

Special Environments of Linear Motion Systems



HIWIN Support



About HIWIN

Optimal Solutions for Special Environments

Environment or condition	Requirements	Solutions	
Cleanroom	- Ensure that lubricants do not contaminate the cleanroom environment. - Ensure operational components generate minimum particles or dust that could affect the cleanroom environment.	Choose low-particulate lubricants for component lubrication.	
		Select materials for components that generate fewer particles.	
	Even in limited spaces, equipment must remain lubricated for long-term use, requiring a solution that can reduce the frequency of lubrication.	Choose components with auxiliary lubrication device accessories to extend maintenance cycles.	
Vacuum Environment	Maintain a stable vacuum level by selecting suitable components and lubricants.	Use vacuum lubricants to ensure components remain lubricated without affecting the vacuum level.	
		Use low outgassing rate all-metal fittings suitable for medium to high vacuum applications.	
	To prevent condensation from forming, which can affect equipment performance when returning to atmospheric conditions repeatedly.	Use stainless steel components to prevent rust due to condensation water.	
Corrosive Environment	- Use corrosion-resistant materials to ensure long-term stable operation. - Require resistance to external environments, especially the anti-rust capabilities in acidic or alkaline conditions.	Stainless steel materials can enhance anti-corrosion capabilities and reduce rust risks.	
		Use components with surface treatments to avoid corrosion issues caused by specific acidic or alkaline environments.	
Dust	- In environments with excessive dust, components need to be dust-proof to ensure system operation. - Prevent dust from entering critical components to maintain service life.	Add special dust-proof accessories to prevent foreign dust from entering the components.	
		Prevent accumulation of foreign dust in the mounting holes of linear slides, which could lead to foreign dust entering the components.	
High Temperature	Ensure that components and lubricants maintain performance under high-temperatures environment.	Use high-temperature resistant materials to ensure component operation.	
		Use high-temperature lubricants to ensure lubrication effectiveness.	
Low Temperature	Ensure that lubricants maintain appropriate fluidity and lubrication effects in low-temperature environments.	Use low-temperature lubricants to ensure lubrication effectiveness.	
High Speed	Ensure that lubricants can produce a stable oil film under high-speed operating conditions to prevent component wear.	Use high-speed specific lubricants to prevent oil film disruption.	
	Components should withstand the extra load under high-speed operation to maintain long-term stable equipment operation.	Choose accessories that can withstand the impact caused by high speeds.	
		Choose materials that can withstand the impact caused by high speeds.	
Intelligent Systems	For situations where maintenance is inconvenient, real-time monitoring of part status is necessary to optimize maintenance and replacement cycles.	Equip components with sensor modules to achieve data visualization for monitoring needs.	
Extended Maintenance	Even in limited space, equipment must remain lubricated for long-term use, requiring a solution that can reduce the frequency of lubrication.	Choose components with externally applied lubricant accessories to extend maintenance periods.	

	Selection Solution	Compatible Products	Reference Page
	Lubrication Solution	• HIWIN G02 & G03 Low Dust Lubricating Grease • HIWIN G03 Low Dust Lubricating Grease	P.8 P.9
	Material Solution	• Stainless Steel Material	P.3
	Accessory Selection	• EL Auxiliary Lubrication	P.15
	Lubrication Solution	• Lubricants for Vacuum Applications	P.12
	Material Solution	• All-Metal Accessories	P.5
	Material Solution	• Stainless Steel Material	P.3
	Material Solution	• Stainless Steel Material	P.3
	Surface Treatment	• hicoating Surface Treatment	P.13
	Accessory Selection	• Scraping Ring, Scraper, Wool Felt • SynchMotion® technology • Dust-proof cover strip	P.20 P.21 P.17 P.19
	Material Solution	• Reinforced, Brass/Stainless Steel Bolts Cap	P.19 P.20
	Lubrication Solution	• All-Metal Accessories	P.5
		• High-Temperature lubricants	P.12
	Lubrication Solution	• HIWIN G07 Grease	P.11
	Lubrication Solution	• HIWIN G04 lubricants	P.10
	Accessory Selection	• SynchMotion® technology	P.17
	Material Solution	• All-Metal Material	P.5
	Modularization	• HIWIN Intelligent Series	P.22~P.24
	Accessory Selection	• EL Auxiliary Lubrication • E2 Self-Lubricating	P.15 P.16

1. Material Solution

1.1 Stainless Steel Series

For linear motion systems used in special environments, it is recommended to select materials and products based on specific environmental conditions. HIWIN linear guideways, ballscrews, and ball splines can be manufactured in stainless steel, providing the functionality of standard products while also allowing for metal accessories and specialized lubricants as required.

Options for Special Environment Measures:

Cleanroom	Corrosion Resistant	High Temperature	Low Temperature	Low Vibration
Vacuum	Extended Maintenance	High Speed	Dust	Intelligent Systems

Stainless Steel Properties :

- Used in cleanroom environments, compatible with HIWIN G02/G03 low dust lubricant.
- Suitable for vacuum environments up to 10^{-6} torr; vacuum lubrication can refer page12.
- Features corrosion resistance.

Linear Guideway:

For high-temperature environments, greased with special lubricants (refer to page 12) and choose high-temperature resistant accessories. For more information, contact HIWIN. For low-temperature environments, use specific low-temperature lubricants (refer to page 11).

Specifications:

- Suitable for HG, EG, MG, QH, and QE series; for details, please refer to Appendix 1.

Ballscrews:

For high-temperature environments, greased with special lubricants (refer to page 12) and choose high-temperature resistant accessories. For more information, contact HIWIN. For low-temperature environments, use specific low-temperature lubricants (refer to page 11).

Specifications:

- Suitable for all ballscrew series from $\varnothing 4$ to $\varnothing 32$; for details, Please refer to Table 2 in Appendix 2.

Ball Splines:

For low-temperature environments, use specific low-temperature lubricants (refer to page 11). For high-temperature environments, HIWIN provides special lubricants (refer to page 12).

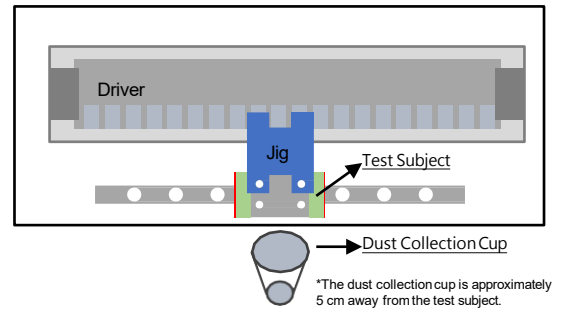
Specifications:

- Suitable for RS and FS series; for details, please refer to Table 2 in Appendix 2.



1.1.1 Particle Emission Test Data

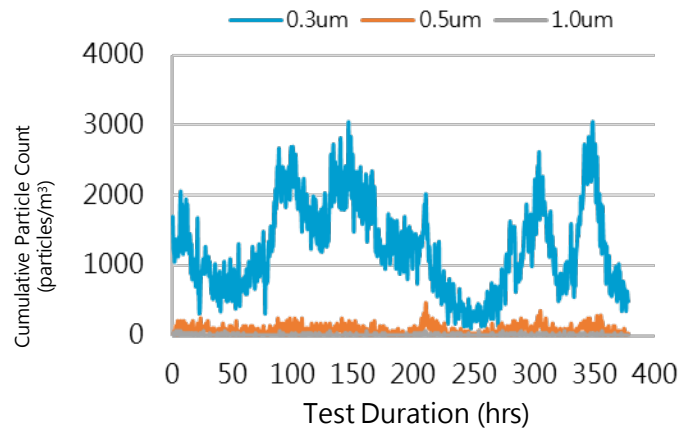
A particle emission testing machine, designed according to ISO standards, will be placed in a cleanroom environment to conduct the tests. The machine utilizes a linear motor to drive. Set up the dust collection cup and the test sample at a distance of 5 centimeters from each other for sampling (as illustrated on the right).



Linear Guideway Test Results

According to HIWIN test conditions, the results meet ISO 14644 Class 5

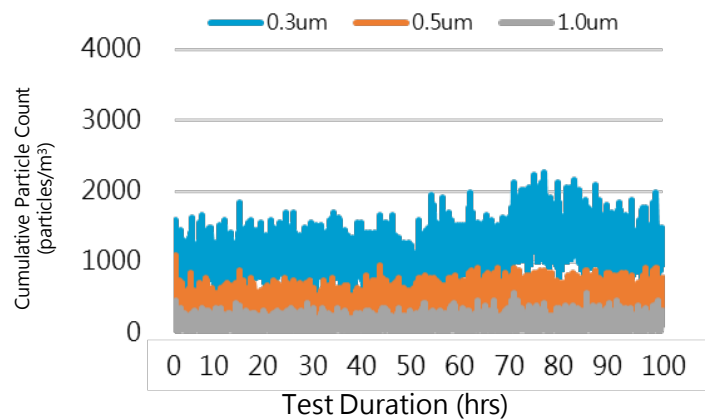
Test Conditions	
Specification	Linear Guide QH15
Speed	1 m/s
Acceleration	50 m/s ²
Travel	420 mm
Dust Collection Flow Rate	28.3 LPM
Lubricating Grease	HIWIN G03



Ball Spline Test Results

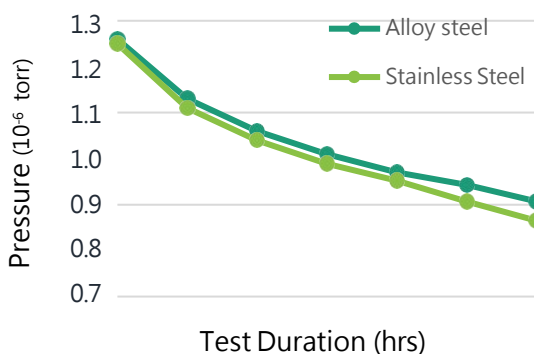
According to HIWIN test conditions, the results meet ISO 14644 Class 5

Test Conditions	
Specification	SP10-RS
Speed	1 m/s
Acceleration	1 m/s ²
Travel	200 mm
Dust Collection Flow Rate	28.3 LPM
Lubricating Grease	HIWIN G03



1.1.2 Vacuum Measurement Data

Test Conditions	
Specification	Linear Guideway HG15
Chamber Size	140×110×70 cm
Pumping Rate	2200 L/s



1.1.3 Corrosion Resistance Test Data

Test Sample: Linear Guideway HG25
Test Standard: ASTM B117
Concentration of Solution: 5% NaCl(aq)

Material	Alloy steel	Stainless Steel
Time		
Before test		
8 hours		
24 hours		
96 hours		

1.2 All-Metal Material Series

The all-metal material linear motion systems HIWIN can provide including linear guideways, Ballscrews, and Ball Splines which utilize metal components throughout. In general plastic materials have higher

outgassing rates in vacuum environments, while steel materials exhibit lower outgassing rates, suitable for medium to high vacuum environments.

Additionally, this series offers excellent temperature resistance and high-speed performance, applicable in a wide range of operational environments.

Options for Special Environment Measures:

Cleanroom	Corrosion Resistant	High Temperature	Low Temperature	Low Vibration
Vacuum	Extended Maintenance	High Speed	Dust	Intelligent Systems

All-Metal Material Properties:

- Suitable for vacuum environments up to 10^{-6} torr.
- Excellent high-temperature resistance, operating temperature can reach up to 150°C
- Features a special recirculation design for high-speed environments.

Industries of Application:

- Semiconductor manufacturing equipment
- Heat treatment equipment
- Vacuum environments

Linear Guideway

Use special lubricants for vacuum and high-temperature environments; for more information, please refer to page 12 and contact HIWIN. For cleanroom environments. Please use HIWIN G02/G03 low dust lubricants; details can be found on page 8.



Specifications:

- Suitable for HG, EG, MG, RG series, specify with an "SE" notation; for more details, Please refer to Appendix 1.

Ballscrews

Use special lubricants for vacuum and high-temperature environments; for more information, please refer to page 12 and contact HIWIN.



Specifications:

- Suitable for the entire series with metal accessories or customizable metal accessory specifications; for detailed selection, refer to Tables 1 and 3 in Appendix 2.

Ball Splines

Use special lubricants for vacuum and high-temperature environments; for more information, please refer to page 12 and contact HIWIN.



Specifications:

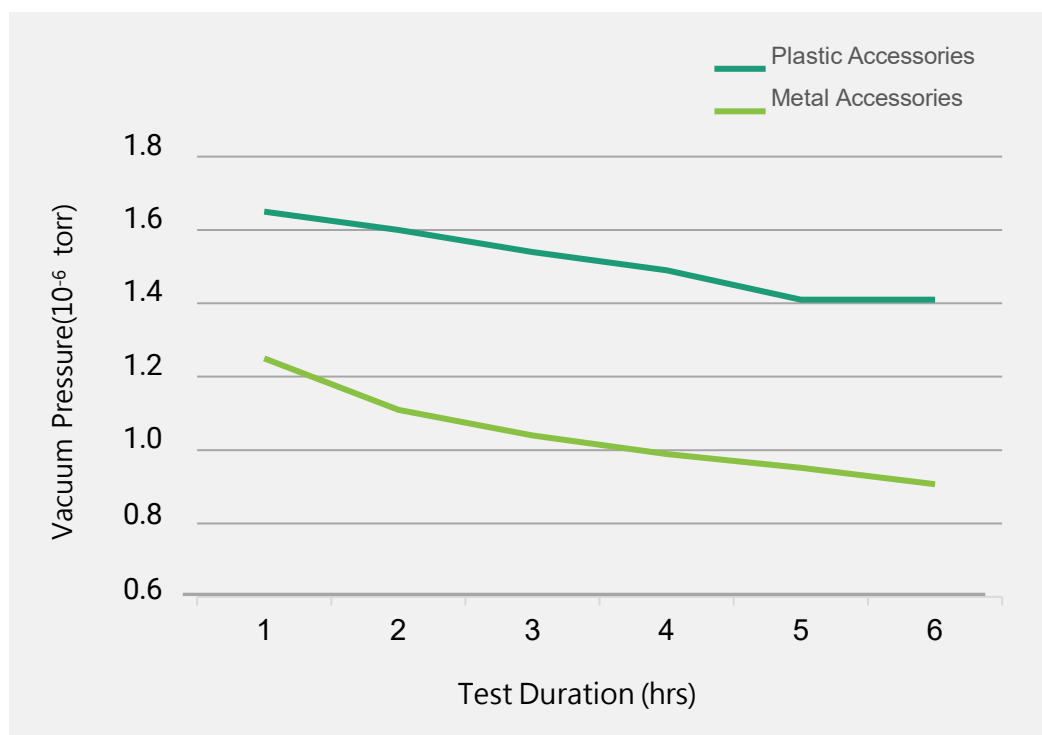
- Suitable for the entire series with metal accessories or customizable metal accessory specifications; for detailed selection, refer to Tables 1 and 3 in Appendix 2.

1.2.1 Vacuum Measurement Data

A vacuum testing machine designed according to ISO standards is used to place test samples inside a vacuum chamber for vacuum gauge measurement. The experimental parameters and chamber dimensions are shown in the table on the right side.

Test Conditions:	
Specification	Linear Guide HG15
Chamber Size	140 × 110 × 70 cm
Extraction rate	2200 L/s

Vacuum Test Results:



2. Lubrication Solutions

Various Types of Greases Introduction

To fully harness the performance of linear transmission systems, HIWIN Technologies offer specialized greases suitable for different usage environments. Selections can be made based on environmental needs from page 8 to page 12.

2.1 Low Dust Grease - HIWIN G02 & HIWIN G03 - - - - - P8

1. Excellent low dust properties, suitable for cleanroom environments.
2. Superior wear resistance, providing good protection for components.
3. Long-lasting grease, suitable for a wide temperature range.
4. Composed of hydrocarbon synthetic oil and a special calcium soap base, it offers excellent anti-oxidation and corrosion resistance.
5. Compatible with plastic/steel and plastic/plastic processing components, and offers good compatibility with rubber and plastic materials.

2.2 Low Dust Grease (High Speed) - HIWIN G03 - - - - - P9

1. Excellent low dust properties, suitable for cleanroom environments.
2. Superior wear resistance, providing good protection for components.
3. Long-lasting grease with excellent wear resistance at high speeds.
4. Low start-up and operational torque at low temperatures, ensuring high efficiency and energy saving.
5. Compatible with plastic materials.

2.3 High-Speed Grease -HIWIN G04 - - - - - P10

1. Excellent wear resistance at high speeds.
2. Low friction resistance at high speeds.
3. Good water resistance.

2.4 Low Temperature Grease -HIWIN G07 - - - - - P11

1. Suitable for low temperature environments from 0°C to -50°C.
2. Excellent low friction resistance in low temperature environments.

2.5 Vacuum Environment Grease - - - - - P12

Suitable for high vacuum environments($1 \times 10^{-3} \sim 1 \times 10^{-8}$ torr)

2.6 High Temperature Grease - - - - - P12

Suitable for environments above 250°C.

2.1 Low Dust Grease - HIWIN G02 & HIWIN G03

To prevent wear on the rolling parts of the linear transmission systems and to fully harness their performance, HIWIN Technologies offers compatible greases for different environments. In cleanroom environments, HIWIN G02 and G03 can be selected, both of which meet the ISO class 6 standards. G03 is suitable for high-speed conditions.

Options for Special Environment Measures:

Cleanroom	Corrosion Resistant	High Temperature	Low Temperature	Low Vibration
Vacuum	Extended Maintenance	High Speed	Dust	Intelligent Systems

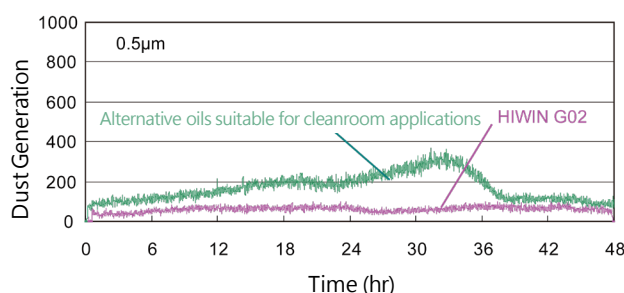
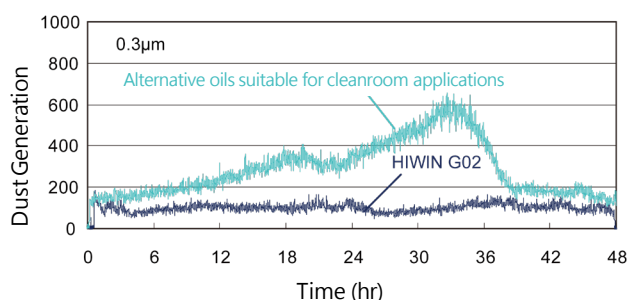
HIWIN G02 & G03 Features:

- Excellent low dust characteristics, suitable for cleanroom environments.
- Superior wear resistance properties, providing good protection for components.
- Composed of hydrocarbon synthetic oil and a special calcium soap base, featuring anti-oxidation and corrosion resistance.
- Low startup torque at low temperatures, ensuring high efficiency.

Basic Properties:

		HIWIN G02	HIWIN G03	Other
Color		Beige		
Base Oil		Synthetic Hydrocarbon Oil		
Thickener		Special Calcium Soap Base		
Penetration(0.1 mm)		265-295		
Viscosity (cst)	40℃	100	30	
	100℃	15	5.9	
Dropping Point		> 180℃	> 210℃	
Four-Ball Test (according to ASTM D2266)		474 μm	366 μm	
Applicable Temperature (℃)		-30~140	-45~125	-30~120

Dust Generation Test:



Test Results Comparison	HIWIN G02	HIWIN G03	Other	Note
Wear Resistance	●	●	▲	According to ASTM D2266
Low Dust Generation	●	●	▲	Dust Generation in Cleanroom via single-axis
Corrosion Resistance	●	●	●	

▲ : Standard ● : Superior

2.2 Low Dust Grease (High-Speed) - HIWIN G03

High-speed motion can easily generate heat due to friction, and resistance may occur between the rolling elements and the raceway. Using a grease that can suppress heat generation during high-speed use and provides excellent lubricity can achieve high-speed operation.

Options for Special Environment Measures:

Cleanroom	Corrosion Resistant	High Temperature	Low Temperature	Low Vibration
Vacuum	Extended Maintenance	High Speed	Dust	Intelligent Systems

HIWIN G03 Features:

- Excellent low dust properties, suitable for cleanroom environments.
- Superior wear resistance, providing good protection for components.
- Long-lasting grease with excellent wear resistance at high speeds.
- Low startup and operating torque at low temperatures, ensuring high efficiency and energy savings.

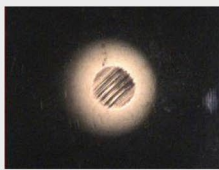
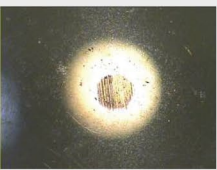
Basic Properties:

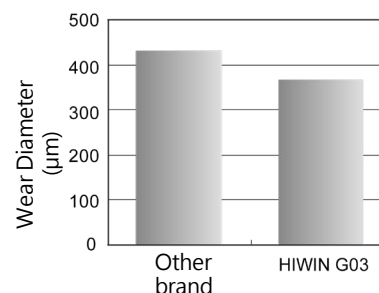
	HIWIN G04	Other
Color	Beige	
Base Oil	Synthetic Hydrocarbon Oil	
Thickener	Special Calcium Soap Base	
Penetration (0.1 mm)	265-295	
Viscosity (cst)	40°C	30
	100°C	5.9
Dropping Point	> 210°C	
Four-Ball Test	366 μm	
Applicable Temperature (°C)	-45~125	-30~120

Product Features:

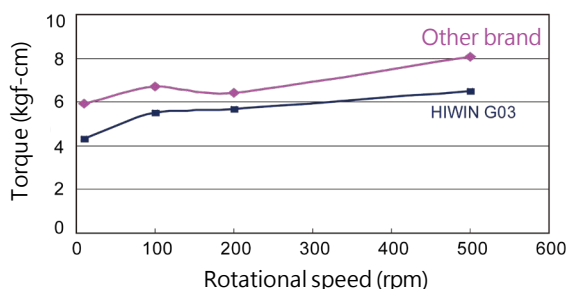
	HIWIN G04	Other	Note
Wear Resistance	●	▲	Increased by 15%
Low Dust Generation	●	▲	Dust Generation in Cleanroom via single-axis KK series test
Low-Speed Friction Torque	●	▲	Reduced by 7~15% at below 500 rpm
High-Speed Friction Resistance	●	▲	Motor Voltage Reduction of 1.2~2.6%

Four-Ball Test (according to ASTM D2266):

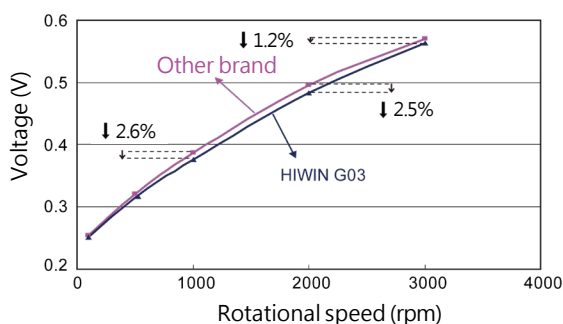
	Other	HIWIN G03
Wear Surface Scratches		
Diameter (μm)	432	366



Friction Resistance Test:



Screw Friction Torque at Different Speeds



Motor Voltage Values at Different Speeds

2.3 High-Speed Grease - HIWIN G04

Friction during high-speed motion can generate heat and resistance between the rolling elements and raceways. Using a grease that can suppress heat generation during high-speed operation and offers excellent lubrication can enable high-speed feeding.

Options for Special Environment Measures:

Cleanroom	Corrosion Resistant	High Temperature	Low Temperature	Low Vibration
Vacuum	Extended Maintenance	High Speed	Dust	Intelligent Systems

HIWIN G04 Features:

- Excellent wear resistance at high speeds.
- Outstanding low friction resistance at high speeds.
- Great water resistance.

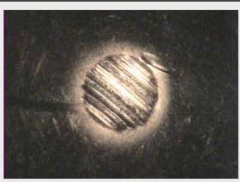
Basic Properties:

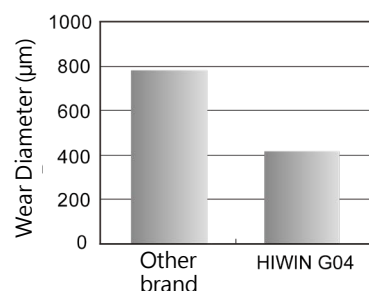
	HIWIN G03	Other
Color	Beige	
Base Oil	Synthetic Hydrocarbon Oil	
Thickener	Special Calcium Soap Base	
Penetration (0.1 mm)	265-295	
Viscosity (cst)	40°C	30
	100°C	5.9
Dropping Point	> 210°C	
Four-Ball Test	366 μm	
Applicable Temperature (°C)	-45~125	-30~120

Product Features:

	HIWIN G03	Other	Note
Applicable Temperature (°C)	-45~125	-30~120	
Wear Resistance	●	▲	Increased by 15%
Low Dust Generation	●	▲	Dust Generation in Cleanroom per KK Test
Low-Speed Friction Torque	●	▲	Reduced by 7~15% at below 500 rpm
High-Speed Friction Resistance	●	▲	Motor Voltage Reduction of 1.2~2.6%

Four-Ball Test (according to ASTM D2266):

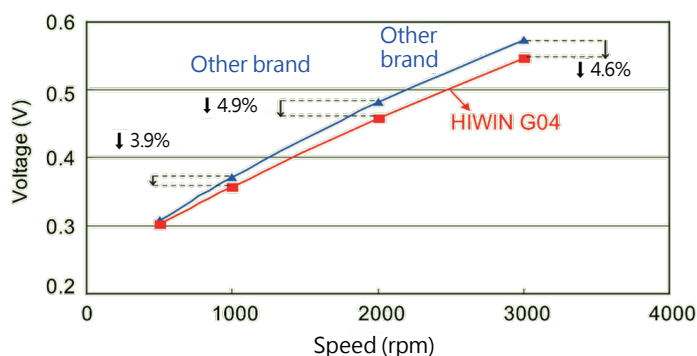
	Other brand	HIWIN G04
Wear Surface Scratches		
Diameter (μm)	781	418



Friction Resistance Test:

Test Conditions: Measure motor drive voltage values for Ballscrews under different greases and speeds.

- Test Piece: Ballscrew
- Specifications: Outer diameter $\varnothing 40$ mm, Lead 10 mm



2.4 Low Temperature Grease - HIWIN G07

In low temperature environments, general greases tend to harden and the viscosity of the base oil increases, leading to higher operational resistance. Therefore, HIWIN G07 is specially formulated for low temperatures, suitable for use from -50°C to 80°C, and offers excellent low friction resistance in cold conditions.

Options for Special Environment Measures:

Cleanroom	Corrosion Resistant	High Temperature	Low Temperature	Low Vibration
Vacuum	Extended Maintenance	High Speed	Dust	Intelligent Systems

HIWIN G07 Features:

- Suitable for low temperature environments from 0°C to -50°C.
- Excellent low friction resistance in low temperatures.

Basic Properties:

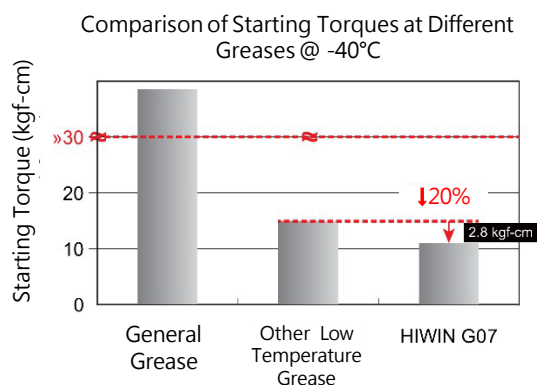
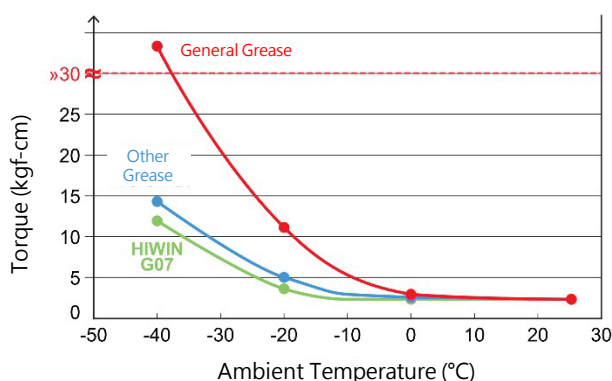
		HIWIN G07
Color		Beige
Base Oil		Mineral Oil
Thickener		Lithium-Calcium Soap Base
Penetration (0.1 mm)		310-340
Viscosity (cst)	40°C	14
	100°C	3
Applicable Temperature (°C)		-50~80

Low Temperature Torque Test:

Test sample: Ballscrew

Specifications: Outer diameter ø25 mm, Lead 5 mm

Test Conditions: -40°C to 25°C



Test Results:

	HIWIN G07	Other	Note
Low Starting Torque (in low temperature)	●	▲	20% reduction in starting torque at -40°C
Low Temperature Characteristics	●	●	

▲ : Standard ● : Superior

2.5 Vacuum Environment Grease

Apart from the special greases mentioned previously, HIWIN offers solutions for vacuum applications as well. For more information, please contact HIWIN.

Options for Special Environment Measures:

Cleanroom	Corrosion Resistant	High Temperature	Low Temperature	Low Vibration
Vacuum	Extended Maintenance	High Speed	Dust	Intelligent Systems

Vacuum Environment Grease Range:

Vacuum application grease		
Suitable for high vacuum levels (torr)		$1 \times 10^{-3} \sim 1 \times 10^{-8}$
Color		White
Base Oil		PFPE
Thickener		PTFE
Penetration (0.1 mm)		260-280
Viscosity (cst)	40°C	420
	100°C	40
Applicable Temperature (°C)		-40~260

2.6 High-Temperature Grease

Apart from the special greases mentioned previously, HIWIN offers solutions for high-temperature environment applications as well. For more information, please contact HIWIN.

Options for Special Environment Measures:

Cleanroom	Corrosion Resistant	High Temperature	Low Temperature	Low Vibration
Vacuum	Extended Maintenance	High Speed	Dust	Intelligent Systems

High-Temperature Environment Grease Range:

For <250°C use:	
Base Oil	PAG
Thickener	Special Lithium Soap Base
For >250°C use:	
Base Oil	PFPE
Thickener	PTFE

3. Surface Treatment- hicoating

To meet the stringent requirements of advanced industries such as semiconductor manufacturing, HIWIN has developed cutting-edge surface treatment technologies. Our hicoating process applies a precision-engineered black oxide layer to the metal surface, significantly enhancing corrosion resistance while safeguarding the integrity of the base material. This innovation ensures superior durability and reliability, even in the most demanding environments.

hicoating Features :

- Enhance rust protection
- Partial acid and alkali resistance properties
- Maintain high precision of the transmission components
- Conform to RoHS compliant

Salt Spray Test :

Test Sample : Linear Guideway HG15

Salt Spray Test Conversion (Reference Only):

A 24-hour salt spray test is approximately equivalent to 120 days in a coastal environment or one year of natural exposure.

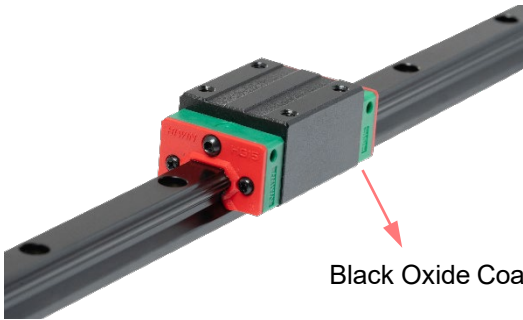
Note: Due to multiple factors influencing corrosion, these results are provided for reference purposes only and may vary under actual conditions.

Options for Special Environment Measures:

Cleanroom	Corrosion Resistant	High Temperature	Low Temperature	Low Vibration
Vacuum	Extended Maintenance	High Speed	Dust	Intelligent Systems

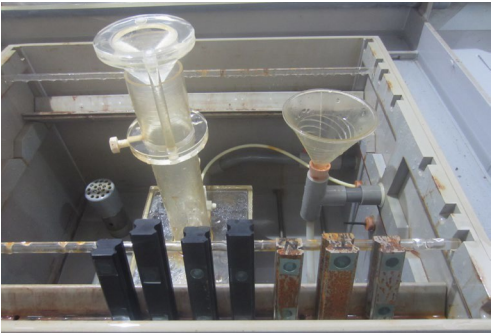
Applicable specifications :

- Linear Guideway, Ballscrew and Ball Spline are all applicable. Please refer to the Appendix for further details.
- Avoid using it in organic solvent environments. Please contact HIWIN if there is any problem.



Black Oxide Coating

Salt Spray Test



Testing conditions	
Testing standard	ASTM B117 (Neutral salt spray test)
Testing solution	5 % NaCl _(aq)
Laboratory temperature	35°C±2°C
Spray amount	1 ~ 2 ml/hr
Spray tank pressure	1 bar
Testing duration	8, 24, 48 and 96hrs

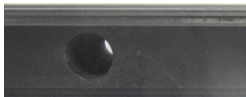
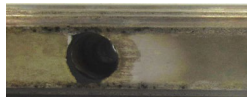
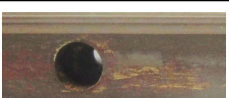
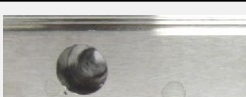
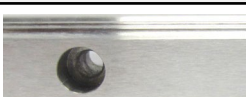
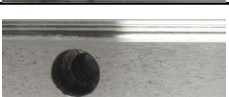
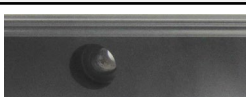
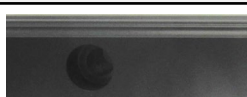
Materials \ Time	Before test	8 hrs	24 hrs	48 hrs	96 hrs
Alloy steel					—
Stainless steel					
hicoating					
Hard chrome plating					—

In some environments where acidic and alkaline solvents are used, following test results can be referred while choosing hicoating, HIWIN refers to the ASTM G31 international standard while testing.

Chemical solution corrosion test :

Testing sample : Linear Guideway HG15

Test results are only for reference. Contact HIWIN if there is any further chemical requirements or detailed information.

Chemical solution corrosion test results		Alloy steel		hicoating	
Before test					
Test duration		24 hrs	96 hrs	24 hrs	96 hrs
Acidic solution	5% Sulfuric acid				
	5% Hydrochloric acid				
	5% Nitric acid				
Alkaline solution	5% Sodium hydroxide				
Organic solution	100% Acetone				

4. Accessories

4.1 EL Self-Lubrication Kit

EL Self-Lubrication kit is installed on both sides of Linear Guideway Blocks and Ballscrew nuts, ensuring continuous lubrication during operation, this system maintains optimal lubricant supply, minimizing friction and wear while preventing environmental contamination caused by oil leakage. With the high-performance lubricant provided by HIWIN, maintenance intervals are significantly extended, delivering superior reliability and cost efficiency.

Options for Special Environment Measures:

Cleanroom	Corrosion Resistant	High Temperature	Low Temperature	Low Vibration
Vacuum	Extended Maintenance	High Speed	Dust	Intelligent Systems

EL Self-Lubrication Kit features :

- Auxiliary Lubrication extending maintenance intervals to over 20,000 km.
- Optimal Lubrication in the grooves of Ballscrews and Linear Guideways for maximum efficiency.
- Versatile Compatibility with a wide range of Ballscrews and Linear Guideways, ensuring seamless integration.
- Cleanroom Certified complying with third-party cleanroom standards for contamination-free performance.
- Recommended Operating Temperature between 25°C to 50°C for optimal functionality.

Applicable specifications :

Select specifications and note 'EL'. For details on Linear Guideway, please refer to Appendix 1; for Ballscrews, refer to Appendix 2.

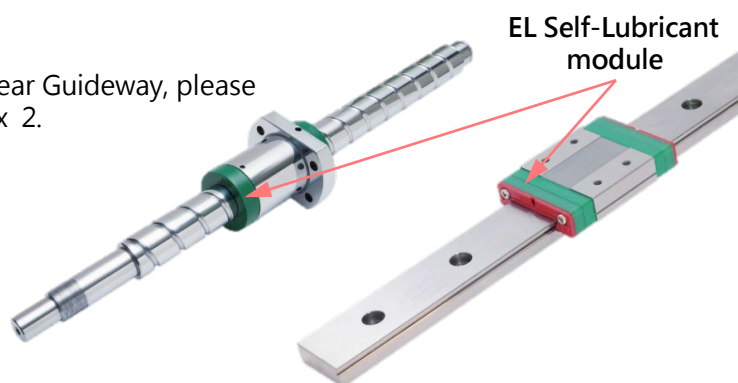
High speed light load using period test :

Test specifications : Linear Guideway MG12

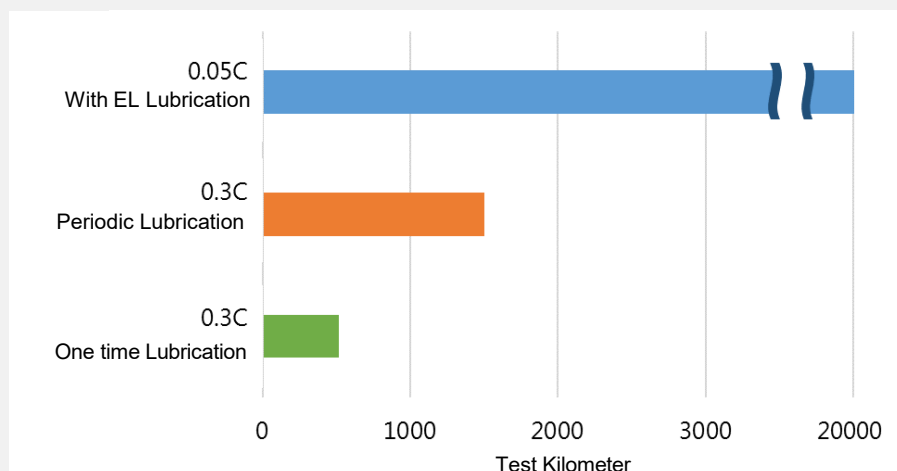
Lubrication condition : Block pre-greasing and EL Lubrication

Application :

- Semiconductor
- Inspection equipment
- Automation
- Transportation



EL High speed, light load using period test results



Travel : 800 mm
Distance : 20,000 km
Speed : 3 m/s
Acceleration : 29.43 m/s²
C : Dynamic load rating

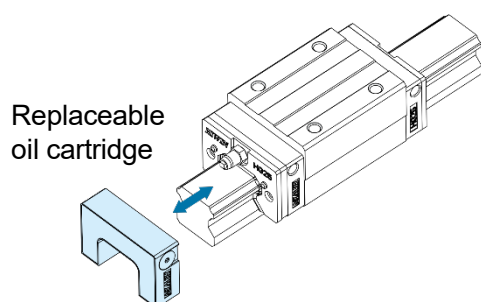
Under light load conditions, the use of EL self-lubrication can extend the maintenance interval to up to 20,000 km.

4.2 E2 Self-Lubrication

HIWIN has developed self-lubricating linear guideways and ballscrews equipped with removable oil storage units designed to extend maintenance intervals. These units deliver consistent and optimal lubrication over an extended period, precisely at the most effective locations. Additionally, the oil storage device is engineered for easy replacement and replenishment, significantly reducing maintenance time and improving operational efficiency.

E2 Self-Lubrication features :

- Save costs
- Extend maintenance interval
- Easy to replace or replenish
- Suggested operation temperature -10°C~60°C
- Can be used in dusty or wet environments

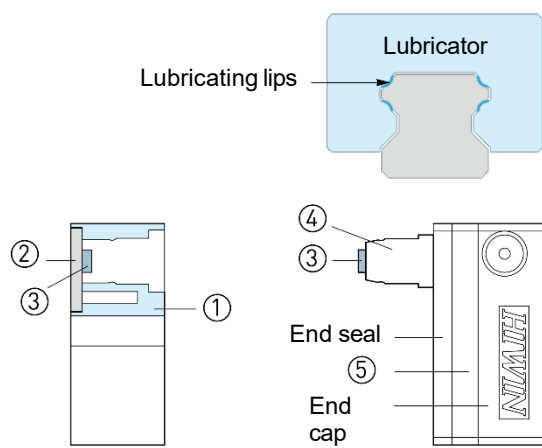


Options for Special Environment Measures:

Cleanroom	Corrosion Resistant	High Temperature	Low Temperature	Low Vibration
Vacuum	Extended Maintenance	High Speed	Dust	Intelligent Systems

Applicable Specifications :

- Select specifications and note 'E2'. For details on Linear Guideway, please refer to Appendix 1; for Ballscrews, refer to Appendix 2.



Configuration of the self-lubricant accessory

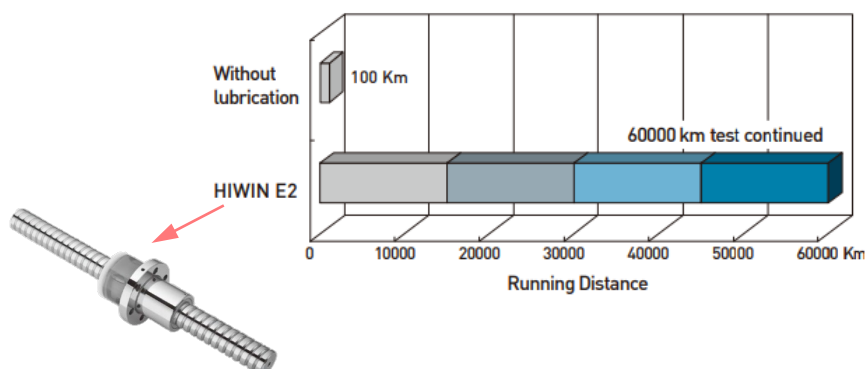
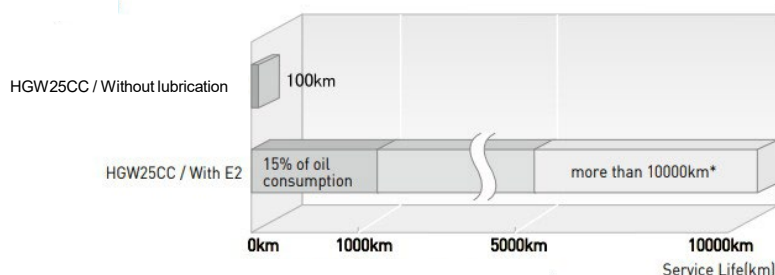
- 1. Oil cartridge
- 2. Cartridge cover
- 3. Oil conductor
- 4. Connector
- 5. Lubricator

Endurance Test :

- Service life varies depending on the specific product specifications.
- Each color block indicates the recommended oil cartridge replacement interval.

Linear Guideway test condition	
Spec.	HGW25CC
Speed	60 m/min
Stroke	1500 mm
Load	500 kgf

Ballscrew test condition	
Spec.	R40-40K2
Speed	3000 rpm
Stroke	1000 mm



4.3 Rolling Circulation System

HIWIN Q Series linear guideways incorporate a rolling circulation system enhanced with SynchMotion® technology with integrated lubricant storage function. This design ensures smooth and quiet operation, superior lubrication performance, and extended service life. It provides broad industrial applicability and is particularly well-suited for high-tech sectors that require high-speed operation, minimal noise levels, and low particle emission.

Features :

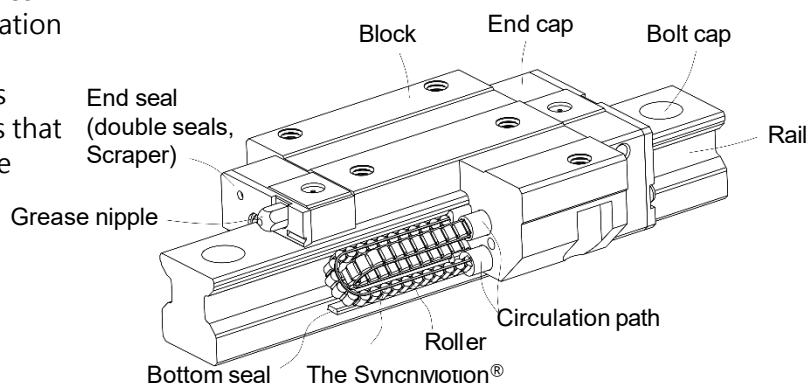
- Quiet operation
- Self-lubrication
- Smooth operation
- High speed

Self-lubricant Design :

Cages with hollow, ring-shaped structures with through-holes designed to facilitate lubricant circulation. Due to the specialized lubrication path design, the lubricant within the partition's storage space can be replenished as needed. This feature significantly reduces the frequency of lubricant refilling, thereby improving maintenance efficiency.

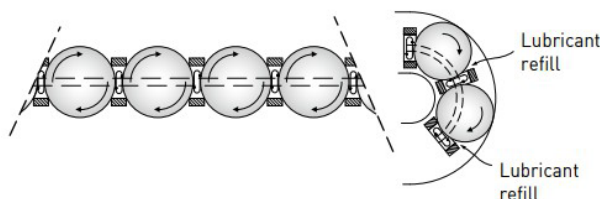
Options for Special Environment Measures:

Cleanroom	Corrosion Resistant	High Temperature	Low Temperature	Low Vibration
Vacuum	Extended Maintenance	High Speed	Dust	Intelligent Systems



Applicable Specification :

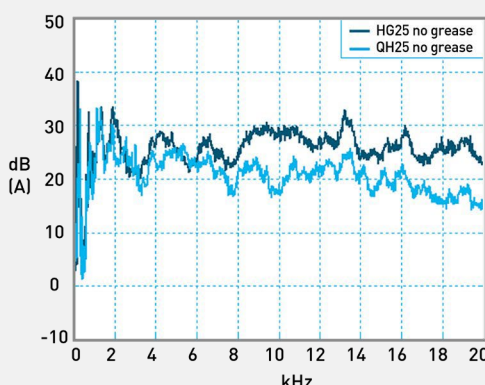
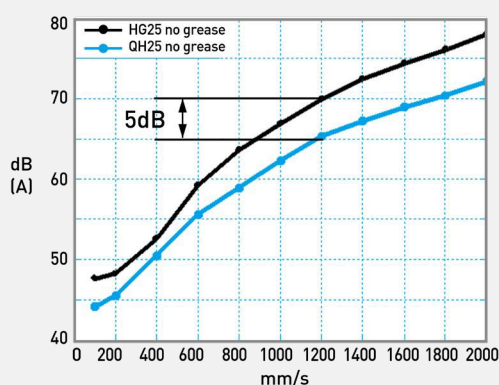
- QH, QE, QW and QR Series. For more details, please refer to Appendix 1.



Test sample	Linear Guideway QHH25CAZAH	Load test
Velocity	24 m/min	
Lubrication	Lithium soap base grease(initial lubrication only)	
Load	5kN	
Mileage	4,000km	

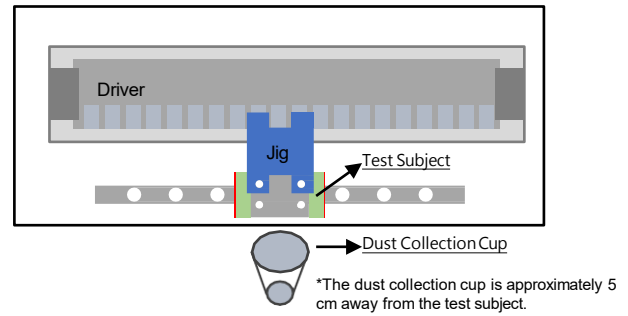
Low Noise Test :

With SynchMotion® Technology, ensures evenly spaced ball distribution, effectively eliminating metallic impact noise between adjacent balls. The total sound intensity has been reduced by about 5 decibels across various velocity domains when compared to the previous generation. (Refer to the illustration at the lower left.)

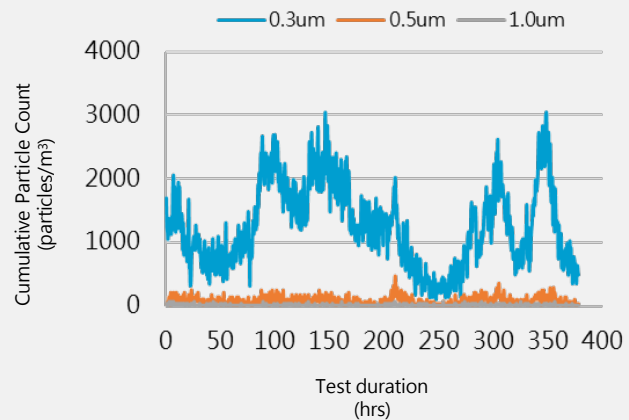


Particulate Emission Test :

According to HIWIN test conditions, the results meet ISO 14644 Class 5.

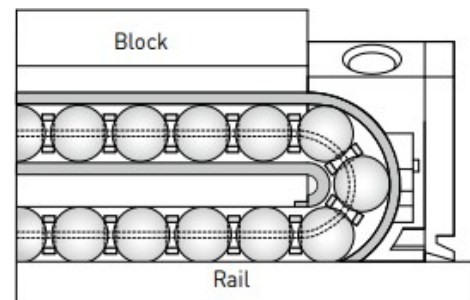


Test sample	Linear Guideway QH15
Velocity	1 m/s
Acceleration	50 m/s ²
Travel	420 mm
Dust Collection Flow Rate	28.3 LPM



High Speed Test :

Due to the partitions of the SynchMotion® structure, it offers excellent high-speed performance. They are employed to separate the balls thereby resulting in low rolling traction and the metallic friction between balls is eliminated.



Test sample	Linear Guideway QHH25CAZAH	High speed test
Velocity	130 m/min	 High Speed Test V=130m/min After 9,500km
Lubricant	Lithium soap base grease(initial lubrication only)	
Mileage	9,500km	

4.4 Cover Strip

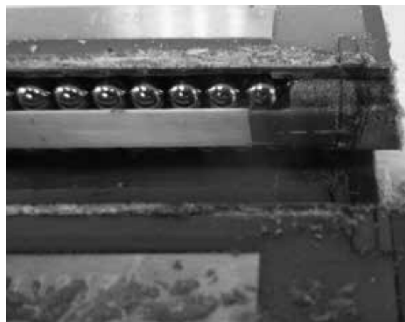
HIWIN linear guideways – For CG and CRG series, the cover strip provides a flush rail surface and helps protect the rail mounting holes, making installation more convenient than traditional bolt covers. It is recommended for applications that require improved protection against dust/chip accumulation around the mounting holes. Overall dust protection depends on the seal/scrapper configuration and the actual operating environment. A plastic end clamp is supplied as standard; a metal-plastic end clamp is recommended for high-temperature environments.

Applicable Specifications :

- Linear Guideway CG and CRG Series. For more details, please refer to Appendix 1.



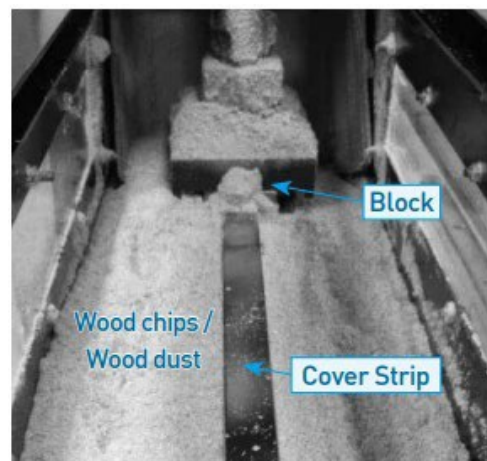
Dust Proof Test Result :

Test sample	Linear Guideway CGH25CA1R700Z0C+DD/CS	Test result
Max. velocity/ acceleration	1m/s, 1G	 No dust gets into ball tracks
Load	No load	
Stroke	1,500 km	
Dust type	Wood chips/Wood dust	
Diameter	100~500 μm	

Options for Special Environment Measures:

Cleanroom	Corrosion Resistant	High Temperature	Low Temperature	Low Vibration
Vacuum	Extended Maintenance	High Speed	Dust	Intelligent Systems

Dust proof accessories :



4.5 Reinforced Bolt Cap

HIWIN linear guideways can be used with the Reinforced Bolt Cap. The Reinforced Bolt Cap consists of a piece of hard plastic and a piece of an elastic O-ring. The hard plastic is made of synthetic resin which is characterized by oil resistance and abrasion resistance; the O-ring is made of rubber which is characterized by oil resistance and elasticity.

Options for Special Environment Measures:

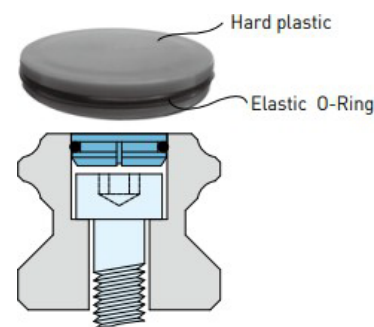
Cleanroom	Corrosion Resistant	High Temperature	Low Temperature	Low Vibration
Vacuum	Extended Maintenance	High Speed	Dust	Intelligent Systems

Applicable Specifications :

- Select specification and note 'RC' .
- For more details, please refer to Appendix 1.

Features of the Reinforced Bolt Cap :

- The elastic O-ring can eliminate some of the machining error caused during the creation of the mounting holes by maintaining the tight fit between the cap and the mounting hole.
- The elastic O-ring can prevent the cap from loosening by absorbing the vibrations caused by external forces acting on the guideways.
- The reinforced cap is designed with an elastic O-ring to contact the mounting hole precisely by eliminating the clearance between the cap and the mounting hole resulting in excellent dust protection.
- Ensures overall rail surface flatness after installation, helps prevent end seal damage, and thereby improves linear guideway service life



4.6 Brass/Stainless Bolt Cap

HIWIN linear guideways could be chosen based on different environment; for example, high-temperature or vacuum environments. For applicable dimensions, please refer to Appendix 1.

Options for Special Environment Measures:

Cleanroom	Corrosion Resistant	High Temperature	Low Temperature	Low Vibration
Vacuum	Extended Maintenance	High Speed	Dust	Intelligent Systems

4.7 Wiper

HIWIN Precision Rolled Ballscrew could be accompanied with a DIN-standard. It could be applied in environments dust >100µm, diameter larger than which is suitable in automation areas.

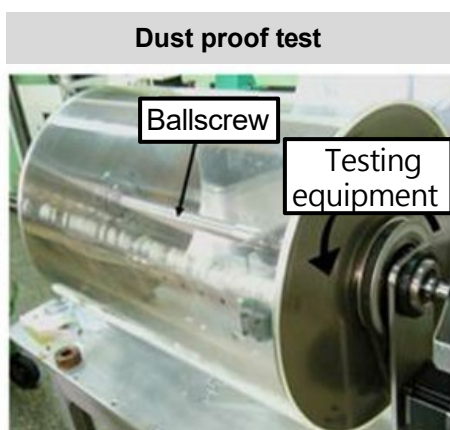
Options for Special Environment Measures:

Cleanroom	Corrosion Resistant	High Temperature	Low Temperature	Low Vibration
Vacuum	Extended Maintenance	High Speed	Dust	Intelligent Systems

Applicable Specifications :

- Learn more about Precision Rolled Ballscrew, please refer to Appendix 2.

Dust Proof Test Result :



Test sample	Ballscrew R38-40K2-FSC	Test result
Cycles	200 million cycles	
Velocity	45 rpm	
Stroke	300 mm	
Dust type	Wood chips/ Wood dust	
Diameter of Particle	53~150 µm	The ballscrew remains capable of continuous operation.

4.8 Scrape Wiper

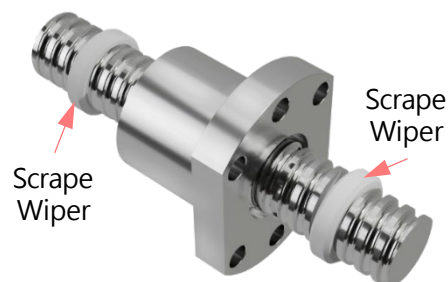
In order to maintain the good use of Ballscrew, Scrape Wiper is designed to prevent particles or debris entering the ball nut. Scrape Wipers are set at the both ends of the ball nut. As the purpose of dust proof, Scrape Wipers are generally made of engineering plastic, which is a standard accessories for making Scrape Wiper. It is able to prevent dust >300 μm from entering the ball nut.

Applicable Specifications :

- Different types can be selected according to specific application requirements. For more details, please refer to Appendix 2.

Options for Special Environment Measures:

Cleanroom	Corrosion Resistant	High Temperature	Low Temperature	Low Vibration
Vacuum	Extended Maintenance	High Speed	Dust	Intelligent Systems



4.9 Felt

Felt Features :

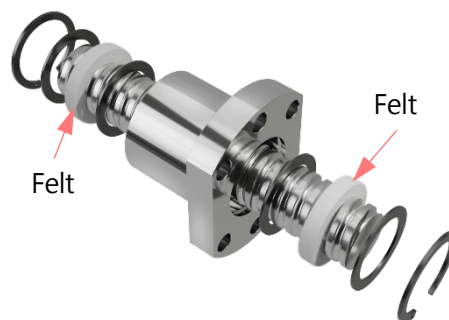
- The shape is O-ring with ball track designs in the internal diameter, which is set at the both ends of the ball nut with a spring washer and a Clock ring to fix it.
- Felt accessories are not available when Ballscrew has surface treatment.
- About 30 μm dust can be prevented

Applicable Specifications :

- Different types can be selected according to specific application requirements. For more details, please refer to Appendix 2.

Options for Special Environment Measures:

Cleanroom	Corrosion Resistant	High Temperature	Low Temperature	Low Vibration
Vacuum	Extended Maintenance	High Speed	Dust	Intelligent Systems



5. Modularization

5.1 Intelligent 4.0 Ballscrew

HIWIN i4.0BS® Intelligent 4.0 Ballscrew has multifunction sensors to detect vibration and temperature with specifically developed algorithm. Users can monitor the status of each machine in real time from the Webpage accessed remotely to arrange maintenance schedule, avoiding machine's unexpected shutdown, and achieving high machine utilization, energy saving, and environmental protection.

Options for Special Environment Measures:

Cleanroom	Corrosion Resistant	High Temperature	Low Temperature	Low Vibration
Vacuum	Extended Maintenance	High Speed	Dust	Intelligent Systems



Intelligent 4.0 Ballscrew Features :

- i4.0BS® transmits signals via sensors and PLC I/O to the edge computing module for calculating and analysis. The results are shown on display devices through Ethernet network to achieve remote monitoring.
- i4.0BS® features remote monitoring function through multiple devices, intelligent diagnosis and historic logs. It can diagnose various warning messages of the ballscrew and detects the failed axis and failure occurrence time to remind users to take actions for predictive maintenance.

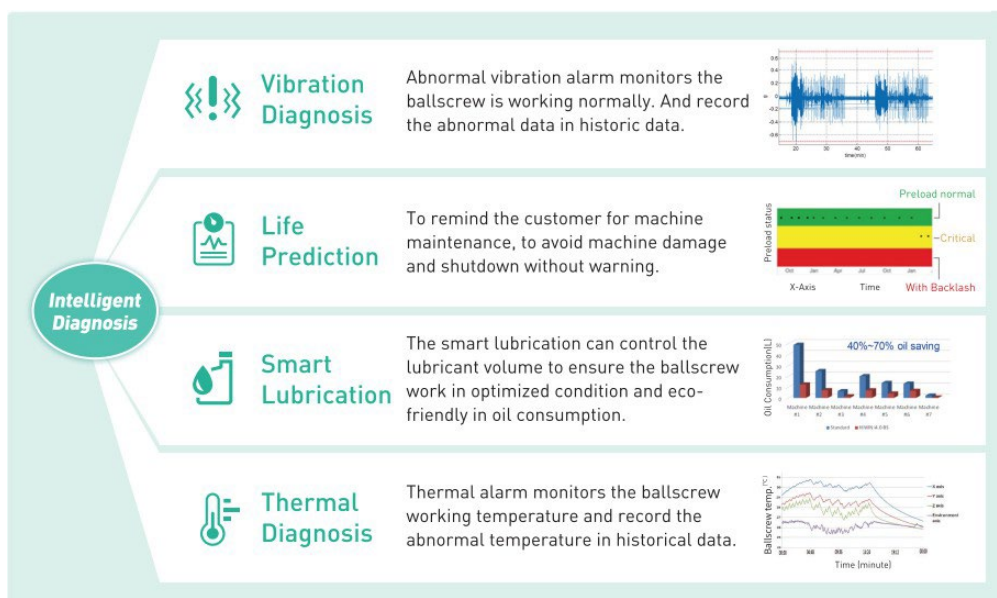
Applicable Industries :

- Semiconductor
- Inspection Equipment
- Automation
- Transportation

Applicable Specifications :

- Applicable to HIWIN flange Ballscrew. For more details, please refer to Appendix 3

Intelligent 4.0 Ballscrew Instructions :

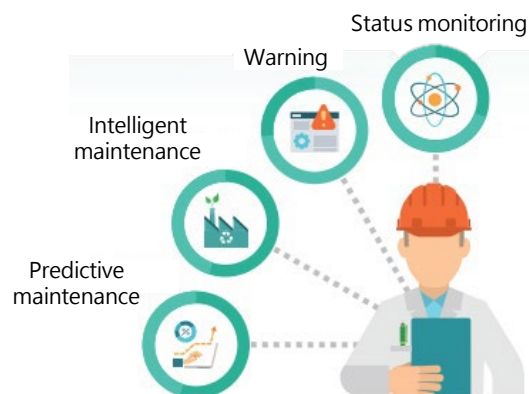
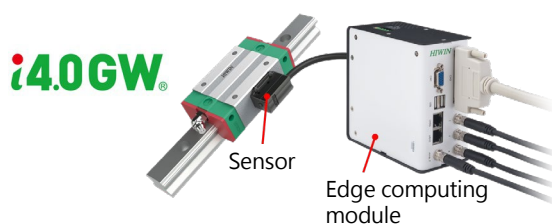


5.2 Intelligent 4.0 Linear Guideway

HIWIN i4.0GW® Intelligent 4.0 Linear Guideway is mainly used in semiconductor equipment. By integrating vibration and temperature sensors with advanced algorithms, it enables real-time condition monitoring via an APP to support predictive maintenance, prevent unexpected downtime, and improve machine utilization and energy efficiency.

Options for Special Environment Measures:

Cleanroom	Corrosion Resistant	High Temperature	Low Temperature	Low Vibration
Vacuum	Extended Maintenance	High Speed	Dust	Intelligent Systems



Intelligent 4.0 Guideway Features :

- Through sensors, the system enables status inspection, abnormal alerts, and data acquisition.
- Users could remotely monitor the status of each machine in real time through Ethernet.
- Integrating HIWIN's high-quality, self-manufactured components , which offer advantages in both product quality and delivery lead time.

Application :

- Semiconductor
- Automation
- Manufacturing

Applicable Specifications :

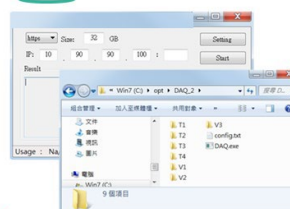
- Blocks with specifications above 15 (excluding MG and WE series) are compatible with i4.0GW® installation. For more details, please refer to Appendix 4

Intelligent 4.0 Guideway with Stage :

- Machine operation model : AOI inspection system
- Machine operation speed : 300 mm/s, 6G



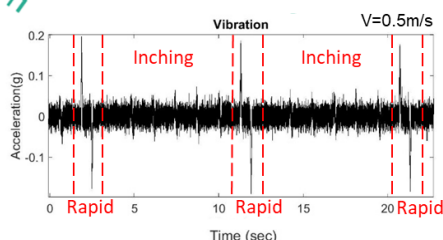
Data Acquisition



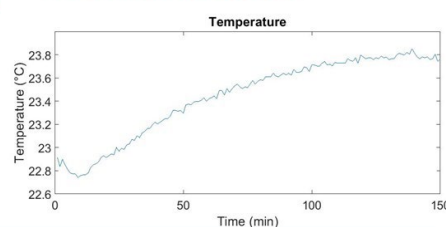
- Vibration data
- Temperature data



Vibration Monitor



Thermal Monitor



5.3 Intelligent Single-Axis Robot

The HIWIN Intelligent Single-Axis Robot integrates HIWIN's advanced in-house technologies. This Intelligent Single-Axis Robot is an entirely new product that combines modularization with mechatronic integration. It can easily meet various customer needs; for example, it can be applied in the semiconductor industry. Users can use programming languages to integrate information from smart modules and other equipment to monitor production status in real time, effectively extending maintenance intervals and preventing significant losses.



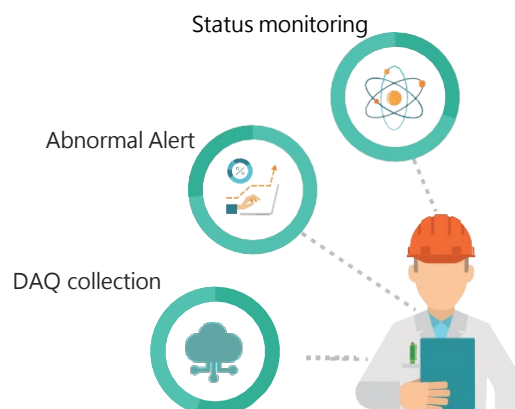
Available Specifications :

- HIWIN Single-Axis Robot KA170, KK86. For more information, please refer to Appendix 5.

Intelligent Single-Axis Robot Instructions :

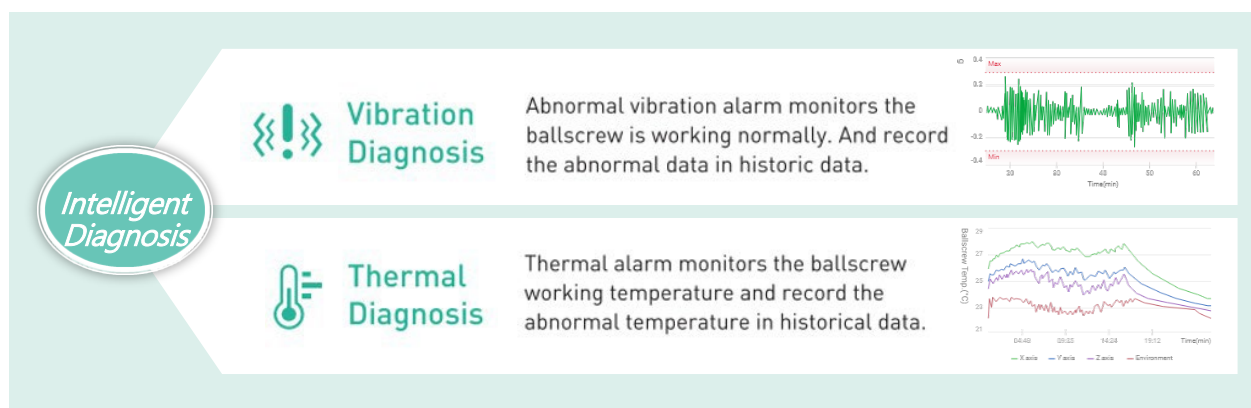
Options for Special Environment Measures:

Cleanroom	Corrosion Resistant	High Temperature	Low Temperature	Low Vibration
Vacuum	Extended Maintenance	High Speed	Dust	Intelligent Systems

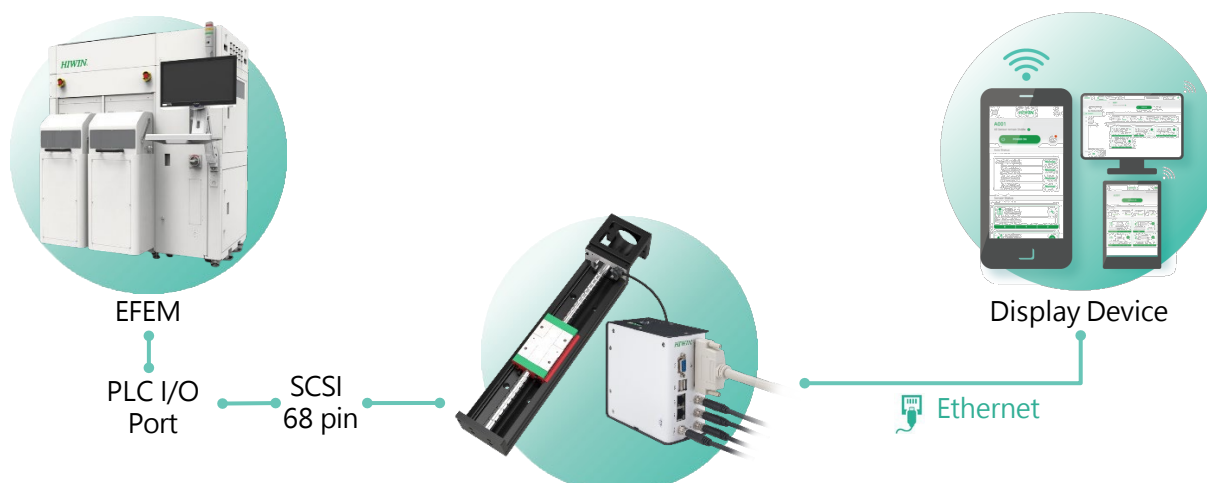


Applications :

- Semiconductor
- Automation
- Manufacturing



Intelligent Single-Axis Robot Structure :



Appendix 1. Supported Linear Guideway Series and Models

Model Number of Series			HG	EG	WE	
Specification Size			15~65	15~35	17, 21, 27, 35, 50	
Type	Instructions	Code				
End cap	Metallic End Cap		SE	●	▲ ⁷	—
	Stainless Metallic End Cap		—	▲ ¹	—	—
Dust Production	Dust proof	End seal+Bottom seal	—	●	●	●
		End seal+Bottom seal+Scraper	ZZ	●	●	●
		Double seals+Bottom seal+Scraper	KK	●	●	●
		Double seals+Bottom seal	DD	●	●	●
	High dust proof	End seal+Bottom seal+Top seal	SH	▲ ²	—	—
		End seal+Bottom seal+Top seal+Scraper	ZH	▲ ²	—	—
		Double seals+Bottom seal+Top seal	DH	▲ ²	—	—
		Double seals+Bottom seal+Top seal+Scraper	KH	▲ ²	—	—
	Ultra High dust proof	End seal+Bottom seal+Top seal	SW	▲ ³	—	—
		End seal+Bottom seal+Top seal+Scraper	ZW	▲ ³	—	—
	End seal(for MG)		—	—	—	—
	Bottom seal(for MG)		U	—	—	—
	Cover strip	End seal+Bottom seal+Cover strip	SS+CS	—	—	—
		End seal+Scraper+Bottom seal+Cover strip	ZZ+CS	—	—	—
		Double seals+Scraper+Bottom seal+Cover strip	KK+CS	—	—	—
		Double seals+Bottom seal+Cover strip	DD+CS	—	—	—
	Reinforced Cap		RC	●	●	▲ ⁹
	Copper/ Stainless Bolt Cap		—	●	●	●
Lubrication	SynchMotion®		—	—	—	
	Replaceable oil cartridge		E2	●	●	—
	Auxiliary Lubrication		EL	—	—	—
Anti-Corrosion	Stainless Linear Guideway ^{4 · 5}		M	▲ ⁶	▲ ⁸	—
	hicoating		hicoating	●	●	●
Intelligence	i4.0GW		—	●	●	—

Notes: 1. HG Series stainless metallic end cap is only available for HG15, 20, 25.

2. HG Series high dust proof accessories, including SH, ZH, DH and KH are only available for HG20, 25, 30, 35, 45C.

3. HG Series ultra high dust proof accessories: SW and ZW. HG15 only has end seal, available for HG20, 25, 30, 35, 45.

4. High dust proof stainless linear guideway is available for HG15~25, QH15~25, EG15 and QE15. MG9~15 only accept to install bottom seal.

5. High dust proof stainless linear guideway with stainless metallic end cap is only available for HG15~25 and MG9~15.

6. HG Series stainless linear guideway is only available for HG15, 20, 25. Rail max. length: 2,000 mm.

7. EG Series metallic end cap is only available for EG20 and EG25.

8. EG Series stainless linear guideway is only available for EG15 spec. Rail max. length: 2,000 mm.

9. WE Series reinforced cap is only available for WER17, 21, 27.

● 100% suitable

▲ Suitable for certain spec.(refer to notes1~18)

MG	QH	QE	QW	QR	CG	RG	CRG
2, 3, 5, 7, 9, 12, 15	15~45	15~35	17, 21, 27, 35	20~45	15~45	15~65	15~65
▲ ¹⁰	—	—	—	—	—	—	—
▲ ¹¹	—	—	—	—	—	—	—
—	●	●	●	●	▲ ¹⁷	●	—
—	●	●	●	●	—	●	—
—	●	●	●	●	—	●	—
—	●	●	●	●	▲ ¹⁷	●	—
—	—	—	—	—	—	—	—
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▲ ¹³	—	—	—	—	—	—	—
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▲ ¹⁴	●	●	●	●	▲ ¹⁸	●	—
●	●	●	●	●	▲ ¹⁸	●	—
—	●	●	●	●	—	—	—
—	●	●	—	●	—	●	—
●	—	—	—	—	—	—	—
●	▲ ¹⁵	▲ ¹⁶	—	—	—	—	—
●	●	●	●	●	●	●	●
—	●	●	—	●	—	●	—

10. MG Series metallic cap is only available for MGN7, 9, 12, 15 and MGW12, 15.

11. MG Series stainless metallic cap is only available for MGN9, 12, 15 and MGW12, 15.

12. If MG Series dust proof accessories with MGN3 need end seal, please note 'SS' after the model number. Others are standard dust proof accessories.

13. MG Series bottom seal is installed on the bottom of the block, which is available for MGN9, 12, 15.

14. MG Series reinforced cap is only available for MGNR12, 15.

15. QH Series stainless linear guideway is only available for QH15, 20, 25. Rail max. length: 2,000 mm.

16. QE Series stainless linear guideway is only available for QE15. Rail max. length: 2,000 mm.

17. CG Series standard dust proof note code: 'SS'. Double seals+Bottom seal+Scraper note code: 'DD'.

18. If CG Series are not enclosed with cover strip, cap will be enclosed. If the cover strip is enclosed, cap will not be enclosed, though.

Appendix 2. Supported Ballscrew and Ball Spline Models

Table 1, Supported Ballscrew Models

			Nominal Outer Diameter (mm)																							
Type	Series	Code	4	6	8	10	12	14	15	16	20	25	28	32	36	38	40	45	50	55	63	70	80	100		
Metallic nut with recirculation	Super Z	Z	–	●	●	●	●	●	●	●	●	●	●	●	–	–	–	–	–	–	–	–	–	–		
	Internal recirculation	I	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●		
	External recirculation	V, W	–	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●		
	Endcap recirculation	H	–	–	●	●	●	●	●	●	●	●	–	●	●	●	●	●	●	●	●	–	●	–		
Dust protection	Scrape Wiper	SS	–	–	–	–	–	–	–	–	–	●	–	●	●	–	●	●	●	–	–	–	–	–		
	Felt+ Scrape Wiper	SH	–	–	–	–	–	–	–	–	–	●	–	●	●	–	●	●	●	–	–	–	–	–		
	Seal type wiper (For standard DIN nut of Roller ballscrew)	NW	–	–	–	–	●	–	●	–	●	●	–	●	–	●	–	–	–	–	–	–	–	–		
	High dust proof wiper (For standard DIN nut of Roller ballscrew)	EW	–	–	–	–	●	–	●	●	●	●	–	●	–	●	●	–	●	–	●	–	–	–		
Lubrication	Auxiliary Lubrication	EL	–	–	–	–	●	–	●	●	●	●	–	●	●	–	●	–	–	–	–	–	–	–		
Anti-corrosion	Stainless Ballscrew	M	●	●	●	●	●	●	●	●	●	●	●	●	–	–	–	–	–	–	–	–	–	–		
	hicoating	–	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●		
intelligence	i4.0 BS	–	–	–	–	–	–	–	–	–	–	–	–	●	●	●	●	●	●	●	●	●	●	●		

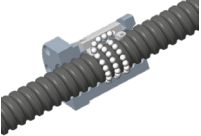
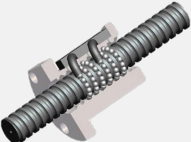
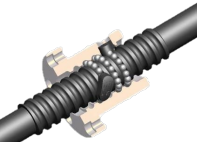
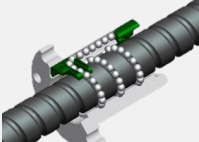
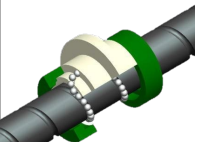
Note : For more details, please contact HIWIN.

Table 2, Supported Stainless Ballscrew and Ball Spline Models

Dia. (mm)	Lead																Max. length(mm)
	1	1.5	2	2.5	3	4	5	6	8	10	16	20	25	30	32	40	
4	●		●														100
6	●	●	●														170
8	●	●	●	●	●	●	●										230
10	●		●	●		●	●			●							280
12	●	●	●	●	●	●	●			●		●					280
14					●	●	●		●								430
15							●			●	●	●		●			500
16			●	●		●	●	●	●	●	● *				●		500
20			●	●	●	●	●	●		●		● *				●	700
25			●	●		●	●	●		●		●	●				700
28							●	●									700
32				●		●	●	●		●	●						700

Note : With * : this spec. provides Stainless Ball Spline.

Table3, Metallic Ballscrew with recirculation

Selection	Super Z	External recirculation	Internal recirculation	Super S	Endcap
Metallic Ballscrew	●	●	● (Need to note "for vacuum")	Customized (Need to note "for vacuum")	Customized (Need to note "for vacuum")
Nut	FSZ, RSZ	FSW, FSV RSW, RSV	FSI, RSI	FSC, RSC	FSH, RSH
Sample pic.					

Note : For more details, please contact HIWIN.

Table4, Supported Ball Spline model

Nominal Outer Diameter(mm)		13 *	16	20	25	32
Metallic nut with recirculation	RS	●	●	●	●	●
	FS	●	●	●	●	●
	FSR	—	●	●	●	●
	FBR	—	●	●	●	●
Anti-corrosion	Stainless Ball Spline	●	●	●	—	—
	hicoating	●	●	●	●	●
Dust protection	Straight groove dustproof ring (Not matched with FBR)	●	●	●	●	●

Note : With * : no FSR and FBR.

Table5, Ball Spline model

Nut Type	RS	FS	FSR	FBR
Sample pic.				

Appendix 3. Intelligent Ballscrew Support Unit



Sensor spec.

IP Level	IP68
Temp. sensor range	-20°C~80°C
Sensor size	21.6×21.2×20.7 mm
Signal cable length	10m/19m
Installation instruction	Screw Fastening
Sensor items	Temp.(°C)+Vibration(g)
Vibration Measurement Range	± 16g
Temp. sensor accuracy	± 1°C
Temp. resolution	0.1°C

Edge Computing Module spec.

IP Level	IP20
Operating temperature	0°C~55°C
Operating Humidity	0 to 90% RH (Non-condensing)
Size	136×65×127 mm
Weight	0.6 kg
Power spec.	DC 24 V ± 10 % 3A
Storage Temperature	-20°C~60°C
Communication	• Ethernet • Digital I/O
Software	HIWIN Web GUI
Number of Sensors Installed	3 (Vibration+Temperature) 1 (Temperature)

Ballscrew Specification Nomenclature

1R40 - 10B2 - PFDWE2 - 800 - 1000 - 0.0035 - S

Start type

- 1.Single start
- 2.Double start
- 3.Triple start
- 4.Four start
- 5:Five Start

Right hand screw

Nominal diameter

Lead

Number of turns

Preload type

- P : Compression type
O : Offset type

Nut Start type

- D : High lead double start
T : High lead triple start
Q : High lead quaternary start
F : High lead five start

Nut shape

- S : Square nut
R : Round
F : Nut with flange

Note :

- D : Biaxial Movement
M : Stainless
H : Hollow Shaft
L : Heavy Load
S : i4.0BS®

Lead deviation in random 300mm travel path thread length

Total length

Thread length

Optional Functions :

- E2 : Self-lubrication
R1 : Rotating Nut
C1,C2 : Cool Type
Q1 : Spacer

Circulation type

- V : Tubes above nut body
(Re-circulation Tube above the nut body)
W : Tubes within nut body
(Re-circulation Tube within the nut body)
B : Bonded tube
I : Internal cap
H : End cap
C : Super S series
T : Super T series
P : RD series
(Re-circulation Tube above the nut body)
S : RD series
(Re-circulation Tube within the nut body)

Nut type

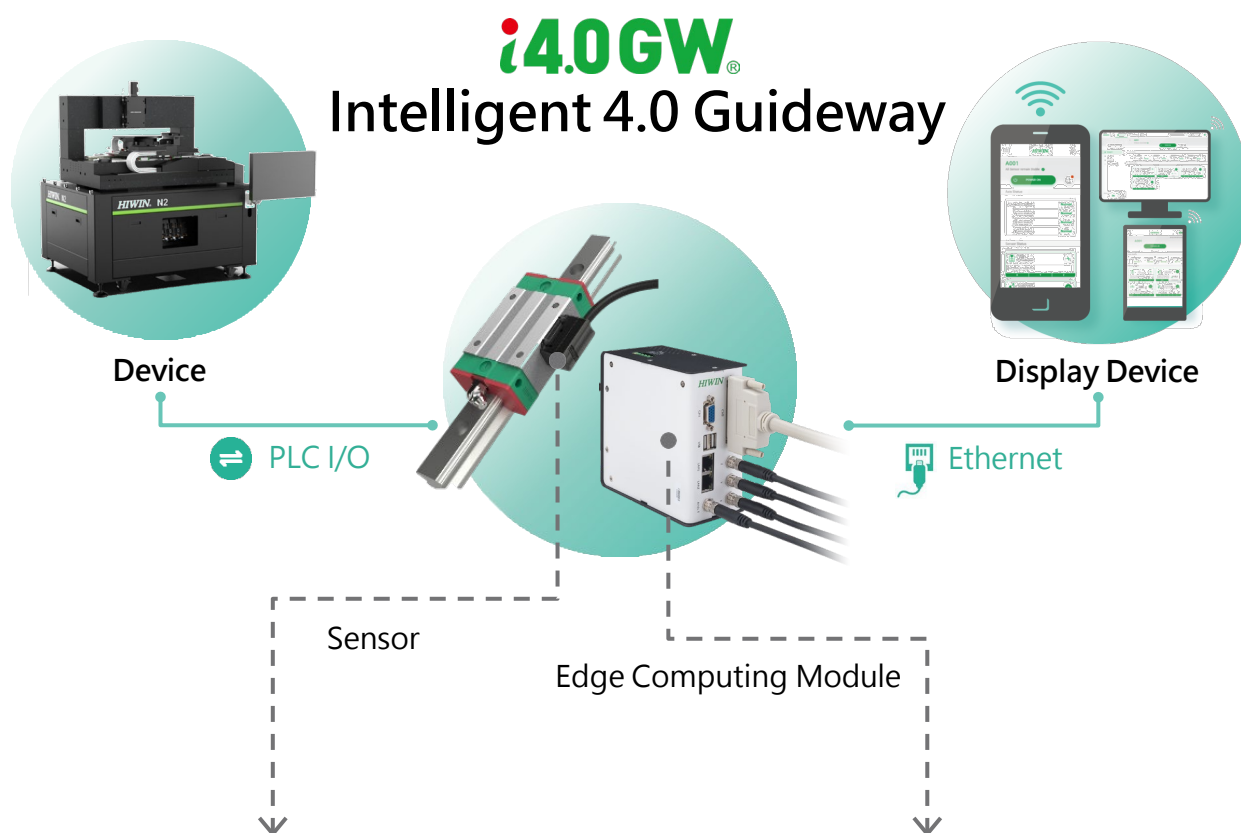
- S : Single nut
D : Double nut

Number of turns

A : 1.5, B: 2.5, C: 3.5	T3 : 3	S1 : 1.8x1	U1 : 2.8x1	K2 : 2	X : 2.8, Y : 3.8, Z : 4.8
A2 : 1.5x2	T4 : 4	S2 : 1.8x2	U2 : 2.8x2	K3 : 3	X2 : 2.8x2
B2 : 2.5x2	T5 : 5	S4 : 1.8x4	V2 : 0.8x2	K4 : 4	Y2 : 3.8x2
C1 : 3.5x1	T6 : 6				Z2 : 4.8x2

If i4.0BS series is required, please add "-S" after the model number.

Appendix 4. Intelligent 4.0 Guideway Support Unit



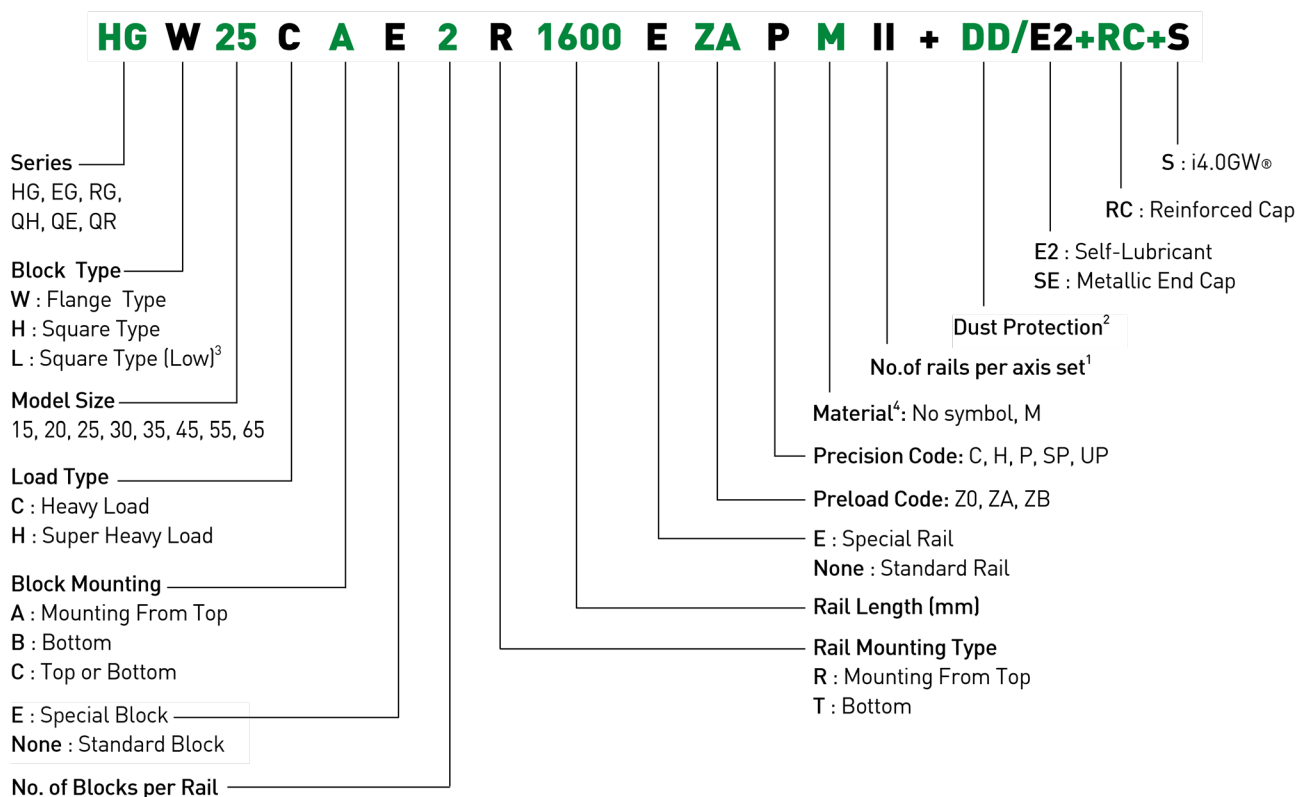
Sensor spec.

IP Level	IP68
Vibration sensor range	± 16g
Temp. measurement range	-20°C~80°C
Size	28.0×13.0×15.5 mm
Signal cable length	10m/19m
Installation instruction	Ball-nut-seated screws

Edge Computing Module spec.

IP Level	IP20
Size	136×65×127 mm
Weight	0.6 kg
Power spec.	DC 24 V ± 10 % 3A
Operating environment humidity	0 to 90% RH (No condensation)
Storage temperature	-20°C~60°C
Operating temperature	0°C~55°C
Communication	▪ Ethernet ▪ Digital I/O (Optional)

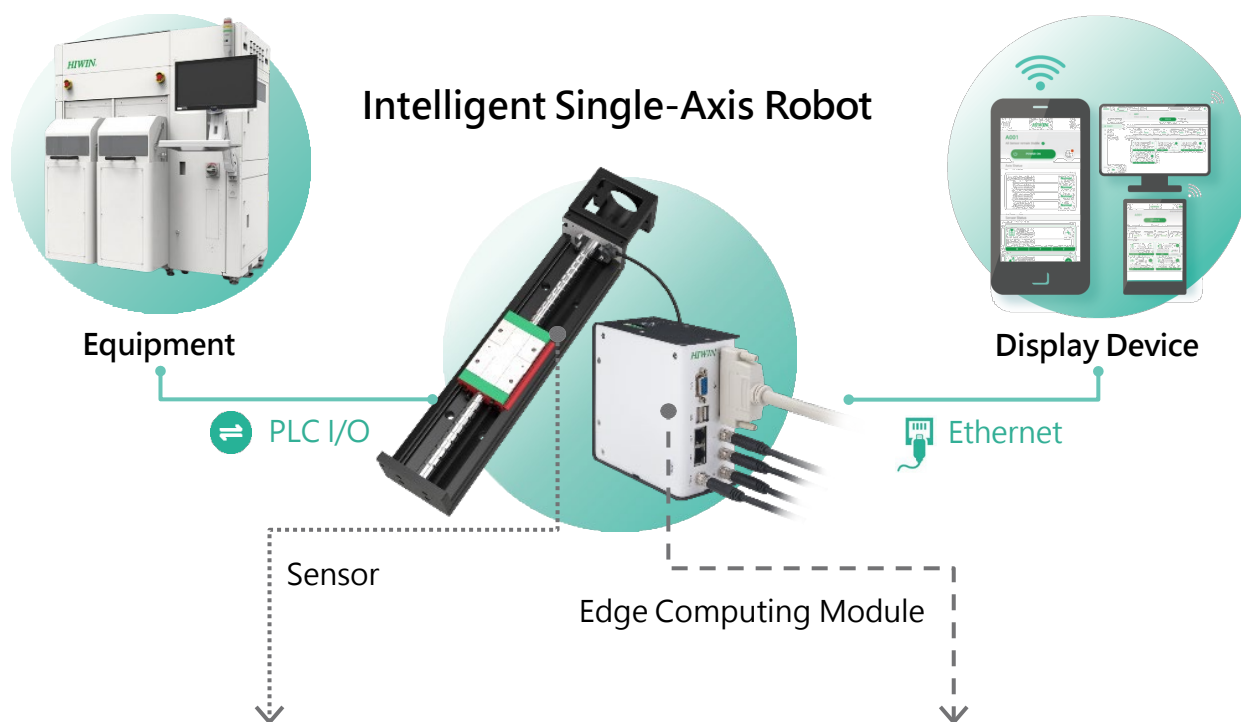
Supported specifications and models : HG, EG, RG, QH, QE, QR Series



Series	HG	EG	WE	QH	QE	QR	CG	RG	CRG
Size	15~65	15~35	17~50	15~45	15~35	20~45	15~45	15~65	15~65
i4.0GW	●	●	×	●	●	●	×	●	×

If i4.0GW series is required, please add "-S" after the model number.

Appendix 5. Supported Intelligent Single-Axis Robot Models



Sensor Spec.

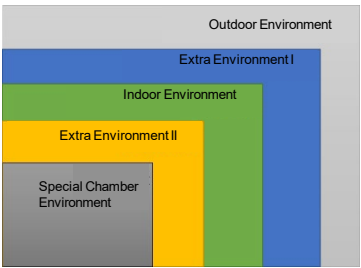
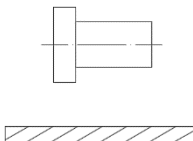
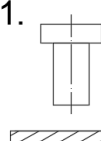
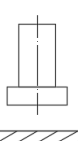
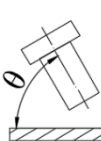
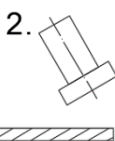
IP Level	IP68
Temp. measurement range	-20°C~80°C
Size	21.6×21.2×20.7 mm
Signal cable length	10m/19m
Installation instruction	Ball-nut-seated screws
Measurable parameters	Temp.(°C)+Vibration (g)
Vibration measurement range	± 16g
Temperature measurement accuracy	± 1°C
Temp. resolution	0.1°C

Edge Computing Module Spec.

IP Level	IP20
Operating temperature	0°C~55°C
Operating environment humidity	0 to 90% RH (No condensation)
Size	136×65×127 mm
Weight	0.6 kg
Power spec.	DC 24 V ± 10 %
Storage temperature	-20°C~60°C
Communication	• Ethernet • Digital I/O
Operating software	HIWIN Web GUI
Sensor installation quantity	3 (Vibration+Temperature) 1 (Temperature)

Series	KA	KK
Size	170, 200	86, 100, 130

Appendix 6. Environment Checklist

		☐ Outdoor Environment ☐ Extra Environment I ☐ Indoor Environment ☐ Extra Environment II ☐ Special Chamber Environment		
Gearing Element		☐ Linear Guideway ☐ Roller Bearings	☐ Ballscrew ☐ Ball bearings	☐ Ball Spline ☐ Strain Wave Gear ☐ Single-Axis Robot
Cleanliness PM		☐ ISO4 / Class10 ☐ ISO5 / Class100 ☐ ISO6 / Class1,000 ☐ ISO7 / Class10,000 ☐ ISO8 / Class100,000		
Degree of Vacuum PV		☐ Atmosphere ☐ Low Vacuum $10^5 \sim 10^2$ Pa / 760 ~ 100 Torr ☐ Medium Vacuum $10^2 \sim 10^1$ Pa / 100 ~ 1 Torr ☐ High Vacuum $10^{-1} \sim 10^{-5}$ Pa / 1 ~ 10^{-3} Torr ☐ Ultra-High Vacuum $10^{-5} \sim 10^{-8}$ Pa / $10^{-3} \sim 10^{-7}$ Torr ☐ Extreme Vacuum $< 10^{-8}$ Pa / $< 10^{-7}$ Torr		
Operating Temperature LT / HT		☐ Below -20°C ☐ -20°C~80°C ☐ More than 80°C ☐ Others _____ °C		
Corrosiveness PE	Chemical properties	Chemicals/Gas Name : _____ ☐ Acidic Solution pH < 7 ☐ Alkaline solution pH > 7		
	Relative Humidity	_____ %RH		
Velocity/Acceleration HS		Linear Velocity : _____ m/s Acceleration : _____ m/s ² (1G=9.8 m/s ²)		
Dust PD		Dust Material : External Protection Particle Diameter : ☐ Standard(>300μm) ☐ Intermediate (>100μm) ☐ Senior (>30μm)		
Maintenance Period MF		☐ Half A Year ☐ One Year ☐ No Maintenance (Estimated Using Kilometers _____)		
Micro Vibration DW		☐ Required · Instructions : _____ ☐ Not required		
Intelligence S		☐ Linear Guideway ☐ Ballscrew ☐ Single-Axis Robot		
Load	Axial Direction	☐ Horizon 	☐ Vertical 1.  or 2. 	☐ Angularity 1.  or 2. 
	Back Weight	_____ kg		
	Applied Force	_____ kgf / N		

Special Environments of Linear Motion Systems

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