SNIBO

Innovation in Motion

LINEAR GUIDE

SAIBO
Innovation in Motion

SAIBO is one of world recognized manufacturers of precision power transmission components. SAIBO group has two divisions, linear motion division and bearing division. Linear Product Division mainly produces curved rail and conveyor, telescopic rail and fork, linear guide, linear module, belt conveyor etc. Bearing Division mainly produces Thin-section bearing, High-speed angular contact ball bearing, linear bearing etc.

SAIBO products are widely used in 3C, factory automation, precision machine, green energy, rail transportation, medical and pharmacy etc. industries. SAIBO end users are located in more than 50 countries and regions around the world.

SAIBO has over 33,000 square meters producing facilities totally and 350 employees. SAIBO continues to develop innovative automation components and modulars to meet customers sustainable solutions.

SAIBO means aim for greatness, focus on details. We seek to work with you and promise the following:

- The right product from your application
- A quality product you can trust
- Engineering assistance that is proven and world renown

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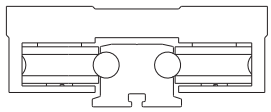
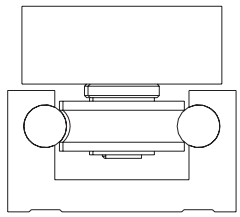


LGA Roller Type Linear Guide (Aluminum Rail Body)

Two steel shafts are assembled external aluminum rail body. Rollers realize high speed, low noise. Carriages are sealed with good dust–protect performance.

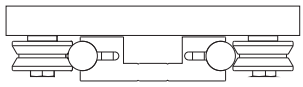
P1—P6



LGB Roller Type Linear Guide (Aluminum Rail Body)

Two steel shafts are assembled internal aluminum rail body. Carriage is narrow and suitable for compact applications. Rollers realize high speed, low noise.

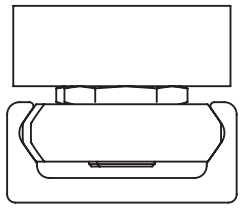
P7—P12



LGC Roller Type Linear Guide (Aluminum Rail Body)

LGC rail adopt wide–body structure and big diameter shafts to realize heavy load capacity and good rigidity.

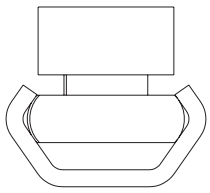
P13—P18



TV Roller Type Linear Guide (Steel Rail)

Rail is made of Cold–drawn steel profile with hardened raceways. Suitable for heavy load, compact structure applications

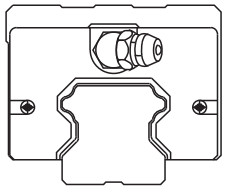
P19—P26



TE Roller Type Linear Guide (Steel Rail)

The series guide rail has a large working range, and still has good reliability in dirty environment.

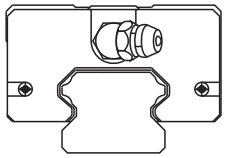
P27—P33



RH Steel Ball Type Linear Guide

Steel balls circulate in four–rows raceways. Heavy load capacity, high accuracy.

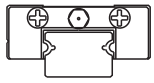
P35—P40



CL Steel Ball Type Linear Guide

CL linear guide has same structure with HG but the assembly height is lower. Suitable for medium and heavy load capacity, high accuracy and compact space applications.

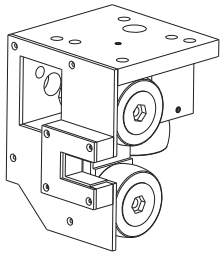
P41—P45



MR Steel Ball Type Linear Guide (Miniature)

Miniature linear guide is designed with two–rows raceways. Suitable for light load and miniaturized equipment.

P47—P51



HV Heavy load linear Guide

The series guide rails and rollers are hardened, with high precision, stable performance and low friction.Especially suitable for heavy loads.

P53—P63

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LGA Roller Type Linear Guide

Construction

LGA linear guide systems are mainly made of lightweight aluminum alloy. Four rollers inside the carriage run on railway's hardened shafts. Stable rolling movement are particularly suitable for use in material handling system and automatic production lines.

Railway

Anodized aluminum alloy body with two hardened and chrome-plated steel shafts

Carriage

Anodized aluminum alloy plate

4 pieces double row balls bearings(Rollers)

2 pieces concentric bolts and 2 pieces eccentric bolts

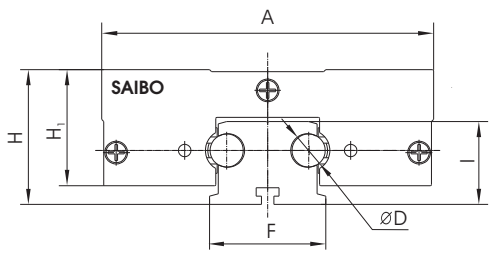
2 pieces plastic lubrication cover with oil soaked felt wipers

Feature

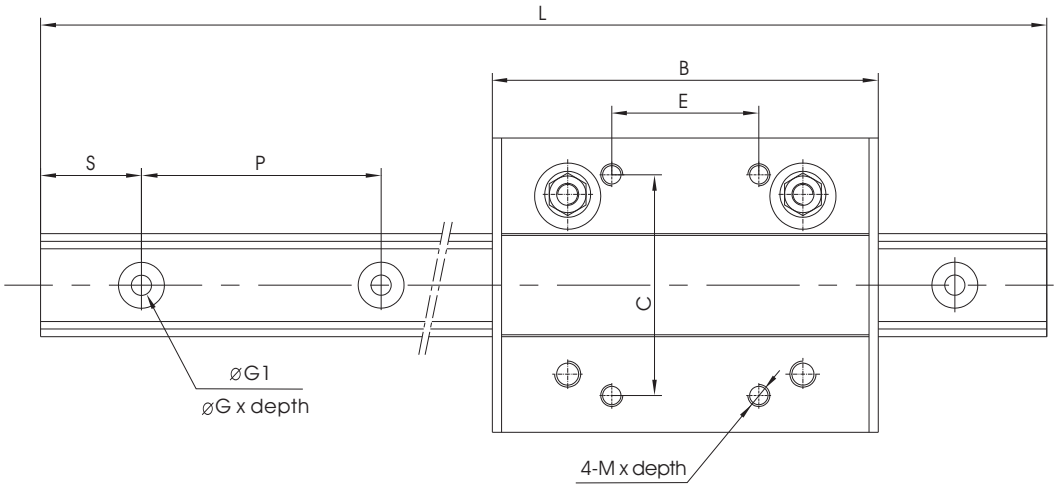
1.High speed, Low friction and Low noise

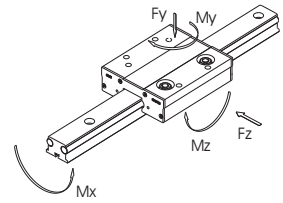
2.Preload is adjustable

3.Sealed and Lubricated



Type	Assembly Dimensions		Carriage Dimensions							
	H	F	A	B	C	E	H_1	M x depth	D	G x depth
LGA25	32.5	28	80	105	60	40	28	M6x8	8	12.5x5.5
LGA30	38.5	34.2	100	120	85	50	33	M8x10	10	14.5x6.5





Railway Dimensions					Max Load capacity(N)		Max moment capacity(N·m)		
G_1	I	S	P	Lmax*	Fymax	Fzmax	Mxmax	Mymax	Mzmax
5.5	20	25	50	3000	520	1200	7.6	26	15
6.5	24	25	50	4000	1200	4000	26	78	45

Setting clearance - free

None clearance is necessary for system's rigidity and stability. LGA series use 2 concentric bolts on one side in the direction of railway and 2 eccentric bolts on the other side. These two eccentric bolts are used for setting clearance-free.

1. Tighten concentric bolts.

2. Tighten the eccentric bolts to near the critical point, but not reach the critical point. (This is to rotate the eccentric bolts).

3. Rotate the eccentric bolts with straight screwdriver at the end of the stud to adjust the clearance. Adjust the clearance to zero.

4. Slide the carriage by hand and adjust to the extent where there causes a slight slipping resistance.

5. Keep eccentric bolt's position and tighten the nut.

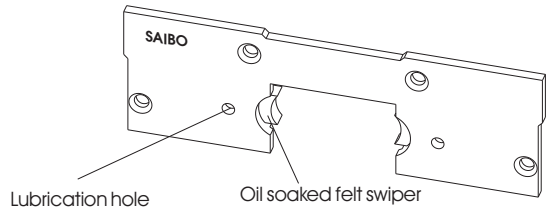
Setting Pre-load

It is same as Setting clearance-free. First adjust clearance to zero, continue rotating eccentric bolts will get pre-load. Appropriate pre-load should be decided according to the application.

Over pre-load will decrease system's life. Please be careful.

Lubrication

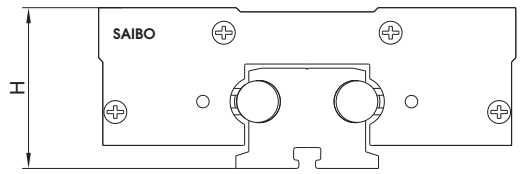
Plastic lubrication cover contains oil soaked felt wipers which can be re-lubricated via lubrication holes.



Working parameter

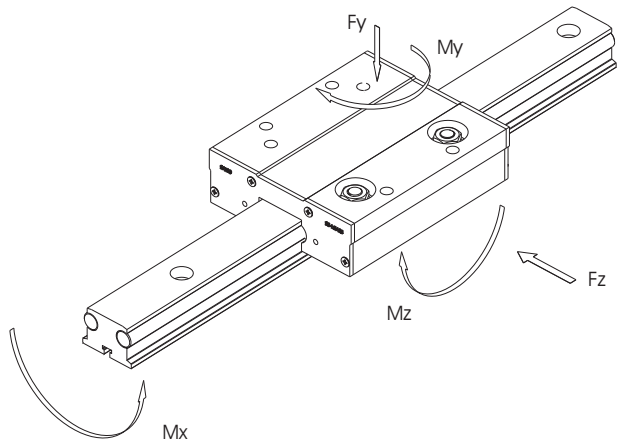
Max speed:	10m/s
Max acceleration:	50m/s^2
Working temperature :	−20°C ~ +80°C

Accuracy



Load / life calculation

Due to the hardness of the railway's shaft and fatigue analysis of railway and roller, the railway's life does not determine the system life. It is determined by roller's life. System's life varies by actual combination of load, working status and environment conditions etc. So loading factor should be calculated firstly. Then system's life could be calculated via using below formula.



LF - Loading factor

(LF should be less than 1.0 for any combination of load)

$$LF = \frac{Fy}{Fymax} + \frac{Fz}{Fzmax} + \frac{Mx}{Mxmax} + \frac{My}{Mymax} + \frac{Mz}{Mzmax}$$

LF - Loading factor

Fy - Actual load in Y direction. (N)

Fz - Actual load in Z direction. (N)

Mx - Actual moment in X direction. (N.m)

My - Actual moment in Y direction. (N.m)

Mz - Actual moment in Z direction. (N.m)

Below parameters can be taken from the table of Load capacity.

Fy max - Max load capacity in Y direction. (N)

Fz max - Max load capacity in Z direction. (N)

Mx max - Max moment capacity in X direction. (N·m)

My max - Max moment capacity in Y direction. (N·m)

Mz max - Max moment capacity in Z direction. (N·m)

Life calculation

SAIBO designed LGA series load capacity according to basic life of 100km for each type. System's life in km could be calculated via below formula.

$$Life(km) = \frac{100}{(0.03+0.97LF*f)^3}$$

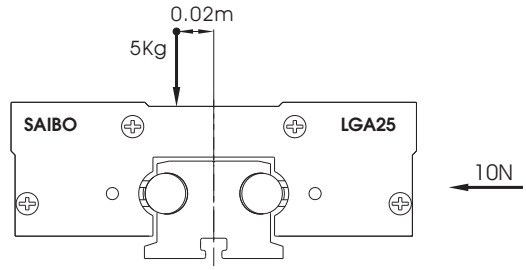
Tolerance H: ±0.20mm

f - Reduction coefficient of the application and environment.

None vibration or shock, Low speed (<1m/s), Low frequency shift direction, clean environment.	1-1.5
Light vibration or shock, medium speed (1-2.5m/s) medium frequency shift direction, some dirtiness	1.5-2
Heavy vibration or shock, high speed (>2.5m/s) high frequency shift direction, heavy dirty	2-3.5

Calculation example

Here select SB-LGA25 as calculation example. This system is loaded as below picture. Working condition is clean and there is no vibration or shock.



The load factor LF is calculated use formula

$$LF = \frac{Fy}{Fymax} + \frac{Fz}{Fzmax} + \frac{Mx}{Mxmax} + \frac{My}{Mymax} + \frac{Mz}{Mzmax}$$

Fy = 5 kg x 9.8 (gravity) = 49 N

Fz = 10 N

Mx = 49 x 0.02 = 0.98 N.m

My = 0

Mz = 0

Take parameters Fy max, Fz max, Mx max, My max, Mz max from table and then fill in the formula

$$LF = \frac{49}{520} + \frac{10}{1200} + \frac{0.98}{7.60} + \frac{0}{Mymax} + \frac{0}{Mzmax} = 0.2314$$

According to the description of working condition, take f=1.1

$$Life(km) = \frac{100}{(0.03+0.97LF*f)^3}$$

$$= \frac{100}{(0.03+0.97*0.2314*1.1)^3}$$

$$= 4716km$$

LGB Roller Type Linear Guide

Construction

LGB linear guide systems are designed for compact space application. The carriages are in narrow structures. Railway, narrow carriage and lubrication cover are its basic construction.

Railway

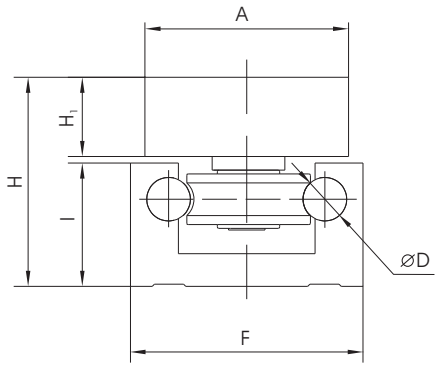
Anodized aluminum alloy body with two hardened and chrome-plated steel shafts

Carriage

Anodized aluminum alloy plate
3 pieces double row balls bearings(Rollers)
Eccentric bolt used for adjust the clearane/preload
Optional lubrication covers with oil soaked felt wipers

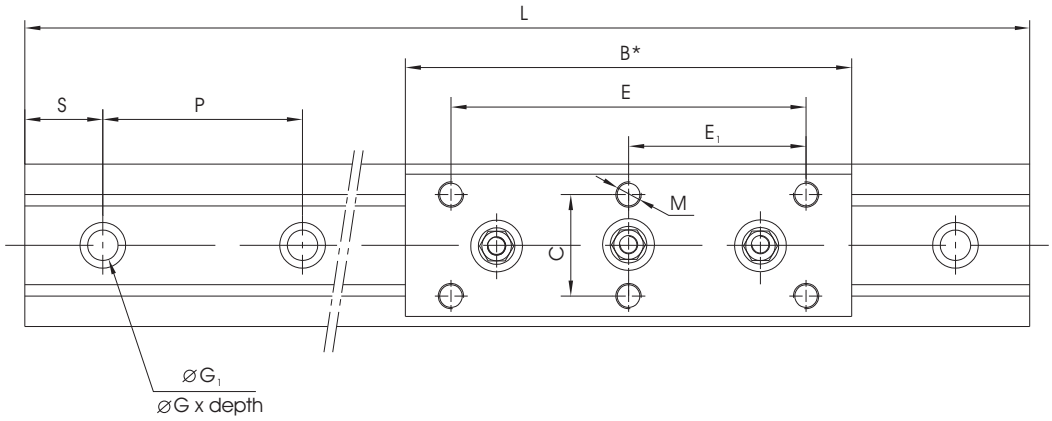
Feature

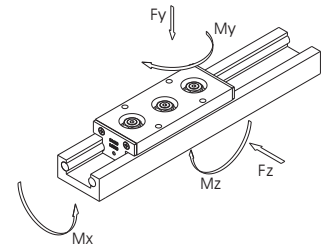
1. High speed, Low friction and Low noise
2. Preload is adjustable
3. Narrow body for compact application
4. Optional Lubrication covers



Type	Assembly Dimensions		Carriage Dimensions								
	H	F	A	B*	C	E	E_1	H_1	M	D	G x depth
LGB15	28.8	32	28	88	20	70	–	10.9	4xM5	6	7.5x2.5
LGB20	35.5	47	47	108	38	50	–	11.5	4xM6	8	9.5x5
LGB25	43	65	64	150	47	130	65	14.7	6xM8	10	11x4

* This size does not include plastic cover's thickness. All size plastic cover's thickness is 2.5mm. So covered carriages' length must add 5.0mm to size B.





Railway Dimensions					Max Load capacity(N)		Max moment capacity(N·m)		
G_1	I	S	P	Lmax	Fymax	Fzmax	Mxmax	Mymax	Mzmax
4.5	17	30	60	3000	330	1000	1.8	12	5.5
5.5	21.75	30	60	3000	520	1200	6.6	45	15
6.5	26.5	30	60	3000	1200	4000	19	120	50

Setting clearance - free

None clearance is necessary for system's rigidity and stability. LGB series carriage has two concentric bolts on both sides and one eccentric bolt in the center along the railway. This eccentric bolt is used for setting clearance-free.

1. Tighten concentric bolts.

2. Tighten the eccentric bolt to near the critical point, but not reach the critical point. (This is for rotate the eccentric bolts).

3. Rotate the eccentric bolts with internal hexagonal wrench in the end of the eccentric bolt to adjust the clearance. Adjust the clearance to zero.

4. Slide the carriage by hand and adjust to the extent where there causes a slight slipping resistance.

5. Keep eccentric bolt's position and tighten the nut.

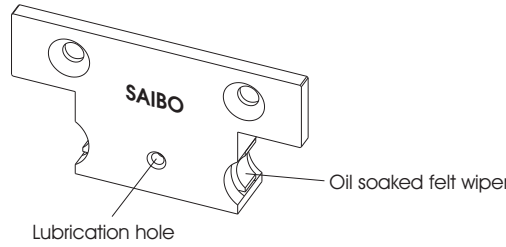
Setting Pre-load

It is same as Setting clearance-free. First adjust clearance to zero, continue rotating eccentric bolt will get pre-load. Appropriate pre-load should be decided according to application.

Over pre-load will decrease system's life. Please be careful.

Lubrication

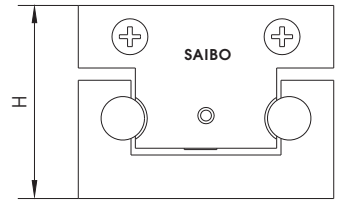
Plastic lubrication cover contains oil soaked felt wipers which can be re-lubricated via lubrication hole. This lubrication cover is optional, not included in standard carriage.



Working parameter

Max speed: 10m/s
Max acceleration: 50m/s^2
Working temperature: −20°C ~ +80°C

Accuracy

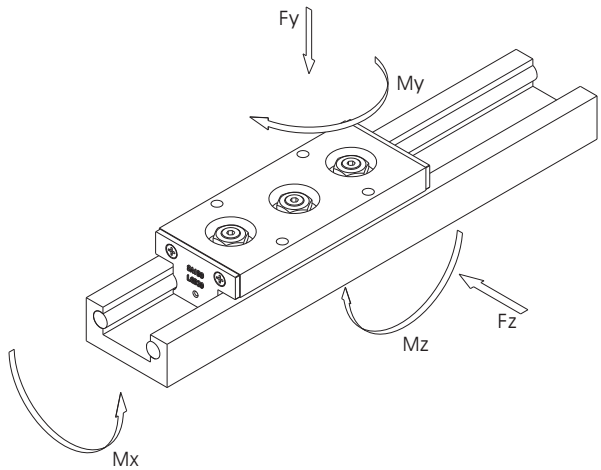


Tolerance H： ±0.20mm

Note: Higher accuracies are available upon request.

Load / life calculation

Due to the hardness of the railway's shaft and fatigue analysis of railway and roller, the railway's life does not determine the system life. It is determined by roller's life. System's life varies by actual combination of load, working status and environment conditions etc. So loading factor should be calculated firstly. Then system's life could be calculated via using below formula.



LF - Loading factor

(LF should be less than 1.0 for any combination of load)

$$LF = \frac{Fy}{Fymax} + \frac{Fz}{Fzmax} + \frac{Mx}{Mxmax} + \frac{My}{Mymax} + \frac{Mz}{Mzmax}$$

LF - Loading factor

Fy - Actual load in Y direction. (N)

Fz - Actual load in Z direction. (N)

Mx - Actual moment in X direction. (N.m)

My - Actual moment in Y direction. (N.m)

Mz - Actual moment in Z direction. (N.m)

Below parameters can be taken from the table of Load capacity.

Fy max - Max load capacity in Y direction. (N)

Fz max - Max load capacity in Z direction. (N)

Mx max - Max moment capacity in X direction. (N·m)

My max - Max moment capacity in Y direction. (N·m)

Mz max - Max moment capacity in Z direction. (N·m)

Life calculation

SAIBO designed LGB series load capacity according to basic life of 100km for each type. So after customers designed system's actual load, system's life could be calculated via below formula.

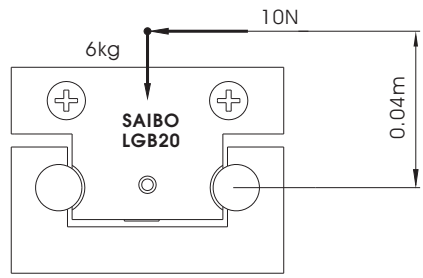
$$Life(km) = \frac{100}{(0.03+0.97LF*f)^3}$$

f - Reduction coefficient of the application and environment.

None vibration or shock, Low speed (<1m/s), Low frequency shift direction, clean environment.	1-1.5
Light vibration or shock, medium speed (1-2.5m/s) medium frequency shift direction, some dirtiness	1.5-2
Heavy vibration or shock, high speed (>2.5m/s) high frequency shift direction, heavy dirty	2-3.5

Calculation example

Here select SB-LGB20 as calculation example. This system loaded as blow picture. Working condition is clean and there is no vibration or shock.



The load factor LF is calculated use formula

$$LF = \frac{Fy}{Fymax} + \frac{Fz}{Fzmax} + \frac{Mx}{Mxmax} + \frac{My}{Mymax} + \frac{Mz}{Mzmax}$$

Fy = 6 kg x 9.8 (gravity) = 58.8 N

Fz = 10 N

Mx = 10 x 0.04 = 0.40 N.m

My = 0

Mz = 0

Take parameters Fy max, Fz max, Mx max, My max, Mz max from table and then fill in the formula

$$LF = \frac{58.8}{520} + \frac{10}{1200} + \frac{0.40}{6.60} + \frac{0}{Mymax} + \frac{0}{Mzmax} = 0.182$$

According to the description of working condition, take f=1.1

$$Life(km) = \frac{100}{(0.03+0.97LF*f)^3}$$

$$= \frac{100}{(0.03+0.97*0.182*1.1)^3}$$

$$= 8849 \text{ km}$$

LGC Roller Type Linear Guide

Construction:

LGC railway is wide structure. This linear guide can be used to replace the system built with two railways and has big load capacity and moment capacity. Especially the moment load is much bigger as two shafts' span is big.

Although railway's width is big, light-weight aluminum alloy still keep railway's weight light. In the body of the railway, there is a big U-shape groove. This groove is used for installing driven parts such as rack and gear, timing belt.

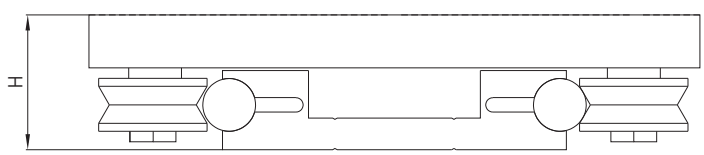
Feature:

1.High speed, Low friction and Low noise
2.Big load capacity and moment capacity
3.Pre-load is adjustable
4.Accurate and stable

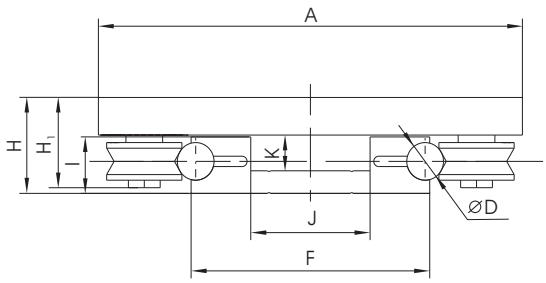
Working parameter

Max speed: 10m/s
Max acceleration: 50m/s^2
Working temperature: −20°C ~ +80°C

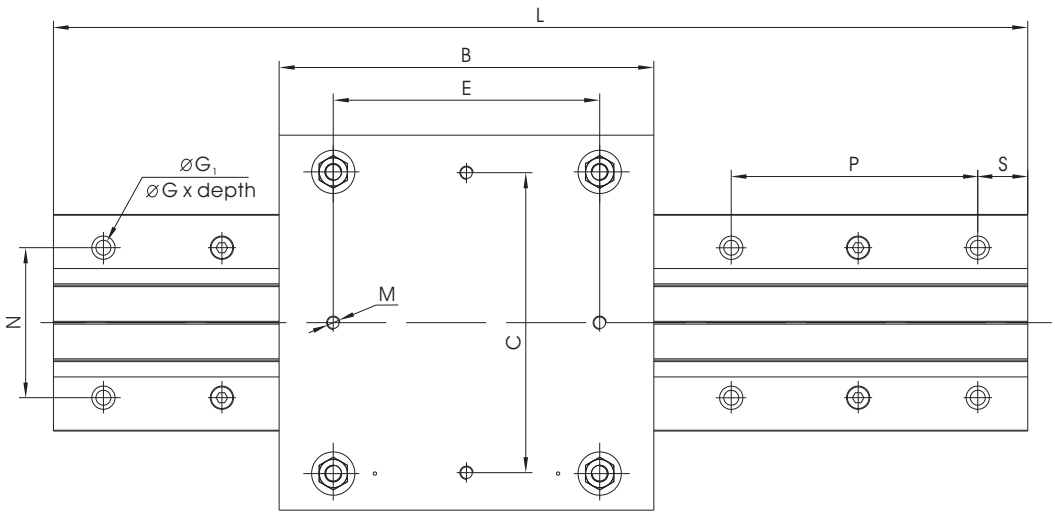
Accuracy

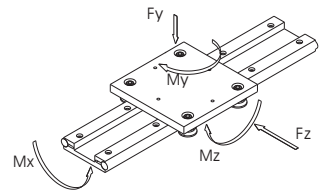


Tolerance H: ± 0.20mm
Note: Higher accuracies are available upon request.



Type	Assembly Dimensions		Carriage Dimensions								
	H	F	A	B	C	E	H_1	M	D	G x depth	G_1
LGC100	51	99	200	200	140	140	48	4-M8	20	14x5.5	9
LGC130	51	130	230	230	180	160	48	4-M8	20	14x5.5	9





Railway Dimensions							Max Load capacity(N)		Max moment capacity(N·m)		
I	J	K	N	S	P	Lmax	Fymax	Fzmax	Mxmax	Mymax	Mzmax
30	40	18	62	30	300	6000	6000	6000	190	210	210
30	65	18	90	30	300	6000	6000	6000	240	240	240

Setting clearance - free

None clearance is necessary for system's rigidity and stability. LGC series use 2 concentric bolts one side in the direction of railway and 2 eccentric bolts on the other side. These two eccentric bolts are used for setting clearance-free.

1. Tighten concentric bolts.

2. Tighten the eccentric bolts to near the critical point, but not reach the critical point. (This is to rotate the eccentric bolts).

3. Rotate the eccentric bolts with wrench at the end of the stud to adjust the clearance. Adjust the clearance to zero.

4. Slide the carriage by hand and adjust to the extent where there causes a slight slipping resistance.

5. Keep eccentric bolt's position and tighten the nut.

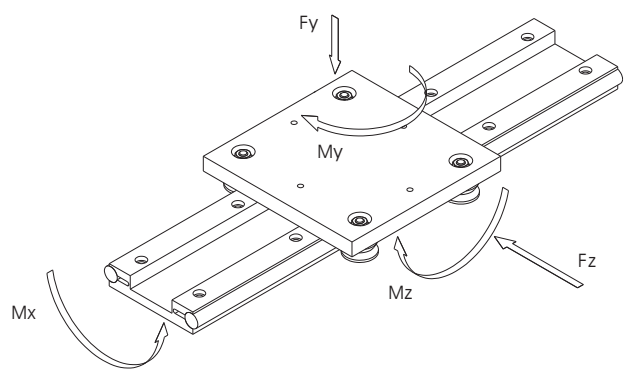
Setting Pre-load

It is same as Setting clearance-free. First adjust clearance to zero, continue rotating eccentric bolts will get pre-load. Appropriate pre-load should be decided according to application.

Over pre-load will decrease system's life. Please be careful.

Load / Life calculation

Due to the hardness of the railway's shaft and fatigue analysis of railway and roller, the railway's life does not determine the system life. It is determined by roller's life. System's life varies by actual combination of load, working status and environment conditions etc. So loading factor should be calculated firstly. Then system's life could be calculated via using below formula.



Working parameter

Max speed:	10m/s
Max acceleration:	50m/s^2
Working temperature:	−20°C ~ +80°C

LF - Loading factor

(LF should be less than 1.0 for any combination of load)

$$LF = \frac{Fy}{Fymax} + \frac{Fz}{Fzmax} + \frac{Mx}{Mxmax} + \frac{My}{Mymax} + \frac{Mz}{Mzmax}$$

LF - Loading factor

Fy - Actual load in Y direction. (N)

Fz - Actual load in Z direction. (N)

Mx - Actual moment in X direction. (N.m)

My - Actual moment in Y direction. (N.m)

Mz - Actual moment in Z direction. (N.m)

Below parameters can be taken from the table of Load capacity.

Fy max - Max load capacity in Y direction. (N)

Fz max - Max load capacity in Z direction. (N)

Mx max - Max moment capacity in X direction. (N·m)

My max - Max moment capacity in Y direction. (N·m)

Mz max - Max moment capacity in Z direction. (N·m)

Life calculation

SAIBO designed LGC linear guide load capacity according to basic life of 100km. System's life in km could be calculated using below formula.

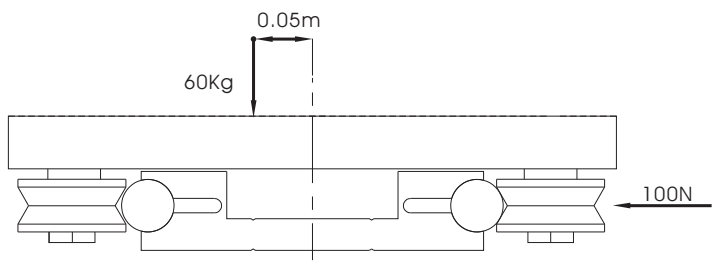
$$Life(km) = \frac{100}{(0.03+0.97LF*f)^3}$$

f - Reduction coefficient of the application and environment.

None vibration or shock, Low speed (<1m/s), Low frequency shift direction, clean environment.	1-1.5
Light vibration or shock, medium speed (1-2.5m/s) medium frequency shift direction, some dirtiness	1.5-2
Heavy vibration or shock, high speed (>2.5m/s) high frequency shift direction, heavy dirty	2-3.5

Calculation example

Here we select a load example to calculate the life. Sample's load is as below picture. Working condition is clean and there is no vibration or shock.



The load factor LF is calculated use formula

$$LF = \frac{Fy}{Fymax} + \frac{Fz}{Fzmax} + \frac{Mx}{Mxmax} + \frac{My}{Mymax} + \frac{Mz}{Mzmax}$$

Fy = 60 kg x 9.8 (gravity) = 588 N

Fz = 10 N

Mx = 588 x 0.04 = 29.4 N.m

My = 0

Mz = 0

Take parameters Fy max, Fz max, Mx max, My max, Mz max from table and then fill in the formula

$$LF = \frac{588}{6000} + \frac{100}{6000} + \frac{29.4}{240} + \frac{0}{Mymax} + \frac{0}{Mzmax} = 0.2372$$

According to the description of working condition, take f=1.1

$$\text{Life(km)} = \frac{100}{(0.03+0.97LF*f)^3}$$

$$= \frac{100}{(0.03+0.97*0.2372*1.1)^3}$$

$$= 4405 \text{ km}$$

TV Roller Type Linear Guide

Construction

TV rail matches roller slider could achieve high-speed, high acceleration, low noise. Lubricate felt wipers provides cleaning and lubrication. According to load capacity, carriage could be set more than 3 rollers.

Rail

Rail is made of high-quality Cold-drawn steel with induction hardened raceways. So it performs good rigidity, excellent wear-resisting property. Various surface treatment is optional for resisting corrosion.

Carriage

Carriage body is made of high strength aluminium alloy. Precision rollers set in concentric and eccentric according to different load capacities.

Feature

High load capacity, good rigidity performance
Low friction, excellent wear-resisting property
High speed and acceleration
Rails are easy to joint for long length

Running Parameter

Max. speed
Size 28: 5m/s
Size 35: 6m/s
Size 43: 7m/s
Max. Acceleration: 15m/s^2

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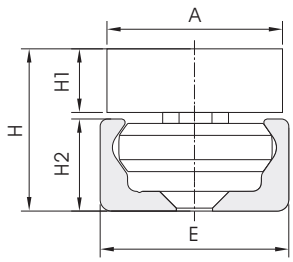
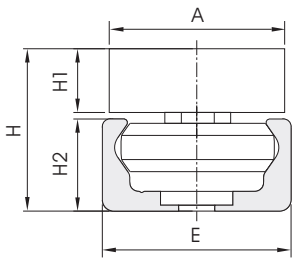
TV Linear Guide

Dimension and Load Capacity



V holes



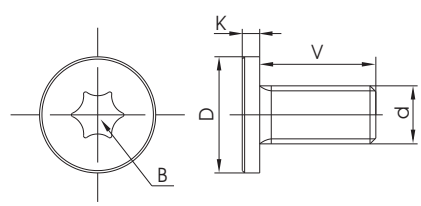
C holes

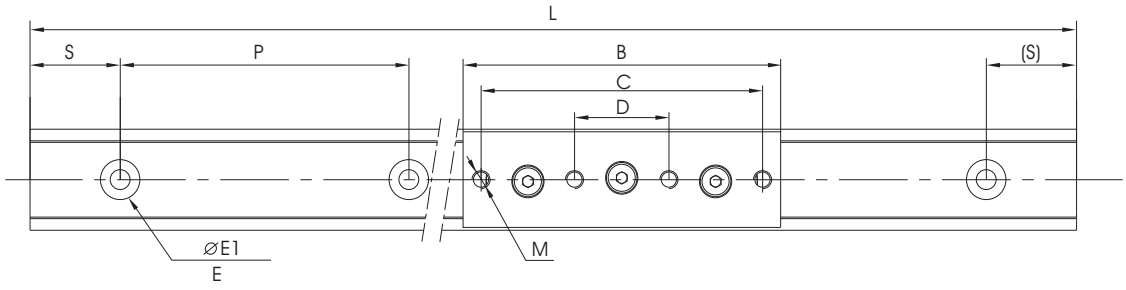
Rail Type	Carriage Type (standard 3 roller)	Assembly Dimensions			Standard Carriage Dimensions		
		H (mm)	E (mm)	A (mm)	B (mm)	C (mm)	D (mm)
TV28 X L	TCA28	24	28	26.5	88	78	35
TV35 X L	TCA35	30	35	34	114	96	30
TV43 X L	TCA43	37	43	40	134	114	55

* V type hole is optional DIN7991 bolt.

* C type hole is optional below bolt.

Screw Dimensions					
TYPE	d (mm)	D (mm)	K (mm)	B (mm)	V (mm)
CCHS28	M5x0.8	10	1.5	T10	10
CCHS43	M8x1.25	16	1.5	T45	16





		Railway Dimensions					
H1 (mm)	M (mm)	E		E1 (mm)	H2 (mm)	P (mm)	S (mm)
		V type	C type				
9.8	M5	⌵⌀ 10.6x90°	⌀ 11x2.1	5.6	12.25	80	25
11.7	M6	⌵⌀ 13.2x90°	—	6.6	16	80	25
14.5	M8	⌵⌀ 17x90°	⌀ 18x3.1	8.5	21	80	25

Model Rule

TV	28	C	X L
			Rail length
		Mount hole type. Vacant means V type mount hole.	
	Size		
Product series code			

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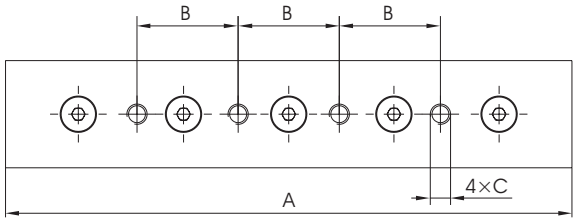
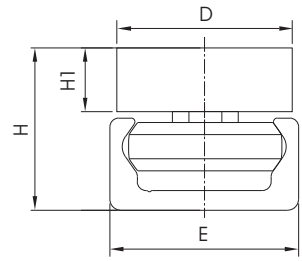
TCA Long Carriage

SAIBO also supply long carriage mounted more rollers to achieve big load capacity.

Carriage Dimension

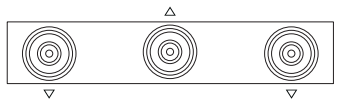




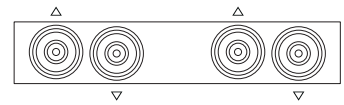
Rail Type	Carriage Type (Long size)	A (mm)	B (mm)	C (mm)	D (mm)	E (mm)	H (mm)	H1 (mm)
TV28 X L	TCA28L	140	25	M5	26.5	28	24	9.8
TV43 X L	TCA43L	208	40	M8	40	43	37	14.5

Rollers Setting

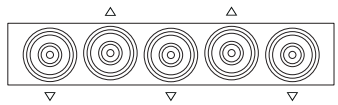
TCA···L3A



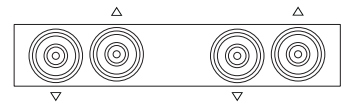
TCA···L4A



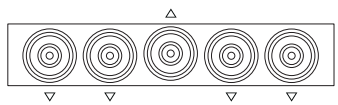
TCA···L5A



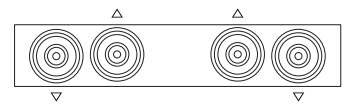
TCA···L4B



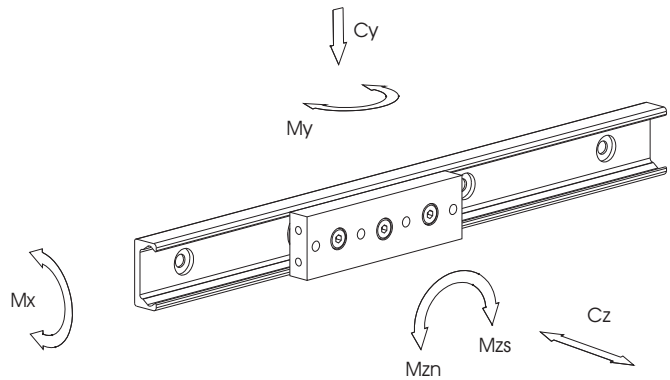
TCA···L5B



TCA···L4C



Notes: "△" Refers to the contact direction between the roller and the guide rail



Load Capacity

Type	No. Rollers	Load Capacity						
		C_{100} (N)	Cy (N)	Cz (N)	M_x (Nm)	M_y (Nm)	M_z (Nm)	
							Mzs	Mzn
TCA28	3	4285	2170	640	6.3	16	27.3	27.3
TCA28L3A	3	4285	2170	640	6.3	29	54.4	54.4
TCA28L4A	4	4285	2170	750	11.5	29	54.4	109
TCA28L4B	4	4285	2170	750	11.5	29	109	54.4
TCA28L4C	4	4285	2170	750	11.5	29	81.6	81.6
TCA28L5A	5	5065	2580	900	11.5	29	81.6	81.6
TCA28L5B	5	6816	3472	640	6.2	29	54.4	54.4
TCA35	3	8050	3515	1065	12.7	33.7	61.5	61.5
TCA43	3	12280	5515	1575	23.6	60	104.5	104.5
TCA43L3A	3	12280	5515	1575	23.6	108.4	212	212
TCA43L4A	4	12280	5515	1855	43.6	108.4	212	418
TCA43L4B	4	12280	5515	1855	43.6	108.4	418	210
TCA43L4C	4	12280	5515	1855	43.6	108.4	313.5	313.5
TCA43L5A	5	14675	6540	2215	43.6	108.4	313.5	313.5
TCA43L5B	5	19650	8800	1570	23.6	108.4	210	210

Preload Setting

Eliminating the gap between the slider and the rail helps to improve the rigidity and stability of the system. The preload adjustment of the TV guide is relatively easy. The method is as follows:

1. First, mount the concentric rollers onto the slider base and lock it with the following hexagonal chuck wrench and inner hex wrench.

2. In the same way, mount the eccentric roller onto the slider base. Fixing the screw to tighten slightly but not lock.

3. Hold the position of the inner hex wrench by one hand. And turn the hexagonal chuck wrench slightly in the other hand, turning the eccentric shaft. Adjust the gap between the rail and the slider. In the meanwhile, move the slider until feel a slight resistance.

4. Hold the position of the Hexagonal chuck wrench by one hand and lock the screw with the inner hex wrench in the other hand.

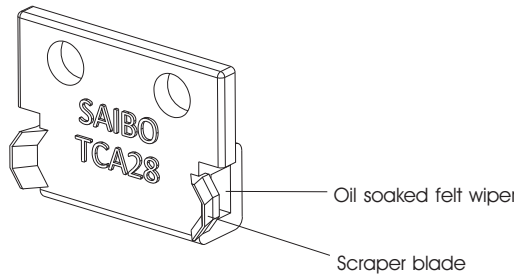
Carriage size	Locking torque (N.m)
28	7
35	7
43	12

Important Note

Appropriate pre–load performs system rigidity. However,over–preload will decrease system's life rapidly. Please be careful.

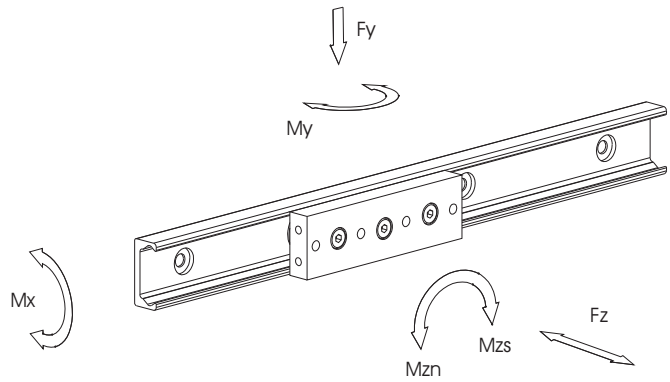
Lubricate

SAIBO Lubricate wiper designed two functions. Scraper blade is to remove the dust on the raceway. Oil soaked felts touch the raceway to lubricate it. All lubricate wiper filled oil before delivery. Please check and fill mineral base oil regularly. Change felt or lubricate wiper when felt was worn.



Load Calculation

Load capacity of the motion guide system varies mainly by the size of bearing and railway, lubricated or not, and the load magnitude and direction. Other factors include speed and acceleration and environment etc. To calculate system life, loading factor LF should be calculated firstly.



LF - Loading factor

(LF should be less than 1.0 for any combination of load)

$$LF = Fy + \left(\frac{Fz}{Cz} + \frac{Mx}{Mxmax} + \frac{My}{Mymax} + \frac{Mz}{Mzmax} \right) Cy$$

LF - Loading factor

Fy - Actual load in Y direction. (N)

Fz - Actual load in Z direction. (N)

Mx - Actual moment in X direction. (N.m)

My - Actual moment in Y direction. (N.m)

Mz - Actual moment in Z direction. (N.m)

Below parameters can be taken from the table of Load capacity.

Fy max - Max load capacity in Y direction. (N)

Fz max - Max load capacity in Z direction. (N)

Mx max - Max moment capacity in X direction. (N·m)

My max - Max moment capacity in Y direction. (N·m)

Mz max - Max moment capacity in Z direction. (N·m)

Life calculation

$$L_{km} = 100 \cdot \left(\frac{C_{100}}{LFf} \right)^3$$

C_{100} – Load coefficient

(Please see it in the table of Carriage load capacity)

f - Reduction coefficient of the application and environment.

None vibration or shock, Low speed (<1m/s), Low frequency shift direction, clean environment.	1-1.5
Light vibration or shock, medium speed (1-2.5m/s) medium frequency shift direction, some dirtiness	1.5-2
Heavy vibration or shock, high speed (>2.5m/s) high frequency shift direction, heavy dirty	2-3.5

TE Roller Type Linear Guide

Construction

The roller guide rail is composed of a C–type track and a roller slider. The slider adopts positive eccentric roller design.

Railway

Guide material: zinc–plated steel or stainless steel
Stainless steel rails have high corrosion resistance

Carriage

The slider body comes in two types: compact body or solid body.
The Rail materials used zinc–plated steel or stainless steel
The solid slider body is made of high-quality aluminum alloy, treated with oxidation.
The rollers are precision-ground ball bearings.

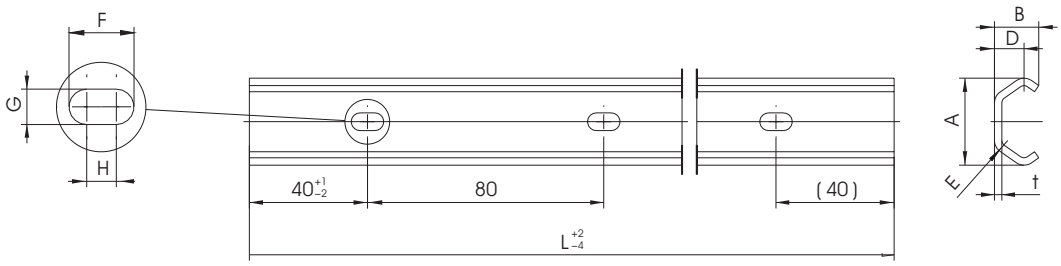
Feature

Anti–corrosion
Good reliability in dirty environments
Large range of work
Slider adjustment is simple

Running Parameter

Running Parameter
Max. Speed: 1.5m/s
Max. Acceleration: 2m/s^2
Operating temperature: the maximum operating temperature of the guide rail is 120℃. If you need to use in a high temperature environment, you can contact our relevant technicians

TE Linear Guide (zinc–plated steel)



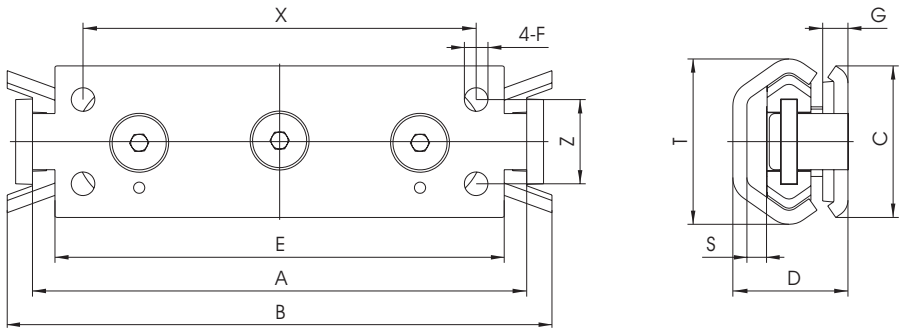
Rail Type	Size	A	B	t	D	E	F	G	H	Adapting Screws
TE	30	29.5	15	2.5	10	4.5	11	6	5	M5
	45	46.4	24	4	15.5	6.5	14	9	5	M8

Model Rule

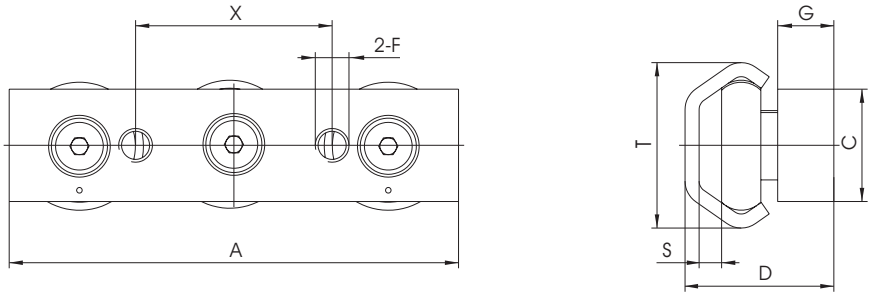
TE	30	X L	
		Rail length（Max 4000 mm）	
	Size		
Product Series Code			

Carriages

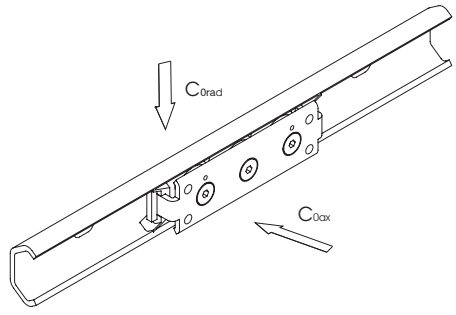
Compact Body Carriages SE30



Solid Body Carriages CE30

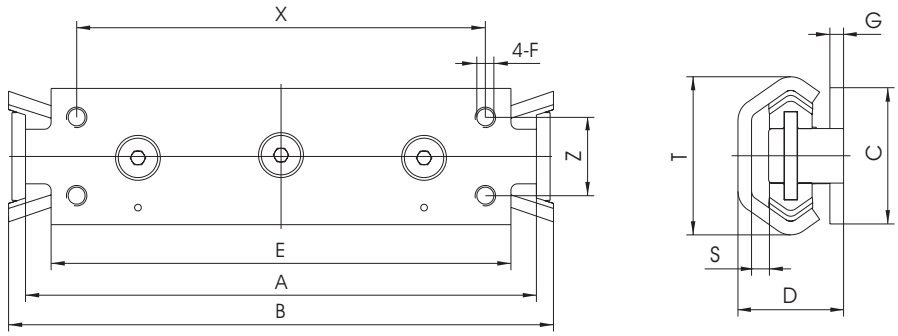


*The sliding block uses a bearing steel roller

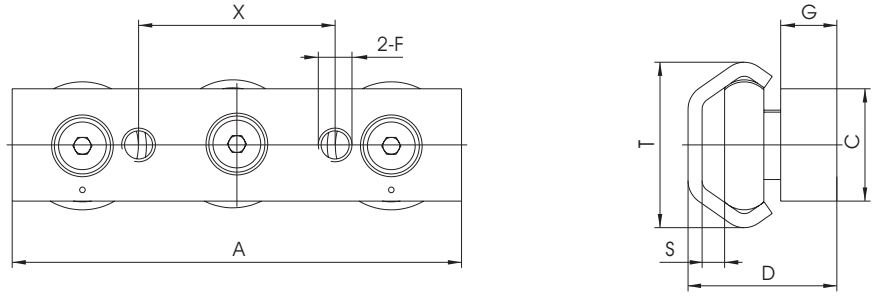


Carriage Type	A	B	C	D	E	F	G	S	T	Z	X	C_{0rad}	C_{0ax}
SE30	88	97	27	20.5	80	M5	4.5	3.5	29.5	15	70	870	435
CE30	80	-	20	26.5	-	M6	10	3.3	29.5	-	35	870	435

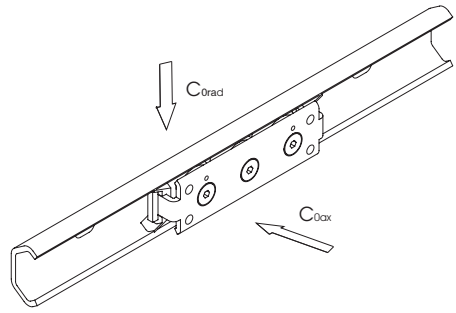
Compact Body Carriages SE45



Solid Body Carriages CE45

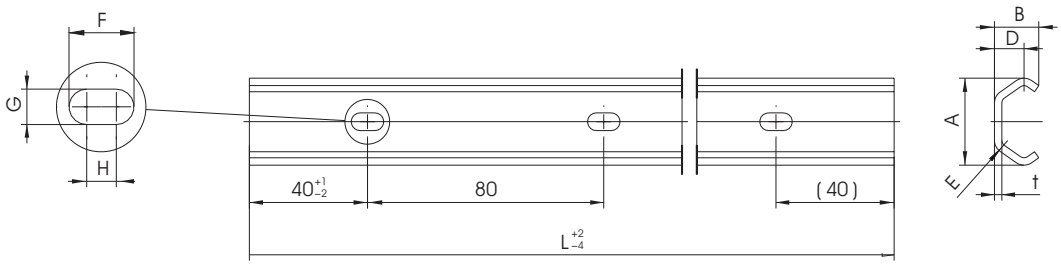


*The Carriages uses a bearing steel roller



Carriage Type	A	B	C	D	E	F	G	S	T	Z	X	C_{0rad}	C_{0ax}
SE45	150	160	40	31	135	M6	4	5	46.4	23	120	1740	935
CE45	120	-	25	38	-	M8	12	5.7	46.4	-	55	1740	935

STE Linear Guide （stainless steel）



Rail Type	Size	A	B	t	D	E	F	G	H	螺钉孔
STE	30	29.5	14.1	2.5	10	4.5	11	6	5	M5
	45	46.4	24	4	15.5	6.5	14	9	5	M8

Model Rule

STE	30	X L
		Rail length（Max 4000 mm）
	Size	
Product Series Code		

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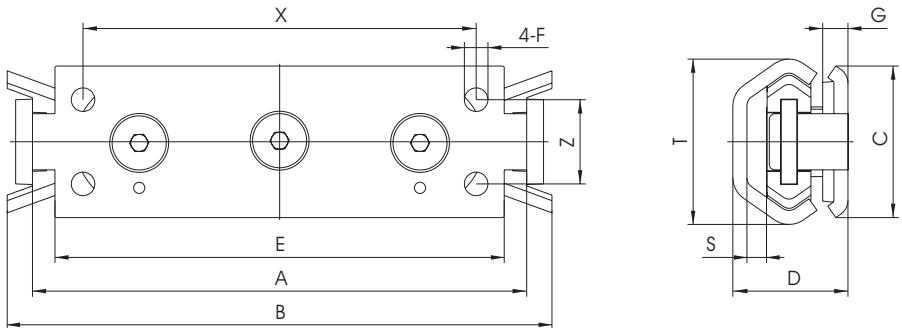
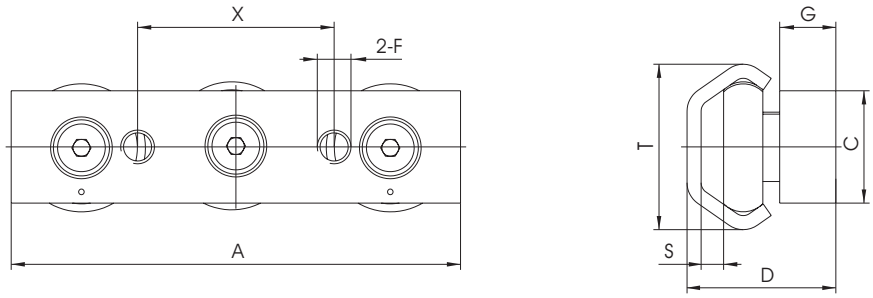
Carriages

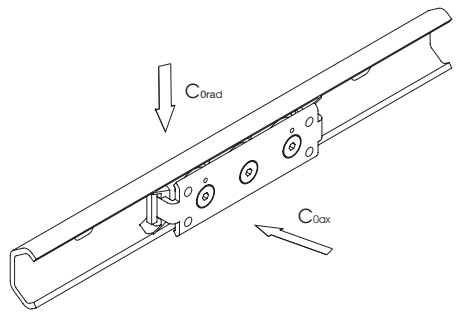
Compact Body Carriages SSE30



Solid Body Carriages SCE30

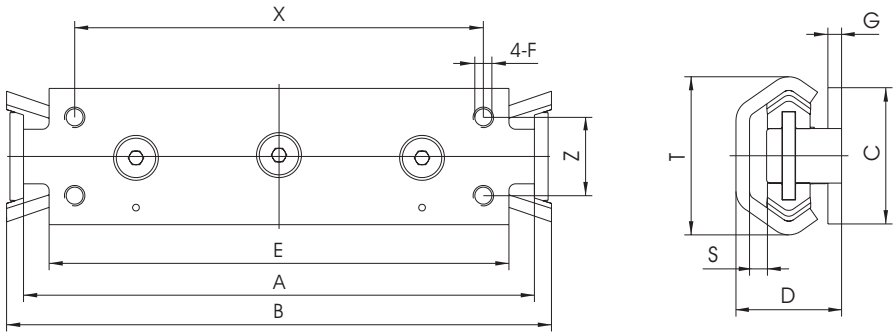


*The Carriages uses stainless steel roller

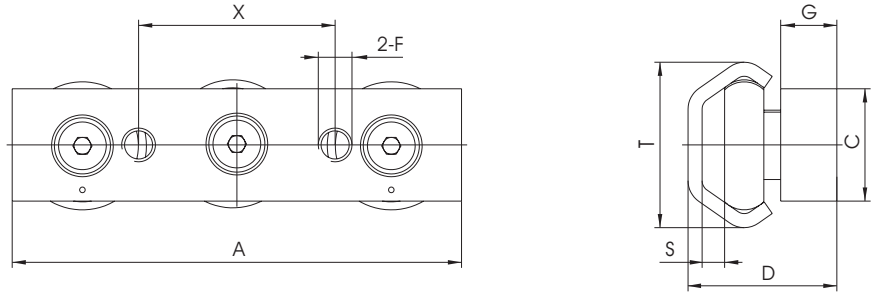


Carriage Type	A	B	C	D	E	F	G	S	T	Z	X	C_{0rad}	C_{0ax}
SSE30	88	97	27	20.5	80	M6	4.5	3.5	29.5	15	70	870	435
SCE30	80	-	20	26.5	-	M5	10	3.3	29.5	-	35	870	435

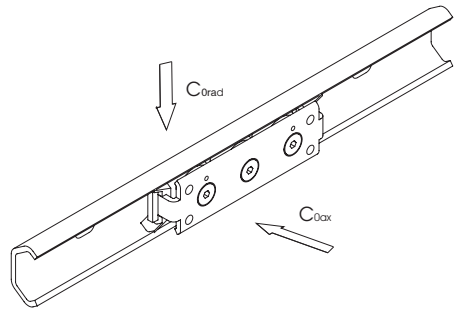
Compact Body Carriages SSE45



Solid Body Carriages SCE45



*The Carriages uses stainless steel roller

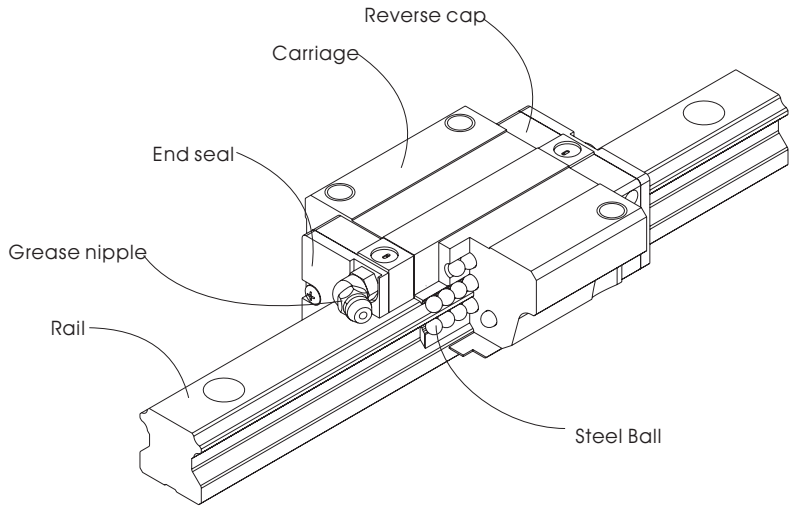


Carriage Type	A	B	C	D	E	F	G	S	T	Z	X	C_{0rad}	C_{0ax}
SSE45	150	160	40	31	135	M6	4	5	46.4	23	120	1740	935
SCE45	120	-	25	38	-	M8	12	5.7	46.4	-	55	1740	935

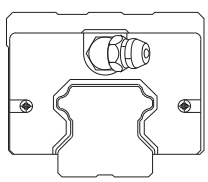
RH Steel Ball Type Linear Guide

Structure

RH linear guide is composed of a rail and carriage(s). Steel balls circulate inside the carriage through the reverse caps at both ends of the carriage. By the designing of four–row raceways, 45degrees contact angles, it has not only equal heavy load capacity in radial and axial directions with high rigidity, but also self–aligning capability to realize high accuracy and smooth operation.

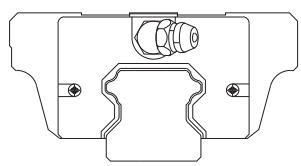


Carriage Types



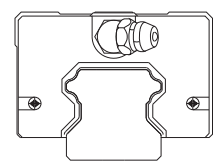
CHH

CHH Square (Higher) type carriage. This assembly height is higher than another two types. Only top mounting available.



CHF

CHF Flange type carriage. This type carriage is suitable for heavy moment load application because of lower assembly height and wider mounting surface. Top mounting and bottom amounting are available.



CHL

CHL Square (Lower) type carriage. This assembly height is same as flange type. Only top mounting available.

Preload

SAIBO offers three classes of standard preload for various applications and conditions.

Class	Code	Preload	Condition	Examples of Application
Light Preload	Z0	0—0.02C	Certain load direction. low impact. low precision required	Transportation devices, auto-packing machines. X-Y axis for general industrial machines. welding machines.
Medium Preload	ZA	0.05C—0.07C	High precision required	Machining centers. Z axis for general industrial. machines. EDM. NC lathes, Precision X-Y tables.
Heavy Preload	ZB	0.10C—0.12C	High rigidity required. with vibration and impact	Machining centers, grinding machines. NC lathes, horizontal and vertical milling machines.

Class	Interchangeable Guideway	Non-Interchangeable Guideway
Preload classes	Z0, ZA	Z0, ZA, ZB

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

Model Rule

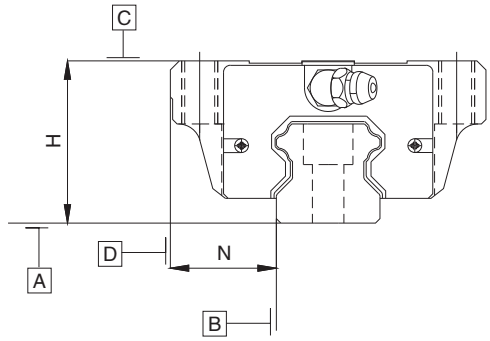
CH H 20 C A E ZA P + ZZ/E2 — **Carriage**

- CH Series
- Block Type
  H: Square Type
  F : Flange Type
  L : Flange Type
- Model size
  15,20,25,30,35,45,55,65
- Load Type
  C: Heavy Load
  H: Super Heavy Load
- Block Mounting Type
  A: Mounting From Top
  B: Bottom
  C: Top or Bottom
- E: Special Block
  None: Standard Block
- Preload Code:Z0,ZA,ZB
- Precision Code: C,H,P
- Dust Protection
- E2: Sekf-Luvricant
  SE: Metallic End Cap

RH R 20 R 1200 E P + RC — **Rail**

- RH Series
- Interchangeable Rail
- Model size
  15,20,25,30,35,45,55,65
- Rail Mounting Type
  R: Mounting From Top
  T: Bottom
- Rail Length(mm)
- E: Special Rail
  None: Standard Rail
- Precision Code: C,H,P
- RC: Reinforced Cap

Accuracy



Accuracy Classes	CH–15,20			CH–25,30,35		
	Normal (C)	High (H)	Precision (P)	Normal (C)	High (H)	Precision (P)
Dimensional tolerance of height H	± 0.1	± 0.03	± 0.015	± 0.1	± 0.04	± 0.02
Dimensional tolerance of width N	± 0.1	± 0.03	± 0.015	± 0.1	± 0.04	± 0.02
Variation of height H	0.02	0.01	0.006	0.02	0.015	0.007
Variation of height N	0.02	0.01	0.006	0.03	0.015	0.007

Accuracy Classes	CH–45,55			CH–65		
	Normal (C)	High (H)	Precision (P)	Normal (C)	High (H)	Precision (P)
Dimensional tolerance of height H	± 0.1	± 0.05	± 0.025	± 0.1	± 0.07	± 0.035
Dimensional tolerance of width N	± 0.1	± 0.05	± 0.025	± 0.1	± 0.07	± 0.035
Variation of height H	0.03	0.015	0.007	0.03	0.02	0.01
Variation of height N	0.03	0.02	0.01	0.03	0.025	0.015

Running Parallelism

Running parallelism of block surface C to surface A			Running parallelism of block surface D to surface B		
Rail Length (mm)	Accuracy (μ m)				
	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
900–1100	24	16	9	6	3
1100–1500	26	18	11	7	4
1500–1900	28	20	13	8	4
1900–2500	31	22	15	10	5
2500–3100	33	25	18	11	6
3100–3600	36	27	20	14	7
3600–4000	37	28	21	15	7

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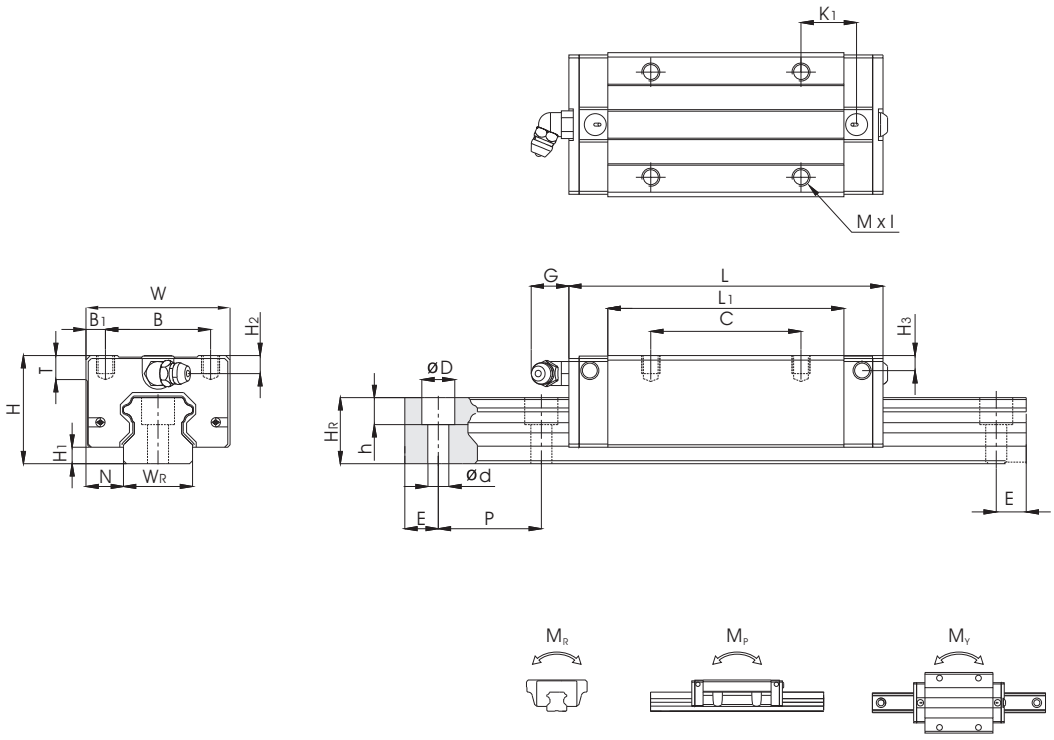
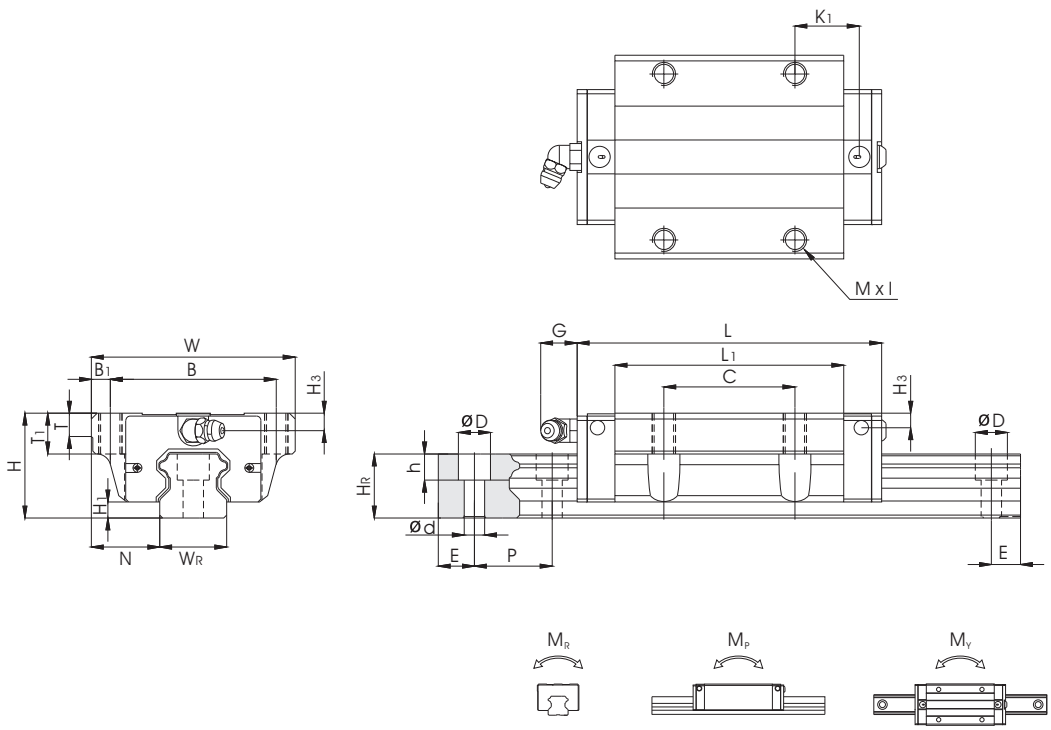
CHH-CA/CHH-HA



Model No.	Dimensions of Assembly (mm)			Dimensions of Block (mm)												Dimensions of Rail (mm)							Mounting Bolt for Rail	Basic Dynamic Load Rating	Basic Static Load Rating	Static Rated Moment			Weight	
	H	H_1	N	W	B	B_1	C	L_1	L	K_1	G	Mxl	T	H_2	H_3	W_R	H_R	D	h	d	P	E	(mm)	C(kN)	C0(kN)	M_R kN-m	M_P kN-m	M_Y kN-m	Block kg	Rail kg/m
CHH 15CA	28	4.3	9.5	34	26	4	26	39.5	61.4	10	5.3	M4x5	6	7.95	7.7	15	15	7.5	5.3	4.5	60	20	M4x16	11.38	16.97	0.12	0.10	0.10	0.18	1.45
CHH 20CA	30	4.6	12	44	32	6	36	50.5	76.7	12.25	12	M5x6	8	6	6	20	17.5	9.5	8.5	6	60	20	M5x16	17.75	27.76	0.27	0.20	0.20	0.30	2.21
CHH 20HA							50	65.2	91.4	12.6														21.18	35.9	0.35	0.35	0.35	0.39	
CHH 25CA	40	5.5	12.5	48	35	6.5	35	58	84	15.7	12	M6x8	8	10	9	23	22	11	9	7	60	20	M6x20	26.48	36.49	0.42	0.33	0.33	0.51	3.21
CHH 25HA							50	78.6	104.6	18.5														32.75	49.44	0.56	0.57	0.57	0.69	
CHH 30CA	45	6	16	60	40	10	40	70	98.4	20.25	12	M8x10	8.5	9.5	13.8	28	26	14	12	9	80	20	M8x25	38.74	52.19	0.66	0.53	0.53	0.88	4.47
CHH 30HA							60	93	121.4	21.75														47.27	69.16	0.88	0.92	0.92	1.16	
CHH 35CA	55	7.5	18	70	50	10	50	80	112.4	20.6	12	M8x12	10.2	16	19.6	34	29	14	12	9	80	20	M8x25	49.52	69.16	1.16	0.81	0.81	1.45	6.30
CHH 35HA							72	105.8	138.2	22.5														60.21	91.63	1.54	1.40	1.40	1.92	
CHH 45CA	70	9.5	20.5	86	60	13	60	97	137.4	23	12.9	M10x17	16	18.5	30.5	45	38	20	17	14	105	22.5	M12x35	77.57	102.71	1.98	1.55	1.55	2.73	10.41
CHH 45HA							80	128.8	169.2	28.9														94.54	136.46	2.63	2.68	2.68	3.61	
CHH 55CA	80	13	23.5	100	75	12.5	75	117.7	166.7	27.35	12.9	M12x18	17.5	22	29	53	44	23	20	16	120	30	M14x45	114.44	148.33	3.69	2.64	2.64	4.17	15.08
CHH 55HA							95	155.8	204.8	36.4														139.35	196.2	4.88	4.57	4.57	5.49	
CHH 65CA	90	15	31.5	126	76	25	70	144.2	200.2	43.1	12.9	M16x20	25	15	15	63	53	26	22	18	150	35	M16x50	163.63	215.33	6.65	4.27	4.27	7.00	21.18
CHH 65HA							120	203.6	259.6	47.8														208.36	303.13	9.38	7.38	7.38	9.82	

CHF–CA/CHF–HA



Model No.	Dimensions of Assembly (mm)			Dimensions of Block (mm)												Dimensions of Rail (mm)							Mounting Bolt for Rail	Basic Dynamic Load Rating	Basic Static Load Rating	Static Rated Moment			Weight	
	H	H_1	N	W	B	B_1	C	L_1	L	K_1	G	Mxl	T	H_2	H_3	W_R	H_R	D	h	d	P	E	(mm)	C(kN)	C0(kN)	M_R kN-m	M_P kN-m	M_Y kN-m	Block kg	Rail kg/m
CHF 15CC	24	4.3	16	47	38	4.5	30	39.5	61.4	8	5.3	M5	6	8.9	3.95	15	15	7.5	5.3	4.5	60	20	M4x16	11.38	16.97	0.12	0.10	0.10	0.17	1.45
CHF 20CC	30	4.6	21.5	63	53	5	40	50.5	76.7	10.25	12	M6	8	10	6	20	17.5	9.5	8.5	6	60	20	M5x16	17.75	27.76	0.27	0.20	0.20	0.40	2.21
CHF 20HC								65.2	91.4	17.6														21.18	35.9	0.35	0.35	0.35	0.52	
CHF 25CC	36	5.5	23.5	70	57	6.5	45	58	84	10.7	12	M8	8	14	9	23	22	11	9	7	60	20	M6x20	26.48	36.49	0.42	0.33	0.33	0.59	3.21
CHF 25HC								78.6	104.6	21														32.75	49.44	0.56	0.57	0.57	0.80	
CHF 30CC	42	6	31	90	72	9	52	70	98.4	14.25	12	M10	8.5	16	13.8	28	26	14	12	9	80	20	M8x25	38.74	52.19	0.66	0.53	0.53	1.09	4.47
CHF 30HC								93	121.4	25.75														47.27	69.16	0.88	0.92	0.92	1.44	
CHF 35CC	48	7.5	33	100	82	9	62	80	112.4	14.6	12	M10	10.1	18	19.6	34	29	14	12	9	80	20	M8x25	49.52	69.16	1.16	0.81	0.81	1.56	6.30
CHF 35HC								105.8	138.2	27.5														60.21	91.63	1.54	1.40	1.40	2.06	
CHF 45CC	60	9.5	37.5	120	100	10	80	97	137.4	13	12.9	M12	15.1	22	30.5	45	38	20	17	14	105	22.5	M12x35	77.57	102.71	1.98	1.55	1.55	2.79	10.41
CHF 45HC								128.8	169.2	28.9														94.54	136.46	2.63	2.68	2.68	3.69	
CHF 55CC	70	13	43.5	140	116	12	95	117.7	166.7	17.35	12.9	M14	17.5	26.5	29	53	44	23	20	16	120	30	M14x45	114.44	148.33	3.69	2.64	2.64	4.52	15.08
CHF 55HC								155.8	204.8	36.4														139.35	196.2	4.88	4.57	4.57	5.96	
CHF 65CC	90	15	53.5	170	142	14	110	144.2	200.2	23.1	12.9	M16	25	37.5	15	63	53	26	22	18	150	35	M16x50	163.63	215.33	6.65	4.27	4.27	9.17	21.18
CHF 65HC								203.6	259.6	52.8														208.36	303.13	9.38	7.38	7.38	12.89	

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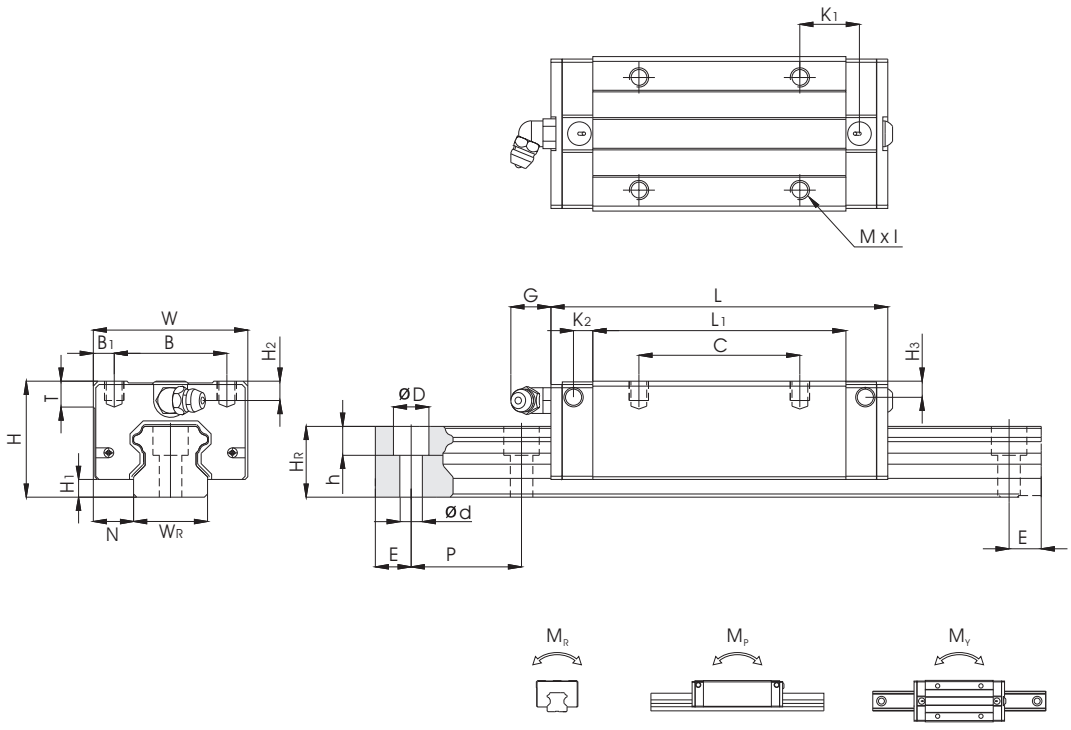
CHLCA/CHL–HA

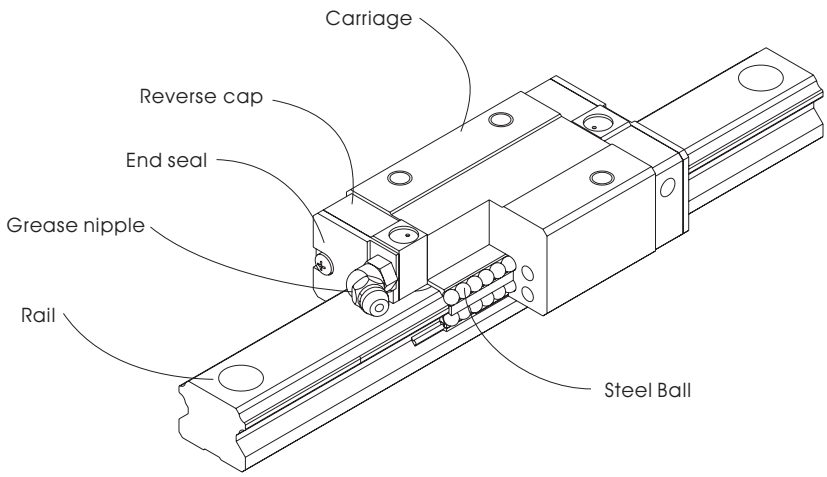


Model No.	Dimensions of Assembly (mm)			Dimensions of Block (mm)													Dimensions of Rail (mm)							Mounting Bolt for Rail	Basic Dynamic Load Rating	Basic Static Load Rating	Static Rated Moment			Weight	
	H	H_1	N	W	B	B_1	C	L_1	L	K_1	K_2	G	Mxl	T	H_2	H_3	W_R	H_R	D	h	d	P	E	(mm)	C(kN)	C_0(kN)	M_R kN-m	M_P kN-m	M_Y kN-m	Block kg	Rail kg/m
CHL 15CA	24	4.3	9.5	34	26	4	26	39.5	61.4	10	4.85	5.3	M4x4	6	3.95	3.7	15	15	7.5	5.3	4.5	60	20	M4x16	11.38	16.97	0.12	0.10	0.10	0.14	1.45
CHL 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	26.48	36.49	0.42	0.33	0.33	0.42	3.21
CHL 25HA							50	78.6	104.6	18.5															32.75	49.44	0.56	0.57	0.57	0.57	
CHL 30CA	42	6	16	60	40	10	40	70	98.4	20.25	6	12	M8x10	8.5	6.5	10.8	28	26	14	12	9	80	20	M8x25	38.74	52.19	0.66	0.53	0.53	0.78	4.47
CHL 30HA							60	93	121.4	21.75															47.27	69.16	0.88	0.92	0.92	1.03	
CHL 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	49.52	69.16	1.16	0.81	0.81	1.14	6.30
CHL 35HA							72	105.8	138.2	22.5															60.21	91.63	1.54	1.40	1.40	1.52	
CHL 45CA	60	9.5	20.5	86	60	13	60	97	137.4	23	10	12.9	M10x17	16	8.5	20.5	45	38	20	17	14	105	22.5	M12x35	77.57	102.71	1.98	1.55	1.55	2.08	10.41
CHL 45HA							80	128.8	169.2	28.9															94.54	136.46	2.63	2.68	2.68	2.75	
CHL 55CA	70	13	23.5	100	75	12.5	75	117.7	166.7	27.35	11	12.9	M12x18	17.5	12	19	53	44	23	20	16	120	30	M14x45	114.44	148.33	3.69	2.64	2.64	3.25	15.08
CHL 55HA							95	155.8	204.8	36.4															139.35	196.2	4.88	4.57	4.57	4.27	

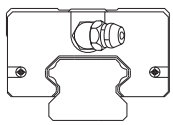
CL Steel Ball Type Linear Guide

Structure

CL linear guide structure is same as RH type. Four–row raceways, 45degrees contact angles designing. It has not only equal heavy load capacity in radial and axial directions with high rigidity, but also self–aligning capability to realize high accuracy and smooth operation. EG assembly height is lower than HG type. Heavy load and medium load carriages are designed to meet different applications.

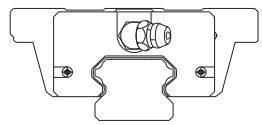


Carriage Types



CLS

CLS Square type carriage. Assembly height is lower than HGH, fit for compact space applications.



CLF

CLF Flange type carriage. Assembly height is same as EGH. This type carriage is suitable for heavy moment load application because of lower assembly height and wider mounting surface. Top mounting and bottom amounting are available.

Preload

SAIBO offers three classes of standard preload for various applications and conditions.

Class	Code	Preload	Condition
Very Light Preload	Z0	0-0.02C	Certain load direction. low impact.low precision required
Light Preload	ZA	0.03C-0.05C	Low load and High precision required
Medium Preload	ZB	0.06C-0.08C	High rigidity required. with vibration and impact

Class	Interchangeable Guideway	Non-Interchangeable Guideway
Preload classes	Z0, ZA	Z0, ZA, ZB

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

Model Rule

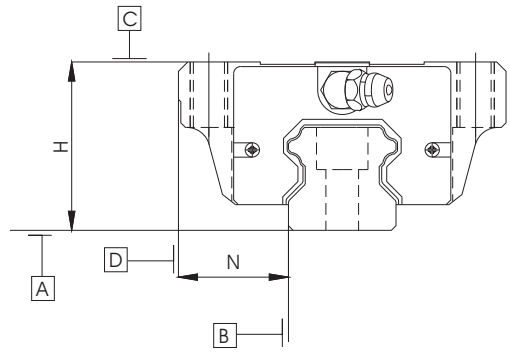
CL F 20 C A E ZA P + DD/E2 — **Carriage**

- CL Series
- Block Type
  S: Square Type
  F: Flange Type
- Model size
  15,20,25,30
- Load Type
  C: Heavy Load
  S: Medium Load
- Block Mounting Type
  A: Mounting From Top
  B: Bottom
- E: Special Block
  None: Standard Block
- Preload Code:Z0,ZA,ZB
- Precision Code: C,H,P
- Dust Protection
- E2: Sekf-Luvricant
  SE: Metallic End Cap

RL R 20 R 1600 E P + RC — **Rail**

- RL Series
- Interchangeable Rail
- Model size
  15,20,25,30
- Rail Mounting Type
  R/U: Mounting From Top
  T: Bottom
- Rail Length(mm)
- E: Special Rail
  None: Standard Rail
- Precision Code: C,H,P
- RC: Reinforced Cap

Accuracy



Accuracy Classes	RL–15,20			RL–25,30		
	Normal (C)	High (H)	Precision (P)	Normal (C)	High (H)	Precision (P)
Dimensional tolerance of height H	± 0.1	± 0.03	± 0.015	± 0.1	± 0.04	± 0.02
Dimensional tolerance of width N	± 0.1	± 0.03	± 0.015	± 0.1	± 0.04	± 0.02
Variation of height H	0.02	0.01	0.006	0.02	0.015	0.007
Variation of height N	0.02	0.01	0.006	0.03	0.015	0.007

Running Parallelism

Running parallelism of block surface C to surface A			Running parallelism of block surface D to surface B		
Rail Length (mm)	Accuracy (μm)				
	C	H	P	SP	UP
—100	12	7	3	2	2
100—200	14	9	4	2	2
200—300	15	10	5	3	2
300—500	17	12	6	3	2
500—700	20	13	7	4	2
700—900	22	15	8	5	3
900—1100	24	16	9	6	3
1100—1500	26	18	11	7	4
1500—1900	28	20	13	8	4
1900—2500	31	22	15	10	5
2500—3100	33	25	18	11	6
3100—3600	36	27	20	14	7
3600—4000	37	28	21	15	7

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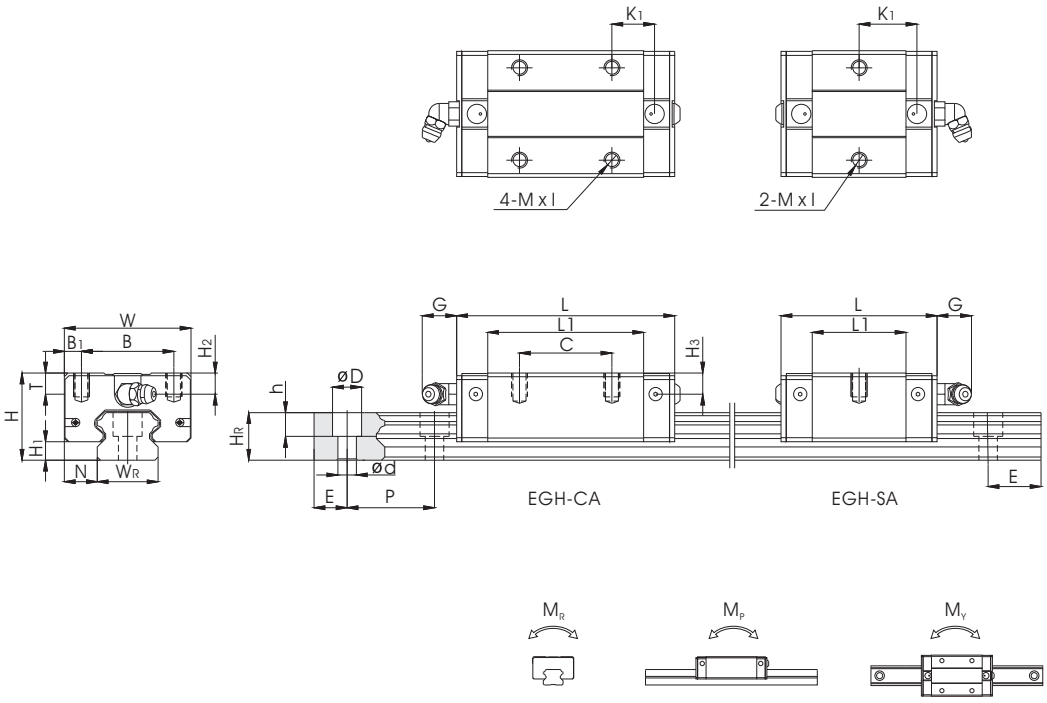
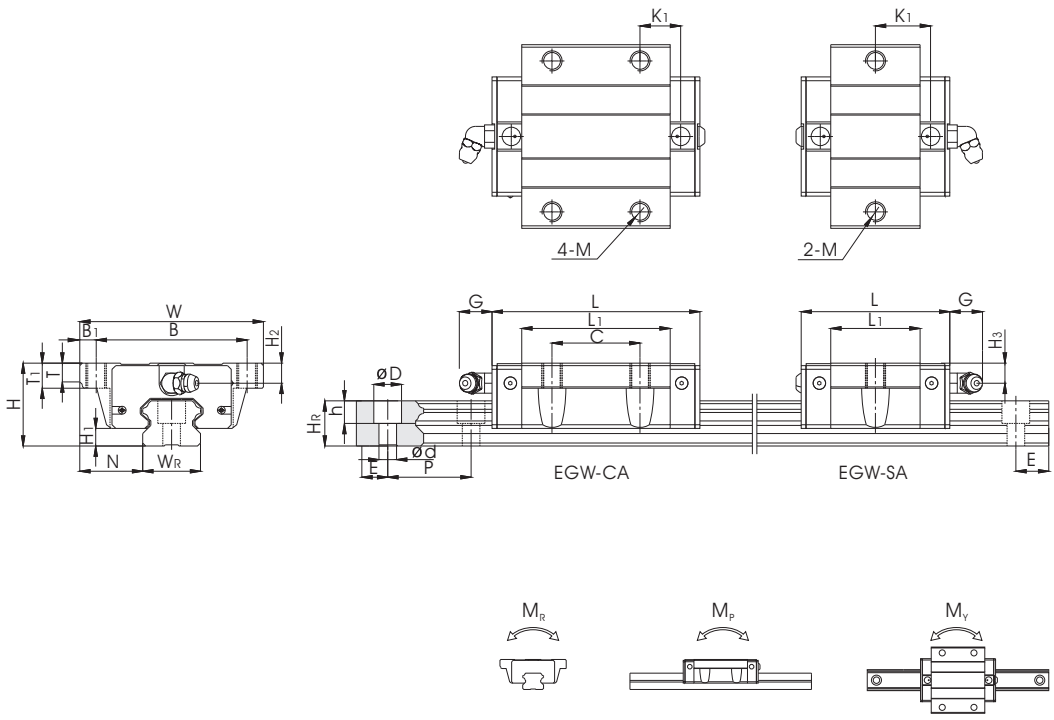
CLS-SA/CLS-CA



Model No.	Dimensions of Assembly (mm)			Dimensions of Block (mm)												Dimensions of Rail (mm)							Mounting Bolt for Rail	Basic Dynamic Load Rating	Basic Static Load Rating	Static Rated Moment			Weight	
	H	H_1	N	W	B	B_1	C	L_1	L	K_1	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	Block kg	Rail kg/m
CLS15SA	24	4.5	9.5	34	26	4	-	23.1	41.1	14.8	5.7	M4x6	6	5.5	6	15	12.5	7.5	5.3	4.5	60	20	M4x16	5.35	9.40	0.08	0.04	0.04	0.09	1.25
CLS15CA							26	39.8	57.8	10.15														7.83	16.19	0.13	0.10	0.10	0.15	
CLS20SA	28	6	11	42	32	5	-	29	51.2	18.75	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
CLS20CA							32	48.1	70.3	12.3														10.31	21.13	0.22	0.16	0.16	0.24	
CLS25SA	33	7	12.5	48	35	6.5	-	35.5	59.7	21.9	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
CLS25CA							35	59	83.2	16.15														16.27	32.40	0.38	0.32	0.32	0.41	
CLS30SA	42	10	16	60	40	10	-	41.5	71.9	26.75	12	M8x12	9	8	9	28	23	14	12	9	80	20	M8x25	16.42	28.10	0.40	0.21	0.21	0.45	4.35
CLS30CA							40	70	100.4	21.05														23.70	47.46	0.68	0.55	0.55	0.76	

CLF-SA/CLF-CA

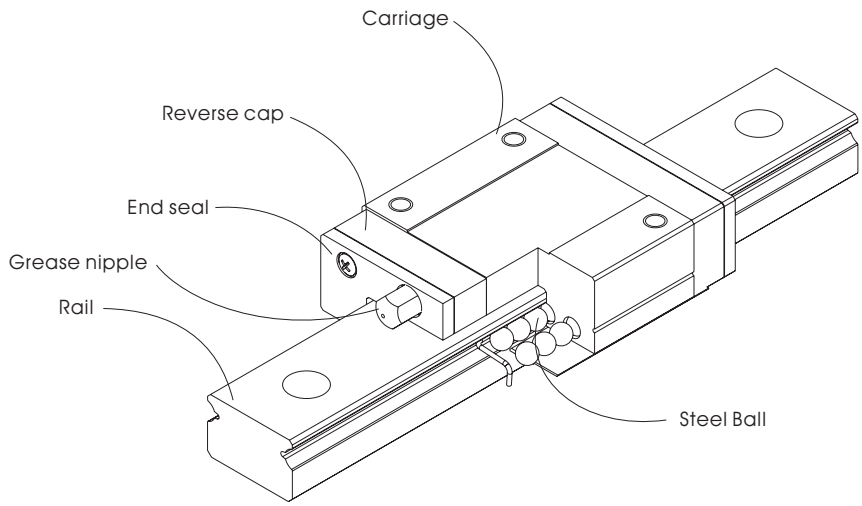


Model No.	Dimensions of Assembly (mm)			Dimensions of Block (mm)													Dimensions of Rail (mm)							Mounting Bolt for Rail	Basic Dynamic Load Rating	Basic Static Load Rating	Static Rated Moment			Weight	
	H	H_1	N	W	B	B_1	C	L_1	L	K_1	G	M	T	T_1	H_2	H_3	W_R	H_R	D	h	d	P	E	(mm)	C(kN)	C_0(kN)	M_R kN-m	M_P kN-m	M_Y kN-m	Block kg	Rail kg/m
CLF15SA	24	4.5	18.5	52	41	5.5	-	23.1	41.1	14.8	5.7	M5	5	7	5.5	6	15	12.5	7.5	5.3	4.5	60	20	M4x16	5.35	9.40	0.08	0.04	0.04	0.09	1.25
CLF15CA							26	39.8	57.8	10.15															7.83	16.19	0.13	0.10	0.10	0.21	
CLF20SA	28	6	19.5	59	49	5	-	29	51.2	18.75	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
CLF20CA							32	48.1	70.3	12.3															10.31	21.13	0.22	0.16	0.16	0.32	
CLF25SA	33	7	25	73	60	6.5	-	35.5	59.7	21.9	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
CLF25CA							35	59	83.2	16.15															16.27	32.40	0.38	0.32	0.32	0.59	
CLF30SA	42	10	31	90	72	9	-	41.5	71.9	26.75	12	M10	7	10	8	9	28	23	14	12	9	80	20	M8x25	16.42	28.10	0.40	0.21	0.21	0.62	4.35
CLF30CA							40	70	100.4	21.05															23.70	47.46	0.68	0.55	0.55	1.04	

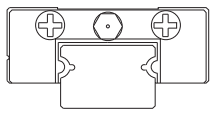
MR Steel Ball Type Linear Guide

Structure

MR miniature linear guide is designed with four–points contact structure. It not only has heavy load capacity in radial and axial directions, but also realizes with high rigidity, high accuracy and smooth operation.

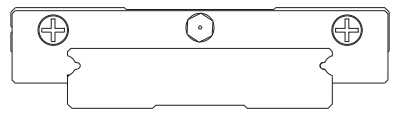


Category



MCS

MCS type rail is standard and narrow.



MCW

MCW type rail is wide. This structure improves carriages load and moment load capacity.

Preload

SAIBO offers three classes of standard preload for various applications and conditions.

Class	Code	Preload	Accuracy
Light Clearance	ZF	Clearance 4-4–10 μ m	C
Very Light Preload	Z0	0	C-P
Light Preload	Z1	0.02C	C-P

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

Model Rule

Carriage

MCS 12 C E Z1 P M + U/-O

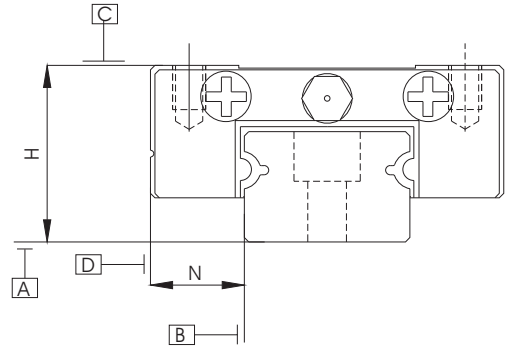
- MCS/MCW Series
- Model size 5,7,9,12,15
- Block Type C: Standard H: Long
- E: Special Block None: Standard Block
- Precision Code: C,H,P
- Preload Code:ZF,Z0,Z1
- No symbol: Carbon Steel M: Stainless Steel
- Bottom Seal Option
- O: Outer Recirculation Module

Rail

MRS R 12 R1000 E P M + RC

- MRS/MRW Series
- Interchangeable Rail
- Model size 5,7,9,12,15
- Rail Length (mm)
- E: Special Rail None: Standard Rail
- Precision Code: C,H,P
- Material: No symbol (Carbon Steel) M (Stainless Steel) HC (Carbon Steel+Hard Chrome Treatment) NC (Carbon Steel+Chemical Black Chrome Treatment)
- RC: Reinforced Cap (Optional For MGN 1212)

Accuracy



Accuracy Classes	Normal (C)	High (H)	Precision (P)
Dimensional tolerance of height H	± 0.04	± 0.02	± 0.01
Dimensional tolerance of width N	± 0.04	± 0.025	± 0.015
Variation of height H	0.03	0.015	0.007
Variation of height N	0.03	0.02	0.01
Pair Variation of width N(Master Rail)	0.07	0.04	0.02

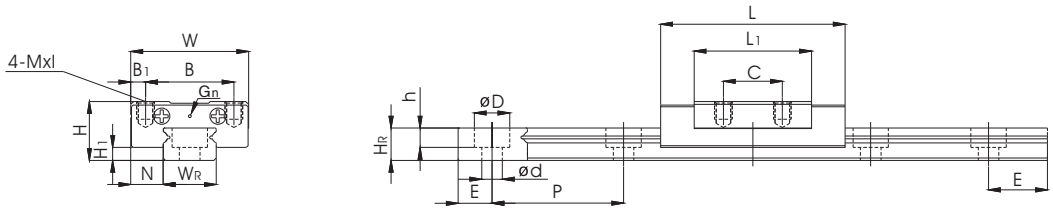
Running Parallelism

Running parallelism of block surface C to surface A				Running parallelism of block surface D to surface B			
Rail Length (mm)	Accuracy (μ m)			Rail Length (mm)	Accuracy (μ m)		
	C	H	P		C	H	P
50	12	6	2	1000—1200	25	18	11
50—80	13	7	3	1200—1300	25	18	11
80—125	14	8	3.5	1300—1400	26	19	12
125—200	15	9	4	1400—1500	27	19	12
200—250	16	10	5	1500—1600	28	20	13
250—315	17	11	5	1600—1700	29	20	14
315—400	18	11	6	1700—1800	30	21	14
400—500	19	12	6	1800—1900	30	21	15
500—630	20	13	7	1900—2000	31	22	15
630—800	22	14	8	2000—	31	22	16
800—1000	23	16	9				

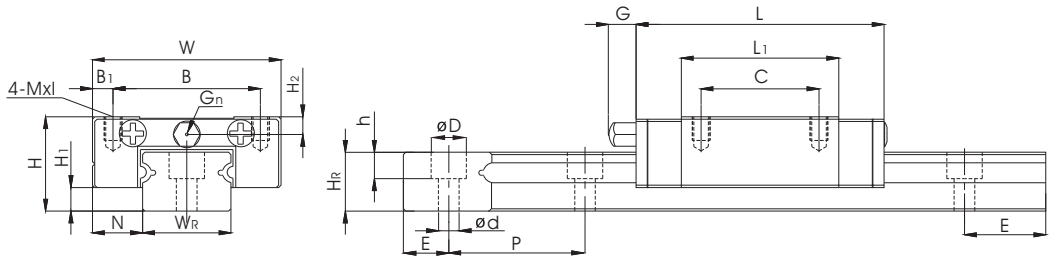
SNIBO
Innovation in Motion

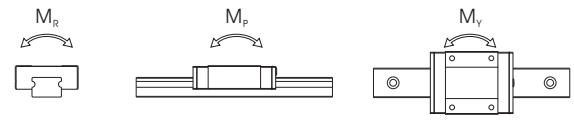
MCS-C/MCS-H

MCS5,7,9,12



MCS15

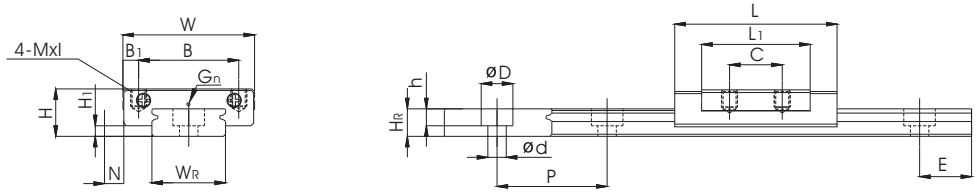




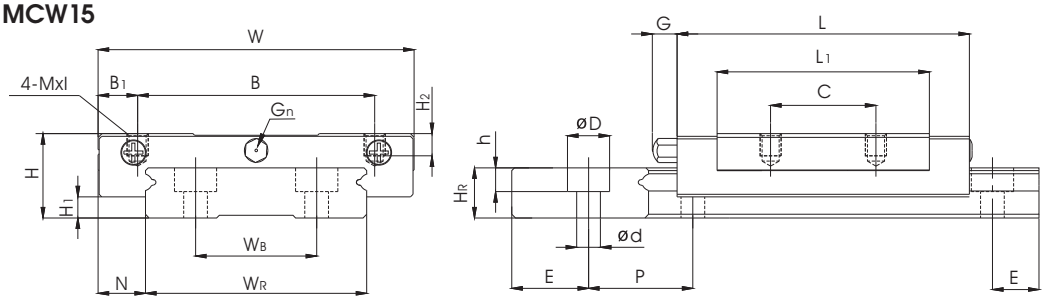
Model No.	Dimensions of Assembly (mm)			Dimensions of Block (mm)										Dimensions of Rail (mm)							Mounting Bolt for Rail	Basic Dynamic Load Rating	Basic Static Load Rating	Static Rated Moment			Weight	
	H	H_1	N	W	B	B_1	C	L_1	L	G	G_n	MxI	H_2	W_R	H_R	D	h	d	P	E	(mm)	C(kN)	C_0(kN)	M_R kN-m	M_P kN-m	M_Y kN-m	Block kg	Rail kg/m
MGN 5C	6	1.5	3.5	12	8	2	-	9.6	16	-	ø0.8	M2x1.5	1	5	3.6	3.6	0.8	2.4	15	5	M2x6	0.54	0.84	2	1.3	1.3	0.008	0.15
MGN 7C	8	1.5	5	17	12	2.5	8	13.5	22.5	-	ø1.2	M2x2.5	1.5	7	4.8	4.2	2.3	2.4	15	5	M2x6	0.98	1.24	4.70	2.84	2.84	0.010	0.22
MGN 7H							13	21.8	30.8													1.37	1.96	7.64	4.80	4.80	0.015	
MGN 9C	10	2	5.5	20	15	2.5	10	18.9	28.9	-	ø1.4	M3x3	1.8	9	6.5	6	3.5	3.5	20	7.5	M3x8	1.86	2.55	11.76	7.35	7.35	0.016	0.38
MGN 9H							16	29.9	39.9													2.55	4.02	19.60	18.62	18.62	0.026	
MGN 12C	13	3	7.5	27	20	3.5	15	21.7	34.7	-	ø2	M3x3.5	2.5	12	8	6	4.5	3.5	25	10	M3x8	2.84	3.92	25.48	13.72	13.72	0.034	0.65
MGN 12H							20	32.4	45.4													3.72	5.88	38.22	36.26	36.26	0.054	
MGN 15C	16	4	8.5	32	25	3.5	20	26.7	42.1	4.5	ø3	M3x4	3	15	10	6	4.5	3.5	40	15	M3x10	4.61	5.59	45.08	21.56	21.56	0.059	1.06
MGN 15H							25	43.4	58.8													6.37	9.11	73.50	57.82	57.82	0.092	

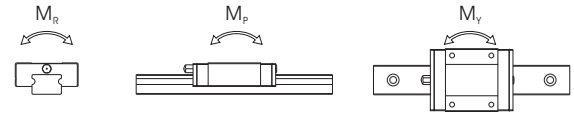
MCW-C/MCW-H

MCW7,9,12



MCW15



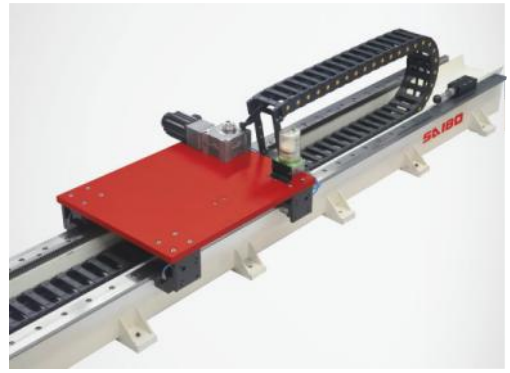


Model No.	Dimensions of Assembly (mm)			Dimensions of Block (mm)										Dimensions of Rail (mm)								Mounting Bolt for Rail	Basic Dynamic Load Rating	Basic Static Load Rating	Static Rated Moment			Weight	
	H	H_1	N	W	B	B_1	C	L_1	L	G	G_n	MxI	H_2	W_R	W_B	H_R	D	h	d	P	E	(mm)	C(kN)	C_0(kN)	M_R kN-m	M_P kN-m	M_Y kN-m	Block kg	Rail kg/m
MGW 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
MGW 7H							19	30.8	41														1.77	3.14	23.45	15.53	15.53	0.029	
MGW 9C	12	2.9	6	30	12	4.5	12	27.5	39.3	–	Ø1.2	M3x3	2.4	18	-	7	6	4.5	3.5	30	10	M3x8	2.75	4.12	40.12	18.96	18.96	0.040	0.91
MGW 9H					24	3.5	24	38.5	50.7														3.43	5.89	54.54	34.00	34.00	0.057	
MGW 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	0.070	1.49
MGW 12H							28	45.6	60.4														5.10	8.24	102.70	57.37	57.37	0.103	
MGW 15C	16	3.4	9	60	45	7.5	20	38	54.8	5.2	Ø3	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
MGW 15H							35	57	73.8														8.93	13.38	13.38	122.60	122.60	0.215	

HV Heavy Load Linear Guide

Construction

HV linear guides are designed for heavy loads. It has the characteristics of high precision, stable performance and low friction. It is mainly used in mobile platform of joint robot, flexible production line, automobile production line and so on.

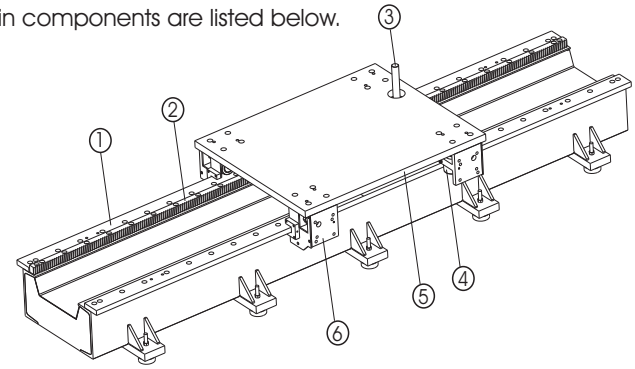


Feature

1. Heavy load capacity.
2. Modular designed components are easy to build different structure.
3. Connectable railway and rack can build to long-distance.
4. Lubrication tube integrated in roller housing.

Standard system

According to load capacity, SAIBO provide 3 sizes standard systems. With these 3 sizes systems' single components, customers are easy to adjust railways' span, carriage sizes and assembly directions. System's main components are listed below.

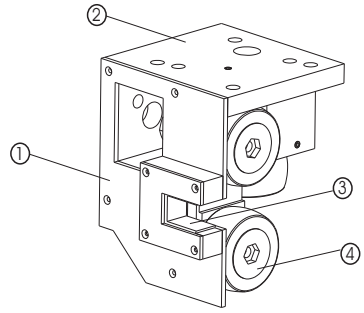


System's main components

① Railway	③ Gear	⑤ Carriage plate
② Rack	④ Roller	⑥ Roller housing

Roller housing

Roller housing is designed according to modular idea. It enables customers to adjust railways' span, carriage's sizes and assemble direction. Roller's inside and railway's wiper lubrication systems are integrated in this roller housing. After installation, customers only fix the automatic lubrication system's nozzle to the lubricate screw holes, the whole system's automatic lubrication will be working.

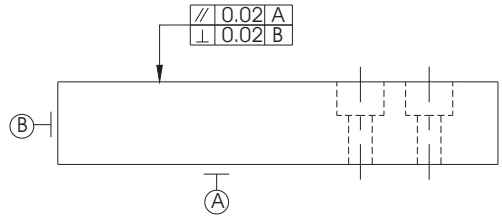


System's main components

① Wiper cover
② Roller housing
③ Felt wiper
④ Roller

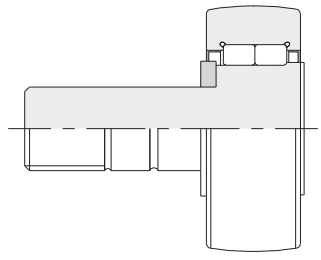
Railway

The railway is made of high carbon bearing steel DIN 100Cr6. Working surface is hardened to over 50HRC. Accuracy is as below picture. Max length is 2000mm, but it can be connected easily to any length.



Roller

Roller is precision double rows roller bearing. It is heavy duty designed and treated. Heavy duty lithium soap grease is filled inside the bearing before delivery. Roller's outer diameter surface is spherical where radius is 500mm.

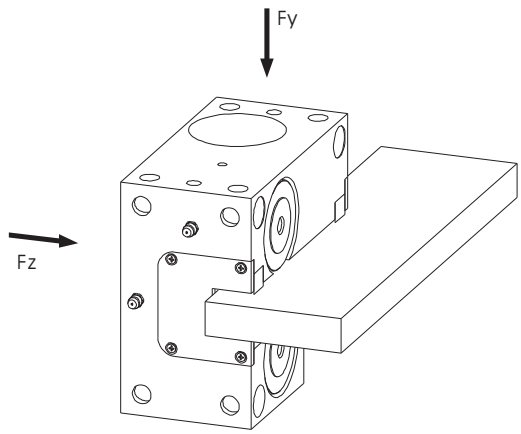


Load capacity

Roller inside is without cages and has the largest possible number of rolling elements. Therefore it has particularly high load capacity. According to designed basic life 1000km, rollers' load capacity is listed as below:

Roller size	Roller load capacity (N)	
	Dynamic	Static
62	41000	59300
72	58000	75300
90	75000	102300

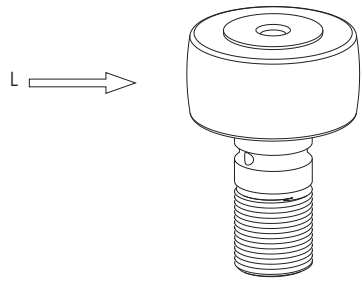
Considering fixed to the roller housing, application's shock, safety factor, each roller housing's load capacity has to be reduced to below values.



Roller size	Roller housing load capacity (N)	
	Fy	Fz
62	13000	13000
72	17000	17000
90	33000	33000

Load/life calculation

After selected system size, verification calculation is necessary. Due to the hardness of the railway and fatigue analysis of railway and roller, the railway's life does not determine the system life. It is determined by biggest loaded roller's life. The system life will be equivalent to the shortest roller's life.



$$LF = \frac{L}{Lmax}$$

(LF should be less than 1.0)

L - Actual load (N)

L max - Load capacity for basic life 1000km (N)

Roller size	L max -Load capacity for basic life 1000km (N)
62	41000
72	58000
90	75000

Then calculate roller's life by using below formula:

$$\textbf{Life(km)} = \frac{1000}{(0.03+0.97LF*f)^3}$$

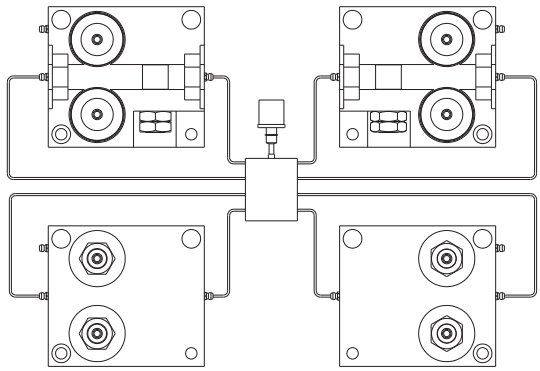
f - Reduction coefficient of the application and environment.

None vibration or shock, Low speed (<1m/s), Low frequency shift direction, clean environment.	1-1.2
Light vibration or shock, medium speed (1-2.5m/s) medium frequency shift direction, some dirtiness	1.2-5
Heavy vibration or shock, high speed (>2.5m/s) high frequency shift direction, heavy dirty	1.5-2.5

Lubrication

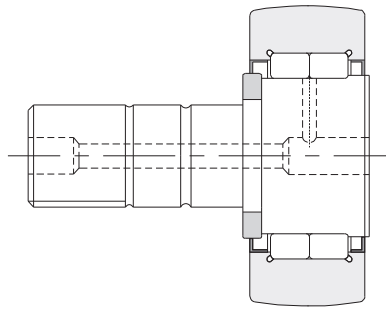
Railway

Lubrication will reduce the friction and increase system's life. Lubrication structure designed in the roller housing where oil soaked felt wipers running on the railways working surface. It should be re-lubricated each 100km running. It is easy to fill oil from the nozzle outside the roller housing. Lubricate should be mineral oil. When the felt wiper wear to a certain extent, it must be replaced. If necessory, nozzle could be connected to the automatic oiling system as below picture.



Roller

Heavy duty lithium soap grease is filled inside the bearing before delivery. We recommend re-lubricate roller after each 1000Km working. In every roller housing, all of three rollers' lubricate holes are connected to roller housing's lubricate tube. So fill grease into the nozzle outside of the roller housing, each bearing will be re-lubricated. According to grease's properties, roller can be used between -30°C and 120°C working conditions.

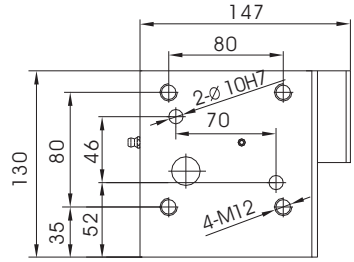


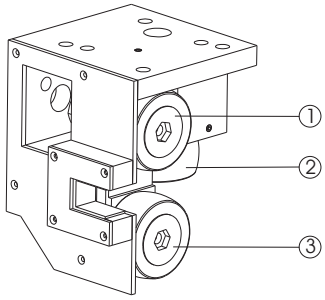
Gear and rack

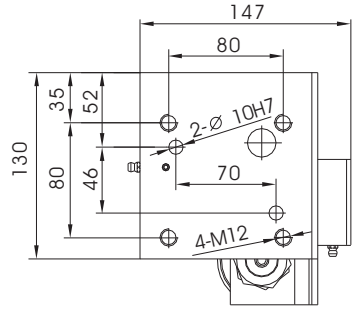
Gear and rack must be lubricated each 100km running. We recommend high viscosity and heavy load mineral oil.

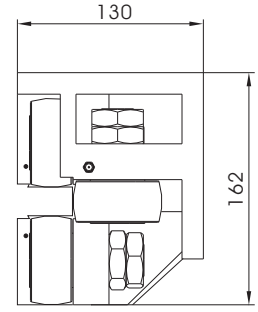
Size 62

Roller housing



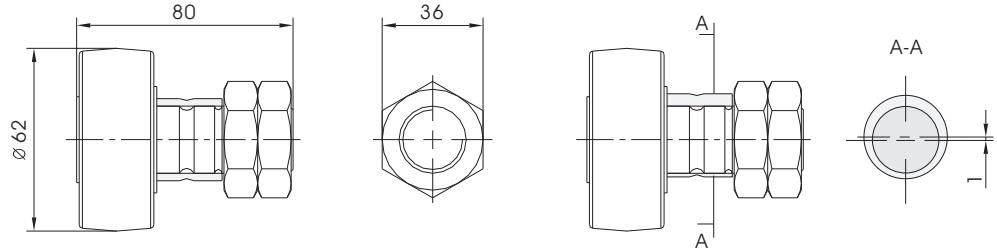




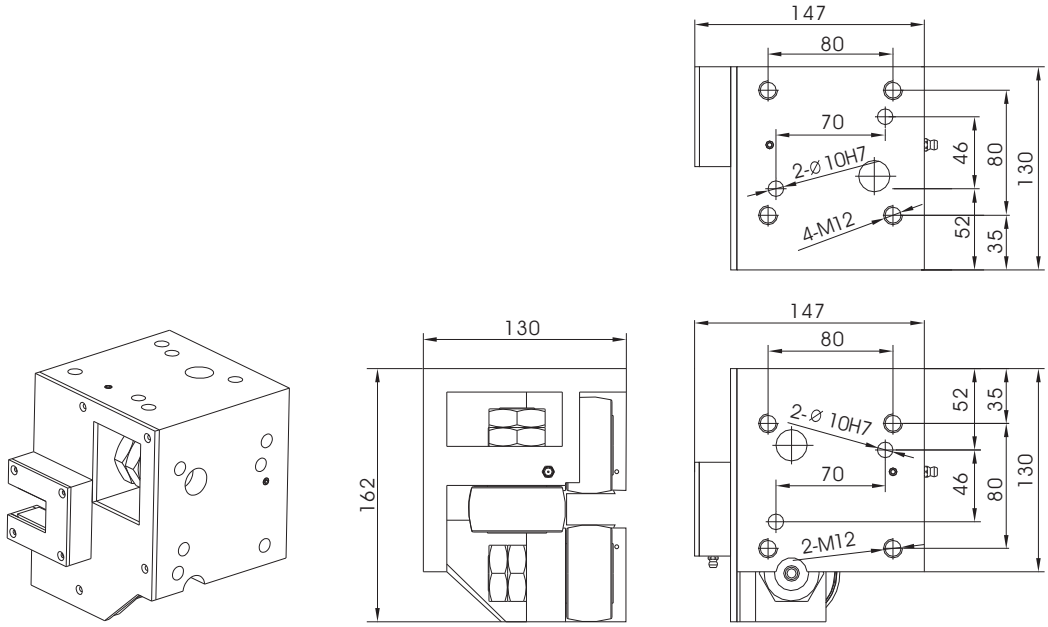


Roller housing type	Concentric/Eccentric roller position			Load capacity (N)	
	Position①	Position②	Position③	Dynamic for concentric roller	Dynamic for eccentric roller
SB-HV62-RH62.1R	concentric	eccentric	eccentric	13000	4000
SB-HV62-RH62.2R	eccentric	concentric	eccentric	13000	4000
SB-HV62-RH62.3R	eccentric	eccentric	concentric	13000	4000

Roller

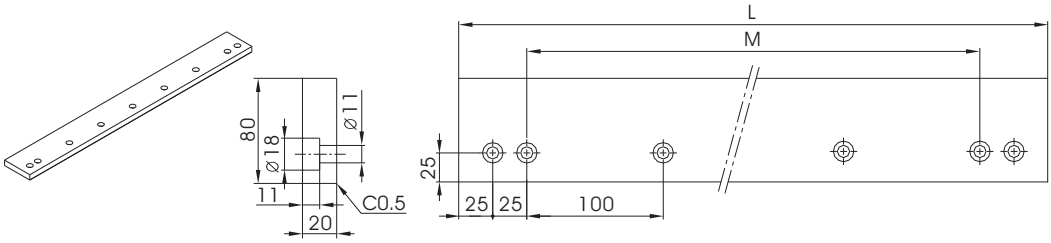


Type	Roller load capacity (N)	
	Dynamic	Static
SB-HV62-RC62	41000	59300
SB-HV62-RE62	41000	59300



Roller housing type	Concentric/Eccentric roller position			Load capacity (N)	
	Position①	Position②	Position③	Dynamic for concentric roller	Dynamic for eccentric roller
SB-HV62-RH62.1L	concentric	eccentric	eccentric	13000	4000
SB-HV62-RH62.2L	eccentric	concentric	eccentric	13000	4000
SB-HV62-RH62.3L	eccentric	eccentric	concentric	13000	4000

Railway

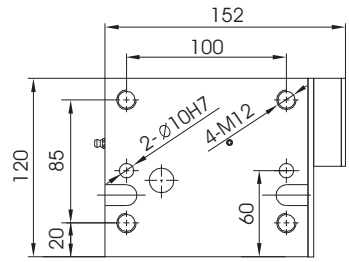


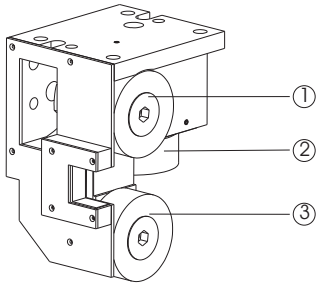
Type	L*	M
SB-HV62-004	2000	1900

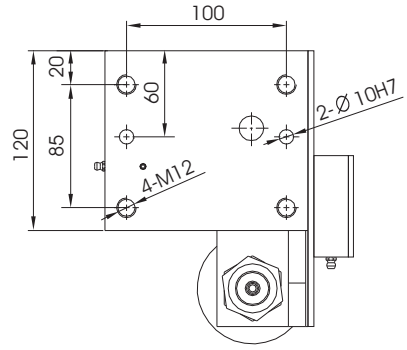
* Railways can be connected.

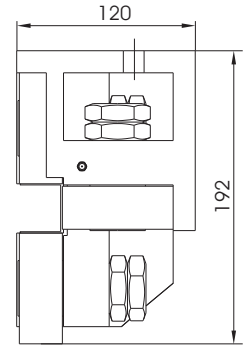
Size 72

Roller housing



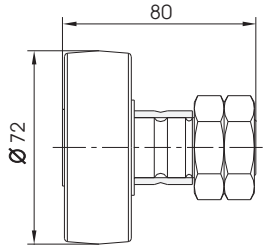


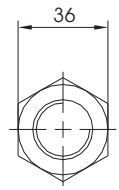


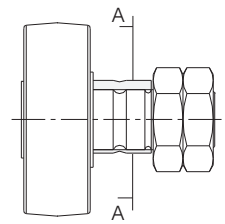


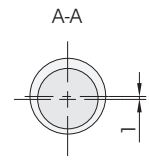
Roller housing type	Concentric/Eccentric roller position			Load capacity (N)	
	Position①	Position②	Position③	Dynamic for concentric roller	Dynamic for eccentric roller
SB-HV72-RH72.1R	concentric	eccentric	eccentric	17000	5000
SB-HV72-RH72.2R	eccentric	concentric	eccentric	17000	5000
SB-HV72-RH72.3R	eccentric	eccentric	concentric	17000	5000

Roller

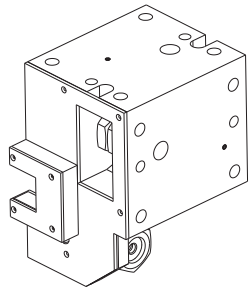


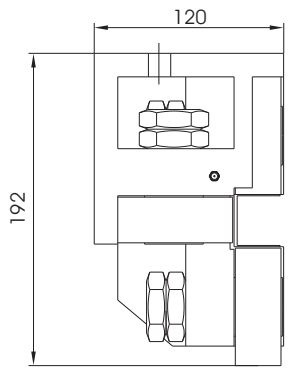


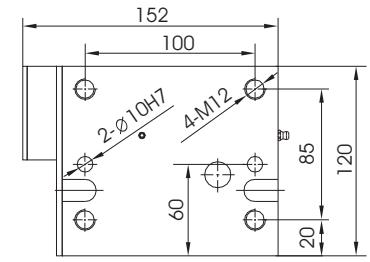


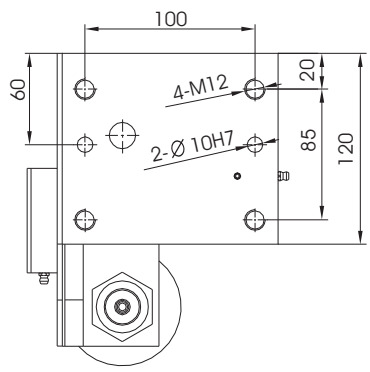


Type	Roller load capacity (N)	
	Dynamic	Static
SB-HV72-RC72	58000	75300
SB-HV72-RE72	58000	75300



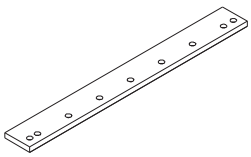


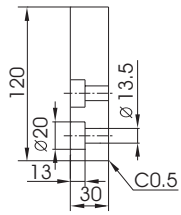


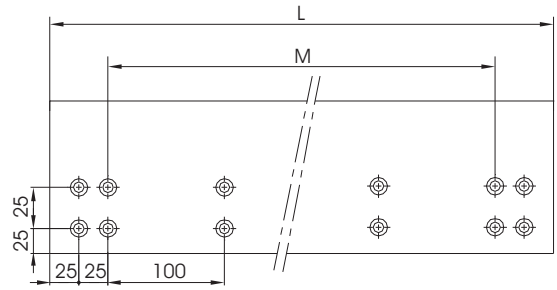


Roller housing type	Concentric/Eccentric roller position			Load capacity (N)	
	Position①	Position②	Position③	Dynamic for concentric roller	Dynamic for eccentric roller
SB-HV72-RH72.1L	concentric	eccentric	eccentric	17000	5000
SB-HV72-RH72.2L	eccentric	concentric	eccentric	17000	5000
SB-HV72-RH72.3L	eccentric	eccentric	concentric	17000	5000

Railway





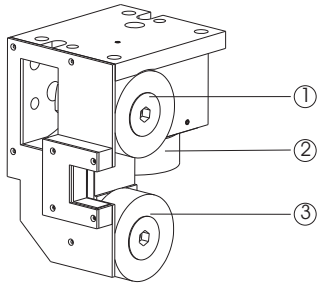


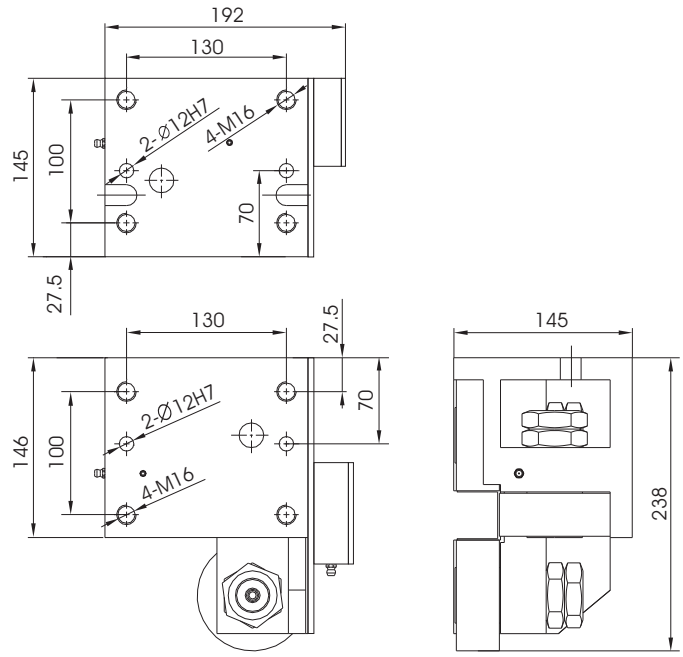
Type	L*	M
SB-HV72-004	2000	1900

* Railways can be connected.

Size 90

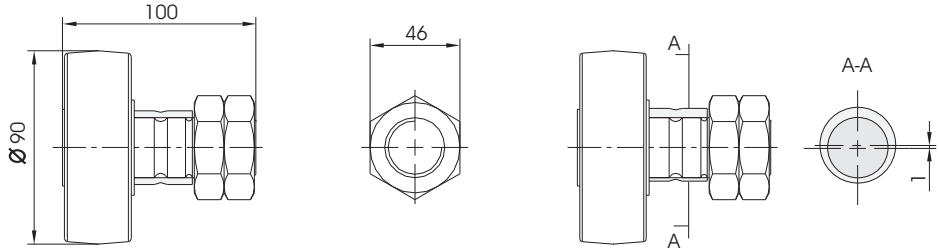
Roller housing



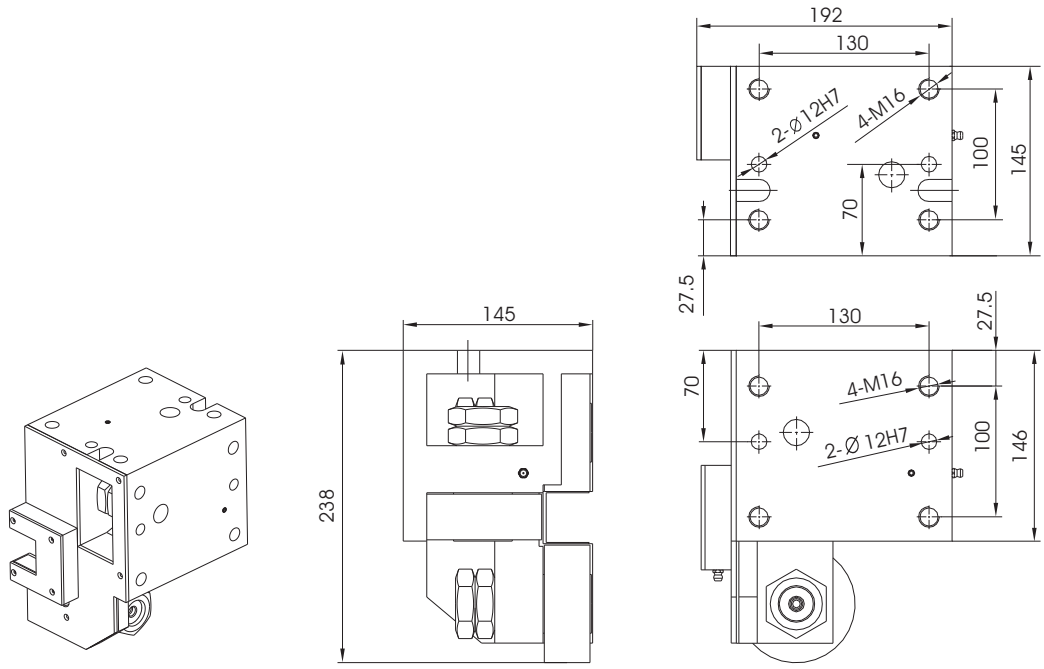


Roller housing type	Concentric/Eccentric roller position			Load capacity (N)	
	Position①	Position②	Position③	Dynamic for concentric roller	Dynamic for eccentric roller
SB-HV90-RH90.1R	concentric	eccentric	eccentric	33000	8000
SB-HV90-RH90.2R	eccentric	concentric	eccentric	33000	8000
SB-HV90-RH90.3R	eccentric	eccentric	concentric	33000	8000

Roller

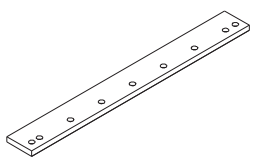


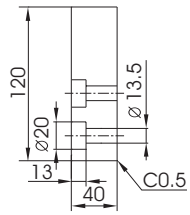
Type	Roller load capacity (N)	
	Dynamic	Static
SB-HV90-RC90	75000	102300
SB-HV90-RE90	75000	102300

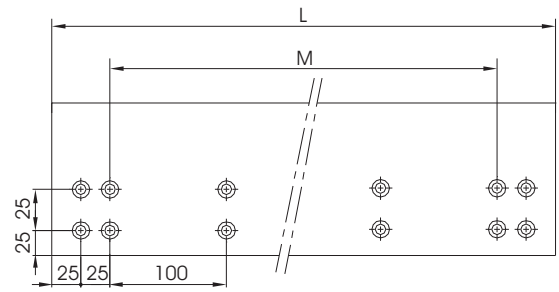


Roller housing type	Concentric/Eccentric roller position			Load capacity (N)	
	Position①	Position②	Position③	Dynamic for concentric roller	Dynamic for eccentric roller
SB-HV90-RH90.1L	concentric	eccentric	eccentric	33000	8000
SB-HV90-RH90.2L	eccentric	concentric	eccentric	33000	8000
SB-HV90-RH90.3L	eccentric	eccentric	concentric	33000	8000

Railway







Type	L*	M
SB-HV90-004	2000	1900

* Railways can be connected.

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