Construction of WILL-D Rolling Linear Guides

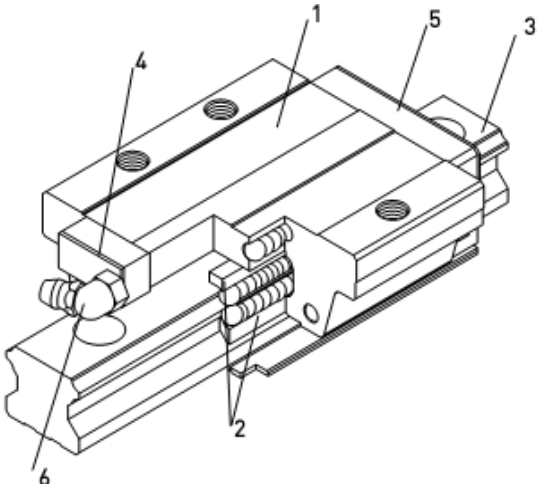
1、Linear guides consist of rails, block, rolling elements(balls or rollers), deflectors, sealing retainers, etc.

2、In order to meet the needs of customers, **WILL** has

For WILL-DA, it adopts four row circular arc contacting design with low differential block, fine self-adjustment and high loading.

For WILL-DE, it adopts the same design as WILL-DA but its contacting profile is double circular arc. So it is of high precision, high rigidity, high loading and fine damping.

For WILL-DZ, it adopts the rollers as its rolling elements, so it is of high contacting rigidity, great damping and highest loading.



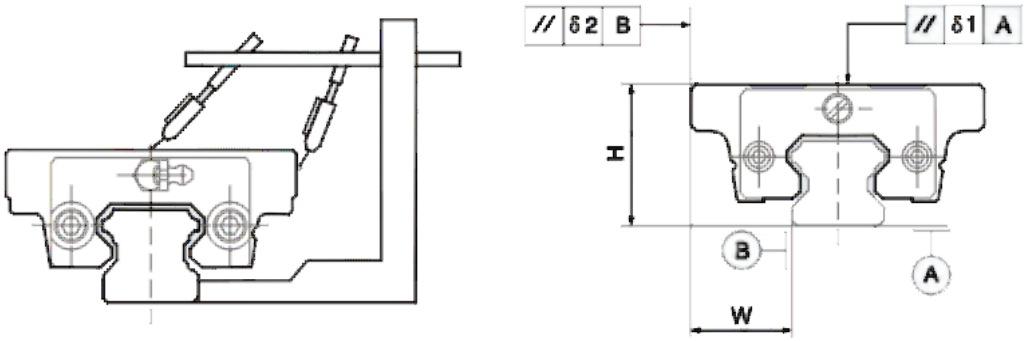
1-Block 2-Retainer 3-Rail 4-Een seal 5-Deflactor 6-Grease nipple

Accuracy of WILL-D Rolling Linear Guides

■ Accuracy of WILL-D rolling linear guides

The accuracy of WILL-D linear guides is divided into both movement parallelism and synthetic accuracy in accordance with the stipulations given in the standard JB/T7175.4-2006

The measuring method is shown in the following Fig.



Accuracy of WILL-D Rolling Linear Guides

■ ---Movement parallelism

It means the parallel error between rail reference surface and block reference surface when the rail is fixed on the reference surface by the bolts and the block is moved along it's total traverse.

Rail Length(mm)	Accuracy grade$\delta_1\delta_2$ (μm)				
	2	3	4	5	6
≤500	4	8	14	20	28
>500～1000	6	10	17	25	34
>1000～1500	8	13	20	30	40
>1500～2000	9	15	22	32	46
>2000～2500	11	17	24	34	54
>2500～3000	12	18	26	36	62
>3000～3500	13	20	28	38	70
>3500～4000	15	22	30	40	80

δ_2 is only suitable for reference rail. For non-reference rail, δ2 can not be examined.

■ ---Synthetic accuracy

Height equality of H means the difference between max. value and min. value of H which are formed by the block mounted on the same plane.

Width equality of W means the difference between max. value and min. value of W which are formed by the block mounted on one rail.

Note: 1. When more than two rails are used on the same plane, the width equality of W is only used for the reference side of the rails. The mark "J" can be seen at the end of serial numbers printed on the reference side's rail.
2. H and W shall be obtained by measuring the block center in the middle position of the rail when the linear guide has been fixed on a platform.

Item	Accuracy grade (μm)				
	2	3	4	5	6
Tolerance of H	±12	±25	±50	±100	±200
Height equality of H	5	7	20	40	60
Tolerance of W	±15	±30	±60	±150	±240
Height equality of W	7	10	25	70	100

W is only suitable for reference rail. For non-reference rail. W can not be examined.

Load calculation for WILL-D Rolling Linear Guides

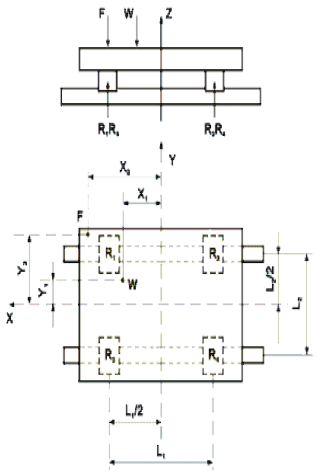
The load that linear motion rolling system can bear is influenced by various factors such as the setting forms(horizontal, vertical, crosswise, etc.), the gravity center and bearing position of the movable elements, the effecting point of drawing for elements on the rail, the staring and stopping inertias, the cutting force, etc.

The load that each block shall bear must be caculated first according to engineering mechanics, then qty. of suitable rails and blocks can be defined according to the space layout.

■ The following Fig. show how to calculate the loads each block bear under a few different conditions.

A

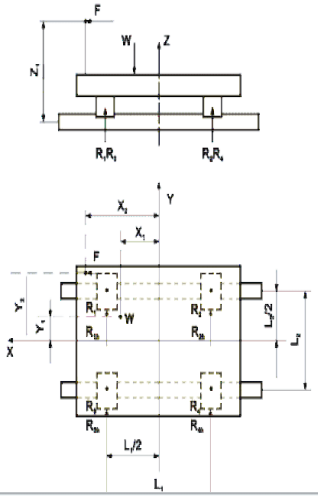
Table with four



W: Table weight
F: Extenal load
R: Slider bearing resistance

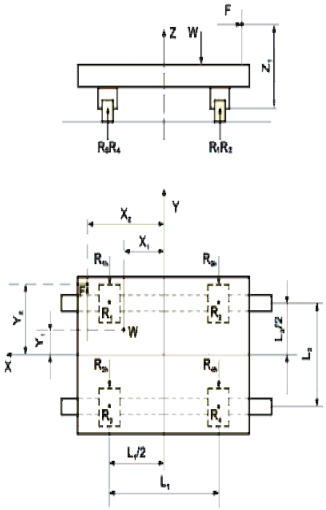
$$R_1=\frac{F+W}{4}+\frac{WY_1+FY_2}{2L_2}+\frac{WX_1+FX_2}{2L_1}$$
$$R_2=\frac{F+W}{4}+\frac{WY_1+FY_2}{2L_2}-\frac{WX_1+FX_2}{2L_1}$$
$$R_3=\frac{F+W}{4}-\frac{WY_1+FY_2}{2L_2}+\frac{WX_1+FX_2}{2L_1}$$
$$R_4=\frac{F+W}{4}-\frac{WY_1+FY_2}{2L_2}-\frac{WX_1+FX_2}{2L_1}$$

B



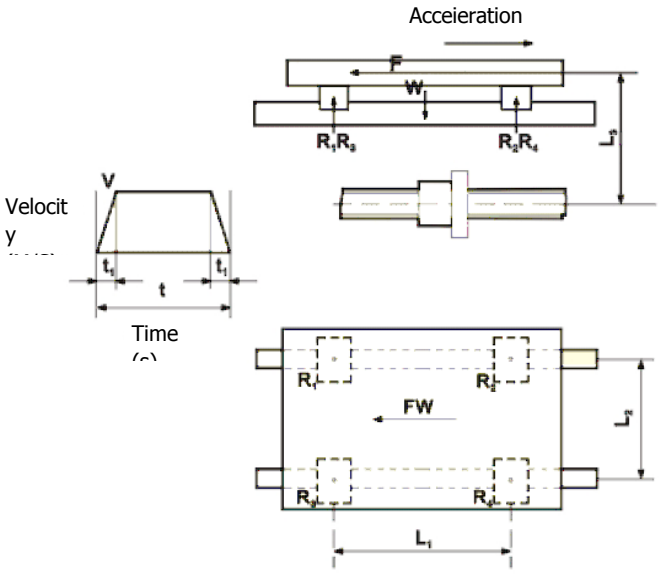
$$R_1=\frac{W}{4}+\frac{WY_1}{2L_2}+\frac{WX_1+FZ_2}{2L_1}$$
$$R_2=\frac{W}{4}+\frac{WY_1}{2L_2}-\frac{WX_1+FZ_2}{2L_1}$$
$$R_3=\frac{W}{4}-\frac{WY_1}{2L_2}+\frac{WX_1+FZ_2}{2L_1}$$
$$R_4=\frac{W}{4}-\frac{WY_1}{2L_2}-\frac{WX_1+FZ_2}{2L_1}$$
$$R_{1b}=\frac{FY_2}{2L_1}$$
$$R_{2b}=-\frac{FY_2}{2L_1}$$
$$R_{3b}=\frac{FY_2}{2L_1}$$
$$R_{4b}=-\frac{FY_2}{2L_1}$$

C



$$R_1=\frac{W}{4}+\frac{WX_1}{2L_1}+\frac{WY_1+FZ_2}{2L_2}$$
$$R_2=\frac{W}{4}-\frac{WX_1}{2L_1}+\frac{WY_1+FZ_2}{2L_2}$$
$$R_3=\frac{W}{4}+\frac{WX_1}{2L_1}-\frac{WY_1+FZ_2}{2L_2}$$
$$R_4=\frac{W}{4}-\frac{WX_1}{2L_1}-\frac{WY_1+FZ_2}{2L_2}$$
$$R_{1b}=\frac{F}{4}+\frac{FX_2}{2L_1}$$
$$R_{2b}=\frac{F}{4}-\frac{FX_2}{2L_1}$$
$$R_{3b}=\frac{F}{4}+\frac{FX_2}{2L_1}$$
$$R_{4b}=\frac{F}{4}-\frac{FX_2}{2L_1}$$

Load calculation for WILL-D Rolling Linear Guides



g: Gravity acceleration
v: Velccity
L_3: Distance between ballscrew & F

$$R_2=R_4=\frac{W}{4}-\frac{L_3}{2L_1}\frac{V}{gt_1}W$$

$$R_1=R_3=\frac{W}{4}+\frac{L_3}{2L_1}\frac{V}{gt_1}W$$

In uniform motion

$$R_1=R_2=R_3=R_4=\frac{W}{4}$$

■ For variable load in the total traverse, the theoretical load should be caculated according to the following formulas.

1. For the loads variable in sectional traverse mode, $P_n=\sqrt[3]{(P_1^3L_1+P_2^3L_2+\ldots+P_n^3L_n)/L}$

Where P_n---Load corresponding to the sectional traverse Ln(KN);

L_n---Sectional traverse(KM);

L---Total traverse and it can be regarded as $\sum$Ln(KM);

2. For the loads variable in linear mode P_o =(Pmin + 2 Pmax)/3 (KN)

3. For the loads variable in full-sine wave P_o =0.65Pmax (KN)

4. For the loads variable in semi-sine wave P_o =0.75Pmax (KN)

5. For the loads bearing both vertical & horizontal directions(P_h) at the same time (KN)

6. For the loads bearing torque M at the same time $P_c=P_o+C_o\frac{M}{M_1}$

where

P_o---external load C_o---rated static load M---torque for external load M_t---rated torque, it means M_A、M_B、M_C Respectively

Rated life calculation for WILL-D Rolling Linear Guides

■ ---Rated life calculation of the ball linear guides:

Rated life calculation of the roller linear guides:

where

L---rated life(KM) C---rated dynamic load (KN) Pc---calculated theoretical load(KN)

f_t---temperature factor (see table 1) f_w---load factor (see table 4) f_a---Accuracy factor(see table3)

f_n---hardness factor fc---contact factor (see table2)

$f_h = 50(\frac{HRC}{58})^{3.6}$ where, HRC---ball track actual hardness

In general, Fh is taken as 1 since the ball track hardness should not be less than HRC 58 according to the technical stipulations of DRIFT-D rolling linear guides.

■ ---Life time calculation

Given the traverse is defined, the rated life in hour is calculated according to the following formula:

$$L_h = 50(\frac{L \times 10^3}{2 \times I \times n \times 60}) \approx \frac{8.3L}{I \times n}(h)$$

where

I---traverse length(m) n--- to & fro movement frequency L---rated life Lh---life time(hour)

■ Temperature factor f_t Table 1

Working temperature (℃)	≤100	100~150	150~200	200~250
f_t	1.00	0.09	0.73	0.60

■ Contact factor f_c Table 2

Qty. of block per rail	1	2	3	4	5
f_c	1.00	0.81	0.72	0.66	0.61

■ Accuracy factor f_a Table 3

Accuracy grade	2	3	4	5
f_c	1.0	1.0	0.9	0.9

■ Load factor f_w Table 4

Work conditions	f_w
In low speed operation without extemal impact or vibration v< 15m/min	1～1.5
In middle speed operation without bovious impact or vibration 15 ≤v< 60m/min	1.5～2
In high speed operation with external impact or vibration v>60m/s	2～3.5

Setting up of WILL-D Rolling Linear Guides

■ ---Setting up of linear guide

Trim the deformed area and de-burr the setting up reference surface for the rails by the use of oilstones and then clearthereference sides of the rails.

Remove rust-proof grease or oil on the rails and identify the reference side by the help of the marks or the brackets printed on the sides of rails and blocks. Then align the refernce side with the setting up reference

surface and pre-tighten the linear guide by the locking screws. The tightening force should not be too much, so that and the bottom and the reference side of the rail can be completely fitted with the setting up surfaces.

All the above mentioned done, every locking screw should be gradually tightened from the middle to the two ends in crossed manner. Finally, check the accuracies and set up the next linear guide.

■ ---Clamping

Fig.1 shows the most common clamping.

The working surface of the clamping plate is sink-cut into two parts, of which any one can be trimmed according to the concrete sizes of elements when using so that the rail or the block can be tightly pressed

by the clamping plate. If the clamping manner shown in Fig.1 is not used. The clamping manner shown in Fig.2

or other rest assistant tools must be used to ensure the refernce side surface can be correctly fitted with the relative reference surface of the fitted part toguarantee the manufacturing accuracy of linear guide straightness

can be kept. Otherwise, the smartness of linear movement ma be influenced.

Apart from the above mentioned clamping manners, there is a lot of other rest clamping manners, one of which shown in Fig.3 is our recommendation for user's reference.

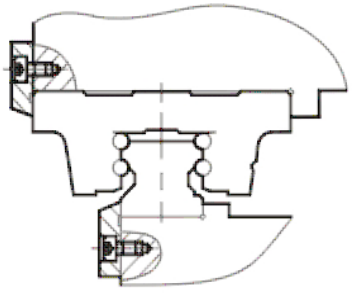


Fig.1

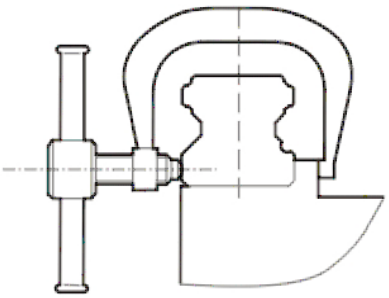


Fig.2

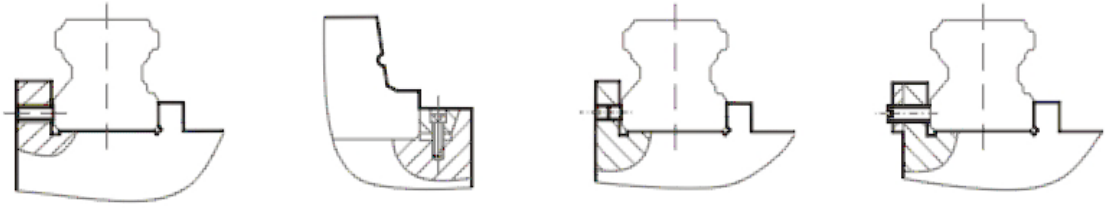


Fig.3

Fig.3

Setting up of WILL-D Rolling Linear Guides

■ Notice to setting up & design

WILL-D linear guide is of constraintstructure, with the helf of which the guide can bear the load from top, bottom, left & right directions. So, it is necessary to design the best assembly structure suitable for the machinery structure and its bearing lo

1. If two guides are mounted on the same plane and the load that guides bear is impact load as well as the machinery equipment requires high accuracies, then the position surtaces should be provided on the sides of both rails and blocks(see fig.1).

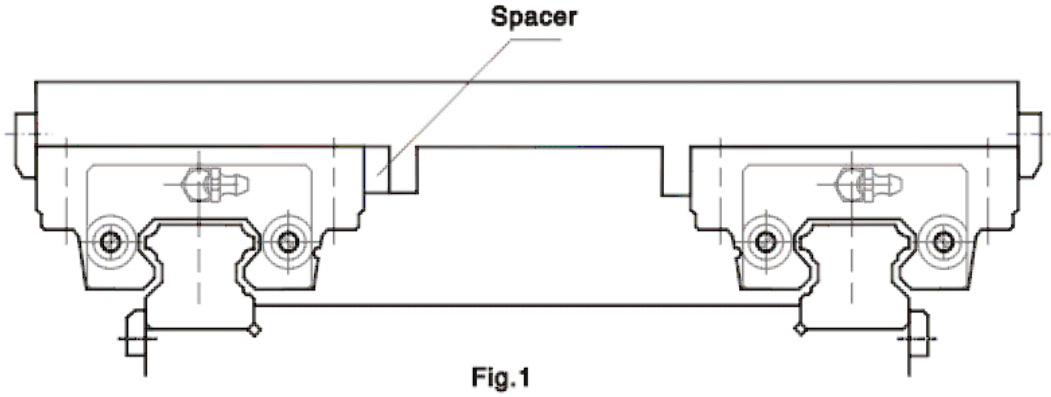


Fig.1

2.Fig. 2 & Fig. 3 show the most common setting up manners.

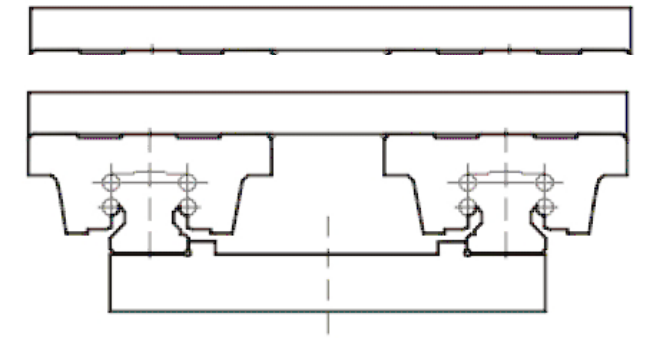


Fig.2

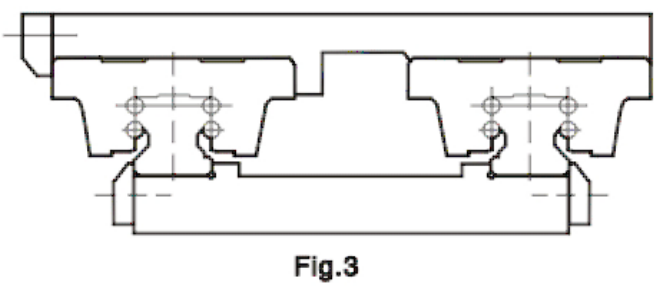
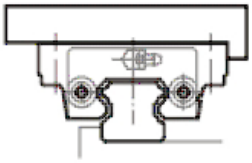


Fig.3

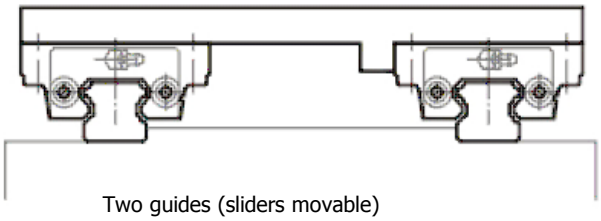
Fig.3

Setting up of WILL-D Rolling Linear Guides

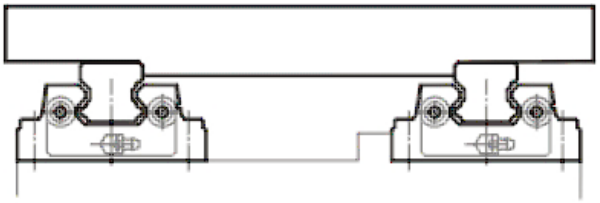
3.0



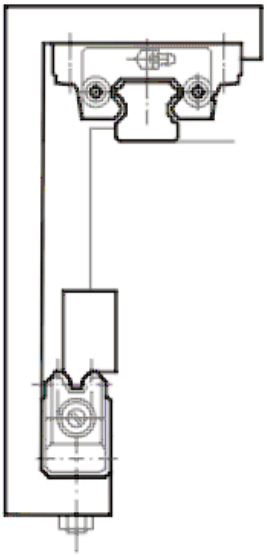
One guide



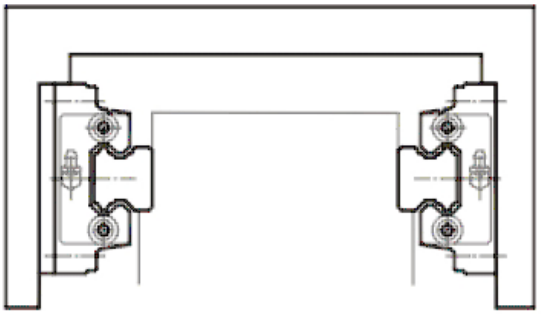
Two guides (sliders movable)



Two guides (rail movable)



Combination of common guide with single row typed guide



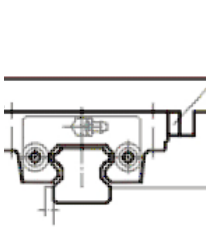
Two opposited guides(1)



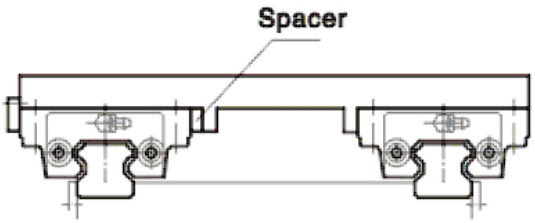
Two opposited guides(2)

Setting up of WILL-D Rolling Linear Guides

4.Examp;es pf specoal assembly:



Spacer



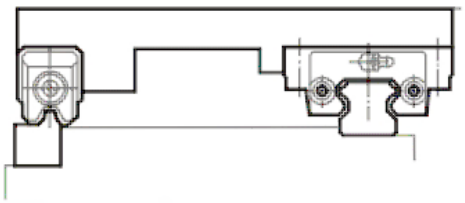
Spacer

All–fixed assembly

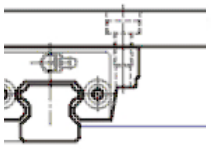
d assembly

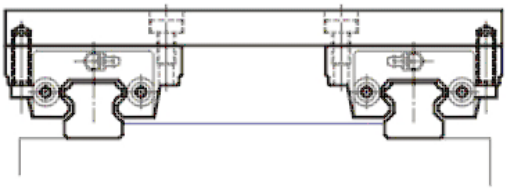
ation of common
ow guide(wide p

Combination of common guide with
single row guide(wide platform)



e platform)



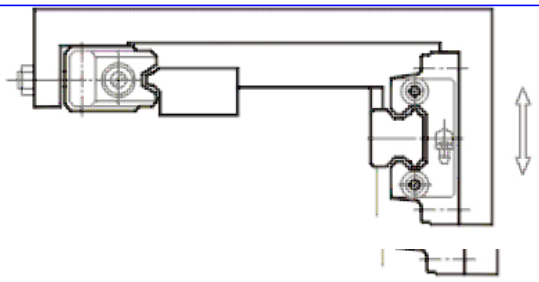


Locking bolts of HJG sliders
are both from top & bottom

o & bottom

of common guid
uide(cantilever l

Combination of common guide with
single row guide(cantilever load)



Combination of common guide with single row guide(cantilever load)

Setting up of WILL-D Rolling Linear Guides

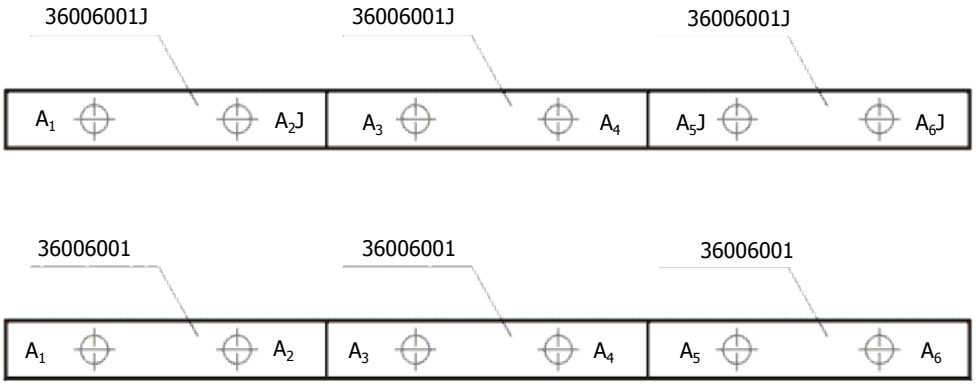
■ Notice to setting up & application.

1.For linear guide pair, the setting up should be carried out in pair according to the coding numbers. The linear guide with mark "J" at the end of the coding numbers is a reference guide.

For example: 36006009J---reference guide

36006009---non-reference guide

2. For joint extended linear guide pair, a great attention should be paid to the coding numbers of the joint positions and joint the guides according to the coding numbers respectively. See examples shown in the following Figs.



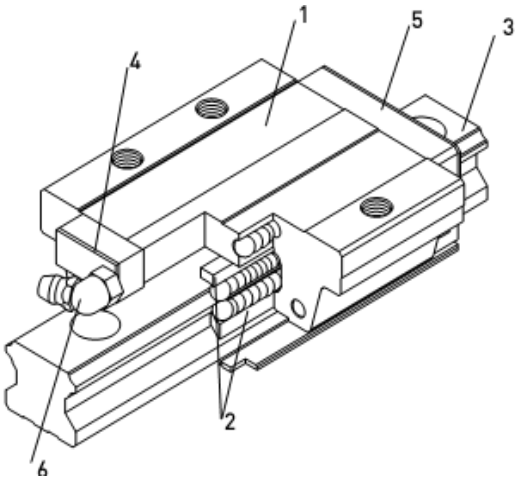
3. As a kind of precision rolling functional devices, WILL-D rolling guides have beentested and adjusted in accuracies and operating functions before delivery. Therefore, the customers should not to dismantle WILL-D linear guides by themselves at libert losing the original accuracies and smooth operation. If the customers, indeed, need to dismantle the blocks from WILL-D linear guides, the customers should have a contact with the factory of WILL-D linear guides to ask for the so-called "transferring g

substitute for the time being in order to avoid foreign impurity coming in.



Construction of WILL-DA Rolling Linear Guides

The rail and block of WILL-DA linear guides are made of quality alloy and ground by the special-purposed grinding machines. The balls set between the rail & block are kept by the steel retainers to avoid scattering in disassembly. The balls are retur resin, forming recycle movement. The sealed caps on the ends and scrapers are designed for preventing dust and impurity from coming in. The Grease nipple and the fow tunnel are also provided for lubrication.



1—block 2—Retainer 3—Rail 4—Sealed cap 5—Deflactor 6—Grease nipple

■ ---Equal loads on four directions:

Special 45° pressure angle is designed for WILL-DA rolling element so that equal loads from radial, anti-radial and horizontal directions can be applied to.

■ ---High rigidity and high load:

Special four row circular are contacted structure used on WILL-DA has increased the contacting sectors so that the load bearing capacity, the contacting rigidity and the sysmetic rigidity can be greatly improved in comparison with the two row structure.

■ ---High accuracy

Synchronized multi-surface grinding by special CNC machine tool, laser measuring technology and other advanced technologies have ensured productive accuracies.

■ ---Smooth running, low noise and non-pollution:

Deflecting and guiding system made of special synthetic resin and specially designed can ensure the linear movement with smooth running and low noise.

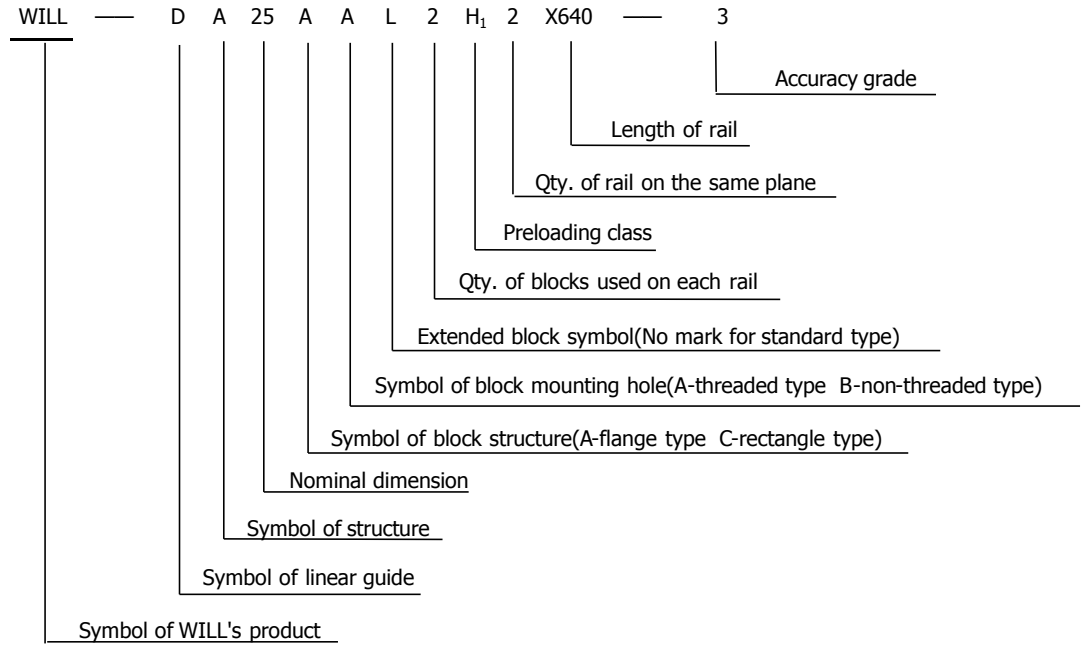
■ ---Compact design:

Smaller section but higher rigidity ensure compact structure of the machinery.

■ ---Easy setting up:

WILL-DA has no harsh setting up requirements for users.

Coding of WILL-DA Rolling Linear Guides

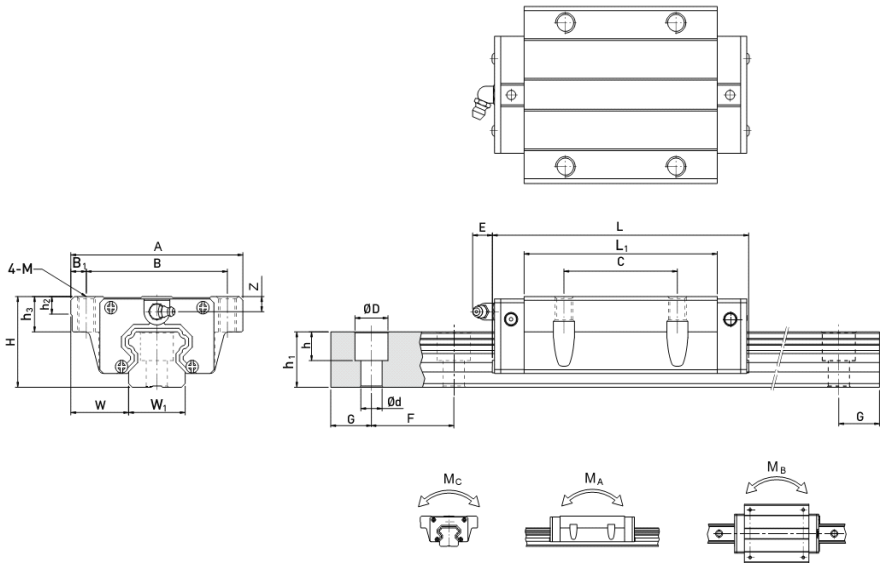


Selection of Preload for WILL-DA Rolling Linear Guides

■ The preload selection is mainly according to the different impact, vibration and accuracy. The following table can be used for reference when selecting preload.

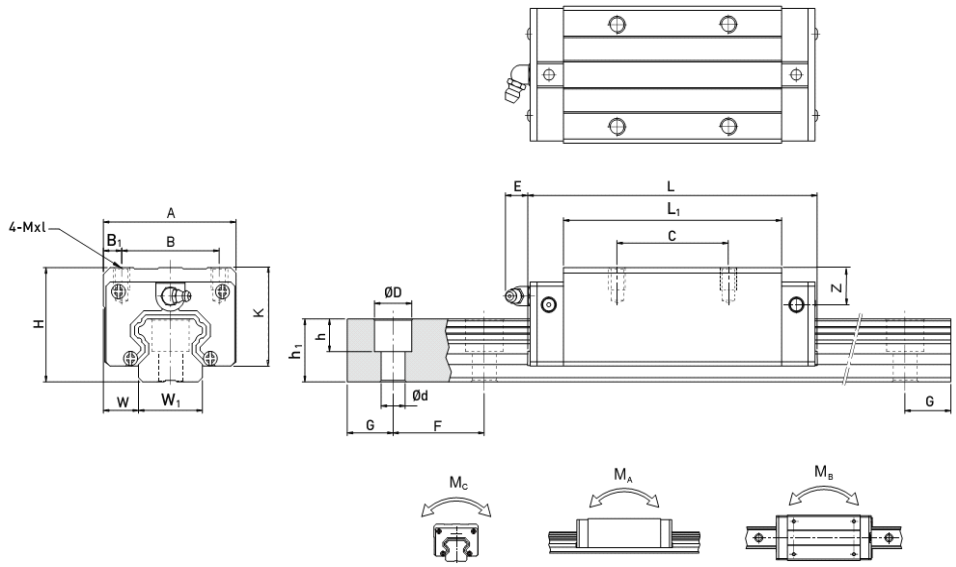
Preloading class	Working conditions	Recommendation
H_o-Very low	1)Without impacting load	1)Welding machine packing machines, etc,.
	2)Several rails used at the same time	2)Material feeding machine, etc,.
H_1-low	1)With low impacting, direction-fixed load and low vibration on rails.	1)Machine with light load but high accuracy.
	2)Only for secondary rail.	2)Cross & longi. Guides for common machines.
	3)For non-reference rail with light load but high accuracy.	3)Non-reference rail of fair accurate machines.
H_2-Middle	1)Cantilever load or upset load.	1)Robots.
	2)Only one block on the rail.	2)Reference rails of NC or CNC machines, EDMS, precision tables, etc,.
	3)For non-reference rail with low load but high accuracy.	
H_3-High	1)With high impact and big vibration and strict rigidity requirement.	1)Metal cutting machine tools or machining centers.
	2)Machines that should bear strong cutting force.	2)Turning-milling-boring machine tools or NC/CNC machine tools.

DA-A/DA-AL Series



Mdoel No.	Dimensions of Assembly (mm)		Dimensions of Block (mm)												Dimensions of Rail (mm)					Rated load (KN)		Static Rated Moment (N·m)			Weight	
	H	W	A	B	B_1	K	C	h_2	h_3	L_1	L	N	E	M	W_1	h_1	dXDXh	F	G	Dynamic (C)	Static (Co)	M_A	M_B	M_C	block (kg)	Rail (kg/m)
DA 15A	24	16	47	38	4.5	19.4	30	7	11	38.2	58.2	4.5	5.5	5	15	15	4.5×7.5×5.3	60	20	6.8	12.1	66	66	90	0.20	1.5
DA 20A	30	21.5	63	53	5	25	40	10	10	50	76	5	12	6	20	18	6×9.5×8.5	60	20	12.6	21.8	143	143	213	0.35	2.3
DA 20AL	30	21.5	63	53	5	25	40	10	10	66	92	5	12	6	20	18	6×9.5×8.5	60	20	19.5	29.1	248	248	284	0.47	2.3
DA 25A	37(36)	23.5	70	57	6.5	30	45	12	16	59	86	6	12	8	23	22	7×11×9	60	20	18.2	31.5	248	248	284	0.60	3.3
DA 25AL	37(36)	23.5	70	57	6.5	30	45	12	16	78	105	6	12	8	23	22	7×11×9	60	20	24.9	42.1	421	421	466	0.76	3.3
DA 30A	42	31	90	72	9	34	52	10	18	70	103	7	12	10	28	26	9×14×12	80	20	25.7	42.9	394	394	592	1.10	4.8
DA 30AL	42	31	90	72	9	34	52	10	18	92	125	7	12	10	28	26	9×14×12	80	20	34.2	57.3	670	670	789	1.30	4.8
DA 35A	50(48)	33	100	82	9	40.5	62	13	21	80	109	8	12	10	34	29	9×14×12	80	20	34.2	56	589	589	942	1.70	6.6
DA 35AL	50(48)	33	100	82	9	40.5	62	13	21	105	134	8	12	10	34	29	9×14×12	80	20	46	74.7	1000	1000	1259	2.10	6.6
DA 45A	62(60)	37.5	120	100	10	51	80	15	25	98	138	9	16	12	45	38	14×20×16	100 (105)	25	55	87.7	1148	1148	1919	3.00	11.0
DA 45AL	62(60)	37.5	120	100	10	51	80	15	25	130	170	9	16	12	45	38	14×20×16	100 (105)	25	73.8	117	1954	1954	2557	3.50	11.0
DA 55A	72(70)	43.5	140	116	12	58	95	17	30	118	161	11	16	16 (14)	53	44	18×26×20 (16×23×20)	120	30	81.2	126	1985	1985	3331	4.70	15.1
DA 55AL	72(70)	43.5	140	116	12	58	95	17	30	456	199	11	16	16 (14)	53	44	18×26×20 (16×23×20)	120	30	108.9	168.3	3375	3375	4451	6.00	15.1
DA 65A	90	53.5	170	142	14	76	110	23	37	147	186	16	16	16	63	53	18×26×22	150	35	129.6	197.1	3876	3876	6090	8.50	22.5
DA 65AL	90	53.5	170	142	14	76	110	23	37	207	246	16	16	16	63	53	18×26×22	150	35	176.4	262.8	6590	6590	8133	10.70	22.5
DA 85A	110	65	215	185	15	94	140	30	55	179	238	16	16	20	85	65	24×35×28	180	45	210	310	9850	9850	10630	17	35.2
DA 85AL	110	65	215	185	15	94	140	30	55	236	295	16	16	20	85	65	24×35×28	180	45	282	412	11800	11800	13570	23	35.2

DA-C/DA-CL Series



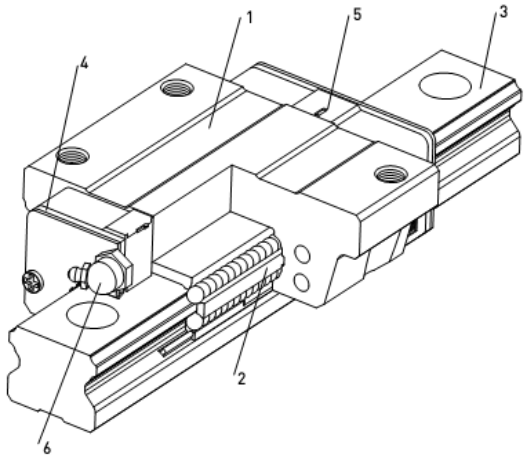
Mdoel No.	Dimensions of Assembly (mm)		Dimensions of Block (mm)										Dimensions of Rail (mm)					Ratde load (KN)		Static Rated Moment (N·m)			Weight	
	H	W	A	B	B_1	K	C	L_1	L	N	E	MxI	W_1	h_1	dXDXh	F	G	Dynamic (C)	Static (Co)	M_A	M_B	M_C	block (kg)	Rail (kg/m)
DA 15C	28	9.5	34	26	4	23.4	26	38.2	58.2	8.5	5.5	M4x5	15	15	4.5X7.5X5.3	60	20	6.8	12.1	66	66	90	0.18	1.5
DA 20C	30	12	44	32	6	25	36	50	76	5	12	M5x6	20	18	6X9.5X8.5	60	20	12.6	21.8	143	143	213	0.25	2.3
DA 20CL	30	12	44	32	6	25	50	66	92	5	12	M5x6	20	18	6X9.5X8.5	60	20	19.5	29.1	248	248	284	0.35	2.3
DA 25C	40	12.5	48	35	6.5	33	35	59	86	10	12	M6x8	23	22	7X11X9	60	20	18.2	31.5	248	248	360	0.54	3.3
DA 25CL	40	12.5	48	35	6.5	33	50	78	105	10	12	M6x8	23	22	7X11X9	60	20	24.9	42.1	421	421	466	0.67	3.3
DA 30C	45	16	60	40	10	37	40	70	103	10	12	M8x10	28	26	9X14X12	80	20	25.7	42.9	394	394	592	0.90	4.8
DA 30CL	45	16	60	40	10	37	60	892	125	10	12	M8x10	28	26	9X14X12	80	20	34.2	57.3	670	670	789	1.10	4.8
DA 35C	55	18	70	50	10	47	50	80	109	15	12	M8x12	34	29	9X14X12	80	20	34.2	56	589	589	942	1.50	6.6
DA 35CL	55	18	70	50	10	47	72	105	134	15	12	M8x12	34	29	9X14X12	80	20	46	74.7	1000	1000	1259	2.00	6.6
DA 45C	70	20.5	86	60	13	60	60	98	138	20	16	M10x17	45	38	14X20X16	100 (105)	25	55	87.7	1148	1148	1919	2.60	11.0
DA 45CL	70	20.5	86	60	13	60	80	130	170	20	16	M10x17	45	38	14X20X16	100 (105)	25	73.8	117	1954	1954	2557	3.10	11.0
DA 55C	80	23.5	100	75	12.5	67	75	118	161	21	16	M12x18	53	44	18X26X20 (16X23X20)	120	30	81.2	126	1985	1985	3331	4.30	15.1
DA 55CL	80	23.5	100	75	12.5	67	95	156	199	21	16	M12x18	53	44	18X26X20 (16X23X20)	120	30	108.9	168.3	3375	3375	4451	5.40	15.1
DA 65C	90	31.5	126	76	25	76	70	147	186	16	16	M16x20	63	53	18X26X22	150	35	129.6	197.1	3876	3876	6090	7.30	22.5
DA 65CL	90	31.5	126	76	25	76	120	207	246	16	16	M16x20	63	53	18X26X22	150	35	176.4	262.8	6590	6590	8133	9.30	22.5
DA 85C	110	35.5	156	100	28	94	80	179	238	16	16	M18x25	85	65	24X35X28	180	45	210	310	9850	9850	10630	13.00	35.2
DA 85CL	110	35.5	156	100	28	94	140	236	295	16	16	M18x25	85	65	24X35X28	180	45	282	412	11800	11800	13570	16.00	35.2

Note: If you'd like to select the parameters in bracket, please give a special statement to us when ordering.

Construction of WILL-DE Rolling Linear Guides

■ WILL-DE linear guide adopts a special double circular arc contacting design to get more high rigidity, loading and anti-impact ability.

■ The rail and block of DRIFT-DE linear guide are made of quality alloy and ground by the special-purposed grinding machines. The balls set between the rail & block are kept by the steel retainers to avoid scattering in disassembly. The balls are return resin, forming recycle movement. The sealed caps on the ends and scrapers are designed for preventing dust and impurity from coming in.The Grease nipple and the flow tunnel are also provided for lubrication.



1—block 2—Retainer 3—Rail 4—Sealed cap 5—Deflactor 6—Grease nipple

■ Equal loads on four directions: Special 45°pressure angle is designed for WILL-DE so that equal loads from radial, anti-radial and horizontal directions can be applied to.

■ High rigidity and high load:

Special four row circular arc contacting structure is designed as the outward intersecting point of contacting line so that high torque & rigidity can be obtained.High rigidity & loading are available because of increased

contacting points. i.e. four points.

■ Smooth running, low noise & non-pollution:

Deflecting and guiding systerm made of special synthetic resin and special designed can ensure linear movement with smooth running and low noise.

■ Four point contact of four row bearing: Loads can increase the friction factor a little but the damping ability can be increased because of this design.

■ Setting up & judgment for abnormal setting up:

No harsh setting up requirements for users. If the setting up error is too much, the friction will be increased a lot rapidly. So the user can determine whether the setting up has big error or not according to the friction.

Coding of WILL-DE Rolling Linear Guides

WILL —— D E 25 E A L 2 H_1 2 X640 —— 3

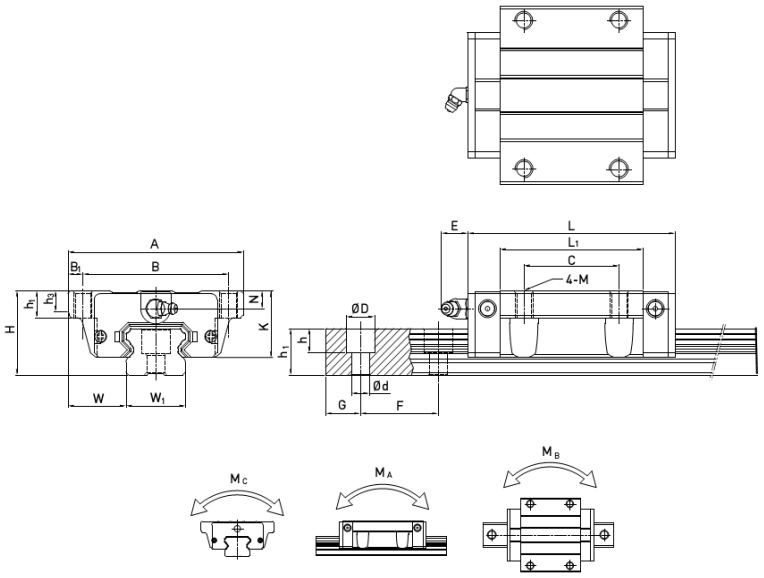
- 3 — Accuracy grade
- X640 — Length of rail
- 2 — Qty. of rail on the same plane
- H_1 — Preloading class
- 2 — Qty. of block used on each rail
- L — Extended block symbol(No mark for standard type)
- A — Symbol of block mounting hole(A-threaded type B-non-threaded type)
- E — Symbol of block structure(E-flange type EC-rectangle type)
- 25 — Nominal dimension
- E — Symbol of structure
- D — Symbol of linear guide
- WILL — Symbol of WILL's product

Selection of Preload for WILL-DE Rolling Linear Guides

■ The preload selection is mainly according to the different impact. Vibration and accuracy. The following table can be used for reference when selecting preload.

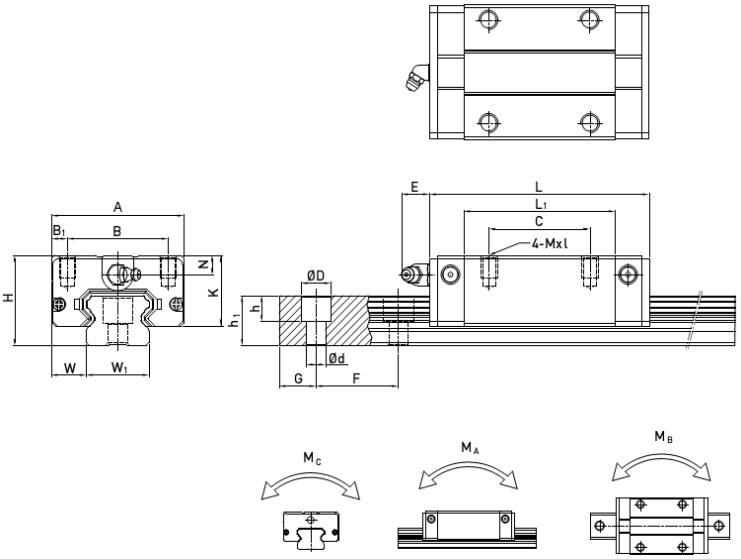
Preloading class	Working conditions	Recommendation
H_0 - Very low	1)Without impacting load 2)Several rails used at the same time	1)Welding machine packing machines, etc,. 2)Material feeding machine, etc,.
H_1 - Llow	1)With low impacting, direction-fixed load and low vibration on rails. 2)Only for secondary rail. 3)No cantilever load or upset load	1)Robots. EDMs. 2)Auxilary systems of various precision tables.
H_2-Middle	1)Cantilever load or upset load. 2)Only one block on the rail. 3)For non-reference rail with low load but high accuracy.	1)Robots. Laser machineres. 2)NC or CNC machines. 3)X-Y tables, surface grinders.
H_3-High	1)With high impact and big vibration and under cantilever load or upset load. 2)Machines that should bear strong cutting force.	1)Metal cutting machine tools or machining centers.

DE-E/DE-EL Series



Mdoel No.	Dimensions of Assembly (mm)		Dimensions of Block (mm)													Dimensions of Rail (mm)					Ratde load (KN)		Static Rated Moment (N·m)			Weight	
	H	W	A	B	B_1	K	C	h_2	h_3	L_1	L	N	E	M	S	W_1	h_1	dXDXh	F	G	Dynamic (C)	Static (Co)	M_A	M_B	M_C	block (kg)	Rail (kg/m)
DE 25E	36	23.5	70	57	6.5	30.8	45	12	16	59	89.2	6.75	12	8	7	23	23	7×11×9	60	20	21.8	37.8	320	320	460	0.6	3.7
DE 25EL	36	23.5	70	57	6.5	30.8	45	12	16	78	108	6.75	12	8	7	23	23	7×11×9	60	20	29.9	50.5	540	540	600	0.8	3.7
DE 30E	42	31	90	72	9	35.8	52	12	18	70	110	7	12	10	9	28	28	9×14×12	80	20	30.8	51.5	510	510	760	1.0	5.5
DE 30EL	42	31	90	72	9	35.8	52	12	18	92	132	7	12	10	9	28	28	9×14×12	80	20	41	68.8	870	870	1020	1.3	5.5
DE 35E	48	33	100	82	9	39.8	62	13.5	20.5	80	120	8.25	12	10	9	34	31	9×14×12	80	20	41	67.2	760	760	1220	1.5	7.6
DE 35EL	48	33	100	82	9	39.8	62	13.5	20.5	105	145	8.25	12	10	9	34	31	9×14×12	80	20	55.2	89.6	1300	1300	1630	2.0	7.6
DE 45E	60	37.5	120	100	10	51.4	80	15	23	98	141	10	16	12	11	45	38	14×20×16	105	25	66	105.2	1490	1490	2490	2.7	12.2
DE 45EL	60	37.5	120	100	10	51.4	80	15	23	130	173	10	16	12	11	45	38	14×20×16	105	25	88.6	140.4	2540	2540	3320	3.6	12.2
DE 55E	70	43.5	140	116	12	60.4	95	17	30	118	165	13	16	14	14	53	45	16×23×20	120	30	87.4	151.2	2580	2580	4330	4.5	17.3
DE 55EL	70	43.5	140	116	12	60.4	95	17	30	156	203	13	16	14	14	53	45	16×23×20	120	30	130.7	202	4380	4380	5780	5.9	17.3
DE 65E	90	53.5	170	142	14	78.4	110	23	37	147	206	18	16	16	16	63	53	18×26×22	150	35	155.5	236.5	5030	5030	7910	9.4	24.4
DE 65EL	90	53.5	170	142	14	78.4	110	23	37	207	266	18	16	16	16	63	53	18×26×22	150	35	211.7	315.4	8560	8560	10570	13.2	24.4

DE-EC/DE-ECL Series

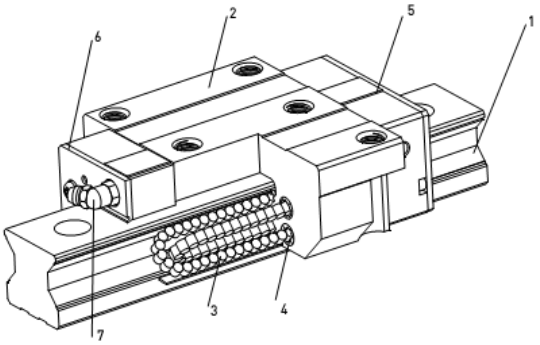


Mdoel No.	Dimensions of Assembly (mm)		Dimensions of Block (mm)										Dimensions of Rail (mm)					Ratde load (KN)		Static Rated Moment (N·m)			Weight	
	H	W	A	B	B_1	K	C	L_1	L	N	E	MxI	W_1	h_1	dXDXh	F	G	Dynamic (C)	Static (Co)	M_A	M_B	M_C	block (kg)	Rail (kg/m)
DE 25EC	40	12.5	48	35	6.5	34.8	35	59	89.2	10.8	12	M6×8	23	23	7×11×9	60	20	21.8	37.8	320	320	460	0.5	3.7
DE 25ECL	40	12.5	48	35	6.5	34.8	50	78	108.2	10.8	12	M6×8	23	23	7×11×9	60	20	29.9	50.5	540	540	600	0.7	3.7
DE 30EC	45	16	60	40	10	38.8	40	70	110.2	10	12	M8×10	28	28	9×14×12	80	20	30.8	51.5	510	510	760	0.8	5.5
DE 30ECL	45	16	60	40	10	38.8	60	92	132.2	10	12	M8×10	28	28	9×14×12	80	20	41	68.8	870	870	1020	1.1	5.5
DE 35EC	55	18	70	50	10	46.8	50	80	120.2	15.3	12	M8×12	34	31	9×14×12	80	20	41	67.2	760	760	1220	1.4	7.6
DE 35ECL	55	18	70	50	10	46.8	72	105	145.2	15.3	12	M8×12	34	31	9×14×12	80	20	55.2	89.6	1300	1300	1630	1.8	7.6
DE 45EC	70	20.5	86	60	13	61.4	60	98	140.8	20	16	M10×17	45	38	14×20×16	105	25	66	105.2	1490	1490	2490	2.7	12.2
DE 45ECL	70	20.5	86	60	13	61.4	80	130	172.8	20	16	M10×17	45	38	14×20×16	105	25	88.6	140.4	2540	2540	3320	3.6	12.2
DE 55EC	80	23.5	100	75	12.5	70.4	75	118	165.1	23	16	M12×18	53	45	16×23×20	120	30	97.4	151.2	2580	2580	4330	4.2	17.3
DE 55ECL	80	23.5	100	75	12.5	70.4	95	156	203.1	23	16	M12×18	53	45	16×23×20	120	30	130.7	202	4380	4380	5780	5.6	17.3
DE 65EC	90	31.5	126	76	25	78.4	70	147	205.5	18	16	M16×20	63	53	18×26×22	150	35	155.5	236.5	5030	5030	7910	7.3	24.4
DE 65ECL	90	31.5	126	76	25	78.4	120	207	265.5	18	16	M16×20	63	53	18×26×22	150	35	211.7	315.4	8560	8560	10570	10.3	24.4

Construction of WILL-DZ Rolling Linear Guides

■ With high loading, strong rigidity and great dampling capacity, WILL-DZ have widely used on heavy-typed machinetools.

■ WILL-DZ consists of the following parts:



1—rail 2—Block 3— roller 4—Circulation path 5—deflector 6—sealed cap 7—Grease nipple

Extra heavy loading:

■ Rollers are used as rolling elements so that the contacting way has become line contact from point contact in order to increase its contact rigidity, anti-impact capacity.

Low noise and long duration:

■ All the rolling elements are separated each other with the help of the retainer chain in order to avoid roller's conflict each other during movement for getting the lowest noise. Because of oil reservoir are available, the oil films can be generated on

elements so that no need for often maintenance and the long working life can be ensured.

High speed & high accuracy:

■ The deflecting track of rolling elements are designed according to the optimum & finite element analysis(FEA) to have the rolling elements deflecting running smoothly for getting a high speed and high accurate running.

Equal four direction loading:

■ Special 45° contacting angle and equal loading in four directions.

Coding of WILL-DZ Rolling Linear Guides

WILL —— D Z 25 Z A L 2 H_1 2 X640 —— 3

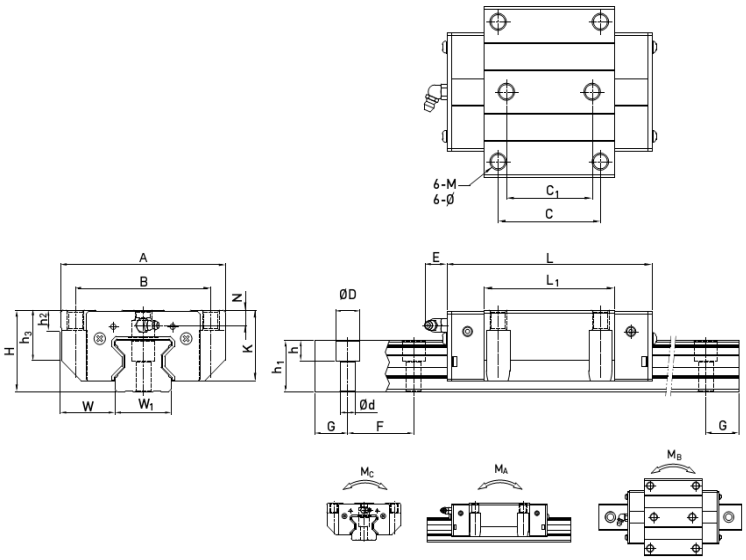
- 3 — Accuracy grade
- X640 — Length of rail
- 2 — Qty. of rail on the same plane
- H_1 — Preloading class
- 2 — Qty. of block used on each rail
- L — Extended block symbol(No mark for standard type)
- A — Symbol of block mounting hole(A-threaded type B-non-threaded type)
- Z — Symbol of block structure(Z--flange type ZC-rectangle type)
- 25 — Nnminal dimension
- Z — Symbol of structure
- D — Symbol of linear guide
- WILL — Symbol of WILL's product

Selection of Preload for WILL-DZ Rolling Linear Guides

■ The preload selection is mainly according to the different impact, vibration and accuracy. The following table can be used for reference when selecting preload.

Prloading class	Working conditions
H_1 - Low	1)With low impacting, direction-fixed load and low vibration on rails. 2)More than 2 secondary rails used at the same time
H_2 - Middle	1)Cantilever load or upset load. 2)Only one block on the rail. 3)For reference rail with low load but high accuracy.
H_3-High	1)With high impact and big vibration and under cantilever load or upset load 2)Machines that should bear strong cutting force.

DZ-Z/DZ-ZL Series

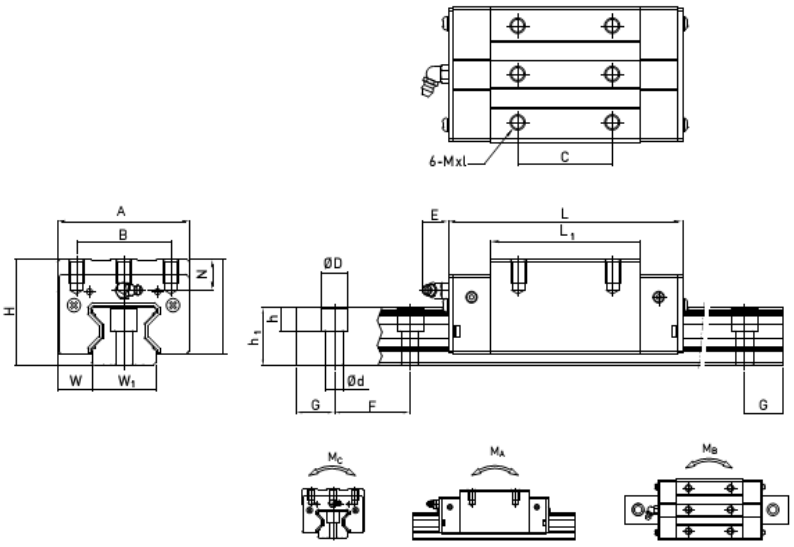


Mdoel No.	Dimensions of Assembly (mm)		Dimensions of Block (mm)													Dimensions of Rail (mm)					Ratde load (KN)		Static Rated Moment (N·m)			Weight	
	H	W	A	B	K	C	C_1	h_2	h_3	L_1	L	N	E	M	Ø	W_1	h_1	dXDXh	F	G	Dynamic (C)	Static (Co)	M_A	M_B	M_C	block (kg)	Rail (kg/m)
DZ 45Z	60	37.5	120	100	52	80	60	15	35.5	98	148	10.5	16	12	11	45	38	14×20×16	52.5	25	76	170	2995	2995	4557	2.6	11.2
DZ 45ZL	60	37.5	120	100	52	80	60	15	35.5	130	180	10.5	16	12	11	45	38	14×20×16	52.5	25	88	210	5342	5342	6453	3.9	11.2
DZ 55Z	70	43.5	140	116	60	95	70	18	41	118	179	11	16	14	14	53	44	16×23×20	60	28.5	127.5	260	4936	4936	7668	4.8	15.3
DZ 55ZL	70	43.5	140	116	60	95	70	18	41	156	217	11	16	14	14	53	44	16×23×20	60	28.5	140	350	9175	9175	11436	6.4	15.3
DZ 65Z	90	53.5	170	142	76	110	82	22	56	147	220	16	16	16	16	63	55	18×26×22	75	36	170	405	10225	10225	16651	9.0	22.4
DZ 65ZL	90	53.5	170	142	76	110	82	22	56	207	280	16	16	16	16	63	55	18×26×22	75	36	223	550	19447	19447	21455	13.0	22.4
DZ 85Z	110	65	215	185	95	140	110	30	66.5	179	266	16	16	20	18	85	70	24×35×28	90	43.5	343	782	33586	33586	43630	18.3	40.1
DZ 85ZL	110	65	215	185	95	140	110	30	66.5	236	323	16	16	20	18	85	70	24×35×28	90	43.5	414	943	42617	42617	48056	26.6	40.1
DZ 100Z	120	75	250	220	104	200	200	30	80	265	377	23	16	20	20	100	80	26×39×32	105	51	420	1113	45372	45372	52633	34.2	52.1

Note: 1) For DZ 100ZC,there are 9 setting on the top The 9 setting holes are located 3 rows in directions B & C symmetrically.

2) It side lubrication id rnnded ,please giv special notice

DZ-ZC/DZ-ZCL Series



Mdoel No.	Dimensions of Assembly (mm)		Dimensions of Block (mm)									Dimensions of Rail (mm)					Ratde load (KN)		Static Rated Moment (N·m)			Weight	
	H	W	A	B	K	C	L_1	L	N	E	MxI	W_1	h_1	dXDXh	F	G	Dynamic (C)	Static (Co)	M_A	M_B	M_C	block (kg)	Rail (kg/m)
DZ 45ZC	70	20.5	86	60	62	60	98	148	20.5	16	M10X16	45	38	14×20×16	52.5	25	76	170	2995	2995	4557	1.9	11.2
DZ 45ZCL	70	20.5	86	60	62	80	130	180	20.5	16	M10X16	45	38	14×20×16	52.5	25	88	210	5342	5342	6453	2.5	11.2
DZ 55ZC	80	23.5	100	75	70	75	118	179	21	16	M12X18	53	44	16×23×20	60	28.5	127.5	260	4936	4936	7668	3	15.3
DZ 55ZCL	80	23.5	100	75	70	95	156	217	21	16	M12X18	53	44	16×23×20	60	28.5	140	350	9175	9175	11436	4	15.3
DZ 65ZC	90	31.5	126	76	76	70	147	220	16	16	M16X16	63	55	18×26×22	75	36	170	405	10225	10225	16651	6.5	22.4
DZ 65ZCL	90	31.5	126	76	76	120	207	280	16	16	M16X16	63	55	18×26×22	75	36	223	550	19447	19447	21455	9.1	22.4
DZ 85ZC	110	35.5	156	100	95	80	179	266	16	16	M18X25	85	70	24×35×28	90	43.5	343	782	33586	33586	43630	12.8	40.1
DZ 85ZCL	110	35.5	156	100	95	140	236	323	16	16	M18X25	85	70	24×35×28	90	43.5	414	943	42617	42617	48056	16.9	40.1
DZ 100ZC	120	50	200	130	104	200	265	377	23	16	M20X27	100	80	26×39×32	105	51	420	1113	45372	45372	52633	27.3	52.1

Note: 1) For DZ100ZC. There are 9 setting holes on the top. The 9 setting holes are located in 3 rows in directions B & C symmetrically.

2)If side lubrication is needed, please give special notice.

Comparison of WILL Products Followers with Competitors' Products

WILL	THK	HIWIN
DA..A	HSR..A	HGW..CA
DA..AL	HSR..LA	HGW..HA
DA..C	HSR..R	HGH..CA
DA..CL	HSR..LR	HGH..HA
DE..E	SHS..C	EGW..SA
DE..EL	SHS..LC	EGW..CA
DE..EC	SHS..R	EGH..SA
DE..ECL	SHS..LR	EGH..CA
DZ..Z	--	RGW..CC
DZ..ZL	--	RGW..HC
DZ..ZC	--	RGH..CA
DZ..ZCL	--	RGH..HA