7	7	1.16	1.63	7.45	6.59	10.6		
WVRT 2065	40			65	147		1x30	17.5							3x15	9	9	1.46	2.17	11.8	10.5	14.1		
WVRT 2080	50			80	184		1x45	17.5							4x15	12	12	2.01	3.26	16.8	18.2	21.2		
WVRT 2095	60			95	220		2x30	17.5							5x15	14	14	2.26	3.80	23.0	24.5	24.7		
WVRT 2110	70	40	16	110	257	30	1x45	32.5	M4	15.5	7.5	8	16	M4	6x15	17	17	2.51	4.34	37.9	35.7	28.2	3	6
WVRT 2125	80			125	290		2x45	17.5							7x15	19	19	2.76	4.89	46.7	44.3	31.8		
WVRT 3055	30			55	229		1x40	7.5							1x35	6	6	2.71	3.67	12.2	13.9	31.9		
WVRT 3080	45			80	336		1x65	7.5							2x25	10	10	4.06	6.11	33.1	36.2	53.1		
WVRT 3105	60			105	442		1x50	27.5							3x25	13	13	4.68	7.33	64.6	59.8	63.8		
WVRT 3130	75			130	551		1x75	27.5							4x25	17	17	5.87	9.77	107	100	85		
WVRT 3155	90	105	16	155	657	30	2x50	27.5	M4	15.5	7.5	8	16	M4	5x25	20	20	6.98	12.2	131	138	106	3	6
WVRT 3180	105			180	766		1x75	52.5							6x25	24	24	8.05	14.7	189	196	128		
WVRT 3205	130			205	871		2x75	27.5							7x25	26	26	8.57	15.9	222	230	138		

A fully stainless steel type with high corrosion resistance can also be provided..

For example: WVRT 2035 M

The marking of stainless steel type

5. Miniature WVRT-A Type (Base Mounting Hole Type)



unit: mm

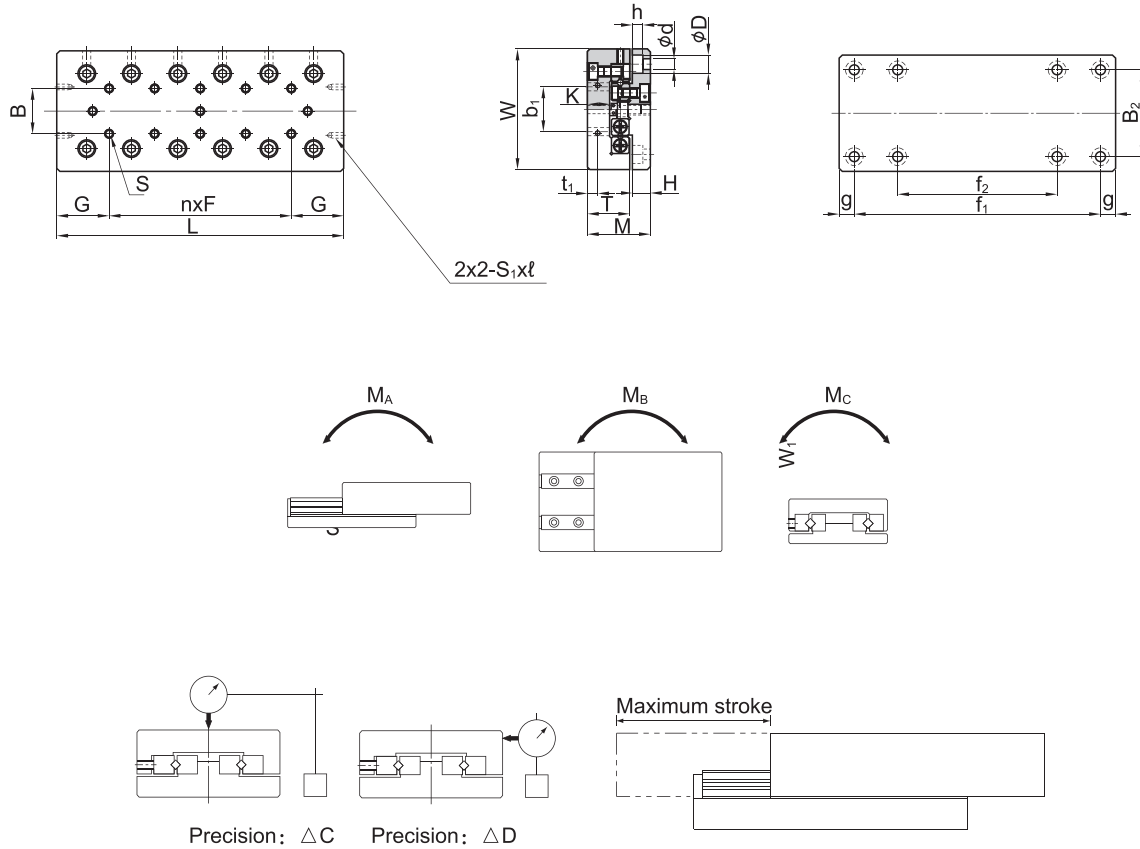
Nominal model	Main dimensions					Workbench surface size				Side dimensions				Base surface dimensions and installation hole positions				Basic rated load		Static allowable torque			Precision μm		
	Maximum stroke	width W ± 0.1	height M ± 0.1	length L	quality g	The position of the threaded holes for the workbench installation				T	T ₁	H	W ₁	dxDxh	ℓ ₁	ℓ ₂	g ₁	Roller quantity Z	C kN	C ₀ kN	M _A N•m	M _B N•m	M _C N•m	△C	△D
						B	nx	F	G																
WVRT 1025A	12	20	8	25	23	14	1x18	3.5	M2.5	7.5	3.5	4	6.7	2.5x4.1x2.2	-	18	3.5	5	0.46	0.61	1.52	1.25	2.29	2	4
WVRT 1035A	18			35	32		1x28	3.5							-	25	5	7	0.63	0.92	2.62	2.32	3.44		
WVRT 1045A	25			45	42		1x20	12.5							25	38	3.5	10	0.95	1.53	4.14	4.53	5.73		
WVRT 1055A	32			55	52		1x30	12.5							29	48	3.5	12	1.09	1.83	5.92	6.41	6.87		
WVRT 1065A	40			65	62		2x20	12.5							31	55	5	14	1.23	2.14	8.08	8.62	8.02		
WVRT 1075A	45			75	72		1x30	22.5							35	65	5	18	1.50	2.75	13.3	14.0	10.3		
WVRT 1085A	50			85	82		2x30	12.5							40	75	5	20	1.63	3.05	16.4	17.2	11.5		
WVRT 2035A	18	30	12	35	78	22	1x28	3.5	M3	11.5	5.5	6	12.2	3.5x6x3.2	-	25	5	5	0.84	1.09	4.32	3.55	7.06	2	4
WVRT 2050A	30			50	113		1x43	3.5							-	35	7.55	7	1.16	1.63	7.45	6.59	10.6		
WVRT 2065A	40			65	147		1x30	17.5							33	55	5	9	1.46	2.17	11.8	10.5	14.1		
WVRT 2080A	50			80	181		1x45	17.5							40	70	5	12	2.01	3.26	16.8	18.2	21.2		
WVRT 2095A	60			95	217		2x30	17.5							45	85	5	14	2.26	3.80	23.0	24.5	24.7		
WVRT 2110A	70			110	254		1x45	32.5							50	95	7.5	17	2.51	4.34	37.9	35.7	28.2		
WVRT 2125A	80			125	287		2x45	17.5							55	110	7.5	19	2.76	4.89	46.7	44.3	31.8		
WVRT 3055A	30	40	16	55	226	30	1x40	7.5	M4	15.5	7.5	8	16	4.5x7.5x4.2	-	40	7.5	6	2.71	3.67	12.2	13.9	31.9	3	6
WVRT 3080A	45			80	333		1x65	7.5							43	68	6	10	4.06	6.11	33.1	36.2	53.1		
WVRT 3105A	60			105	439		1x50	27.5							55	90	15	13	4.68	7.33	64.6	59.8	63.8		
WVRT 3130A	75			130	548		1x75	27.5							65	115		17	5.87	9.77	107	100	85		
WVRT 3155A	90			155	652		2x50	27.5							95	140		20	6.98	12.2	131	138	106		
WVRT 3180A	105			180	761		1x75	52.5							85	165		24	8.05	14.7	189	196	128		
WVRT 3205A	130			205	866		2x75	27.5							90	190	26	8.57	15.9	222	230	138			

A fully stainless steel type with high corrosion resistance can also be provided.

For example: WVRT 2035A M

Labeling of stainless steel grades

6. WVRU Type



unit: mm

Nominal model	Main dimensions				Workbench surface size												Base surface dimensions and installation hole positions				Basic rated load		Static allowable torque			Precision μm			
	Maximum stroke	width W -0.2 -0.4	height M ± 0.1	length L	Quality (Note) g	The position of the threaded holes for the workbench installation				Position of threaded holes for side assembly								B_2	f_1	f_2	g	Roller quantity Z	C kN	C_0 kN	M_A N·m	M_B N·m	M_C N·m	ΔC	ΔD
						B	$n \times F$	G	S	b_1	t_1	$S_1 \times \ell$	T	H	K	$d \times D \times h$													
WVRU 1025	12	30	17	25	0.08(0.04)	10	-	12.5	M2	12	2.5	M2x4	11	5.5	6.5	2.55x4.1x2.5	22	18	-	3.5	5	0.46	0.61	1.52	1.25	4.12	2	4	
WVRU 1035	18			35	0.11(0.05)		1x10											7	0.63		0.92	2.62	2.32	6.18					
WVRU 1045	25			45	0.15(0.07)		2x10											10	0.95		1.53	4.14	4.53	10.3					
WVRU 1055	32			55	0.18(0.09)		3x10											12	1.09		1.83	5.92	6.41	12.4					
WVRU 1065	40			65	0.21(0.1)		4x10											14	1.23		2.14	8.08	8.62	14.4					
WVRU 1075	45			75	0.24(0.12)		5x10											18	1.50		2.75	13.3	14.0	18.6					
WVRU 1085	50			85	0.27(0.13)		6x10											20	1.63		3.05	16.4	17.2	20.6					
WVRU 2035	18	40	21	35	0.2(0.09)	15	-	17.5	M3	16	3.4	14	6.5	7.5	3.5x6x3.5	30	25	-	5	5	0.84	1.09	4.32	3.55	9.77	3	6		
WVRU 2050	30			50	0.26(0.13)		1x15										7	1.16		1.63	7.45	6.59	14.7						
WVRU 2065	40			65	0.34(0.17)		2x15										9	1.46		2.17	11.8	10.6	19.5						
WVRU 2080	50			80	0.42(0.21)		3x15										12	2.01		3.26	16.9	18.2	29.3						
WVRU 2095	60			95	0.5(0.25)		4x15										14	2.06		3.80	23	24.5	34.2						
WVRU 2110	70			110	0.58(0.29)		5x15										17	2.51		4.34	37.9	35.7	39.1						
WVRU 2125	80			125	0.66(0.33)		6x15										19	2.76		4.89	46.7	44.3	44.0						

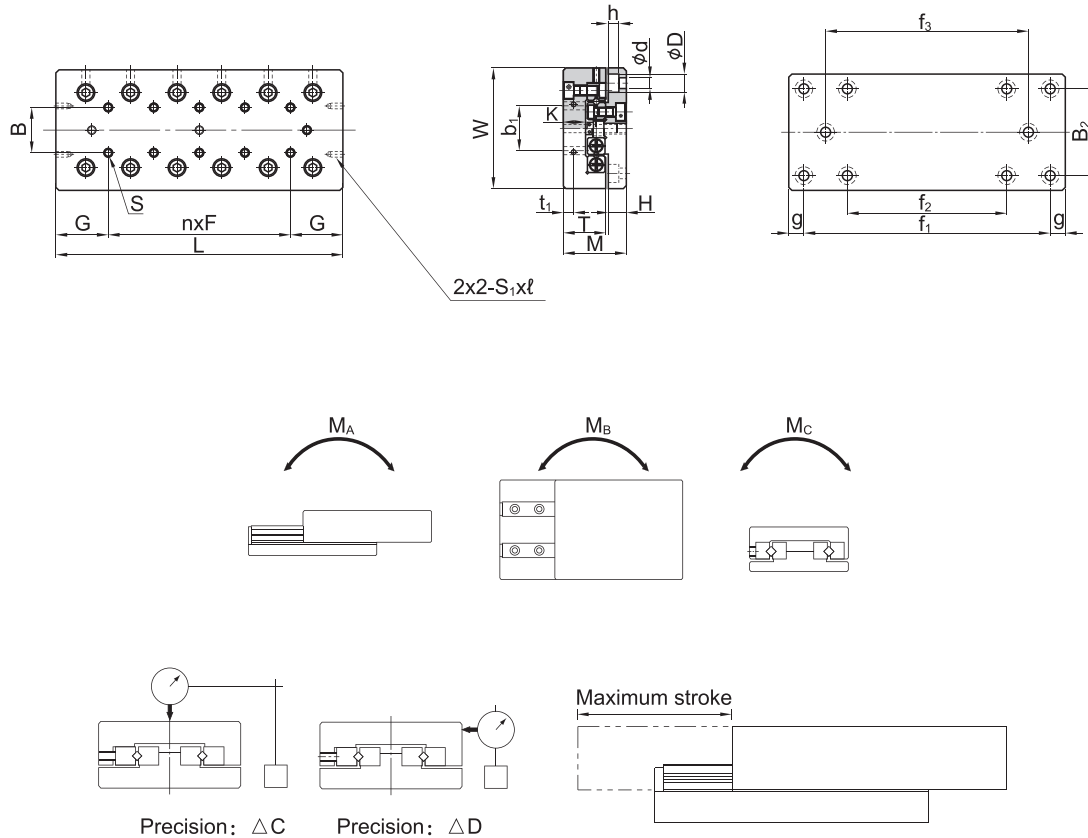
A fully stainless steel type with high corrosion resistance is also available.

The values in parentheses indicate the mass of the stainless steel type.

For example: WVRU 2035 M

—— Stainless steel type marking (workbench and base: aluminum))

7、WVRU type



unit: mm

Nominal model	Main dimensions					Workbench surface size											Base surface dimensions and installation hole positions					Basic rated load		Static allowable torque			Precision μm			
	Maximum stroke	width W ±0.1	height M ±0.1	length L	Quality (Note) g	The position of the threaded holes for the workbench installation				Position of threaded holes for side assembly							B ₂	f ₁	f ₂	f ₃	g	Roller quantity Z	C kN	C ₀ kN	M _A N·m	M _B N·m	M _C N·m	△C	△D	
						B	nxF	G	S	b ₁	t ₁	S ₁ xL	T	H	K	dxDxh														
WVRU 3055	30	60	28	55	0.57[0.3]	25	-	27.5	M4	40	5.5	M3x6	18.5	9	10	4.5x7.5x5	40	35	-	-	10	6	2.71	3.67	12.2	13.9	51.3	2	5	
WVRU 3080	45			80	0.8[0.4]		1x25											60	-	-		10	4.06	6.11	33.1	36.2	85.5			
WVRU 3105	60			105	1.03[0.05]		2x25											85	-	-		13	4.68	7.33	64.6	59.8	103	3	6	
WVRU 3130	75			130	1.26[0.7]		3x25											110	-	-		17	5.87	9.77	107	100	137			
WVRU 3155	90			155	1.49[0.9]		4x25											135	-	85		20	6.98	12.2	131	138	171			
WVRU 3180	105			180	1.72[1]		5x25											160	-	110		24	8.05	14.7	189	196	205			7
WVRU 3205	130			205	1.95[1.1]		6x25											185	85	135		26	8.57	15.9	222	230	222			
WVRU 4085	50			80	35		85											1.5[0.8]	40	-		42.5	M5	55	6.5	M3x6	24			10.5
WVRU 4125	75	125	2.3[1.2]			1x40	80	-	-	11	8.82	13.5	147	134	270	3	7													
WVRU 4165	105	165	3.1[1.5]			2x40	120	-	-	14	11.5	18.9	200	214	378															
WVRU 4205	135	205	3.8[1.9]			3x40	160	80	-	22.5	18	14.0	24.3	330	347			486												
WVRU 4245	155	245	4.6[2.2]			4x40	200	120	-	22	16.3	29.7	492	513	594															
WVRU 4285	185	285	5.3[2.6]			5x40	240	160	-	26	18.6	35.1	687	711	703															

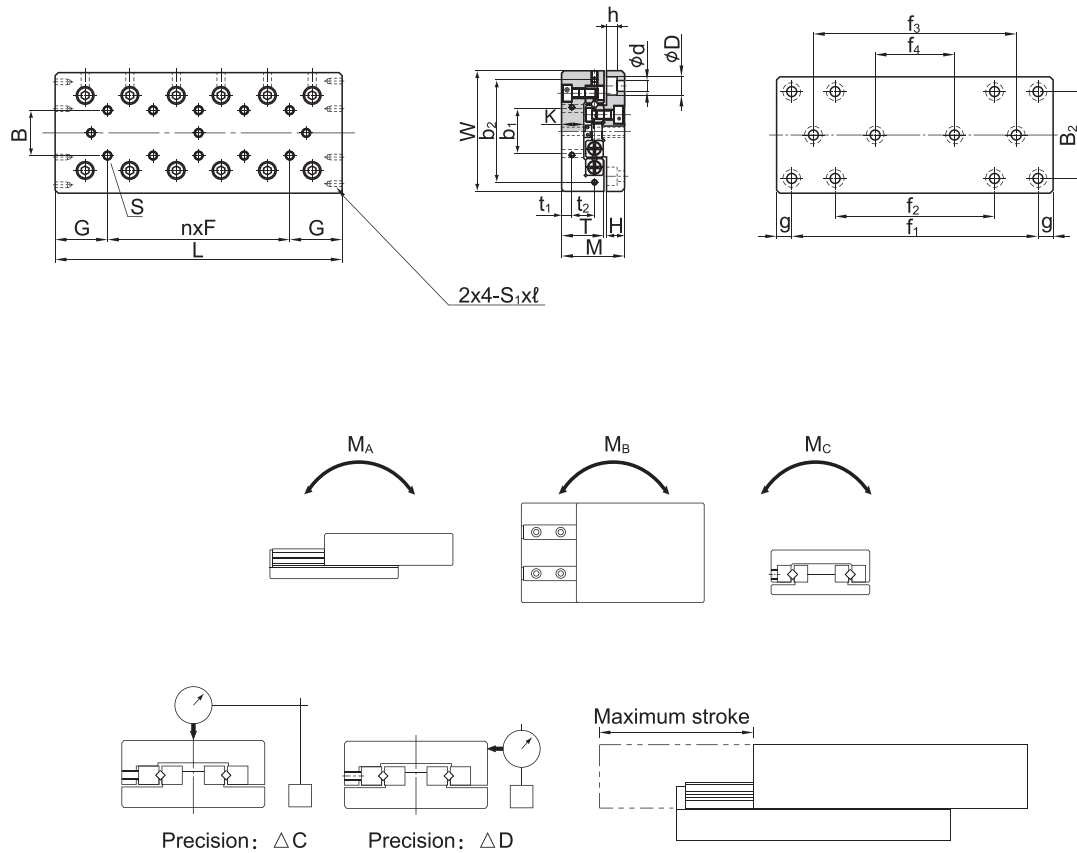
Note: A fully stainless steel type with high corrosion resistance is also available.

The values in parentheses indicate the mass of the stainless steel type.

For example: WVRT 3080 M

└ Stainless steel type marking (workbench and base: aluminum)

8. WVRU Type



unit: mm

Nominal model	Main dimensions					Workbench surface size														Base surface dimensions and installation hole positions					Basic rated load		Static allowable torque			Precision		
	Maximum stroke	width W ±0.1	height M ±0.1	length L	Quality (Note) g	The position of the threaded holes for the workbench installation				Position of threaded holes for side assembly										B ₂	f ₁	f ₂	f ₃	g	Roller quantity Z	C kN	C ₀ kN	M _A N·m	M _B N·m	M _C N·m	ΔC μm	ΔD μm
						B	nx F	G	S	b ₁	b ₂	t ₁	t ₂	S ₁ x1	T	H	K	dx Dxh														
WVRU 6110	60	100	45	110	3.2(1.7)	50	-	55	M6	60	92	8	15	M4x8	31	13	15	7x11x7	60	90	-	-	10	6	16.4	22.7	150	172	510	3	6	
WVRU 6160	95			160	4.6(2.5)		1x50													140	-	-		9	20.5	30.2	410	367	680	3	6	
WVRU 6210	130			210	6(3.2)		2x50													190	-	-		13	28.2	45.3	800	740	1020	3	7	
WVRU 6260	165			260	7.4(4)		3x50													240	-	-		16	35.3	60.5	1040	1100	1360	3	7	
WVRU 6310	200			310	8.7(4.8)		4x50													290	-	-		19	38.8	68.0	1630	1540	1530	4	8	
WVRU 6360	235			360	10.1(5.6)		5x50													340	140	-		22	45.3	83.1	1970	2050	1870	4	8	
WVRU 6410	265			410	11.5(6.4)		6x50													390	190	-		26	51.6	98.3	2750	2840	2210	4	8	
WVRU 9210	130	145	60	210	12(7.1)	85	-	105	M8	90	135	11	20	M4x8	43	16	21	9x14x9	90	100	-	-	55	9	52.3	75.8	1440	1290	2730	3	7	
WVRU 9310	180			310	17.6(7.9)		1x100													200	-	-		14	81.1	133	2810	2990	4780	3	7	
WVRU 9410	350			410	23.2(-)		2x100													300	-	-		15	81.1	133	3660	3420	4780	4	8	
WVRU 9510	450			510	28.8(-)		3x100													400	-	-		19	98.7	171	5710	5410	6140	4	8	
WVRU 9610	550			610	34.4(-)		4x100													500	100	-		22	115	208	6910	7200	7500	4	9	
WVRU 9710	650			710	40(-)		5x100													600	200	-		26	131	246	9460	9980	8870	4	9	
WVRU 9810	750			810	45.6(-)		6x100													700	300	100		29	139	265	12800	12400	9550	5	10	
*WVRU 9910	850			910	51.2(-)		7x100													800	400	200		33	155	303	16500	15900	10900	5	10	
*WVRU 91010	950			1010	56.8(-)		8x100													900	500	300		37	169	341	20500	20000	12300	5	10	

A fully stainless steel type with high corrosion resistance is also available.

The values in parentheses indicate the mass of the stainless steel type.

The WVRU9910 and WVRU91010 models are made to order.

For example: WVRT 3080 M

└ Stainless steel type marking (workbench and base: aluminum)

9. Example of Nominal Model Composition

The composition of the nominal model varies depending on the characteristics of each model. Therefore, please refer to the composition example of the corresponding nominal model.

(1) Micro cross roller units

WVRT and WVRT-A types

WVRT2035	M
└─┘	└─┘
Nominal model	The marking of stainless steel type

(2) Cross roller unit

WVRU type

WVRU2035	M
└─┘	└─┘
Nominal model	The marking of stainless steel type (Workbench and base: aluminum)

10. Precautions for Use

Use

- (1) Please do not disassemble the parts. It may cause functional damage.
- (2) The cross roller unit has been adjusted to the appropriate preload state through the clearance adjustment bolt at the factory. If adjusted again, it may cause clearance or excessive preload, resulting in significant performance degradation. Please be careful.
- (3) Please do not drop or strike the cross roller unit. Otherwise, it may cause scratches or damage. Additionally, even if no damage is visible on the surface after an impact, it may still cause functional damage.
- (4) When handling the product, please use protective gloves, safety shoes and other protective equipment as needed to ensure safety.

Precautions for Use

- (1) Please be cautious to prevent the entry of foreign substances such as chips and coolant. Otherwise, it may lead to damage.
- (2) When foreign substances such as chips are attached, please reseal the lubricant after cleaning.
- (3) Please avoid using it under conditions exceeding 100°C.
- (4) Do not use the internal braking function that prevents the worktable from detaching as a mechanical brake. Impact may cause damage to the brake.
- (5) For small strokes, it is difficult to form an oil film on the contact surface between the rolling surface and the rolling elements, which may cause fretting wear. Please use a lubricant with excellent resistance to fretting wear. Additionally, it is recommended to periodically move the full stroke length to form an oil film between the rolling surface and the rolling elements.
- (6) Do not forcibly hammer the positioning parts (pins, keys, etc.) into the product. This may cause indentations on the rolling surface, leading to functional damage.
- (7) When the rigidity and precision of the installed components are insufficient, the bearing load may concentrate locally, significantly reducing the bearing performance. At the same time, please thoroughly discuss the rigidity and precision of the support seat and base, as well as the strength of the fixing bolts,

Lubrication

- (1) The lubrication of the crossed roller unit is the same as that of ordinary bearings. Use an appropriate amount of soap-based grease or lubricating oil.
- (2) Please carefully wipe off the anti-rust oil and then seal in the lubricant before use.
- (3) When lubricating the product, directly apply the lubricant to the rolling surface. Perform several running-in operations with the stroke length as the unit to allow the grease to enter the product interior.
- (4) Please avoid mixing different lubricants. Even if the thickeners are the same, greases with different additives may have adverse effects on each other.
- (5) When using in special environments such as places with frequent vibration, clean rooms, vacuum, low or high temperatures, please use grease that matches the specifications and environment.
- (6) The consistency of grease changes with temperature. The sliding resistance of the crossed roller unit changes with the consistency of the grease. Please note.
- (7) After greasing, the stirring resistance of the grease may increase the sliding resistance of the crossed roller unit. Please be sure to perform running-in operations to fully run-in the grease before operating the machinery.
- (8) After greasing is completed, excess grease may splash around. Please wipe it off as needed.
- (9) The properties of grease deteriorate and its lubricating performance decreases over time. Therefore, it is necessary to inspect and replenish the grease according to the usage frequency.
- (10) The lubrication intervals vary depending on the usage conditions and environments. Please determine the final greasing intervals and amounts based on the actual equipment.

Deviation of the cage

Although the cage that holds the rollers can operate with extreme precision, it may sometimes deviate due to the influence of mechanical drive vibration, inertial force, and shock, etc.

Please consult WODTOP if used under the following conditions:

- (1) When used vertically
- (2) When driven by a pneumatic cylinder
- (3) When driven by a cam
- (4) When driven by a high-speed crank
- (5) Under heavy torque load
- (6) When using an external baffle for the worktable to align with the guide rail

storage

When storing the crossed roller units, please keep them in the original packaging provided by WODTOP in a horizontal position indoors, and avoid environments with high temperatures, low temperatures and high humidity.

Abandonment

Please dispose of the product as industrial waste in an appropriate manner.◦

1. Characteristics

In the WVR type, the precision rollers are combined with the roller retainer that is arranged orthogonally and the 90° V-shaped groove rolling surface set on the dedicated track. By assembling two rows of roller guides in parallel, the guide system can withstand loads in four directions. Moreover, since pre-load can be applied to the crossed roller guide, a gap-free, highly rigid and smooth sliding mechanism can be achieved. The WVB type is a limited linear motion system with low friction and high precision, which uses a ball retainer B type that holds precision steel balls at short pitch intervals and is combined with a dedicated track V type. Crossed roller guides and ball guides are widely used in the sliding parts of precision machines such as office equipment and their peripheral devices, various measuring instruments, printed circuit board drilling machines, optical measurement devices, optical tables, control mechanisms, X-ray devices, etc.

(1) Long service life and high rigidity

By adopting a unique roller retention method, the effective contact length of the rollers has been increased by 1.7 times compared to traditional products. Moreover, due to the shortened pitch intervals and increased number of rollers, the rigidity has been enhanced by 2 times, resulting in a 6-fold increase in service life. Therefore, for the vibration and shock issues that are prone to occur in the linear motion section, a fully safe design can be achieved.

(2) Smooth movement

In the WVR type, each roller is separated and held by the cage, and due to the fact that the roller pockets in the cage have a surface contact with the rollers, it has good lubricating oil retention, resulting in less wear and enabling smooth rolling motion.

(3) High corrosion resistance

The WVR and WVB series also offer stainless steel types with excellent corrosion resistance.

2. Structure

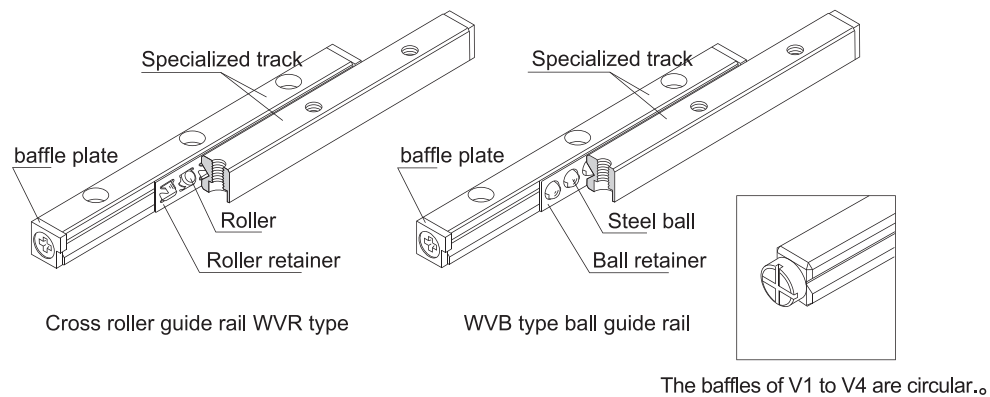
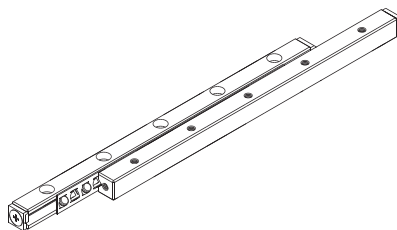


Figure 1 shows the structure of the crossed roller guide rail type WVR and the ball guide rail type WVB.

3. Types and Specialties

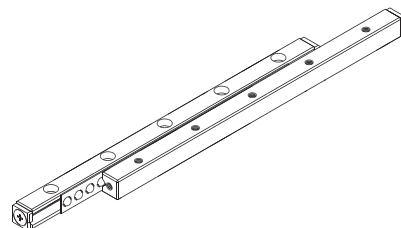
Crossed roller guide rail WVR type

The cage that holds the precision rollers arranged perpendicularly to each other is a small, high-rigidity linear motion system that only moves along the V-shaped groove of the track for a distance of 1/2 of its stroke.



Ball guide WVB type

The ball retainer that holds the precision steel balls at short pitch intervals only moves in the V-shaped groove of the track for half of the travel distance, making it a linear motion system with low friction and high precision.



4. Rated Load and Rated Life

(1) Rated loads in all directions

The basic dynamic load ratings (CZ) and (C0Z) in the size chart represent the values for one rolling element in the direction shown in the figure. When calculating the rated life, the basic dynamic load ratings (CZ) and (C0Z) for the actual number of rolling elements in use can be calculated according to the following formula.

C_Z: The basic dynamic load rating (kN) of one rolling element in the size table

C_{0Z}: The basic rated static load (kN) of one rolling element in the size table

Z: The number of rolling elements (the quantity of rolling elements within the effective load-carrying area)

P: Roller pitch (refer to dimension table A 7-8 to A 7-25)

WVR type is used

Load direction		
Basic dynamic load rating C(kN)	$C = C_L = \left\{ \left(\frac{Z}{2} - 1 \right) \times 2P \right\}^{\frac{1}{36}} \times \left(\frac{Z}{2} \right)^{\frac{2}{3}} \times C_Z$	$C = 2^{\frac{Z}{9}} = \left\{ \left(\frac{Z}{2} - 1 \right) \times 2P \right\}^{\frac{1}{36}} \times \left(\frac{Z}{2} \right)^{\frac{2}{3}} \times C_Z$
Basic static load rating C ₀ (kN)	$C_0 = C_{0L} = \frac{Z}{2} \times C_{0Z}$	$C_{0T} = 2 \times \frac{Z}{2} \times C_{0Z}$

Note: $\frac{Z}{2}$ Discard the decimal places.

WVB type is used

Load direction		
Basic dynamic load rating C(kN)	$C = C_L = Z^{\frac{2}{3}} \times C_Z$	$C = 2 \times Z^{\frac{2}{3}} \times C_Z$
Basic static load rating C ₀ (kN)	$C_0 = C_{0L} = Z \times C_{0Z}$	$C_{0T} = 2 \times Z \times C_{0Z}$

(2) Static safety factor f_s

For WVR and WVB types, when they are at rest or in operation, they may be subjected to unexpected external forces such as inertial forces caused by vibration, shock, or start-stop. It is necessary to consider the static safety factor for such load effects.

$$f_s = \frac{C_0}{P_c}$$

f_s : Static safety factor

C₀ : Basic static rated load (kN)

P_c : Calculated load value (kN)

Table 1 Benchmark Values of Static Safety Factor (f_s)

Use machinery	Load conditions	The lower limit of f _s
General industrial machinery	When there is no vibration or shock	1~1.3
	When there is vibration or shock	2~3

(3) Calculate the rated life.

At WODTOP, the rated life of ball guides is defined as 50km, and that of roller guides is defined as 100km. The rated life (L10) can be calculated by the following formula based on the basic dynamic load rating (C) and the load (Pc) acting on the LM rolling guide.

When using steel ball rails (with a basic dynamic load rating of 50 km)

$$L_{10} = \left(\frac{C}{P_c} \right)^3 \times 50 \quad \dots\dots\dots (1)$$

L₁₀ : Rated service life (km)
C : Basic dynamic rated load (kN)
P_c : Calculated load value (kN)

When using a guide rail with rollers (using a basic dynamic load rating of 100 km)

$$L_{10} = \left(\frac{C}{P_c} \right)^{\frac{10}{3}} \times 100 \quad \dots\dots\dots (2)$$

When comparing the rated life (L10), it is necessary to take into account which of the basic dynamic load ratings is defined as 50 km or 100 km, and convert the basic dynamic load rating as required according to ISO 14728-1. The basic dynamic load rating conversion formula stipulated in ISO is:

When using guide rails with steel balls

$$C_{100} = \frac{C_{50}}{1.26}$$

C₅₀ : The basic dynamic load rating with a rated life of 50,000 km.
C₁₀₀ : The basic dynamic load rating with a rated life of 100,000 km.

When using a guide rail with rollers

$$C_{100} = \frac{C_{50}}{1.23}$$

(4) Calculation of rated life when considering conditions of use

In practical applications, due to the fact that most operations are accompanied by vibration and shock, the load acting on crossed roller guides and ball guides constantly changes, making it difficult to accurately grasp. Additionally, the hardness of the rolling surface, the ambient temperature during use, and the use of sliders in a tight state can also have a significant impact on lifespan. Considering these conditions, the rated life (L10m) taking into account the usage conditions can be calculated by the following formulas (3) and (4).

Considering the coefficient α of the usage conditions

$$\alpha = \frac{f_T}{f_W}$$

α : Taking into account the coefficient of the usage conditions
f_T : temperature coefficient (Refer to Figure 1.)
f_W : Load factor (Refer to Table 2.)

Rated life L10m considering the usage conditions

When using guide rails with steel balls

$$L_{10m} = \left(\alpha \times \frac{C}{P_c} \right)^3 \times 50 \quad \dots\dots\dots (3)$$

L_{10m} : Rated life considering the conditions of use (km)
C₀ : Basic dynamic rated load (kN)
P_c : Calculated value of radial load (kN)

When using a guide rail with rollers

$$L_{10m} = \left(\alpha \times \frac{C}{P_c} \right)^{\frac{10}{3}} \times 100 \quad \dots\dots\dots (4)$$

(5) Calculate the lifespan time.

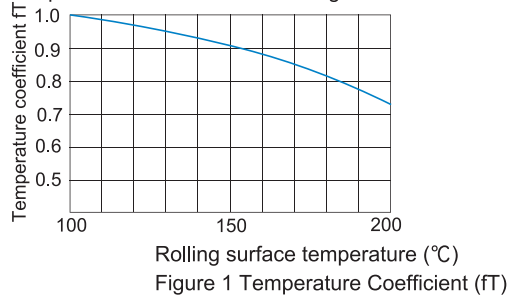
After obtaining the rated life (L10), if the stroke length and the number of reciprocations per minute remain constant, the working life time can be calculated using the following formula.

$$L_h = \frac{L_{10} \times 10^6}{2 \times \ell_s \times n_1 \times 60}$$

L_h : Rated life considering the conditions of use (h)
ℓ_s : Basic dynamic rated load (mm)
n₁ : Calculated value of radial load (min⁻¹)

(6) f_T : Temperature coefficient

When the operating temperature of the WVR or WVB type exceeds 100°C, the adverse effects of high temperature should be taken into account, and the basic rated load should be multiplied by the temperature coefficient indicated in Figure 1.



Note: If the ambient temperature exceeds 100°C, please consult WODTOP.

(7) f_w : Load factor

Generally, mechanical devices that perform reciprocating motion are often accompanied by vibration or shock during operation. It is particularly difficult to accurately calculate the vibration generated at high speeds and all the shocks caused by frequent starts and stops. Therefore, when the actual load acting on the WVR type or WVB type cannot be obtained, or when the influence of speed and vibration is significant, please divide the basic dynamic load rating (C) by the load factor obtained empirically in Table 2.

Table 2 Load Coefficient(f_w)

Vibration, shock	Velocity (V)	f_w
tiny	At very low speeds, $V \leq 0.25$ m/s	1~1.2
Little	At low speeds, $0.25 < V \leq 1$ m/s	1.2~1.5

(8) Precision specification

The accuracy of the special tracks for crossed roller guides is classified into high grade (H) and precision grade (P) as shown in Table 3.

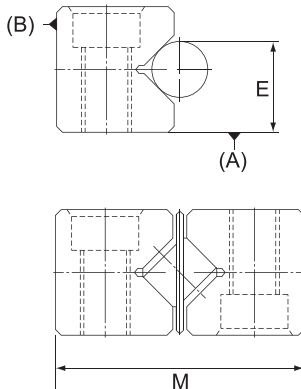


Figure 2

Table 3 Precision Specifications of V-shaped Specialized Track
Unit: mm

accuracy level	Advanced	Precision grade
Marking	H	P
Project		
The parallelism of rolling surfaces A and B	According to Figure 3	
The allowable dimensional tolerance at height E	± 0.02	± 0.01
Group mutual tolerance note at height E	0.01	0.005
The permissible dimensional tolerance for width M	0 -0.2	0 -0.1

The group mutual tolerance of height E is applicable to four tracks used on the same plane.

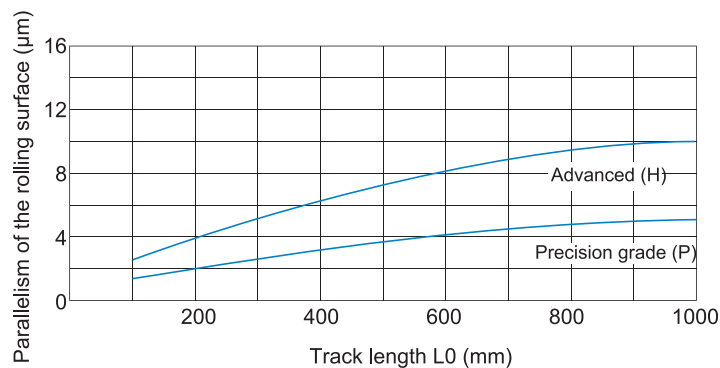
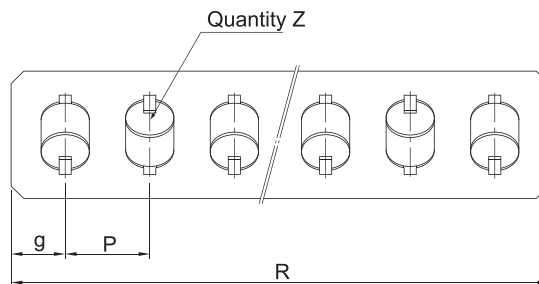
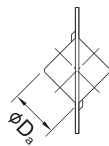
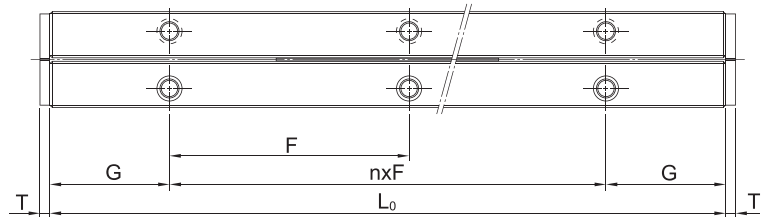
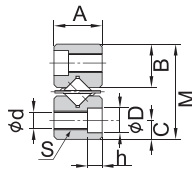


Figure 3 Parallelism between the track length and the rolling surface

5. Crossed roller guide rail WVR type (WVR1)



Unit: mm

Nominal model	maximum itinerary	Main dimensions																Allowable preload amount δ μ m	Basic rated load (per roller)		Orbit (Mass) kg/m	
		Combined dimensions			Installation dimensions														Roller Quantity Z			
		M	A	L ₀	nxF	G	B	C	S	d	D	h	T	D _a	R	g	P					
WVR 1-20x5Z	12	8.5	4	20	1x10	5	3.9	1.8	M2	1.65	3	1.4	1.6	1.5	14	2	2.5	5	-2	0.152	0.153	0.11
WVR 1-30x7Z	22			30	2x10										19			7				
WVR 1-40x10Z	27			40	3x10										26.5			10				
WVR 1-50x13Z	32			50	4x10										34			13				
WVR 1-60x16Z	37			60	5x10										41.5			16				
WVR 1-70x19Z	42			70	6x10										49			19				
WVR 1-80x21Z	52			80	7x10										54			21				

Example of the composition of the nominal model

WVR1 -30 H x 8Z

The number of rollers or steel balls
 Precision marking
 Specialized track dimensions, unit: mm (Examples of dimensions for different total length combinations: 40/50)
 The nominal model of the combination (WVB for ball guide rails)

Note: The above nominal model number indicates a set of devices, which is a combination of 4 LM tracks and 2 retainers.

When ball guides with ball retainers are required, please refer to Type B ball retainers and specify the number of steel balls needed.

(For example) WVB1-50H x 12Z

Number of steel balls

The mass in the dimension table is expressed as the value per 1m of each rail.

Stainless steel types with corrosion resistance can also be provided. (Marked as M, for example, WVR1M)

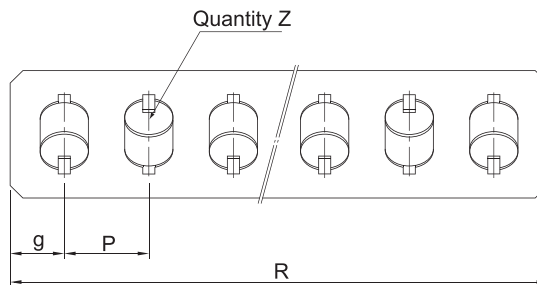
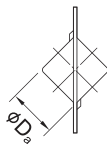
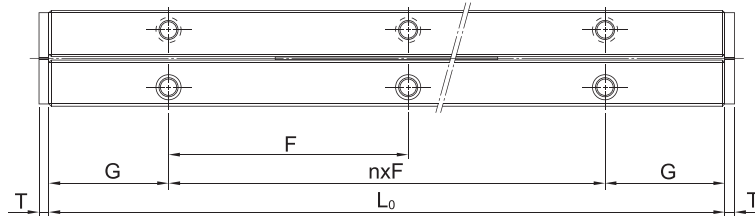
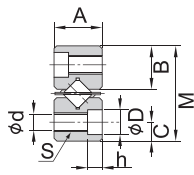
When fixing the dedicated rail for the WVR1 type, precision instrument cross recessed small screws (No. 0 small screws) can be used.

Nominal model	Type	Nominal diameter x pitch of the screw
WVR1 type is used for	No. 0 pan head small screws (Class 3)	M1.4x0.3

Japanese Camera Industry Standard JCIS 10-70

Precision instrument cross recessed small screws (No. 0 small screws)

6. Crossed Roller Guide WVR Type (WVR2)



Unit: mm

Nominal model	maximum itinerary	Main dimensions																Allowable preload amount δ μ m	Basic rated load (per roller)		Orbit (Mass) kg/m	
		Combined dimensions			Installation dimensions														Roller Quantity Z			
		M	A	L ₀	nxF	G	B	C	S	d	D	h	T	D _a	R	g	P					
WVR 2-30x5Z	18	12	6	30	1x15	7.5	5.6	2.5	M3	2.55	4.4	2	1.5	2	21	2.5	4	5	-3	0.276	0.271	0.23
WVR 2-45x8Z	24			45	2x15										33			8				
WVR 2-60x11Z	30			60	3x15										45			11				
WVR 2-75x13Z	44			75	4x15										53			13				
WVR 2-90x16Z	50			90	5x15										65			16				
WVR 2-105x18Z	64			105	6x15										73			18				
WVR 2-120x21Z	70			120	7x15										85			21				
WVR 2-135x23Z	84			135	8x15										93			23				
WVR 2-150x26Z	90			150	9x15										105			26				
WVR 2-165x29Z	96			165	10x15										117			29				
WVR 2-180x32Z	102			180	11x15										129			32				

Example of the composition of the nominal model

WVR2 -30 H x 6Z

— Precision marking — The number of rollers or steel balls

Specialized track dimensions, unit: mm (Examples of dimensions for different total length combinations: 90/105)

The nominal model of the combination (WVB for ball guide rails)

Note: The above nominal model number indicates a set of devices, which is a combination of 4 LM tracks and 2 retainers.

When ball guides with ball retainers are required, please refer to Type B ball retainers and specify the number of steel balls needed.

(For example) WVB2-90H x 15Z
— Number of steel balls

The mass in the size table is expressed as the value per 1m of each rail.

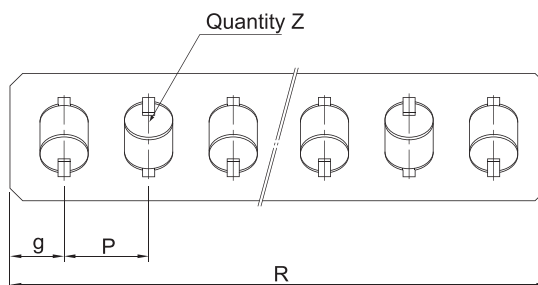
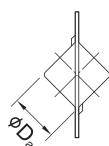
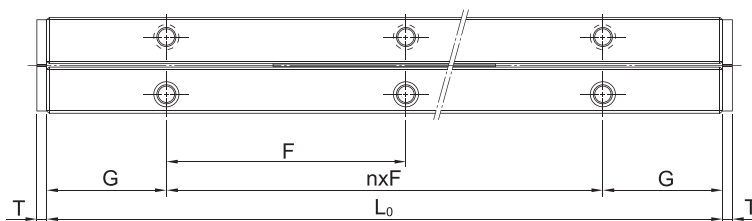
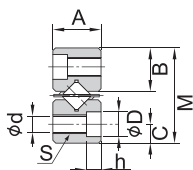
Stainless steel types with corrosion resistance can also be provided. (Marked as M, for example, WVR2M)

When fixing the dedicated rail for the WVR2 type, precision instrument cross recessed small screws (No. 0 small screws) can be used.

Nominal model	Type	Nominal diameter x pitch of the screw
WVR2 type is used	No. 0 pan head small screws (Class 3)	M2x0.4

Cross recessed small screws JIS B 1111 (pan head small screws)

7. Crossed Roller Guide WVR Type (WVR3)



Unit: mm

Nominal model	maximum itinerary	Main dimensions																Allowable preload amount δ μm	Basic rated load (per roller)		Orbit (Mass) kg/m	
		Combined dimensions			Installation dimensions										Roller Quantity Z				C _Z kN	C _{OZ} kN		
		M	A	L ₀	nxF	G	B	C	S	d	D	h	T	D _a	R	g	P					
WVR 3-50x7Z	28	18	8	50	1x25	12.5	8.3	3.5	M4	3.3	6	3.1	2	3	36	3	5	7	-4	0.639	0.611	0.45
WVR 3-75x8Z	48			75	2x25										51			10				
WVR 3-100x14Z	58			100	3x25										71			14				
WVR 3-125x17Z	78			125	4x25										86			17				
WVR 3-150x21Z	88			150	5x25										106			21				
WVR 3-175x24Z	108			175	6x25										121			24				
WVR 3-200x28Z	118			200	7x25										141			28				
WVR 3-225x31Z	138			225	8x25										156			31				
WVR 3-250x35Z	148			250	9x25										176			35				
WVR 3-275x38Z	168			275	10x25										191			38				
WVR 3-300x42Z	178	300	11x25	211	42																	

Example of the composition of the nominal model

WVR3 -75 H x 9Z

Precision marking

The number of rollers or steel balls

Specialized track dimensions, unit: mm (Examples of dimensions for different total length combinations: 100/125)

The nominal model of the combination (WVB for ball guide rails)

Note: The above nominal model number indicates a set of devices, which is a combination of 4 LM tracks and 2 retainers.

When ball guides with ball retainers are required, please refer to Type B ball retainers and specify the number of steel balls needed.

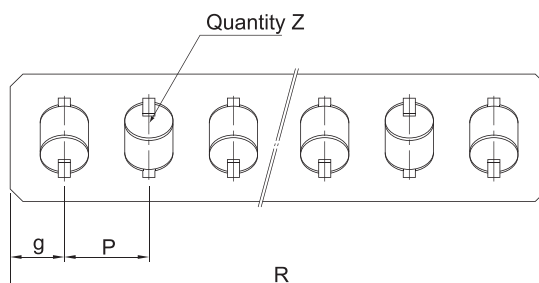
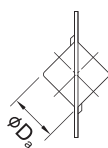
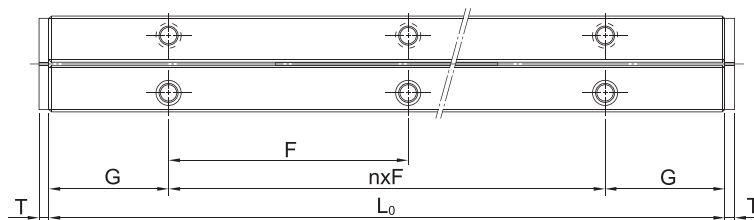
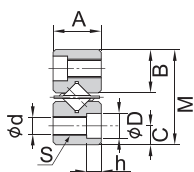
(For example) WVB3-150H x 20Z

Number of steel balls

The mass in the size table is expressed as the value per 1m of each rail.

Stainless steel types with corrosion resistance can also be provided. (Marked with M, for example, WVR3M)

8. Cross Roller Guide WVR Type (WVR4)



Unit: mm

Nominal model	maximum itinerary	Main dimensions																Allowable preload amount δ μm	Basic rated load (per roller))		Orbit (Mass) kg/m	
		Combined dimensions			Installation dimensions												Roller Quantity Z					
		M	A	L ₀	nxF	G	B	C	S	d	D	h	T	D _a	R	g			P	C _Z kN		C _{OZ} kN
WVR 4-80x7Z	58	22	11	80	1x40	20	10.2	4.5	M5	4.3	8	4.2	2	4	51	4.5	7	7	-5	1.38	1.35	0.8
WVR 4-120x11Z	82			120	2x40										79			11				
WVR 4-160x15Z	106			160	3x40										107			15				
WVR 4-200x19Z	130			200	4x40										135			19				
WVR 4-240x23Z	154			240	5x40										163			23				
WVR 4-280x27Z	178			280	6x40										191			27				
WVR 4-320x31Z	202			320	7x40										219			31				
WVR 4-360x35Z	226			360	8x40										247			35				
WVR 4-400x39Z	250			400	9x40										275			39				
WVR 4-440x43Z	274			440	10x40										303			43				
WVR 4-480x47Z	298			480	11x40										331			47				

Example of the composition of the nominal model

WVR4 -80 P x 9Z

The number of rollers or steel balls

Precision marking

Specialized track dimensions, unit: mm (Examples of dimensions for different total length combinations: 120/160)

The nominal model of the combination (WVB for ball guide rails)

Note: The above nominal model number indicates a set of equipment consisting of 4 LM tracks and 2 retainers.

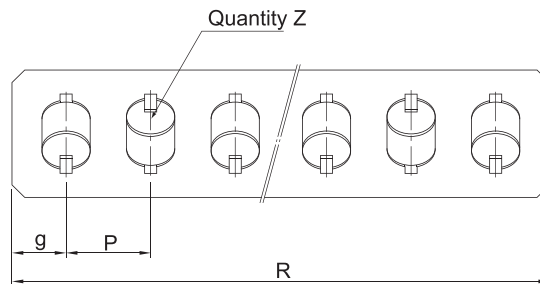
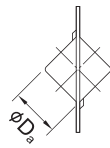
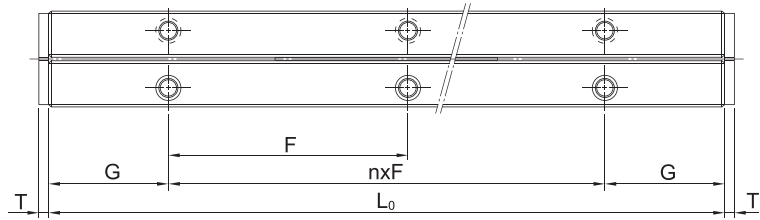
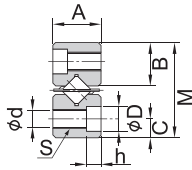
When ball guides with ball retainers are required, please refer to Type B ball retainers and specify the number of steel balls needed.

(For example) WVB4-200H x Number of steel balls

The mass in the dimension table is expressed as the value per 1m of each rail.

Stainless steel types with corrosion resistance can also be provided. (Marked with M, for example, WVR4M)

9. Crossed Roller Guide WVR Type (WVR6)



Unit: mm

Nominal model	maximum itinerary	Main dimensions																Allowable preload amount δ μ m	Basic rated load (per roller))		Orbit (Mass) kg/m	
		Combined dimensions			Installation dimensions														Roller Quantity Z			
		M	A	L ₀	nxF	G	B	C	S	d	D	h	T	D _a	R	g	P			C _Z kN		C _{0Z} kN
WVR 6-100x7Z	56	30	15	100	1x50	25	14.4	6	M6	5.2	9.5	5.2	3.2	6	72	6	10	7	-7	3.78	3.78	1.5
WVR 6-150x10Z	96			150	2x50													10				
WVR 6-200x13Z	136			200	3x50													13				
WVR 6-250x17Z	156			250	4x50													17				
WVR 6-300x20Z	196			300	5x50													20				
WVR 6-350x24Z	216			350	6x50													24				
WVR 6-400x27Z	256			400	7x50													27				
WVR 6-450x31Z	276			450	8x50													31				
WVR 6-500x34Z	316			500	9x50													34				
WVR 6-550x37Z	336			550	10x50													38				
WVR 6-600x41Z	376			600	11x50													41				

Example of the composition of the nominal model

WVR6 -100 P x 6Z

Precision marking

The number of rollers or steel balls

Specialized track dimensions, unit: mm (Examples of dimensions for different total length combinations: 300/400)

The nominal model of the combination (WVB for ball guide rails)

Note: The above nominal model number indicates a set of equipment consisting of 4 LM tracks and 2 retainers.

When ball guides with ball retainers are required, please refer to Type B ball retainers and specify the number of steel balls needed.

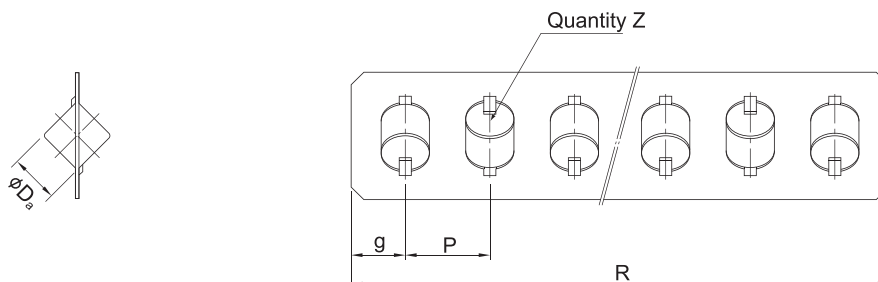
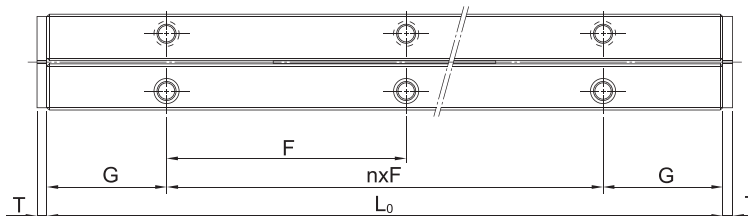
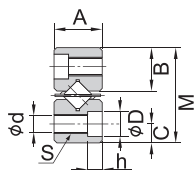
(For example) WVB6-300H x 18Z

Number of steel balls

The mass in the size table is expressed as the value per 1m of each rail.

Stainless steel types with corrosion resistance can also be provided. (Marked with M, for example, WVR6M)

10. Crossed roller guide rail WVR type (WVR9)



Unit: mm

Nominal model	maximum Itinerary	Main dimensions																Allowable preload amount δ μ m	Basic rated load (per roller))		Orbit (Mass) kg/m	
		Combined dimensions			Installation dimensions														Roller Quantity Z			
		M	A	L ₀	nxF	G	B	C	S	d	D	h	T	D _a	R	g	P					
WVR 9-200x10Z	118	40 (40.74)	20	200	1x100	50	19.2	8	M8	6.8	10.5	6.2	4	9 (9.525)	141	7.5	14	10	-10	9.53	9.48	3.2
WVR 9-300x15Z	178			300	2x100										211			15				
WVR 9-400x20Z	238			400	3x100										281			20				
WVR 9-500x25Z	298			500	4x100										351			25				
WVR 9-600x30Z	358			600	5x100										421			30				
WVR 9-700x35Z	418			700	6x100										491			35				
WVR 9-800x40Z	478			800	7x100										561			40				
WVR 9-900x45Z	538			900	8x100										631			45				
WVR 9-1000x50Z	598			1000	9x100										701			50				
WVR 9-1100x55Z	658			1100	10x100										771			55				
WVR 9-1200x60Z	718	1200	11x100	841	60																	

Example of the composition of the nominal model

WVR9 -600 H x 30Z

Precision marking
 The number of rollers or steel balls

Specialized track dimensions, unit: mm (Examples of dimensions for different total length combinations: 300/400)

The nominal model of the combination (WVB for ball guide rails)

Note: The above nominal model number indicates a set of devices, which is a combination of 4 LM tracks and 2 retainers.

When ball guides with ball retainers are required, please refer to Type B ball retainers and specify the number of steel balls needed.

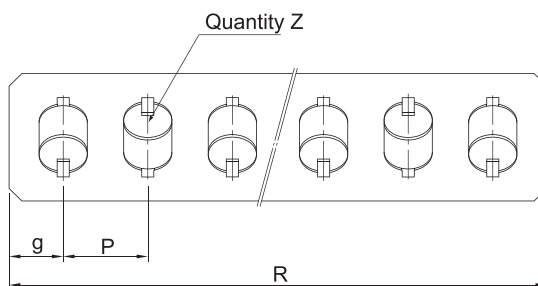
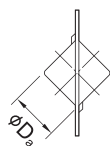
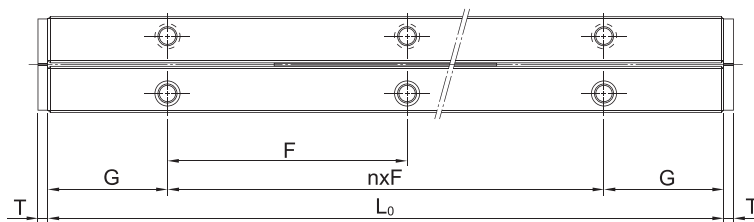
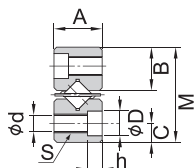
(For example) WVB9-700H x 33Z

Number of steel balls

The mass in the size table is expressed as the value per 1m of each rail.

Stainless steel types with corrosion resistance can also be provided. (Marked with M, for example, WVR9M)

11. Cross roller guide WVR type (WVR12)



Unit: mm

Nominal model	maximum itinerary	Main dimensions																Allowable preload amount δ μ m	Basic rated load (per roller))		Orbit (Mass)	
		Combined dimensions			Installation dimensions										Roller Quantity Z				C _Z kN	C _{OZ} kN	kg/m	
		M	A	L ₀	nxF	G	B	C	S	d	D	h	T	D _a	R	g	P					
WVR 12-200x7Z	110	58 (57.86)	28	200	1x100	50	28	12	M10	8.5	14	8.2	5	12 (11.906)	145	12.5	20	7	-13	17.6	17.2	5.3
WVR 12-300x10Z	190			300	2x100										205			10				
WVR 12-400x14Z	230			400	3x100										285			14				
WVR 12-500x17Z	310			500	4x100										345			17				
WVR 12-600x21Z	350			600	5x100										425			21				
WVR 12-700x24Z	430			700	6x100										485			24				
WVR 12-800x28Z	470			800	7x100										565			28				
WVR 12-900x31Z	550			900	8x100										625			31				
WVR 12-1000x34Z	630			1000	9x100										685			34				
WVR 12-1100x38Z	670			1100	10x100										765			38				
WVR 12-1200x41Z	750			1200	11x100										825			41				

Example of the composition of the nominal model

WVR12 -200 P x 9Z

The number of rollers or steel balls

Precision marking

Specialized track dimensions, unit: mm (Examples of dimensions for different total length combinations: 300/400)

The nominal model of the combination (WVB for ball guide rails)

Note: The above nominal model number indicates a set of devices, which is a combination of 4 LM tracks and 2 retainers.

When ball guides with ball retainers are required, please refer to Type B ball retainers and specify the number of steel balls needed.

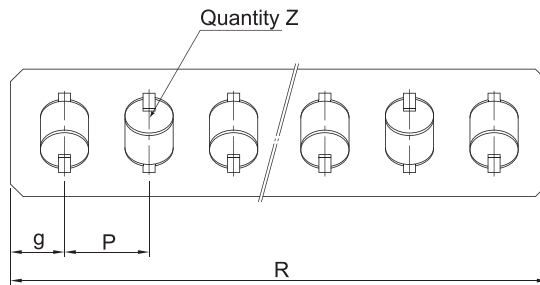
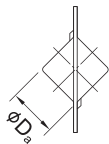
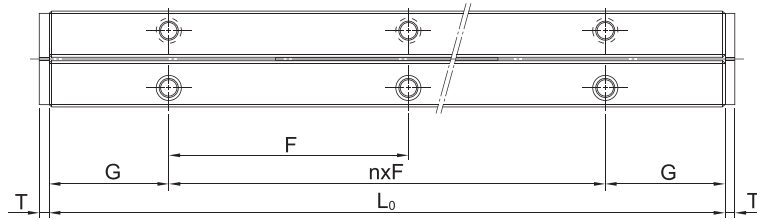
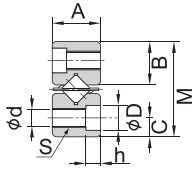
(For example) WVB12-700H x 20Z

Number of steel balls

The mass in the size table is expressed as the value per 1m of each rail.

Stainless steel types with corrosion resistance can also be provided. (Marked with M, for example, WVR12M)

12. Crossed Roller Guide WVR Type (WVR15)



Unit: mm

Nominal model	maximum itinerary	Main dimensions																Allowable preload amount δ μ m	Basic rated load (per roller)		Orbit (Mass) kg/m	
		Combined dimensions			Installation dimensions														Roller Quantity Z			
		M	A	L ₀	nxF	G	B	C	S	d	D	h	T	D _a	R	g	P					
WVR 15-300x8Z	190	71 (71.11)	36	300	2x100	50	34.4	14	M12	10.5	17.5	10.2	6	15 (15.081)	205	15	25	8	-16	27.9	26.8	8.3
WVR 15-400x11Z	240			400	3x100										280			11				
WVR 15-500x13Z	340			500	4x100										330			13				
WVR 15-600x16Z	390			600	5x100										405			16				
WVR 15-700x19Z	440			700	6x100										480			19				
WVR 15-800x22Z	490			800	7x100										555			22				
WVR 15-900x25Z	540			900	8x100										630			25				
WVR 15-1000x27Z	640			1000	9x100										680			27				
WVR 15-1100x30Z	690			1100	10x100										755			30				
WVR 15-1200x33Z	740			1200	11x100										830			33				

Example of the composition of the nominal model

WVR15 -300 H x 10Z

Precision marking
 The number of rollers or steel balls

Specialized track dimensions, unit: mm (Examples of dimensions for different total length combinations: 300/400))
 The nominal model of the combination (WVB for ball guide rails)

Note: The above nominal model number indicates a set of equipment consisting of 4 LM tracks and 2 retainers..

When ball guides with ball retainers are required, please refer to Type B ball retainers and specify the number of steel balls needed.

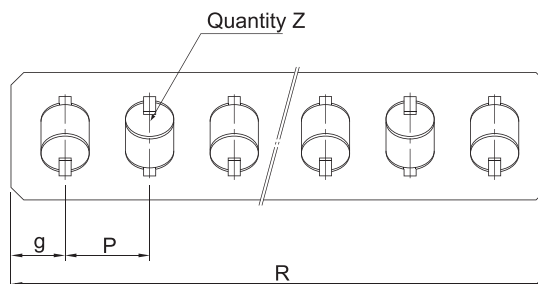
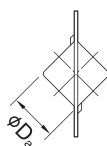
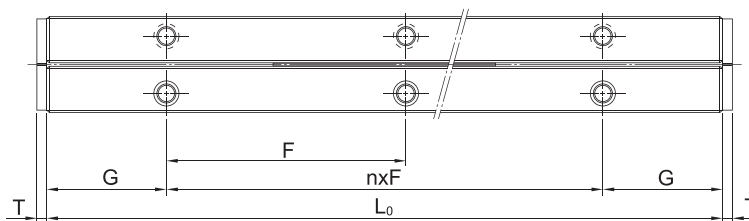
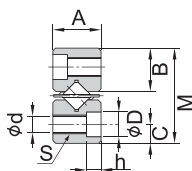
(For example) WVB15-800H x 20Z

Number of steel balls

The mass in the size table is expressed as the value per 1m of each rail.

Stainless steel types with corrosion resistance can also be provided. (Marked with M, for example, WVR15M)

Linear guide rail



Nominal model	maximum lifecycle	Main dimensions																Allowable preload amount δ μm	Basic rated load (per roller))		Orbit (Mass)	
		Combined dimensions			Installation dimensions														Roller Quantity Z			
		M	A	L ₀	nxF	G	B	C	S	d	D	h	T	D _a	R	g	P					
WVR 18-300x6Z	228	83	40	300	2x100	50	40.2	18	M14	12.5	20	12.2	6	18	186	18	30	6	-18	40.9	38.8	10.5
WVR 18-400x9Z	248			400	3x100										276			9				
WVR 18-500x11Z	328			500	4x100										336			11				
WVR 18-600x13Z	408			600	5x100										396			13				
WVR 18-700x16Z	428			700	6x100										486			16				
WVR 18-800x18Z	508			800	7x100										546			18				
WVR 18-900x20Z	588			900	8x100										606			20				
WVR 18-1000x23Z	608			1000	9x100										696			23				
WVR 18-1100x25Z	688			1100	10x100										756			25				
WVR 18-1200x27Z	768			1200	11x100										816			27				

WVR18 -400 H x 10Z

  The number of rollers or steel balls

Specialized track dimensions, unit: mm (Examples of dimensions for different total length combinations: 300/400)

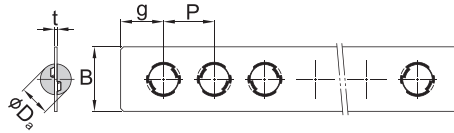
The nominal model of the combination (WVB for ball guide rails)

Note: The above nominal model number indicates a set of devices, which is a combination of 4 LM tracks and 2 retainers.

The mass indicated in the dimension table is given as the value per 1m for each rail.

Stainless steel types with corrosion resistance can also be provided. (Marked with M, for example, WVR18M)

14. Ball Retainer Type B



Nominal model	Main dimensions					Basic rated load (Each steel ball)		Combined orbit
	D_a	t	B	P	g	C_z N	C_{0z} N	
B 1	1.5	0.2	3.5	2.5	2	7.84	21.6	V1
B 2	2	0.3	5	4	3	12.7	39.2	V2
B 3	3	0.4	7	6	4.5	27.5	87.3	V3
B 4	4	0.5	9	7	4.5	45.1	155	V4
B 6	6	0.6	13.5	10	6	98	353	V6
B 9	9.525	1	19	14	8.5	216	784	V9
B 12	11.906	1	25	20	12.5	324	1420	V12
B 15	15.081	1.2	31	25	15	490	2160	V15

15. Installation Method

(1) When using the gap adjustment bolt:

Place tracks 2 and 3 closely together on the base mounting surface, and place track 1 closely on the worktable mounting surface. Then, firmly tighten the track assembly bolts.

(2) Temporarily fix track 4 on the workbench.

When designing, please note that the assembly bolts of the track should be capable of full locking operation even in the installed state.

(3) The base and the worktable should be installed in the position relationship as shown in Figure 1. The roller retainer is inserted from the end. If the retainer cannot be inserted due to no clearance, the track 4 can be moved towards the adjusting bolt and then inserted again.

(4) As shown in Figure 1, set up the dial indicator. Then, while gently pushing the worktable left and right, slowly tighten all the adjusting bolts until there is no gap left and right.

(5) Install stop blocks at the ends of the tracks.

Move the worktable and adjust the position of the cage to ensure the required stroke length is achieved.

As shown in Figure 2-1, place the roller retainer in the central part of the track. Use a torque wrench to evenly tighten the adjusting bolts (b, c, and d) within the roller range until the dial indicator shows the predetermined displacement. Then fully tighten the assembly bolts at the adjusted positions.

The displacement of the dial indicator represents the preload of each cage of rollers.

As shown in Figure 2-2, move the workbench and lock the remaining adjusting bolts (a and e) in the same sequence.

When installing multiple workbenches, you can first measure the locking torque or sliding resistance of the adjusting bolt of the first one. If you want to install the second one,

If the locking torque or sliding resistance is the same in the future, approximately the same preload can be applied.

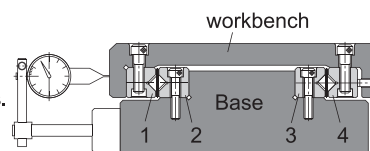


Figure 1 Installation of Crossed Roller Guide Rails

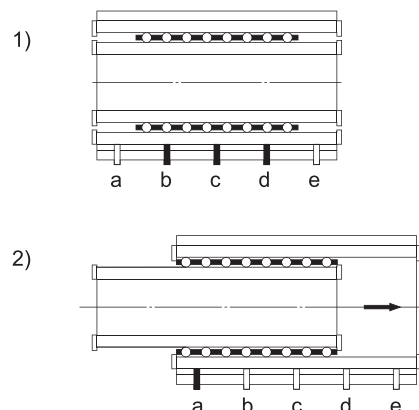
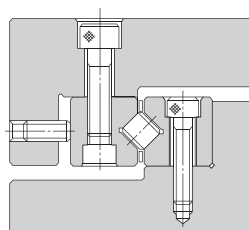


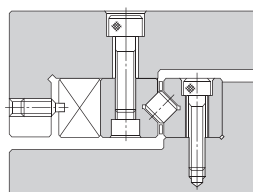
Figure 2 Locking sequence of adjusting bolts

16. Example of Gap Adjustment

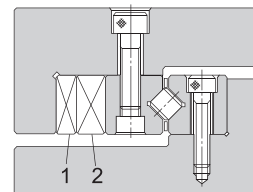
Please design the adjusting bolt and the roller on the same horizontal line.



The track is usually pushed by adjusting bolts.



When there are requirements for precision and rigidity, pressure plates can be used.



In cases where particularly high precision and rigidity are required, conical wedges 1 and 2 can be used.

Figure 3 Example of Gap Adjustment

17. Preload amount

Excessive preload is the cause of faults such as indentations or shortened lifespan. The allowable preload amount for a row of roller retainers is indicated in the size table. Please confirm the displacement of the roller contact part while tightening the adjustment bolt.

18. Precision of the installation surface

To achieve high walking accuracy, it is necessary to make precision adjustments such as parallelism or straightness of the track installation surface. The parallelism and flatness of the track installation surface should be ground to achieve the same or higher parallelism as the track. At the same time, please install the track correctly and tightly against the installation surface.

19. Special installation bolts

Usually, tracks are installed at the parts where clearance adjustment is carried out. As shown in Figure 1, the fixation is achieved by using the bolt holes set on the track. At this time, the diameters of the bolt holes (d_1 and D_1) should be increased according to the adjustment amount during processing.

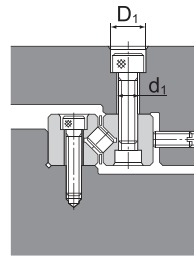


Figure 1

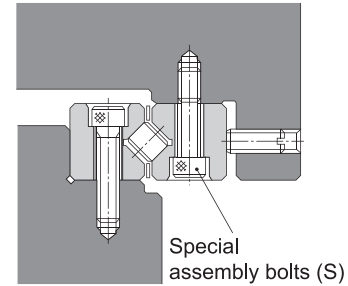


Figure 2

In addition, if the installation method shown in Figure 2 must be adopted structurally, the assembly bolts (S) of this track can use the special assembly bolts as shown in Figure 3.

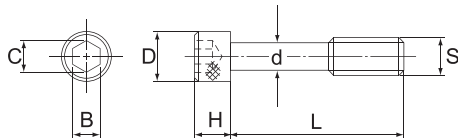


Figure 3 Special Installation Bolts

Table 1 Special Installation Bolts

Nominal model	S	d	D	H	L	B	Mass (g)	Applicable orbit
S 3	M3	2.3	5	3	12	2.5	1	V3
S 4	M4	3.1	5.8	4	15	3	2	V4
S 6	M5	3.9	8	5	20	4	4	V6
S 9	M6	4.6	8.5	6	30	5	5	V9
S 12	M8	6.25	11.3	8	40	6	15	V12
S 15	M10	7.9	13.9	10	45	8	27	V15
S 18	M12	9.6	15.8	12	50	10	43	V18

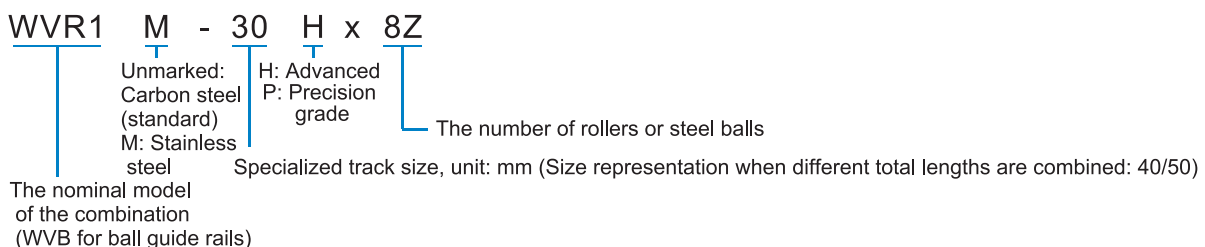
20. Nominal model number

Example of nominal model composition

The composition of the nominal model varies depending on the characteristics of each model. Therefore, please refer to the composition example of the corresponding nominal model.

Cross roller guide rails, ball guide rails

● WVR and WVB types



Note: The above nominal model number indicates a set of equipment, which is a combination of 4 LM tracks and two retaining plates.

● Only dedicated tracks.

WV6 -200

- WV6**: Nominal model
- 200**: Special track dimensions Unit: mm

● Only the roller retaining plate

WR6 x 13Z

- WR6**: Nominal model Roller: R; Roller: B
- x 13Z**: The number of rollers or steel balls

● Special installation bolts

S6

- S6**: Nominal model

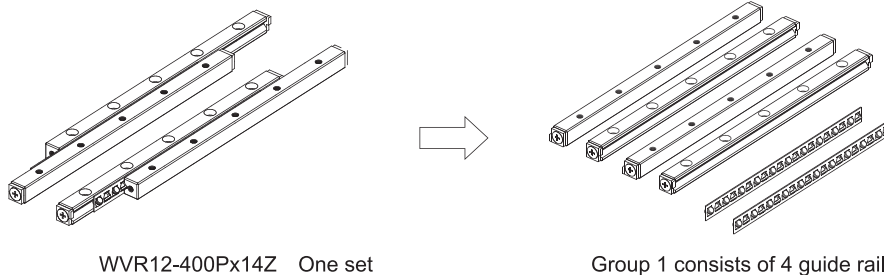
When purchasing only the dedicated track, roller retainers, and dedicated installation bolts, please indicate the quantities separately.

21. Points to Note When Placing an Order

Ordering Unit

A set of crossed roller guides or ball guides refers to the combination state of 4 tracks and 2 retainers.

- Ordering examples of crossed roller guides and ball guides



WVR12-400Px14Z One set

Group 1 consists of 4 guide rails and 2 cages.

If you wish to use a combination of tracks and retainers not listed in the size table, please consult WODTOP.

22. Precautions for Use

Use

- (1) Please do not disassemble the parts. It may cause functional damage.
- (2) Please do not drop or strike the crossed roller guide rails or ball guide rails. Otherwise, it may cause scratches or damage. Additionally, even if no visible damage is apparent after an impact, it may still lead to functional failure.
- (3) When handling the product, please use protective gloves, safety shoes and other protective equipment as needed to ensure safety.

Notes on Use

- (1) Please be careful to prevent the entry of foreign substances such as chips and coolant. Otherwise, it may cause damage.
- (2) When used in environments where chips, corrosive solvents, water, etc. may enter the product interior, please use telescopic guards or protective covers, etc. to prevent them from entering the product interior.
- (3) When foreign substances such as chips are attached, please refill the lubricant after cleaning.
- (4) Please avoid using it at temperatures exceeding 100°C.
- (5) When the stroke is very small, it is difficult for an oil film to form on the contact surface between the rolling surface and the rolling elements, which may cause fretting wear. Please use grease with excellent fretting wear resistance. In addition, it is recommended to periodically move the full stroke length to form an oil film between the rolling surface and the rolling elements.
- (6) Please do not forcibly hammer the locating parts (pins, keys, etc.) into the product. This may cause indentations on the rolling surface, leading to functional damage.
- (7) Using it in a state where the rolling elements have fallen off may cause initial damage.
- (8) If the rolling element drops out, please stop using this product and contact WODTOP.
- (9) When the rigidity and accuracy of the installed components are insufficient, the bearing load will be concentrated locally, resulting in a significant reduction in bearing performance. At the same time, please conduct a thorough discussion on the rigidity and accuracy of the support seat and base, as well as the strength of the fixing bolts.

Lubrication

- (1) Please wipe off the anti-rust oil carefully and apply the lubricant before use.
- (2) When lubricating the product, apply the lubricant directly to the rolling surface. Run the product several times over its stroke length to allow the grease to penetrate into the interior of the product.
- (3) Please avoid mixing different lubricants. Even greases with the same thickener may have adverse effects on each other due to differences in additives and other factors.
- (4) When used in places with frequent vibration, dust-free rooms, vacuum, low-temperature and high-temperature and other special environments, please use grease that matches the specifications and environment.
- (5) The consistency of grease varies with temperature. The sliding resistance of crossed roller guides and ball guides changes with consistency. Please note.
- (6) After greasing, due to the stirring resistance of the grease, the sliding resistance of the crossed roller guide rail and ball guide rail may increase. Please be sure to perform running-in operation, fully run-in the grease, and then operate the machinery.
- (7) After the greasing is completed, excess grease may splash around. Please wipe it as needed.
- (8) As the usage time of grease increases, its properties deteriorate and its lubricating performance decreases. Therefore, it is necessary to inspect and replenish the grease according to the usage frequency.
- (9) The lubrication intervals vary depending on the operating conditions and environment. Please determine the final greasing intervals and quantities based on the actual equipment.

Installation

When fixing the track with a through hole using crossed roller guides, use an inner hexagon cylindrical head bolt. However, for the models shown in Table 1, it is recommended to use the screws as recorded.

Table 1 Base Fixing Screws

Nominal model	Type	The nominal diameter of the screw
WVR1	M1.4	M1.4
WVR2	M2	M2

Orbit length

The movement of the roller retainer and the ball retainer is carried out in the same direction as the worktable movement at 1/2 of the worktable's displacement.

Let the length of the retainer be ℓ and the stroke length be ℓ_s . Therefore, in order to prevent the retainer from being in a cantilever state on the track, the length of the track (L_k) should be at least as follows.

$$L_k \geq \ell + \frac{\ell_s}{2}$$

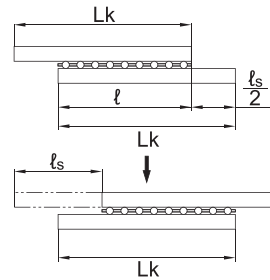


Figure 1

Deviation of the cage

Although the cage of the rollers (or steel balls) can operate with extreme precision, due to the influence of mechanical drive vibration, inertial force and shock, etc., the cage may sometimes deviate. If used under the following circumstances, please consult WODTOP.

- (1) When used vertically
- (2) When the pneumatic cylinder is driven
- (3) When driven by a cam
- (4) When driven by a high-speed crankshaft
- (5) Under the action of a large torque load
- (6) When aligning the external baffle of the workbench with the guide rail

About the baffle plate

To prevent the cage from falling off, a baffle is installed at the end face of the track. However, please note that if the cage frequently collides with the baffle, it may cause wear on the baffle and loosening of the baffle fixing screws, etc., which could be the cause of the cage falling off.

Dust-proof

To prevent foreign substances from entering the internal parts of the crossed roller guide and ball guide, the side dust-proof method as shown in Figure 2 can be adopted. For dust-proofing in the front and rear directions, it is recommended to consider using telescopic covers or circular soft telescopic covers.

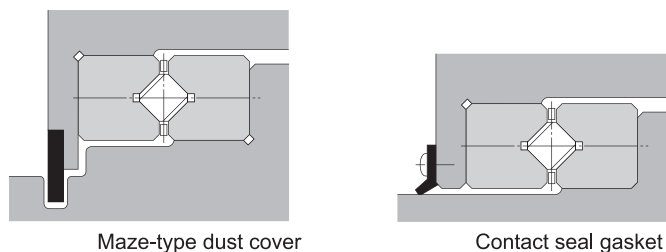


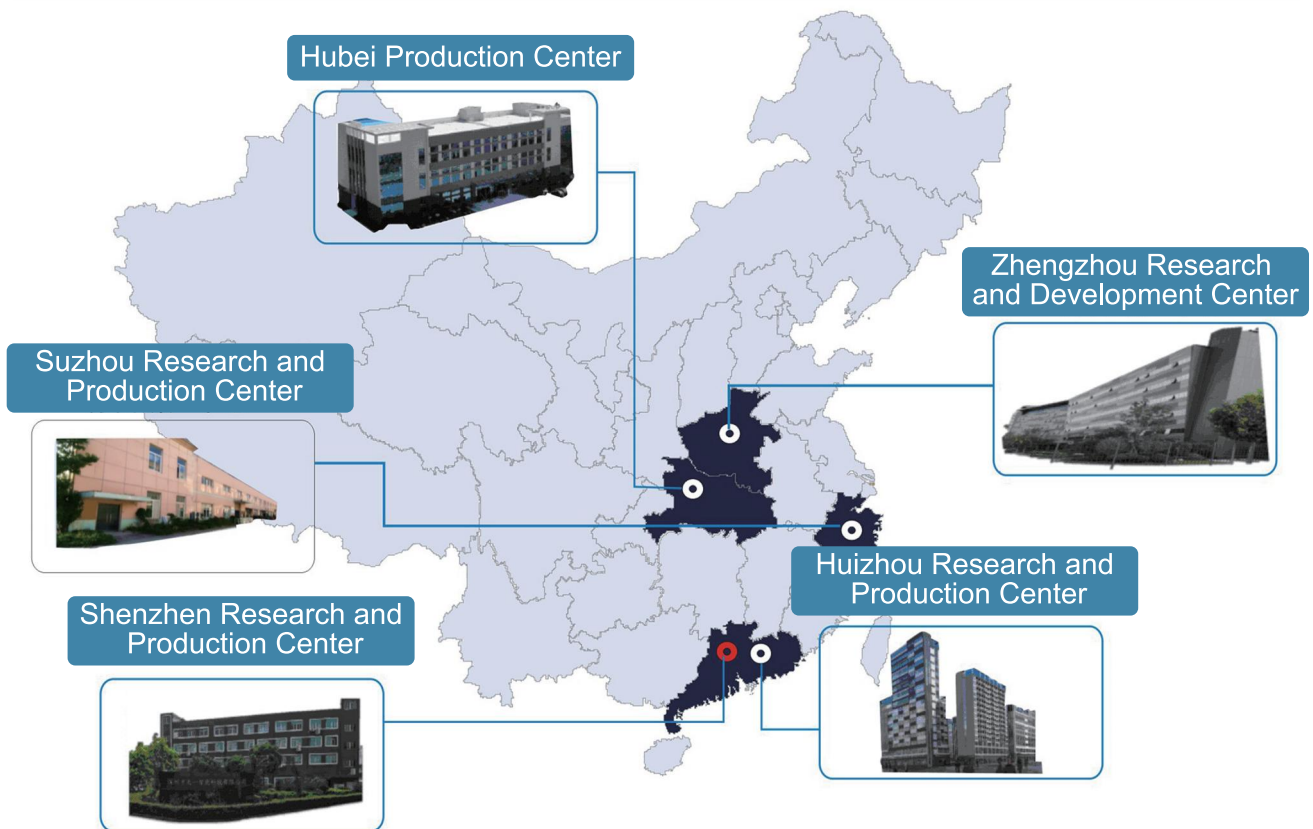
Figure 2 Dust-proofing Methods

storage

When storing crossed roller guides and ball guides, please keep them in the original packaging provided by WODTOP in a horizontal position indoors, and avoid environments with high temperatures, low temperatures and high humidity.

Abandonment

Properly dispose of the products as industrial waste.



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