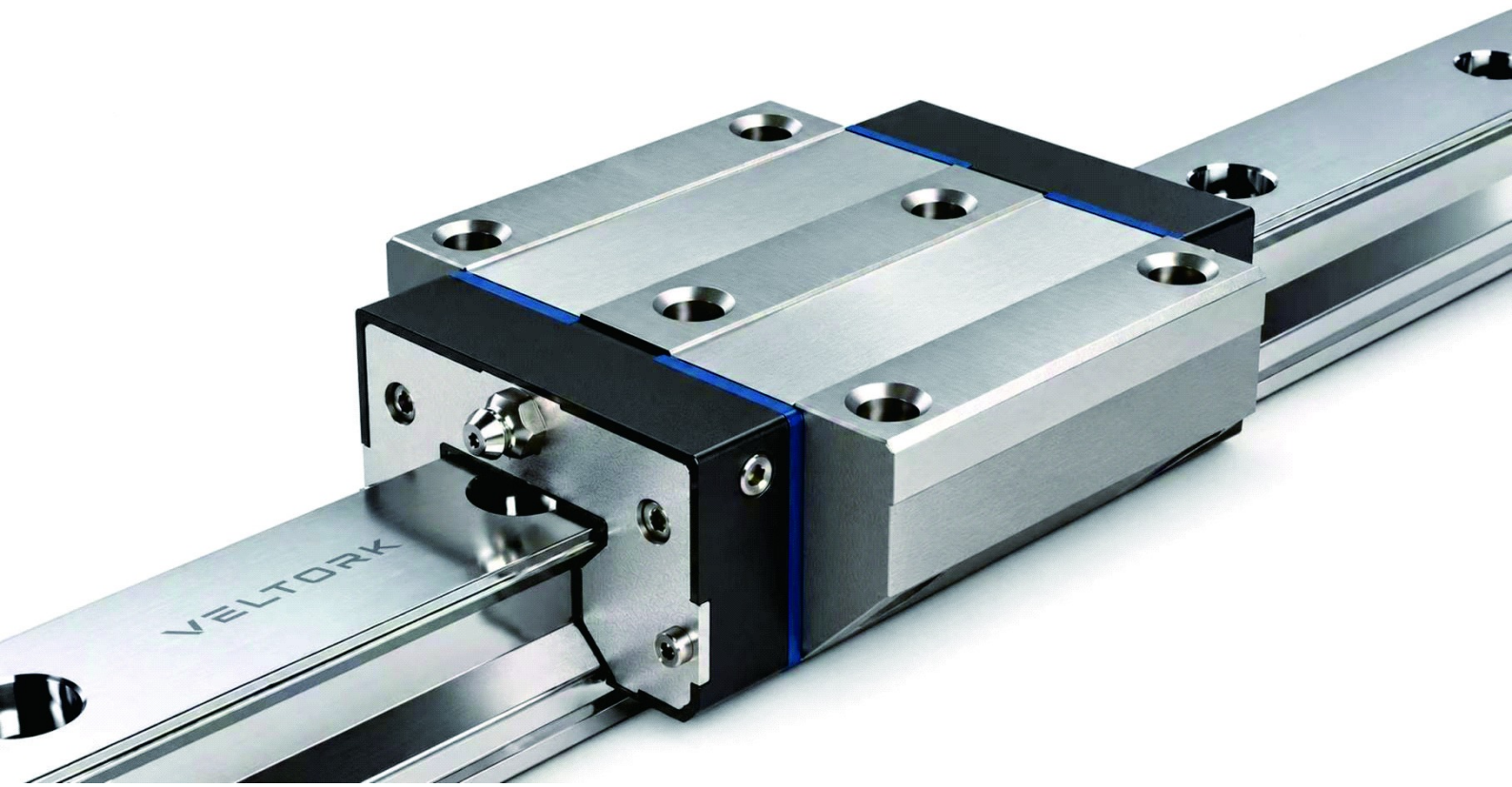
VELTORK



LINEAR GUIDE SYSTEMS

Precision Linear Guides — Ball & Roller

VR · Roller | VB · Ball · O-type | VX · Ball · X-type

Product Catalogue

Precise · Interchangeable · Globally consistent quality

Edition 10/2026

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About VELTORK

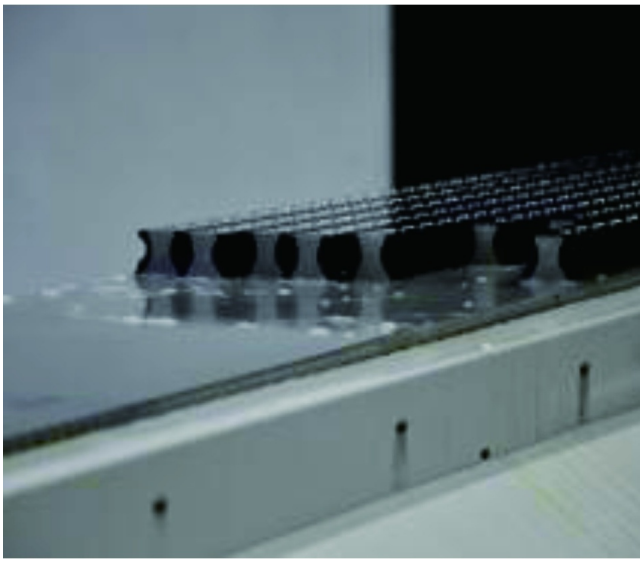
VELTORK is a European brand specialising in high-precision linear motion solutions. The group is headquartered in Germany, has branches in France, Germany and Turkey, and has strong capabilities in the research, testing, manufacture and application of linear guides. Drawing on more than 150 years of experience in special-steel production and processing, the VELTORK brand serves high-end equipment manufacturers worldwide with outstanding technical expertise and reliable product quality.

Veltork (Guangdong) Technology Co., Ltd. was founded in Jiangmen, Guangdong, in 2017. In 2024 it was fully acquired by VELTORK, which increased its capital and expanded production.

Guided by the principles of precision, innovation and reliability, Veltork provides high-precision, long-life and dependable linear motion solutions. Its Jiangmen plant specialises in roller linear guide systems of SP accuracy class and higher, and in high-assembly ball linear guide systems.

PRODUCTION AND QUALITY CONTROL

Standardised processes along the entire production chain ensure efficient, stable manufacturing. Quality is checked at every stage — incoming material inspection, in-process and sampling inspection, and 100 % final inspection — so that only reliable, high-quality products are delivered.



Finished rails



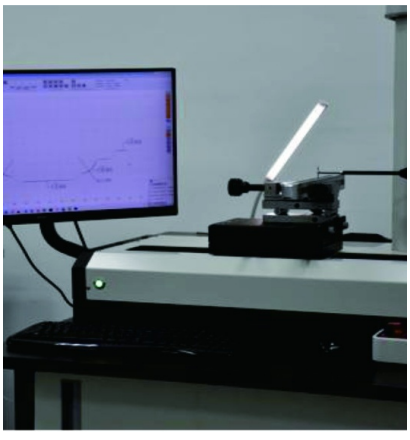
Carriage production



Rail production



Rail accuracy testing



Profile measurement in the quality lab

Preface

The Chinese ministerial JB standard defines the linear guide as a “rolling linear guide pair”, commonly shortened to “linear guide pair” or “linear guide”. European brands mostly use descriptive terms such as “rolling guidance (bearing) system”, calling guides with rollers “roller linear guide systems” and guides with balls “ball linear guide systems”. Some Taiwanese brands use “linear slide” or “linear rail”, and some Japanese and Taiwanese brands use “linear guide”. Because European, Japanese and Taiwanese brands still dominate the linear guide market in mainland China, these terms are all familiar there. The JB standard is not mandatory, and all of these terms are in fairly wide use.

VELTORK originates from Europe and delivers to European quality standards. In this catalogue, ball-type guides are called “ball linear guide systems” and roller-type guides “roller linear guide systems”; information that applies to both is presented under “linear guide systems”.

In a linear guide system, rolling elements (balls or rollers) circulate endlessly between carriage and rail, so that a loaded table moves along the rail easily and with high precision. Compared with conventional sliding guides, rolling guidance reduces the coefficient of friction to about 2.5% of the original value; breakaway friction is far lower and the risk of stick-slip is greatly reduced, so feed and positioning accuracy in the µm range is easily achieved. In addition, the interference fit between rail and carriage allows the system to carry loads from every direction – up, down, left and right. Combined with ball screws, linear guide systems substantially raise the precision and efficiency of equipment.

Calculations and outline dimensions in this catalogue follow the ISO 14728 series. The main mounting dimensions are interchangeable with the leading international brands and conform to the JB standard; our internal accuracy standards match DIN 636 and exceed JB.

Linear guide systems were first used mainly in metal-cutting machine tools, where requirements for assembly height and rigidity are high, and were sold mostly as matched, non-interchangeable sets. In recent years demand has grown in applications such as woodworking machinery and injection-moulding robots, where rigidity, assembly height and similar accuracy parameters matter less but assembly efficiency matters more; these users increasingly buy interchangeable rails and carriages separately and combine them themselves. Please note: when buying linear guide systems, always confirm the meaning of the order code so that the order matches your requirements. Many products with insufficient accuracy (excessive tolerances) that do not meet interchangeability requirements are sold to end users as “interchangeable”. This can cause rapid wear through sharply increased assembly stresses or, where mounting accuracy is out of control, abnormal high-frequency opening and closing of the carriage that bursts its return units, among other problems.

With first-class equipment and leading inspection technology accurate to 0.001 mm, VELTORK precisely verifies every accuracy parameter relevant to interchangeability – centre distance and centre height of rail and carriage, raceway height and more – so that rails and carriages can be supplied as interchangeable parts.

Linear Guide Order Number

Complete set — carriages mounted on the guide rail

ORDER-CODE EXAMPLE — WHAT EACH POSITION MEANS

VR	0	51	·	3	1	3	·	2	·	1240	II	20/20	·	3	1	0	·	1	01	·	KK	·	E
Series	Rail corr.	Carriage type		Size	Preload	Accuracy		Carriages		Rail length	Rails / set	End holes		Rail holes	Segments	Carr. corr.		Lubricant	Fitting		Seals		Special
1	2	3		4	5	6								7	8	9		10	11		12		

1 Series

Code	Rolling element	Assembly	Arrangement	Rail for steel cover strip
VR	Roller	High	O	—
VB	Ball	High	O	yes
VX	Ball	High	X	yes
VN	Ball	High	X	no
VE	Ball	Low	X	no

VR, VB and VX available now; further series to follow.

2 Rail corrosion protection

0	Standard — oiled
1	Hard-chrome plated, silver
2	Black-chrome plated
3	Nickel plated
4	Black-oxide finish
5	Stainless steel

3 Carriage type & mounting

Code	Body	Length	Height	Mounting holes · bolting
50	Flanged	Standard	Standard	Through-holes · from below
51	Flanged	Standard	Standard	Threaded · from above or below
52	Flanged	Standard	Standard	Threaded · from above
53	Flanged	Long	Standard	Threaded · from above or below
54	Flanged	Long	Standard	Through-holes · from below
55	Flanged	Long	Standard	Threaded · from above
65	Flanged	Short	Standard	Threaded · from above or below
21	Narrow	Standard	High	Threaded · from above
22	Narrow	Standard	Standard	Threaded · from above
23	Narrow	Long	Standard	Threaded · from above
24	Narrow	Long	High	Threaded · from above
66	Narrow	Short	Standard	Threaded · from above

Codes in the dimension tables are available; others are reserved.

4 Size

Code	Size	Code	Size	Code	Size	Code	Size
1	15	8	20	2	25	7	30
3	35	4	45	5	55	6	65

Other sizes: one digit or letter, defined with the dimension sheet.

5 Preload class

Code	Class	Preload
0	C0	Slight, ≤ 2 % C — ball guides only
1	C1	Light, 3 % C
2	C2	Medium, 8 % C
3	C3	Heavy, 12 % C
4	C4	Extra heavy, 16 % C
5	C5	Ultra heavy, 19 % C

Non-stock (longer lead time): C0, C4, C5; C1 roller; C3 ball.

6 Accuracy class

0	UP — ultra precision
1	SP — super precision
2	P — precision
3	H — high
4	N — normal

7 Rail mounting holes & top-surface cover

0	Counterbored from above, chamfered · plastic caps
1	Counterbored from above, no chamfer · brass caps
2	Counterbored from above, chamfered · steel cover strip
3	Non-standard counterbored, chamfered · plastic caps (specify)
4	Threaded from below · no top cover

8 Rail segments

1	One-piece rail
2–9	Jointed rail — number of segments
X	Jointed rail with 10 or more segments — state the number

9 Carriage corrosion protection

0–5	Codes as in (2) — 0 standard, 1 hard chrome, 2 black chrome, 3 nickel, 4 black oxide, 5 stainless steel

10 Initial lubricant (factory-filled)

0	Guide-rail oil; flush out if commissioned > 3 months after dispatch
1	Lithium grease; remove before changing to oil lubrication
2	Light preservative oil; clean off before lubricating

11 Lubrication fitting

Code	Fitting	Connection	Form
00	Grease nipple	M4 × 0.7	straight
01	Grease nipple	M6 × 1	45° elbow
02	Grease nipple	M6 × 1	straight
08	Grease nipple	PT 1/8	45° elbow
23	Pipe fitting	M6 × 1 → M8 × 1	90° elbow
24	Pipe fitting	M6 × 1 → M8 × 1	straight
25	Pipe fitting	PT 1/8 → M8 × 1	90° elbow
26	Pipe fitting	PT 1/8 → M8 × 1	straight
33	Push-in tube fitting Ø4	M6 × 1	90° elbow
34	Push-in tube fitting Ø4	M6 × 1	straight
35	Push-in tube fitting Ø4	PT 1/8	90° elbow
36	Push-in tube fitting Ø4	PT 1/8	straight

01–19 grease fittings · 21–99 oil fittings · others on request

12 Seals

Code	End seal	Metal scraper	Bottom seal	Inner seal
—	Single-lip (standard)	—	Standard	—
ZZ	Single-lip	●	Standard	—
KK	Double-lip	●	Standard	—
DD	Double-lip	—	Heavy-duty	—
SH	Single-lip, heavy-duty	—	Heavy-duty	●
ZH	Single-lip, heavy-duty	●	Heavy-duty	●
KH	Double-lip, heavy-duty	●	Heavy-duty	●
DH	Double-lip, heavy-duty	—	Heavy-duty	●

Free values: 2 = carriages per rail · 1240 = rail length, mm · II = rails per set · 20/20 = end distances to the first / last hole, left / right as seen from the reference edge · E = special requirements, specification attached. Required minimum: VR051.313.2.1240II20/20 — other positions agreed with VELTORK sales.

Guide Rail Order Number

Interchangeable guide rail, supplied separately

ORDER-CODE EXAMPLE — WHAT EACH POSITION MEANS



1 Series — as the carriage

Code	Rolling element	Assembly	Arrangement	Rail for steel cover strip
VR	Roller	High	O	—
VB	Ball	High	O	yes
VX	Ball	High	X	yes
VN	Ball	High	X	no
VE	Ball	Low	X	no

2 Rail corrosion protection

0	Standard — oiled
1	Hard-chrome plated, silver
2	Black-chrome plated
3	Nickel plated
4	Black-oxide finish
5	Stainless steel

3 Size

Code	Size	Code	Size	Code	Size	Code	Size
1	15	8	20	2	25	7	30
3	35	4	45	5	55	6	65

Other sizes: one digit or letter, defined with the dimension sheet.

4 Accuracy class

0	UP — ultra precision
1	SP — super precision
2	P — precision
3	H — high
4	N — normal

5 Rail mounting holes & top-surface cover

0	Counterbored from above, chamfered · plastic caps
1	Counterbored from above, no chamfer · brass caps
2	Counterbored from above, chamfered · steel cover strip
3	Non-standard counterbored, chamfered · plastic caps (specify)
4	Threaded from below · no top cover

6 Rail segments

1	One-piece rail
2–9	Jointed rail — number of segments
X	Jointed rail with 10 or more segments — state the number

Free values: 1240 = rail length in mm · 20/20 = end distances to the first / last hole, left / right as seen from the reference edge · E = special requirements, specification attached. Required minimum: VR071.1240 — other positions agreed with VELTORK sales.

Carriage Order Number

Interchangeable carriage, supplied separately — the numbers listed in the product tables

ORDER-CODE EXAMPLE — WHAT EACH POSITION MEANS



1 Series

Code	Rolling element	Assembly	Arrangement	Rail for steel cover strip
VR	Roller	High	O	—
VB	Ball	High	O	yes
VX	Ball	High	X	yes
VN	Ball	High	X	no
VE	Ball	Low	X	no

2 Carriage type & mounting

Code	Body	Length	Height	Mounting holes · bolting
50	Flanged	Standard	Standard	Through-holes · from below
51	Flanged	Standard	Standard	Threaded · from above or below
52	Flanged	Standard	Standard	Threaded · from above
53	Flanged	Long	Standard	Threaded · from above or below
54	Flanged	Long	Standard	Through-holes · from below
55	Flanged	Long	Standard	Threaded · from above
65	Flanged	Short	Standard	Threaded · from above or below
21	Narrow	Standard	High	Threaded · from above
22	Narrow	Standard	Standard	Threaded · from above
23	Narrow	Long	Standard	Threaded · from above
24	Narrow	Long	High	Threaded · from above
66	Narrow	Short	Standard	Threaded · from above

Codes in the dimension tables are available; others are reserved.

3 Size

Code	Size	Code	Size	Code	Size	Code	Size
1	15	8	20	2	25	7	30
3	35	4	45	5	55	6	65

Other sizes: one digit or letter, defined with the dimension sheet.

4 Preload class

Code	Class	Preload
0	C0	Slight, ≤ 2 % C — ball guides only
1	C1	Light, 3 % C
2	C2	Medium, 8 % C
3	C3	Heavy, 12 % C
4	C4	Extra heavy, 16 % C
5	C5	Ultra heavy, 19 % C

Non-stock (longer lead time): C0, C4, C5; C1 roller; C3 ball.

5 Accuracy class

0	UP — ultra precision
1	SP — super precision
2	P — precision
3	H — high
4	N — normal

6 Carriage corrosion protection

0	Standard — oiled
1	Hard-chrome plated, silver
2	Black-chrome plated
3	Nickel plated
4	Black-oxide finish
5	Stainless steel

7 Initial lubricant (factory-filled)

0	Guide-rail oil; flush out if commissioned > 3 months after dispatch
1	Lithium grease; remove before changing to oil lubrication
2	Light preservative oil; clean off before lubricating

8 Lubrication fitting

Code	Fitting	Connection	Form
00	Grease nipple	M4 × 0.7	straight
01	Grease nipple	M6 × 1	45° elbow
02	Grease nipple	M6 × 1	straight
08	Grease nipple	PT 1/8	45° elbow
23	Pipe fitting	M6 × 1 → M8 × 1	90° elbow
24	Pipe fitting	M6 × 1 → M8 × 1	straight
25	Pipe fitting	PT 1/8 → M8 × 1	90° elbow
26	Pipe fitting	PT 1/8 → M8 × 1	straight
33	Push-in tube fitting Ø4	M6 × 1	90° elbow
34	Push-in tube fitting Ø4	M6 × 1	straight
35	Push-in tube fitting Ø4	PT 1/8	90° elbow
36	Push-in tube fitting Ø4	PT 1/8	straight

01–19 grease fittings · 21–99 oil fittings · others on request

9 Seals

Code	End seal	Metal scraper	Bottom seal	Inner seal
—	Single-lip (standard)	—	Standard	—
ZZ	Single-lip	●	Standard	—
KK	Double-lip	●	Standard	—
DD	Double-lip	—	Heavy-duty	—
SH	Single-lip, heavy-duty	—	Heavy-duty	●
ZH	Single-lip, heavy-duty	●	Heavy-duty	●
KH	Double-lip, heavy-duty	●	Heavy-duty	●
DH	Double-lip, heavy-duty	—	Heavy-duty	●

E = special requirements, specification attached. Required minimum: VR51.321 (series · type · size · preload · accuracy) — this is the number shown in the Carriage Order Number tables; other positions agreed with VELTORK sales.

VR Series — Product Overview

The VR-Series roller guides are designed for compact linear-motion applications with rolling elements — machine tools, industrial robots and general mechanical manufacturing — with universal dimensions and a compact structure.

- Equally high load rating in all four principal load directions.
- Very low noise with excellent running smoothness.
- Dynamic performance: v max = 4 m/s, a max = 150 m/s².
- Standard carriages also suit specialised installation and operating conditions.
- Central mounting bolts give extremely high stiffness in all load directions.

PRODUCT RANGE



VR51

Flanged · Standard Length · Standard Height



VR53

Flanged · Extended · Standard Height



VR22

Narrow · Standard Length · Standard Height



VR23

Narrow · Extended · Standard Height



VR21

Narrow · Standard Length · Elevated



VR24

Narrow · Extended · Elevated

VR51

Roller Carriage · Flanged · Standard Length · Standard Height



DYNAMIC CHARACTERISTICS

Speed	**v max = 4 m/s**
Acceleration	**a max = 150 m/s²**

PRELOAD GRADES

C1	Preload 3 %C
C2	Preload 8 %C
C3	Preload 12 %C

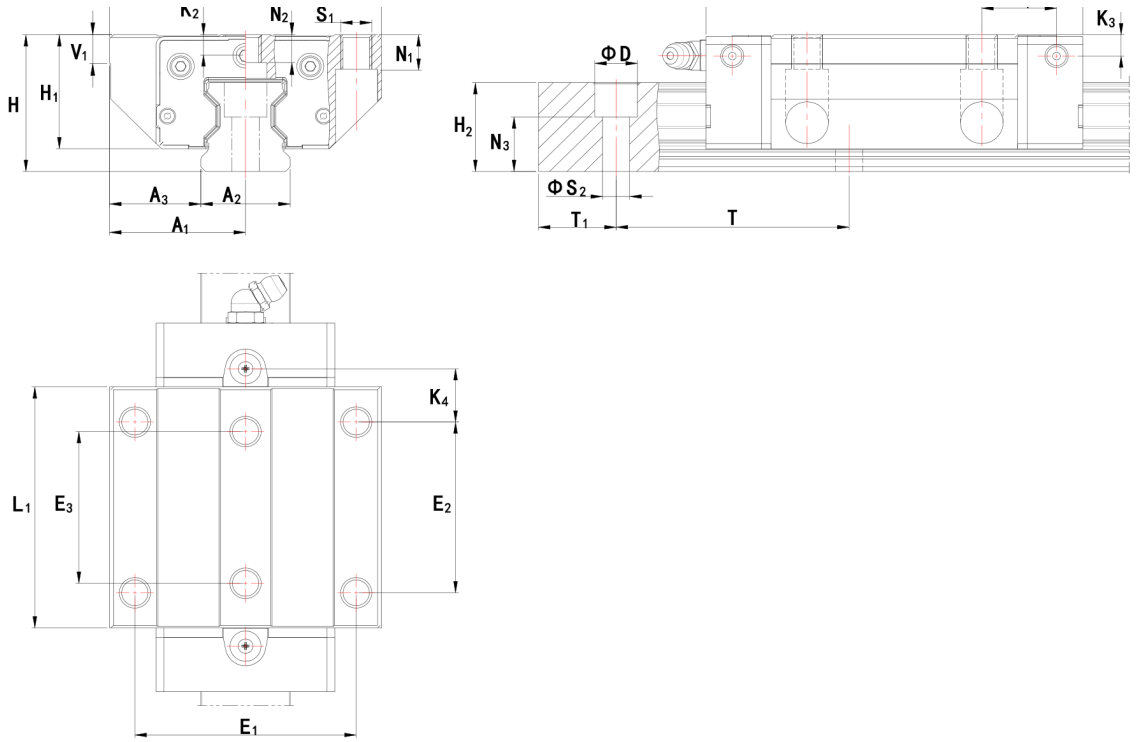
ORDERING Assign the carriage and rail order numbers using the coding system on the Ordering pages.

CARRIAGE ORDER NUMBERS

Size	Accuracy class	Carriage Order Number		
		C1	C2	C3
25	H (3)	VR51.213	VR51.223	
	P (2)	VR51.212	VR51.222	
	SP (1)		VR51.221	VR51.231
	UP (0)		VR51.220	VR51.230
30	H (3)	VR51.713	VR51.723	
	P (2)	VR51.712	VR51.722	
	SP (1)		VR51.721	VR51.731
	UP (0)		VR51.720	VR51.730
35	H (3)	VR51.313	VR51.323	
	P (2)	VR51.312	VR51.322	
	SP (1)		VR51.321	VR51.331
	UP (0)		VR51.320	VR51.330
45	H (3)	VR51.413	VR51.423	
	P (2)	VR51.412	VR51.422	
	SP (1)		VR51.421	VR51.431
	UP (0)		VR51.420	VR51.430
55	H (3)	VR51.513	VR51.523	
	P (2)	VR51.512	VR51.522	
	SP (1)		VR51.521	VR51.531
	UP (0)		VR51.520	VR51.530
65	H (3)	VR51.613	VR51.623	
	P (2)	VR51.612	VR51.622	
	SP (1)		VR51.621	VR51.631
	UP (0)		VR51.620	VR51.630

VR51 — Dimensions

Roller Carriage · Flanged · Standard Length · Standard Height



DIMENSIONS (mm)

Size	Model No.	Dimensions (mm)																
		A	A_1	A_2	A_3	L	L_1	E_1	E_2	E_3	H	H_1	H_2 1)	H_2 2)	K_1	K_2	K_3	K_4
VR25	VR51.2	70	35	23	23.5	100.6	64.6	57	45	40	36	30.5	24.25	24	17.8	5.5	6.4	15.8
VR30	VR51.7	90	45	28	31	111.5	71.5	72	52	44	42	35.5	28.25	28	17.75	6.1	5.9	16.75
VR35	VR51.3	100	50	34	33	118	79.6	82	62	52	48	41	31.1	30.8	17.4	7	7	15.5
VR45	VR51.4	120	60	45	37.5	147	101.5	100	80	60	60	51	39.1	38.8	20.25	8.1	8.1	17.55
VR55	VR51.5	140	70	53	43.5	170.65	123.1	116	95	70	70	58	47.85	47.55	24.85	8.95	8.9	20.85
VR65	VR51.6	170	85	63	53.5	207.3	146	142	110	82	90	76	58.15	57.85	32.9	9.6	9.6	30

LOAD RATINGS · STATIC MOMENTS · MASS

Size	Model No.	Dimensions (mm)									Load rating (N)		Static moment (N·m)				Mass	
		N_1	N_2	N_3	D	S_1	S_2	T	T_1	V_1	C	C_0	M_t	M_{t0}	M_L	M_{L0}	Carriage kg	Rail kg/m
VR25	VR51.2	10	5.3	15	11	M8	7	30	20	7.5	29300	58500	380	760	290	570	0.73	3.17
VR30	VR51.7	11	5.5	16	14	M10	9	40	20	7.8	45080	90000	760	1520	480	950	1.15	4.6
VR35	VR51.3	12	11	19.8	15	M10	9	40	20	8	54100	105900	1070	2100	670	1310	2.15	6.3
VR45	VR51.4	15	13.5	22.8	20	M12	14	52.5	22.5	10	95700	185800	2340	4550	1460	2840	4.05	10.3
VR55	VR51.5	18	13.9	28.7	23	M14	16	60	30	12	132000	250800	3880	7370	2430	4600	5.44	13.1
VR65	VR51.6	23	21.5	36.5	26	M16	18	75	35	15	224900	401200	7940	14170	4960	8860	10.72	17.4

1) H_2 dimension with protective tape 2) H_2 dimension without protective tape

VR53

Roller Carriage · Flanged · Extended · Standard Height



DYNAMIC CHARACTERISTICS

Speed	**v max = 4 m/s**
Acceleration	**a max = 150 m/s²**

PRELOAD GRADES

C1	Preload 3 %C
C2	Preload 8 %C
C3	Preload 12 %C

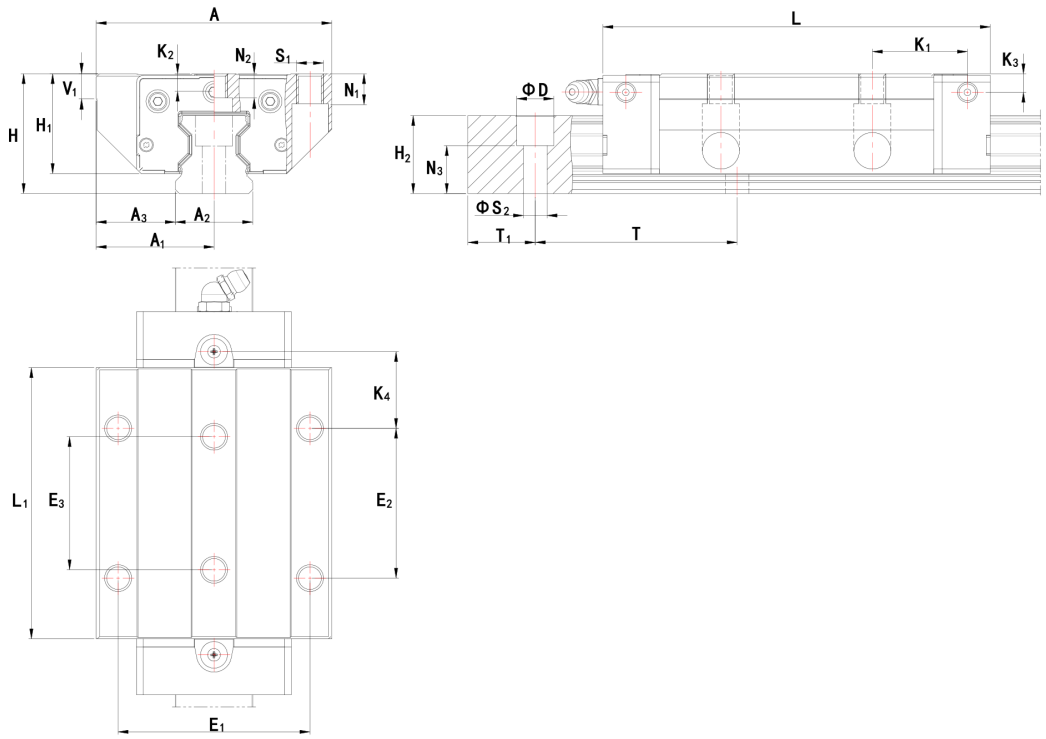
ORDERING Assign the carriage and rail order numbers using the coding system on the Ordering pages.

CARRIAGE ORDER NUMBERS

Size	Accuracy class	Carriage Order Number		
		C1	C2	C3
25	H (3)	VR53.213	VR53.223	
	P (2)	VR53.212	VR53.222	
	SP (1)		VR53.221	VR53.231
	UP (0)		VR53.220	VR53.230
30	H (3)	VR53.713	VR53.723	
	P (2)	VR53.712	VR53.722	
	SP (1)		VR53.721	VR53.731
	UP (0)		VR53.720	VR53.730
35	H (3)	VR53.313	VR53.323	
	P (2)	VR53.312	VR53.322	
	SP (1)		VR53.321	VR53.331
	UP (0)		VR53.320	VR53.330
45	H (3)	VR53.413	VR53.423	
	P (2)	VR53.412	VR53.422	
	SP (1)		VR53.421	VR53.431
	UP (0)		VR53.420	VR53.430
55	H (3)	VR53.513	VR53.523	
	P (2)	VR53.512	VR53.522	
	SP (1)		VR53.521	VR53.531
	UP (0)		VR53.520	VR53.530
65	H (3)	VR53.613	VR53.623	
	P (2)	VR53.612	VR53.622	
	SP (1)		VR53.621	VR53.631
	UP (0)		VR53.620	VR53.630

VR53 — Dimensions

Roller Carriage · Flanged · Extended · Standard Height



DIMENSIONS (mm)

Size	Model No.	Dimensions (mm)																
		A	A_1	A_2	A_3	L	L_1	E_1	E_2	E_3	H	H_1	H_2 1)	H_2 2)	K_1	K_2	K_3	K_4
VR25	VR53.2	70	35	23	23.5	117	81	57	45	40	36	30.5	24.25	24	26	5.5	6.4	24
VR30	VR53.7	90	45	28	31	136	96	72	52	44	42	35.5	28.25	28	30	6.1	5.9	29
VR35	VR53.3	100	50	34	33	142	103.6	82	62	52	48	41	31.1	30.8	29.4	7	7	27.5
VR45	VR53.4	120	60	45	37.5	179.5	134	100	80	60	60	51	39.1	38.8	36.5	8.1	8.1	33.8
VR55	VR53.5	140	70	53	43.5	209.65	162.1	116	95	70	70	58	47.85	47.55	44.35	8.95	8.9	40.35
VR65	VR53.6	170	85	63	53.5	255.3	194	142	110	82	90	76	58.15	57.85	56.9	9.6	9.6	54

LOAD RATINGS · STATIC MOMENTS · MASS

Size	Model No.	Dimensions (mm)									Load rating (N)		Static moment (N·m)				Mass	
		N_1	N_2	N_3	D	S_1	S_2	T	T_1	V_1	C	C_0	M_t	M_{t0}	M_L	M_{L0}	Carriage kg	Rail kg/m
VR25	VR53.2	10	5.3	15	11	M8	7	30	20	7.5	35580	75230	460	980	450	960	0.93	3.17
VR30	VR53.7	11	5.5	16	14	M10	9	40	20	7.8	56480	123330	960	2090	830	1800	1.56	4.6
VR35	VR53.3	12	11	19.8	15	M10	9	40	20	8	66990	139320	1330	2760	1090	2260	2.7	6.3
VR45	VR53.4	15	13.5	22.8	20	M12	14	52.5	22.5	10	116060	241480	2840	5920	2330	4850	5.15	10.3
VR55	VR53.5	18	13.9	28.7	23	M14	16	60	30	12	166600	338540	4890	9950	4250	8650	7.15	13.1
VR65	VR53.6	23	21.5	36.5	26	M16	18	75	35	15	280550	534970	9910	18890	8400	16000	14.18	17.4

1) H_2 dimension with protective tape 2) H_2 dimension without protective tape

VR22

Roller Carriage · Narrow · Standard Length · Standard Height



DYNAMIC CHARACTERISTICS

Speed	**v max = 4 m/s**
Acceleration	**a max = 150 m/s²**

PRELOAD GRADES

C1	Preload 3 %C
C2	Preload 8 %C
C3	Preload 12 %C

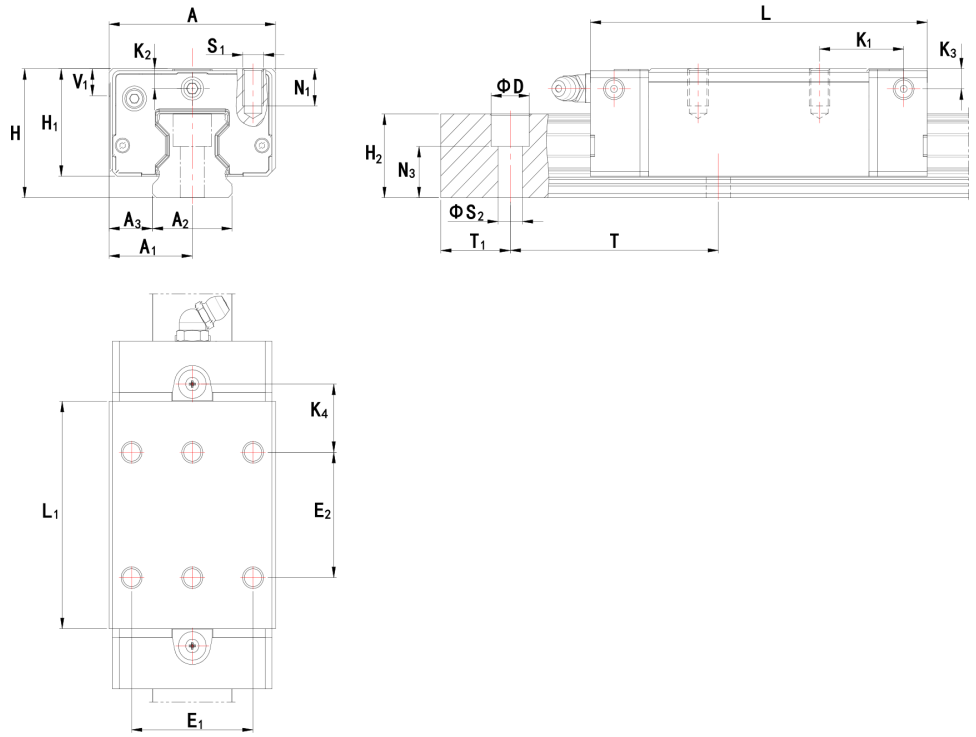
ORDERING Assign the carriage and rail order numbers using the coding system on the Ordering pages.

CARRIAGE ORDER NUMBERS

Size	Accuracy class	Carriage Order Number		
		C1	C2	C3
25	H (3)	VR22.213	VR22.223	
	P (2)	VR22.212	VR22.222	
	SP (1)		VR22.221	VR22.231
	UP (0)		VR22.220	VR22.230
30	H (3)	VR22.713	VR22.723	
	P (2)	VR22.712	VR22.722	
	SP (1)		VR22.721	VR22.731
	UP (0)		VR22.720	VR22.730
35	H (3)	VR22.313	VR22.323	
	P (2)	VR22.312	VR22.322	
	SP (1)		VR22.321	VR22.331
	UP (0)		VR22.320	VR22.330
45	H (3)	VR22.413	VR22.423	
	P (2)	VR22.412	VR22.422	
	SP (1)		VR22.421	VR22.431
	UP (0)		VR22.420	VR22.430
55	H (3)	VR22.513	VR22.523	
	P (2)	VR22.512	VR22.522	
	SP (1)		VR22.521	VR22.531
	UP (0)		VR22.520	VR22.530
65	H (3)	VR22.613	VR22.623	
	P (2)	VR22.612	VR22.622	
	SP (1)		VR22.621	VR22.631
	UP (0)		VR22.620	VR22.630

VR22 — Dimensions

Roller Carriage · Narrow · Standard Length · Standard Height



DIMENSIONS (mm)

Size	Model No.	Dimensions (mm)															
		A	A_1	A_2	A_3	L	L_1	E_1	E_2	H	H_1	H_2 1)	H_2 2)	K_1	K_2	K_3	K_4
VR25	VR22.2	48	24	23	12	100.6	64.6	35	35	36	30.5	24.25	24	22.8	5.5	6.4	20.8
VR30	VR22.7	60	30	28	16	111.5	71.5	40	40	42	35.5	28.25	28	23.75	6.1	5.9	22.75
VR35	VR22.3	70	35	34	18	118	79.6	50	50	48	41	31.1	30.8	23.4	7	7	21.5
VR45	VR22.4	86	43	45	20.5	147	101.5	60	60	60	51	39.1	38.8	30.25	8.1	8.1	27.55
VR55	VR22.5	100	50	53	23.5	170.65	123.1	75	75	70	58	47.85	47.55	34.85	8.95	8.9	30.85
VR65	VR22.6	126	63	63	31.5	207.3	146	76	70	90	76	58.15	57.85	52.9	9.6	9.6	50

LOAD RATINGS · STATIC MOMENTS · MASS

Size	Model No.	Dimensions (mm)								Load rating (N)		Static moment (N·m)				Mass	
		N_1	N_3	D	S_1	S_2	T	T_1	V_1	C	C_0	M_t	M_{t0}	M_L	M_{L0}	Carriage kg	Rail kg/m
VR25	VR22.2	8	15	11	M6	7	30	20	7.5	29300	58500	380	760	290	570	0.53	3.17
VR30	VR22.7	8	16	14	M8	9	40	20	7.8	45080	90000	760	1520	480	950	0.81	4.6
VR35	VR22.3	12	19.8	15	M8	9	40	20	8	54100	105900	1070	2100	670	1310	1.55	6.3
VR45	VR22.4	16	22.8	20	M10	14	52.5	22.5	10	95700	185800	2340	4550	1460	2840	2.9	10.3
VR55	VR22.5	16	28.7	23	M12	16	60	30	12	132000	250800	3880	7370	2430	4600	4.14	13.1
VR65	VR22.6	21	36.5	26	M16	18	75	35	15	224900	401200	7940	14170	4960	8860	8.12	17.4

1) H_2 dimension with protective tape 2) H_2 dimension without protective tape

VR23

Roller Carriage · Narrow · Extended · Standard Height



DYNAMIC CHARACTERISTICS

Speed	**v max = 4 m/s**
Acceleration	**a max = 150 m/s²**

PRELOAD GRADES

C1	Preload 3 %C
C2	Preload 8 %C
C3	Preload 12 %C

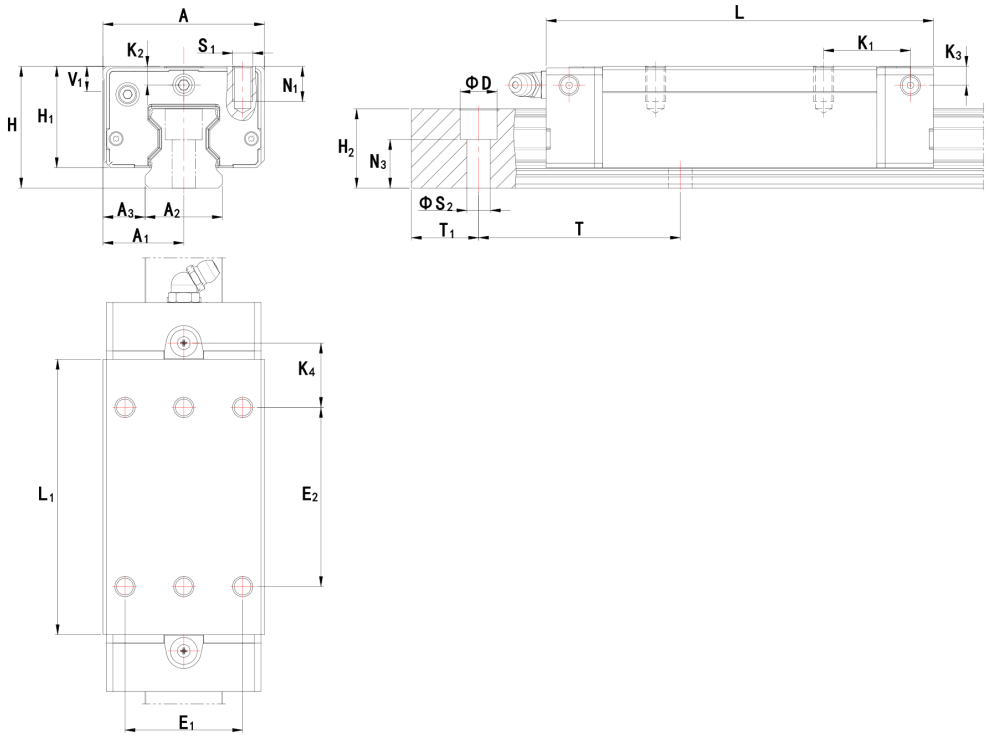
ORDERING Assign the carriage and rail order numbers using the coding system on the Ordering pages.

CARRIAGE ORDER NUMBERS

Size	Accuracy class	Carriage Order Number		
		C1	C2	C3
25	H (3)	VR23.213	VR23.223	
	P (2)	VR23.212	VR23.222	
	SP (1)		VR23.221	VR23.231
	UP (0)		VR23.220	VR23.230
30	H (3)	VR23.713	VR23.723	
	P (2)	VR23.712	VR23.722	
	SP (1)		VR23.721	VR23.731
	UP (0)		VR23.720	VR23.730
35	H (3)	VR23.313	VR23.323	
	P (2)	VR23.312	VR23.322	
	SP (1)		VR23.321	VR23.331
	UP (0)		VR23.320	VR23.330
45	H (3)	VR23.413	VR23.423	
	P (2)	VR23.412	VR23.422	
	SP (1)		VR23.421	VR23.431
	UP (0)		VR23.420	VR23.430
55	H (3)	VR23.513	VR23.523	
	P (2)	VR23.512	VR23.522	
	SP (1)		VR23.521	VR23.531
	UP (0)		VR23.520	VR23.530
65	H (3)	VR23.613	VR23.623	
	P (2)	VR23.612	VR23.622	
	SP (1)		VR23.621	VR23.631
	UP (0)		VR23.620	VR23.630

VR23 — Dimensions

Roller Carriage · Narrow · Extended · Standard Height



DIMENSIONS (mm)

Size	Model No.	Dimensions (mm)															
		A	A_1	A_2	A_3	L	L_1	E_1	E_2	H	H_1	H_2 1)	H_2 2)	K_1	K_2	K_3	K_4
VR25	VR23.2	48	24	23	12	117	81	35	50	36	30.5	24.25	24	23.5	5.5	6.4	21.5
VR30	VR23.7	60	30	28	16	136	96	40	60	42	35.5	28.25	28	26	6.1	5.9	25
VR35	VR23.3	70	35	34	18	142	103.6	50	72	48	41	31.1	30.8	24.4	7	7	22.5
VR45	VR23.4	86	43	45	20.5	179.5	134	60	80	60	51	39.1	38.8	36.5	8.1	8.1	33.8
VR55	VR23.5	100	50	53	23.5	209.65	162.1	75	95	70	58	47.85	47.55	44.35	8.95	8.9	40.35
VR65	VR23.6	126	63	63	31.5	255.3	194	76	120	90	76	58.15	57.85	51.9	9.6	9.6	49

LOAD RATINGS · STATIC MOMENTS · MASS

Size	Model No.	Dimensions (mm)								Load rating (N)		Static moment (N·m)				Mass	
		N_1	N_3	D	S_1	S_2	T	T_1	V_1	C	C_0	M_t	M_{t0}	M_L	M_{L0}	Carriage kg	Rail kg/m
VR25	VR23.2	8	15	11	M6	7	30	20	7.5	35580	75230	460	980	450	960	0.65	3.17
VR30	VR23.7	8	16	14	M8	9	40	20	7.8	56480	123330	960	2090	830	1800	1.06	4.6
VR35	VR23.3	12	19.8	15	M8	9	40	20	8	66990	139320	1330	2760	1090	2260	1.95	6.3
VR45	VR23.4	16	22.8	20	M10	14	52.5	22.5	10	116060	241480	2840	5920	2330	4850	3.65	10.3
VR55	VR23.5	16	28.7	23	M12	16	60	30	12	166600	338540	4890	9950	4250	8650	5.3	13.1
VR65	VR23.6	21	36.5	26	M16	18	75	35	15	280550	534970	9910	18890	8400	16000	10.68	17.4

1) H_2 dimension with protective tape 2) H_2 dimension without protective tape

VR21

Roller Carriage · Narrow · Standard Length · Elevated



DYNAMIC CHARACTERISTICS

Speed	**v max = 4 m/s**
Acceleration	**a max = 150 m/s²**

PRELOAD GRADES

C1	Preload 3 %C
C2	Preload 8 %C
C3	Preload 12 %C

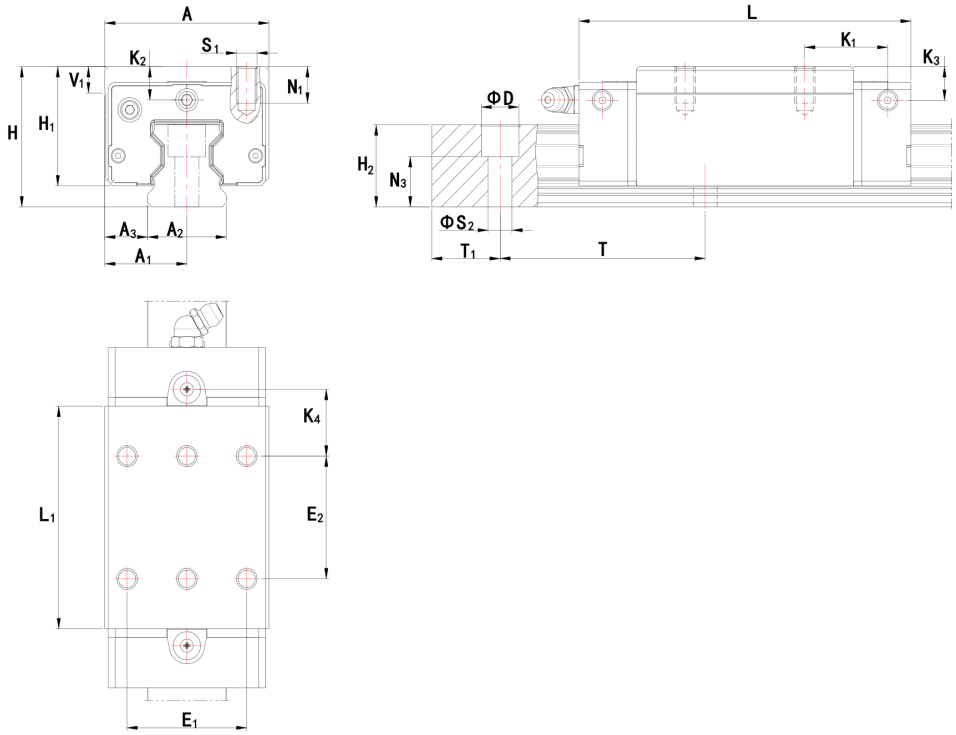
ORDERING Assign the carriage and rail order numbers using the coding system on the Ordering pages.

CARRIAGE ORDER NUMBERS

Size	Accuracy class	Carriage Order Number		
		C1	C2	C3
25	H (3)	VR21.213	VR21.223	
	P (2)	VR21.212	VR21.222	
	SP (1)		VR21.221	VR21.231
	UP (0)		VR21.220	VR21.230
30	H (3)	VR21.713	VR21.723	
	P (2)	VR21.712	VR21.722	
	SP (1)		VR21.721	VR21.731
	UP (0)		VR21.720	VR21.730
35	H (3)	VR21.313	VR21.323	
	P (2)	VR21.312	VR21.322	
	SP (1)		VR21.321	VR21.331
	UP (0)		VR21.320	VR21.330
45	H (3)	VR21.413	VR21.423	
	P (2)	VR21.412	VR21.422	
	SP (1)		VR21.421	VR21.431
	UP (0)		VR21.420	VR21.430
55	H (3)	VR21.513	VR21.523	
	P (2)	VR21.512	VR21.522	
	SP (1)		VR21.521	VR21.531
	UP (0)		VR21.520	VR21.530

VR21 — Dimensions

Roller Carriage · Narrow · Standard Length · Elevated



DIMENSIONS (mm)

Size	Model No.	Dimensions (mm)															
		A	A_1	A_2	A_3	L	L_1	E_1	E_2	H	H_1	H_2 1)	H_2 2)	K_1	K_2	K_3	K_4
VR25	VR21.2	48	24	23	12	100.6	64.6	35	35	40	34.5	24.25	24	22.8	9.5	10.4	20.8
VR30	VR21.7	60	30	28	16	111.5	71.5	40	40	45	38.5	28.25	28	23.75	9.1	8.9	22.75
VR35	VR21.3	70	35	34	18	118	79.6	50	50	55	48	31.1	30.8	23.4	14	14	21.5
VR45	VR21.4	86	43	45	20.5	147	101.5	60	60	70	61	39.1	38.8	30.25	18.1	18.1	27.55
VR55	VR21.5	100	50	53	23.5	170.65	123.1	75	75	80	68	47.85	47.55	34.85	18.95	18.9	30.85

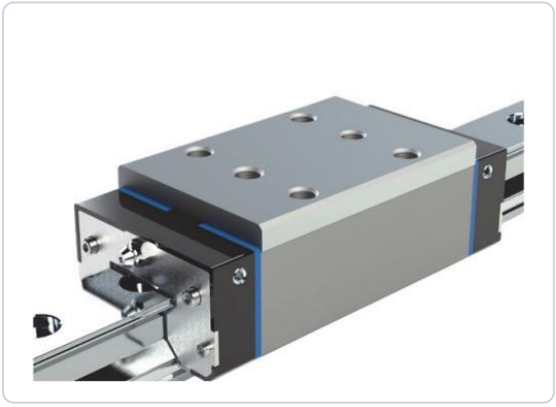
LOAD RATINGS · STATIC MOMENTS · MASS

Size	Model No.	Dimensions (mm)								Load rating (N)		Static moment (N·m)				Mass	
		N_1	N_3	D	S_1	S_2	T	T_1	V_1	C	C_0	M_t	M_{t0}	M_L	M_{L0}	Carriage kg	Rail kg/m
VR25	VR21.2	9	15	11	M6	7	30	20	7.5	29300	58500	380	760	290	570	0.62	3.17
VR30	VR21.7	10	16	14	M8	9	40	20	7.8	45080	90000	760	1520	480	950	0.91	4.6
VR35	VR21.3	12	19.8	15	M8	9	40	20	8	54100	105900	1070	2100	670	1310	1.85	6.3
VR45	VR21.4	16	22.8	20	M10	14	52.5	22.5	10	95700	185800	2340	4550	1460	2840	3.35	10.3
VR55	VR21.5	16	28.7	23	M12	16	60	30	12	132000	250800	3880	7370	2430	4600	5.04	13.1

1) H_2 dimension with protective tape 2) H_2 dimension without protective tape

VR24

Roller Carriage · Narrow · Extended · Elevated



DYNAMIC CHARACTERISTICS

Speed	**v max = 4 m/s**
Acceleration	**a max = 150 m/s²**

PRELOAD GRADES

C1	Preload 3 %C
C2	Preload 8 %C
C3	Preload 12 %C

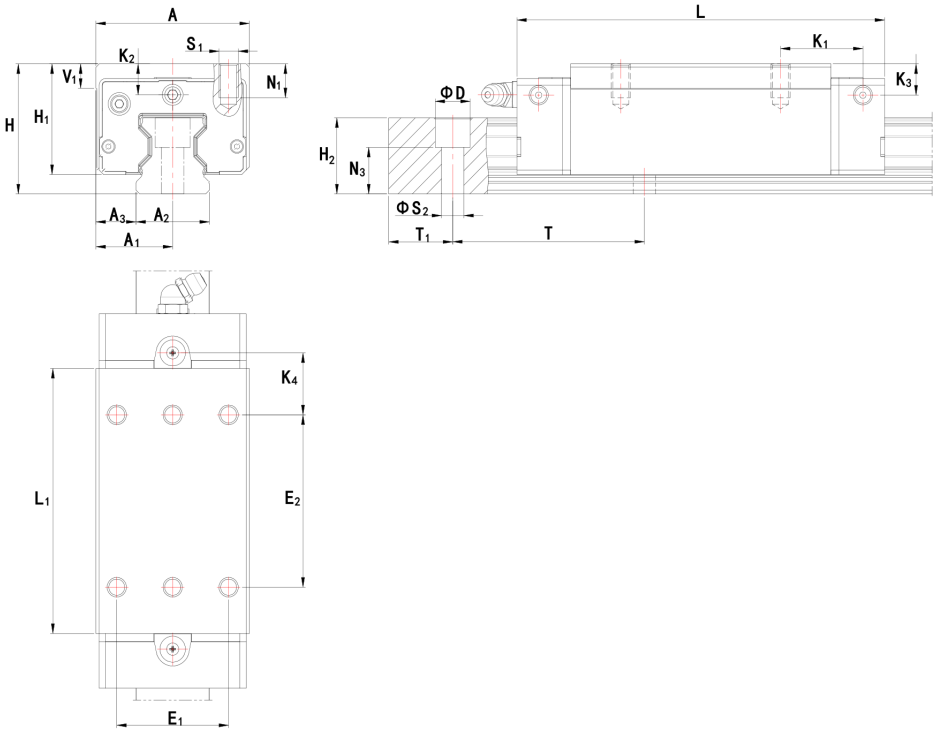
ORDERING Assign the carriage and rail order numbers using the coding system on the Ordering pages.

CARRIAGE ORDER NUMBERS

Size	Accuracy class	Carriage Order Number		
		C1	C2	C3
25	H (3)	VR24.213	VR24.223	
	P (2)	VR24.212	VR24.222	
	SP (1)		VR24.221	VR24.231
	UP (0)		VR24.220	VR24.230
30	H (3)	VR24.713	VR24.723	
	P (2)	VR24.712	VR24.722	
	SP (1)		VR24.721	VR24.731
	UP (0)		VR24.720	VR24.730
35	H (3)	VR24.313	VR24.323	
	P (2)	VR24.312	VR24.322	
	SP (1)		VR24.321	VR24.331
	UP (0)		VR24.320	VR24.330
45	H (3)	VR24.413	VR24.423	
	P (2)	VR24.412	VR24.422	
	SP (1)		VR24.421	VR24.431
	UP (0)		VR24.420	VR24.430
55	H (3)	VR24.513	VR24.523	
	P (2)	VR24.512	VR24.522	
	SP (1)		VR24.521	VR24.531
	UP (0)		VR24.520	VR24.530

VR24 — Dimensions

Roller Carriage · Narrow · Extended · Elevated



DIMENSIONS (mm)

Size	Model No.	Dimensions (mm)															
		A	A_1	A_2	A_3	L	L_1	E_1	E_2	H	H_1	H_2 1)	H_2 2)	K_1	K_2	K_3	K_4
VR25	VR24.2	48	24	23	12	117	81	35	50	40	34.5	24.25	24	23.5	9.5	10.4	21.5
VR30	VR24.7	60	30	28	16	136	96	40	60	45	38.5	28.25	28	26	9.1	8.9	25
VR35	VR24.3	70	35	34	18	142	103.6	50	72	55	48	31.1	30.8	24.4	14	14	22.5
VR45	VR24.4	86	43	45	20.5	179.5	134	60	80	70	61	39.1	38.8	36.5	18.1	18.1	33.8
VR55	VR24.5	100	50	53	23.5	209.65	162.1	75	95	80	68	47.85	47.55	44.35	18.95	18.9	40.35

LOAD RATINGS · STATIC MOMENTS · MASS

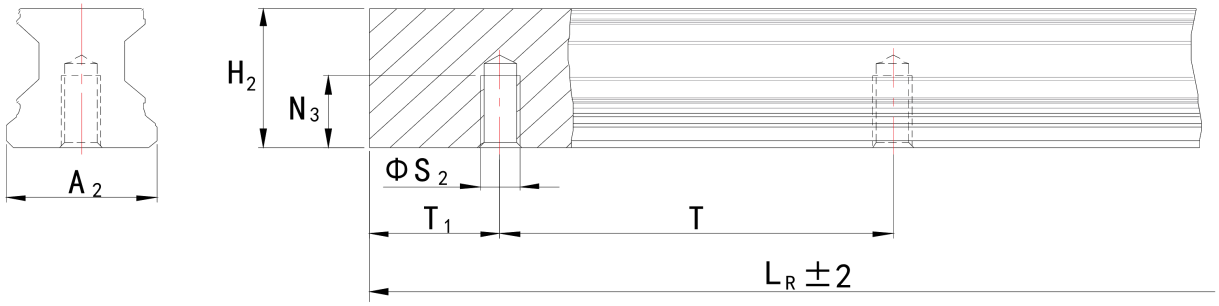
Size	Model No.	Dimensions (mm)								Load rating (N)		Static moment (N·m)				Mass	
		N_1	N_3	D	S_1	S_2	T	T_1	V_1	C	C_0	M_t	M_{t0}	M_L	M_{L0}	Carriage kg	Rail kg/m
VR25	VR24.2	9	15	11	M6	7	30	20	7.5	35580	75230	460	980	450	960	0.77	3.17
VR30	VR24.7	10	16	14	M8	9	40	20	7.8	56480	123330	960	2090	830	1800	1.19	4.6
VR35	VR24.3	12	19.8	15	M8	9	40	20	8	66990	139320	1330	2760	1090	2260	2.35	6.3
VR45	VR24.4	16	22.8	20	M10	14	52.5	22.5	10	116060	241480	2840	5920	2330	4850	4.45	10.3
VR55	VR24.5	16	28.7	23	M12	16	60	30	12	166600	338540	4890	9950	4250	8650	6.55	13.1

1) H_2 dimension with protective tape 2) H_2 dimension without protective tape

VR Series — Rails Mounted from Below

Guide rail with threaded holes, bolted from below · rail mounting-hole code 4

DRAWING



DIMENSIONS (MM)

Size	Dimensions (mm)								Mass
	A_2	H_2	$L_{R\,max}$ 1)	N_3	S_2	T	$T_{1\,min}$	T_1 2)	Rail kg/m
VR25	23	23.40	6000	12	M6	30.0	13	13.00	3.17
VR30	28	27.80	6000	15	M8	40.0	16	18.00	4.6
VR35	34	30.80	6000	15	M8	40.0	16	18.00	6.3
VR45	45	38.80	6000	19	M12	52.5	18	24.25	10.3
VR55	53	47.55	6000	22	M14	60.0	20	28.00	13.1
VR65	63	57.85	6000	25	M16	75.0	21	35.50	17.4

1) Maximum length of a one-piece rail 2) Recommended dimension, tolerance ±0.5 mm L_R rail length, tolerance ±2 mm

VB Series — Product Overview

The VB-Series ball guides use a pre-tensioned O-type (DB) arrangement engineered by the group R&D team for high rigidity and full interchangeability with mainstream European brands.

- Equally high load rating in all four principal load directions.
- Very low noise with excellent running smoothness.
- High dynamic performance: v max = 5 m/s, a max = 500 m/s².
- Full interchangeability — carriages and rails of the same accuracy class combine freely.
- The pre-tensioned O-arrangement offers greater system rigidity than an X-arrangement.

PRODUCT RANGE



VB51

Flanged · Standard Length · Standard Height



VB53

Flanged · Extended · Standard Height



VB22

Narrow · Standard Length · Standard Height



VB23

Narrow · Extended · Standard Height



VB21

Narrow · Standard Length · Elevated

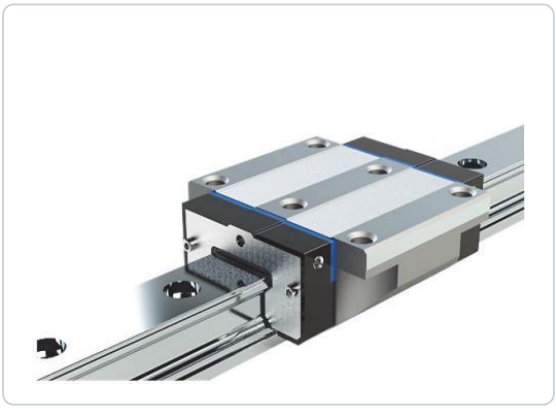


VB24

Narrow · Extended · Elevated

VB51

Ball Carriage · Flanged · Standard Length · Standard Height



DYNAMIC CHARACTERISTICS

Speed	**v max = 5 m/s**
Acceleration	**a max = 500 m/s²**

PRELOAD GRADES

C0	Preload 0–2 %C
C1	Preload 3 %C
C2	Preload 8 %C
C3	Preload 12 %C

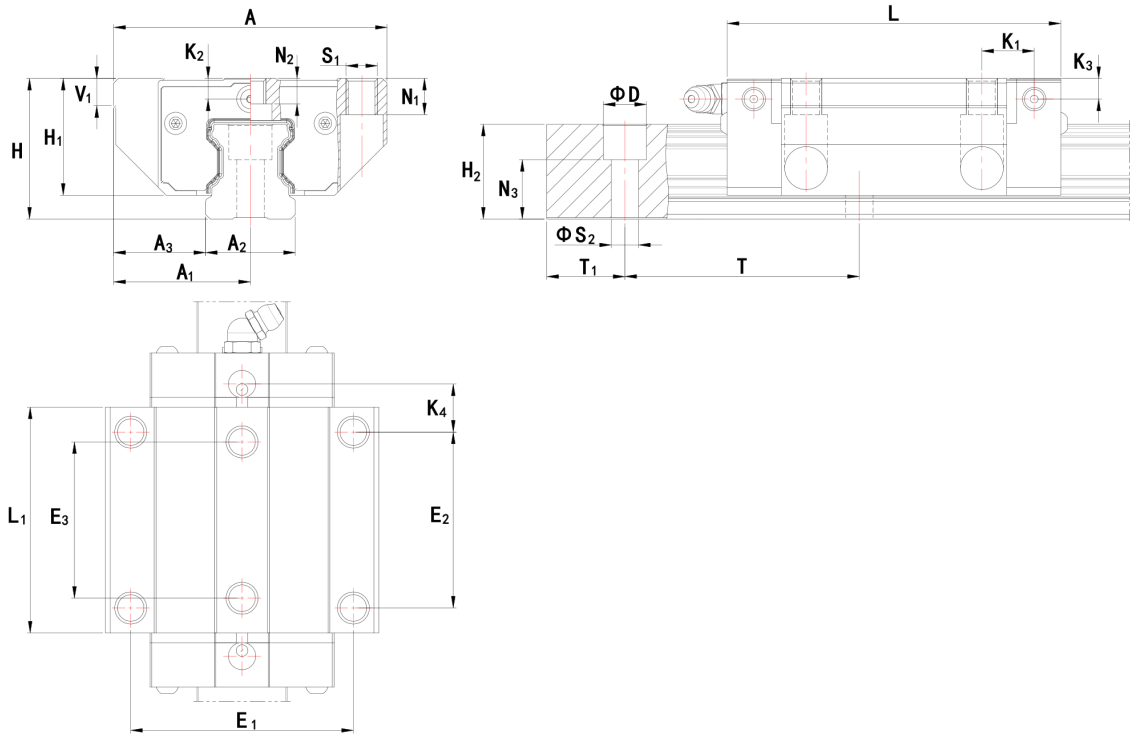
ORDERING Assign the carriage and rail order numbers using the coding system on the Ordering pages.

CARRIAGE ORDER NUMBERS

Size	Accuracy class	Carriage Order Number			
		C0	C1	C2	C3
15	N (4)	VB51.104	VB51.114		
	H (3)	VB51.103	VB51.113	VB51.123	
	P (2)		VB51.112	VB51.122	
	SP (1)		VB51.111	VB51.121	VB51.131
	UP (0)		VB51.110	VB51.120	VB51.130
20	N (4)	VB51.804	VB51.814		
	H (3)	VB51.803	VB51.813	VB51.823	
	P (2)		VB51.812	VB51.822	
	SP (1)		VB51.811	VB51.821	VB51.831
	UP (0)		VB51.810	VB51.820	VB51.830
25	N (4)	VB51.204	VB51.214		
	H (3)	VB51.203	VB51.213	VB51.223	
	P (2)		VB51.212	VB51.222	
	SP (1)		VB51.211	VB51.221	VB51.231
	UP (0)		VB51.210	VB51.220	VB51.230
30	N (4)	VB51.704	VB51.714		
	H (3)	VB51.703	VB51.713	VB51.723	
	P (2)		VB51.712	VB51.722	
	SP (1)		VB51.711	VB51.721	VB51.731
	UP (0)		VB51.710	VB51.720	VB51.730
35	N (4)	VB51.304	VB51.314		
	H (3)	VB51.303	VB51.313	VB51.323	
	P (2)		VB51.312	VB51.322	
	SP (1)		VB51.311	VB51.321	VB51.331
	UP (0)		VB51.310	VB51.320	VB51.330
45	N (4)	VB51.404	VB51.414		
	H (3)	VB51.403	VB51.413	VB51.423	
	P (2)		VB51.412	VB51.422	
	SP (1)		VB51.411	VB51.421	VB51.431
	UP (0)		VB51.410	VB51.420	VB51.430
55	N (4)	VB51.504	VB51.514		
	H (3)	VB51.503	VB51.513	VB51.523	
	P (2)		VB51.512	VB51.522	
	SP (1)		VB51.511	VB51.521	VB51.531
	UP (0)		VB51.510	VB51.520	VB51.530
65	N (4)	VB51.604	VB51.614		
	H (3)	VB51.603	VB51.613	VB51.623	
	P (2)		VB51.612	VB51.622	
	SP (1)		VB51.611	VB51.621	VB51.631
	UP (0)		VB51.610	VB51.620	VB51.630

VB51 — Dimensions

Ball Carriage · Flanged · Standard Length · Standard Height



DIMENSIONS (mm)

Size	Model No.	Dimensions (mm)																
		A	A_1	A_2	A_3	L	L_1	E_1	E_2	E_3	H	H_1	H_2 1)	H_2 2)	K_1	K_2	K_3	K_4
VB15	VB51.1	47	23.5	15	16	58.2	39.2	38	30	26	24	19.9	16.3	16.2	9.6	3.2	3.2	8.05
VB20	VB51.8	63	31.5	20	21.5	75	49.6	53	40	35	30	25.35	20.75	20.55	11.8	3.35	3.35	11.85
VB25	VB51.2	70	35	23	23.5	86.2	57.8	57	45	40	36	29.9	24.45	24.25	13.4	5.3	5.3	12.3
VB30	VB51.7	90	45	28	31	97.7	67.4	72	52	44	42	35.35	28.55	28.35	15.7	6.05	6.05	14
VB35	VB51.3	100	50	34	33	110.5	77	82	62	52	48	40.4	32.15	31.85	16	6.9	6.9	14.5
VB45	VB51.4	120	60	45	37.5	137.6	97	100	80	60	60	50.3	40.15	39.85	19.3	8.2	8.2	17
VB55	VB51.5	140	70	53	43.5	159	115.5	116	95	70	70	57	48.15	47.85	22.25	9	9	22.05
VB65	VB51.6	170	85	63	53.5	188	139.6	142	110	82	90	76	60.15	59.85	27.3	16	16	24.3

LOAD RATINGS · STATIC MOMENTS · MASS

Size	Model No.	Dimensions (mm)									Load rating (N)		Static moment (N·m)				Mass	
		N_1	N_2	N_3	D	S_1	S_2	T	T_1	V_1	C	C_0	M_t	M_{t0}	M_L	M_{L0}	Carriage kg	Rail kg/m
VB15	VB51.1	5.2	4.4	10.3	7.4	M5	4.5	60	20	5	8430	16260	80	160	60	120	0.2	1.4
VB20	VB51.8	7.7	5.2	13.2	9.4	M6	6	60	20	6	16680	29940	210	390	140	270	0.45	2.4
VB25	VB51.2	9.3	7	15.2	11	M8	7	60	20	7.5	20020	36590	290	530	200	370	0.65	3.2
VB30	VB51.7	11	7.9	17	15	M10	9	80	20	7	27800	49780	490	870	340	610	1.1	5.0
VB35	VB51.3	12	10.15	20.5	15	M10	9	80	20	8	36970	65030	800	1410	520	920	1.6	6.8
VB45	VB51.4	15	12.4	23.5	20	M12	14	105	22.5	10	60510	103100	1650	2820	1090	1860	3	10.5
VB55	VB51.5	18	13.5	29	23	M14	16	120	30	12	76300	121800	2440	3890	1630	2590	5.2	16.2
VB65	VB51.6	23	14	38.5	26	M16	18	150	35	15	120400	196000	4770	7770	3190	5180	10.25	22.4

1) H_2 dimension with protective tape 2) H_2 dimension without protective tape

VB53

Ball Carriage · Flanged · Extended · Standard Height



DYNAMIC CHARACTERISTICS

Speed	**v max = 5 m/s**
Acceleration	**a max = 500 m/s²**

PRELOAD GRADES

C0	Preload 0–2 %C
C1	Preload 3 %C
C2	Preload 8 %C
C3	Preload 12 %C

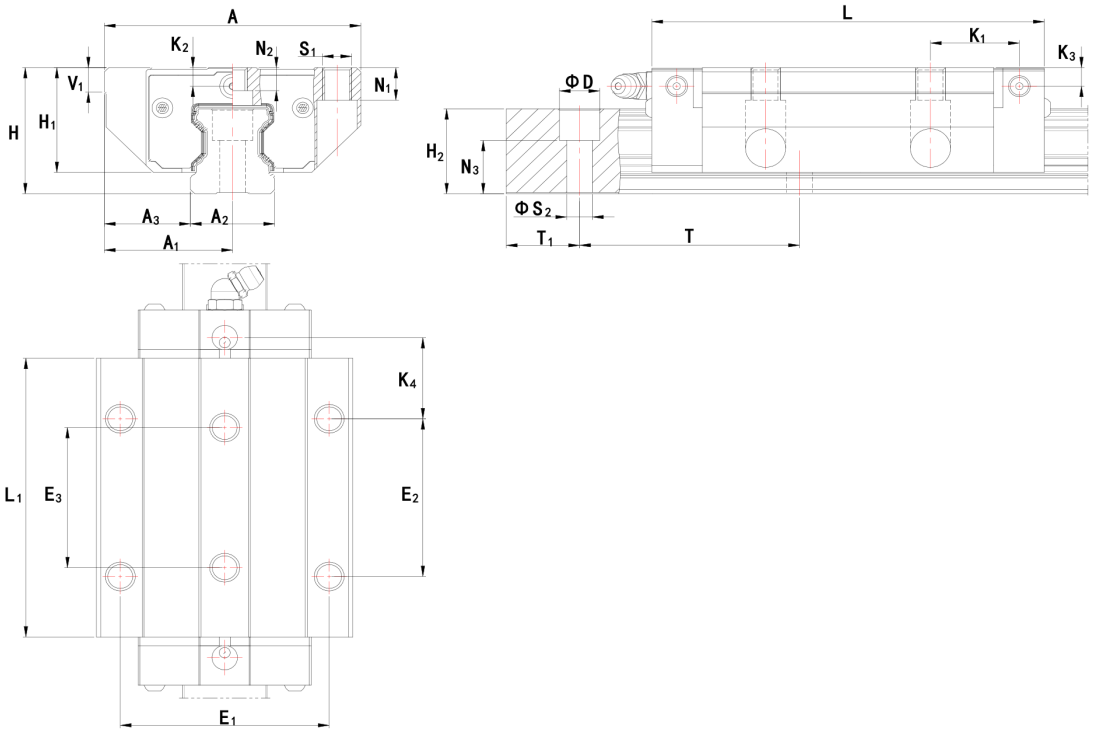
ORDERING Assign the carriage and rail order numbers using the coding system on the Ordering pages.

CARRIAGE ORDER NUMBERS

Size	Accuracy class	Carriage Order Number			
		C0	C1	C2	C3
15	N (4)	VB53.104	VB53.114		
	H (3)	VB53.103	VB53.113	VB53.123	
	P (2)		VB53.112	VB53.122	
	SP (1)		VB53.111	VB53.121	VB53.131
	UP (0)		VB53.110	VB53.120	VB53.130
20	N (4)	VB53.804	VB53.814		
	H (3)	VB53.803	VB53.813	VB53.823	
	P (2)		VB53.812	VB53.822	
	SP (1)		VB53.811	VB53.821	VB53.831
	UP (0)		VB53.810	VB53.820	VB53.830
25	N (4)	VB53.204	VB53.214		
	H (3)	VB53.203	VB53.213	VB53.223	
	P (2)		VB53.212	VB53.222	
	SP (1)		VB53.211	VB53.221	VB53.231
	UP (0)		VB53.210	VB53.220	VB53.230
30	N (4)	VB53.704	VB53.714		
	H (3)	VB53.703	VB53.713	VB53.723	
	P (2)		VB53.712	VB53.722	
	SP (1)		VB53.711	VB53.721	VB53.731
	UP (0)		VB53.710	VB53.720	VB53.730
35	N (4)	VB53.304	VB53.314		
	H (3)	VB53.303	VB53.313	VB53.323	
	P (2)		VB53.312	VB53.322	
	SP (1)		VB53.311	VB53.321	VB53.331
	UP (0)		VB53.310	VB53.320	VB53.330
45	N (4)	VB53.404	VB53.414		
	H (3)	VB53.403	VB53.413	VB53.423	
	P (2)		VB53.412	VB53.422	
	SP (1)		VB53.411	VB53.421	VB53.431
	UP (0)		VB53.410	VB53.420	VB53.430
55	N (4)	VB53.504	VB53.514		
	H (3)	VB53.503	VB53.513	VB53.523	
	P (2)		VB53.512	VB53.522	
	SP (1)		VB53.511	VB53.521	VB53.531
	UP (0)		VB53.510	VB53.520	VB53.530
65	N (4)	VB53.604	VB53.614		
	H (3)	VB53.603	VB53.613	VB53.623	
	P (2)		VB53.612	VB53.622	
	SP (1)		VB53.611	VB53.621	VB53.631
	UP (0)		VB53.610	VB53.620	VB53.630

VB53 — Dimensions

Ball Carriage · Flanged · Extended · Standard Height



DIMENSIONS (mm)

Size	Model No.	Dimensions (mm)																
		A	A_1	A_2	A_3	L	L_1	E_1	E_2	E_3	H	H_1	H_2 1)	H_2 2)	K_1	K_2	K_3	K_4
VB15	VB53.1	47	23.5	15	16.0	72.6	53.6	38	30	26	24	19.90	16.30	16.20	16.80	3.2	3.2	15.25
VB20	VB53.8	63	31.5	20	21.5	91.0	65.6	53	40	35	30	25.35	20.75	20.55	19.80	3.35	3.35	19.85
VB25	VB53.2	70	35.0	23	23.5	107.9	79.5	57	45	40	36	29.90	24.45	24.25	24.25	5.3	5.3	23.15
VB30	VB53.7	90	45.0	28	31.0	119.7	89.4	72	52	44	42	35.35	28.55	28.35	26.70	6.05	6.05	25
VB35	VB53.3	100	50.0	34	33.0	139.0	105.5	82	62	52	48	40.40	32.15	31.85	30.25	6.9	6.9	28.75
VB45	VB53.4	120	60.0	45	37.5	174.1	133.5	100	80	60	60	50.30	40.15	39.85	37.55	8.2	8.2	35.25
VB55	VB53.5	140	70	53	43.5	199	155.5	116	95	70	70	57	48.15	47.85	42.25	9	9	42.05
VB65	VB53.6	170	85	63	53.5	243	194.6	142	110	82	90	76	60.15	59.85	54.8	16	16	51.8

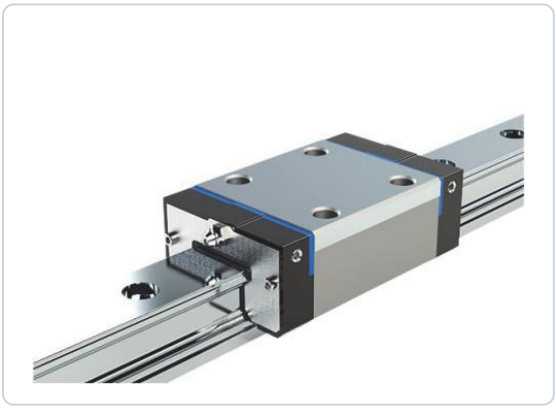
LOAD RATINGS · STATIC MOMENTS · MASS

Size	Model No.	Dimensions (mm)									Load rating (N)		Static moment (N·m)				Mass	
		N_1	N_2	N_3	D	S_1	S_2	T	T_1	V_1	C	C_0	M_t	M_{t0}	M_L	M_{L0}	Carriage kg	Rail kg/m
VB15	VB53.1	5.2	4.4	10.3	7.4	M5	4.5	60	20	5	10320	21680	100	210	70	150	0.3	1.4
VB20	VB53.8	7.7	5.2	13.2	9.4	M6	6	60	20	6	19780	38100	260	490	170	340	0.55	2.4
VB25	VB53.2	9.3	7	15.2	11	M8	7	60	20	7.5	24510	48780	350	700	250	500	0.9	3.2
VB30	VB53.7	11	7.9	17	15	M10	9	80	20	7	34000	66380	600	1160	420	810	1.5	5.0
VB35	VB53.3	12	10.15	20.5	15	M10	9	80	20	8	45260	86700	980	1880	640	1220	2.25	6.8
VB45	VB53.4	15	12.4	23.5	20	M12	14	105	22.5	10	74090	137620	2020	3760	1340	2480	4.3	10.5
VB55	VB53.5	18	13.5	29	23	M14	16	120	30	12	97300	171500	3090	5450	2060	3620	7.5	16.2
VB65	VB53.6	23	14	38.5	26	M16	18	150	35	15	156100	282800	6170	11200	4130	7470	14.15	22.4

1) H_2 dimension with protective tape 2) H_2 dimension without protective tape

VB22

Ball Carriage · Narrow · Standard Length · Standard Height



DYNAMIC CHARACTERISTICS

Speed	**v max = 5 m/s**
Acceleration	**a max = 500 m/s²**

PRELOAD GRADES

C0	Preload 0–2 %C
C1	Preload 3 %C
C2	Preload 8 %C
C3	Preload 12 %C

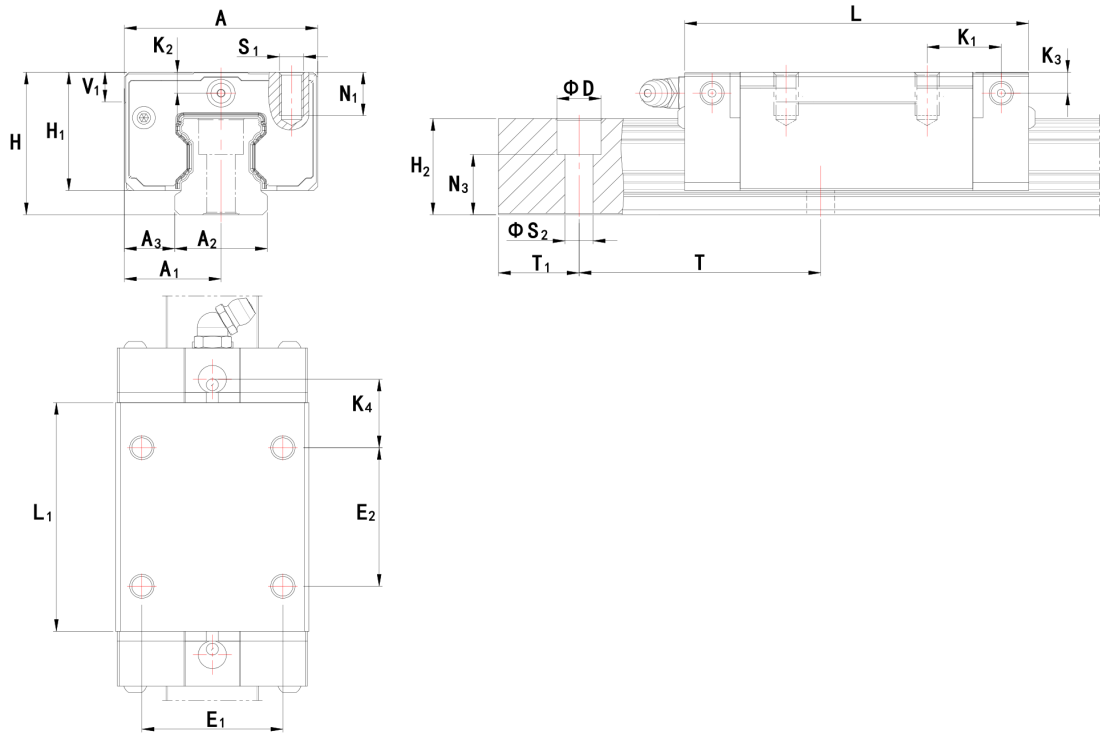
ORDERING Assign the carriage and rail order numbers using the coding system on the Ordering pages.

CARRIAGE ORDER NUMBERS

Size	Accuracy class	Carriage Order Number			
		C0	C1	C2	C3
15	N (4)	VB22.104	VB22.114		
	H (3)	VB22.103	VB22.113	VB22.123	
	P (2)		VB22.112	VB22.122	
	SP (1)		VB22.111	VB22.121	VB22.131
	UP (0)		VB22.110	VB22.120	VB22.130
20	N (4)	VB22.804	VB22.814		
	H (3)	VB22.803	VB22.813	VB22.823	
	P (2)		VB22.812	VB22.822	
	SP (1)		VB22.811	VB22.821	VB22.831
	UP (0)		VB22.810	VB22.820	VB22.830
25	N (4)	VB22.204	VB22.214		
	H (3)	VB22.203	VB22.213	VB22.223	
	P (2)		VB22.212	VB22.222	
	SP (1)		VB22.211	VB22.221	VB22.231
	UP (0)		VB22.210	VB22.220	VB22.230
30	N (4)	VB22.704	VB22.714		
	H (3)	VB22.703	VB22.713	VB22.723	
	P (2)		VB22.712	VB22.722	
	SP (1)		VB22.711	VB22.721	VB22.731
	UP (0)		VB22.710	VB22.720	VB22.730
35	N (4)	VB22.304	VB22.314		
	H (3)	VB22.303	VB22.313	VB22.323	
	P (2)		VB22.312	VB22.322	
	SP (1)		VB22.311	VB22.321	VB22.331
	UP (0)		VB22.310	VB22.320	VB22.330
45	N (4)	VB22.404	VB22.414		
	H (3)	VB22.403	VB22.413	VB22.423	
	P (2)		VB22.412	VB22.422	
	SP (1)		VB22.411	VB22.421	VB22.431
	UP (0)		VB22.410	VB22.420	VB22.430
55	N (4)	VB22.504	VB22.514		
	H (3)	VB22.503	VB22.513	VB22.523	
	P (2)		VB22.512	VB22.522	
	SP (1)		VB22.511	VB22.521	VB22.531
	UP (0)		VB22.510	VB22.520	VB22.530
65	N (4)	VB22.604	VB22.614		
	H (3)	VB22.603	VB22.613	VB22.623	
	P (2)		VB22.612	VB22.622	
	SP (1)		VB22.611	VB22.621	VB22.631
	UP (0)		VB22.610	VB22.620	VB22.630

VB22 — Dimensions

Ball Carriage · Narrow · Standard Length · Standard Height



DIMENSIONS (mm)

Size	Model No.	Dimensions (mm)															
		A	A_1	A_2	A_3	L	L_1	E_1	E_2	H	H_1	H_2 1)	H_2 2)	K_1	K_2	K_3	K_4
VB15	VB22.1	34	17	15	9.5	58.2	39.2	26	26	24	19.9	16.3	16.2	11.6	3.2	3.2	10.05
VB20	VB22.8	44	22	20	12	75	49.6	32	36	30	25.35	20.75	20.55	13.8	3.35	3.35	13.85
VB25	VB22.2	48	24	23	12.5	86.2	57.8	35	35	36	29.9	24.45	24.25	18.4	5.3	5.3	17.3
VB30	VB22.7	60	30	28	16	97.7	67.4	40	40	42	35.35	28.55	28.35	21.7	6.05	6.05	20
VB35	VB22.3	70	35	34	18	110.5	77	50	50	48	40.4	32.15	31.85	22	6.9	6.9	20.5
VB45	VB22.4	86	45	45	20.5	137.6	97	60	60	60	50.3	40.15	39.85	29.3	8.2	8.2	27
VB55	VB22.5	100	50	53	23.5	159	115.5	75	75	70	57	48.15	47.85	32.25	9	9	32.05
VB65	VB22.6	126	63	63	31.5	188	139.6	76	70	90	76	60.15	59.85	47.3	16	16	44.3

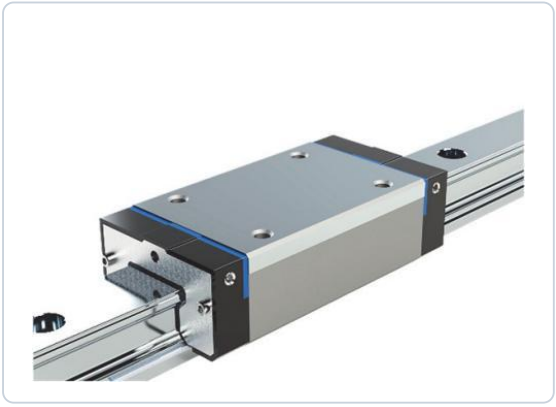
LOAD RATINGS · STATIC MOMENTS · MASS

Size	Model No.	Dimensions (mm)								Load rating (N)		Static moment (N·m)				Mass	
		N_1	N_3	D	S_1	S_2	T	T_1	V_1	C	C_0	M_t	M_{t0}	M_L	M_{L0}	Carriage kg	Rail kg/m
VB15	VB22.1	5.5	10.3	7.4	M4	4.5	60	20	5	8430	16260	80	160	60	120	0.15	1.4
VB20	VB22.8	7	13.2	9.4	M5	6	60	20	6	16680	29940	210	390	140	270	0.35	2.4
VB25	VB22.2	9	15.2	11	M6	7	60	20	7.5	20020	36590	290	530	200	370	0.5	3.2
VB30	VB22.7	11	17	15	M8	9	80	20	7	27800	49780	490	870	340	610	0.85	5.0
VB35	VB22.3	12	20.5	15	M8	9	80	20	8	36970	65030	800	1410	520	920	1.25	6.8
VB45	VB22.4	18	23.5	20	M10	14	105	22.5	10	60510	103100	1650	2820	1090	1860	2.4	10.5
VB55	VB22.5	19	29	23	M12	16	120	30	12	76300	121800	2440	3890	1630	2590	3.8	16.2
VB65	VB22.6	21	38.5	26	M16	18	150	35	15	120400	196000	4770	7770	3190	5180	6.9	22.4

1) H_2 dimension with protective tape 2) H_2 dimension without protective tape

VB23

Ball Carriage · Narrow · Extended · Standard Height



DYNAMIC CHARACTERISTICS

Speed	**v max = 5 m/s**
Acceleration	**a max = 500 m/s²**

PRELOAD GRADES

C0	Preload 0–2 %C
C1	Preload 3 %C
C2	Preload 8 %C
C3	Preload 12 %C

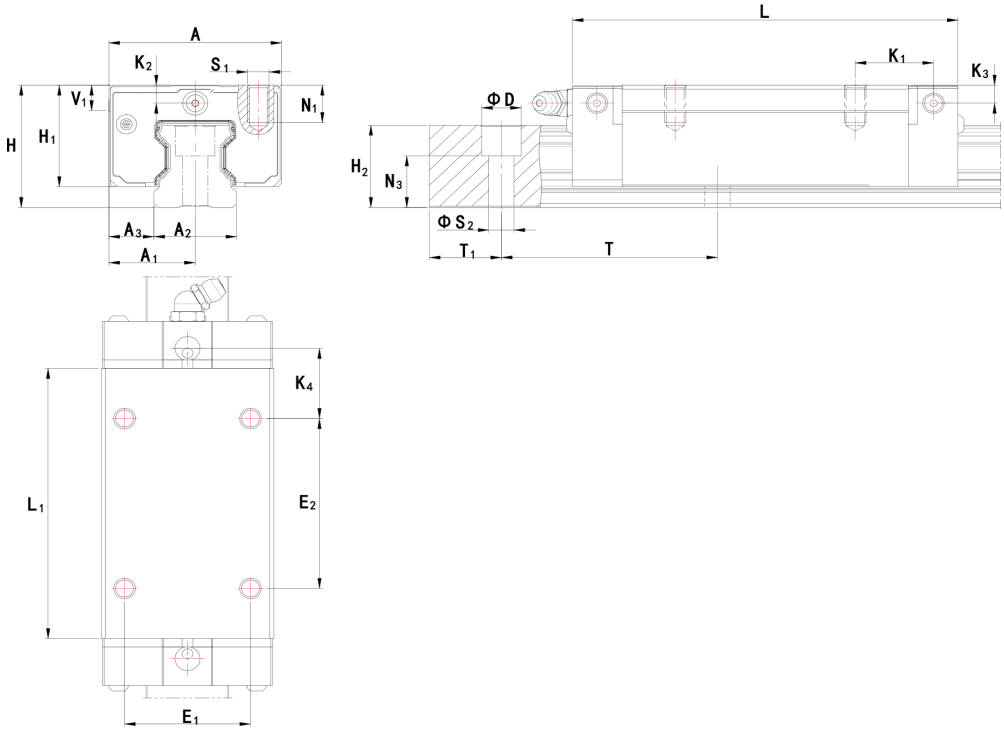
ORDERING Assign the carriage and rail order numbers using the coding system on the Ordering pages.

CARRIAGE ORDER NUMBERS

Size	Accuracy class	Carriage Order Number			
		C0	C1	C2	C3
15	N (4)	VB23.104	VB23.114		
	H (3)	VB23.103	VB23.113	VB23.123	
	P (2)		VB23.112	VB23.122	
	SP (1)		VB23.111	VB23.121	VB23.131
	UP (0)		VB23.110	VB23.120	VB23.130
20	N (4)	VB23.804	VB23.814		
	H (3)	VB23.803	VB23.813	VB23.823	
	P (2)		VB23.812	VB23.822	
	SP (1)		VB23.811	VB23.821	VB23.831
	UP (0)		VB23.810	VB23.820	VB23.830
25	N (4)	VB23.204	VB23.214		
	H (3)	VB23.203	VB23.213	VB23.223	
	P (2)		VB23.212	VB23.222	
	SP (1)		VB23.211	VB23.221	VB23.231
	UP (0)		VB23.210	VB23.220	VB23.230
30	N (4)	VB23.704	VB23.714		
	H (3)	VB23.703	VB23.713	VB23.723	
	P (2)		VB23.712	VB23.722	
	SP (1)		VB23.711	VB23.721	VB23.731
	UP (0)		VB23.710	VB23.720	VB23.730
35	N (4)	VB23.304	VB23.314		
	H (3)	VB23.303	VB23.313	VB23.323	
	P (2)		VB23.312	VB23.322	
	SP (1)		VB23.311	VB23.321	VB23.331
	UP (0)		VB23.310	VB23.320	VB23.330
45	N (4)	VB23.404	VB23.414		
	H (3)	VB23.403	VB23.413	VB23.423	
	P (2)		VB23.412	VB23.422	
	SP (1)		VB23.411	VB23.421	VB23.431
	UP (0)		VB23.410	VB23.420	VB23.430
55	N (4)	VB23.504	VB23.514		
	H (3)	VB23.503	VB23.513	VB23.523	
	P (2)		VB23.512	VB23.522	
	SP (1)		VB23.511	VB23.521	VB23.531
	UP (0)		VB23.510	VB23.520	VB23.530
65	N (4)	VB23.604	VB23.614		
	H (3)	VB23.603	VB23.613	VB23.623	
	P (2)		VB23.612	VB23.622	
	SP (1)		VB23.611	VB23.621	VB23.631
	UP (0)		VB23.610	VB23.620	VB23.630

VB23 — Dimensions

Ball Carriage · Narrow · Extended · Standard Height



DIMENSIONS (mm)

Size	Model No.	Dimensions (mm)															
		A	A_1	A_2	A_3	L	L_1	E_1	E_2	H	H_1	H_2 1)	H_2 2)	K_1	K_2	K_3	K_4
VB15	VB23.1	34	17	15	9.5	72.6	53.6	26	26	24	19.9	16.3	16.2	18.8	3.2	3.2	17.25
VB20	VB23.8	44	22	20	12	91	65.6	32	50	30	25.35	20.75	20.55	14.8	3.35	3.35	14.85
VB25	VB23.2	48	24	23	12.5	107.9	79.5	35	50	36	29.9	24.45	24.25	21.75	5.3	5.3	20.65
VB30	VB23.7	60	30	28	16	119.7	89.4	40	60	42	35.35	28.55	28.35	22.7	6.05	6.05	21
VB35	VB23.3	70	35	34	18	139	105.5	50	72	48	40.4	32.15	31.85	25.25	6.9	6.9	23.75
VB45	VB23.4	86	43	45	20.5	174.1	133.5	60	80	60	50.3	40.15	39.85	37.55	8.2	8.2	35.25
VB55	VB23.5	100	50	53	23.5	199	155.5	75	95	70	57	48.15	47.85	42.25	9	9	42.05
VB65	VB23.6	126	63	63	31.5	243	194.6	76	120	90	76	60.15	59.85	49.8	16	16	46.8

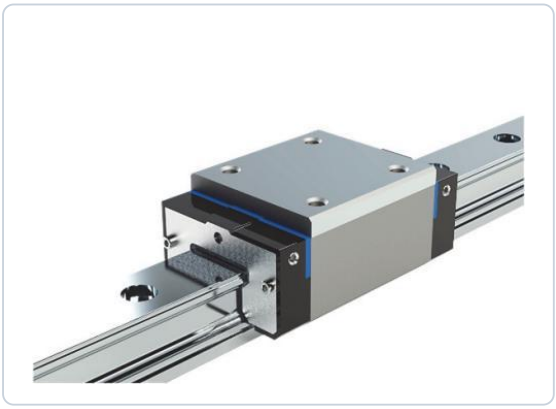
LOAD RATINGS · STATIC MOMENTS · MASS

Size	Model No.	Dimensions (mm)								Load rating (N)		Static moment (N·m)				Mass	
		N_1	N_3	D	S_1	S_2	T	T_1	V_1	C	C_0	M_t	M_{t0}	M_L	M_{L0}	Carriage kg	Rail kg/m
VB15	VB23.1	5.5	10.3	7.4	M4	4.5	60	20	5	10320	21680	100	210	70	150	0.2	1.4
VB20	VB23.8	7	13.2	9.4	M5	6	60	20	6	19780	38100	260	490	170	340	0.45	2.4
VB25	VB23.2	9	15.2	11	M6	7	60	20	7.5	24510	48780	350	700	250	500	0.65	3.2
VB30	VB23.7	11	17	15	M8	9	80	20	7	34000	66380	600	1160	420	810	1.1	5.0
VB35	VB23.3	12	20.5	15	M8	9	80	20	8	45260	86700	980	1880	640	1220	1.7	6.8
VB45	VB23.4	18	23.5	20	M10	14	105	22.5	10	74090	137620	2020	3760	1340	2480	3.2	10.5
VB55	VB23.5	19	29	23	M12	16	120	30	12	97300	171500	3090	5450	2060	3620	4.8	16.2
VB65	VB23.6	21	38.5	26	M16	18	150	35	15	156100	282800	6170	11200	4130	7470	9.8	22.4

1) H_2 dimension with protective tape 2) H_2 dimension without protective tape

VB21

Ball Carriage · Narrow · Standard Length · Elevated



DYNAMIC CHARACTERISTICS

Speed	**v max = 5 m/s**
Acceleration	**a max = 500 m/s²**

PRELOAD GRADES

C0	Preload 0–2 %C
C1	Preload 3 %C
C2	Preload 8 %C
C3	Preload 12 %C

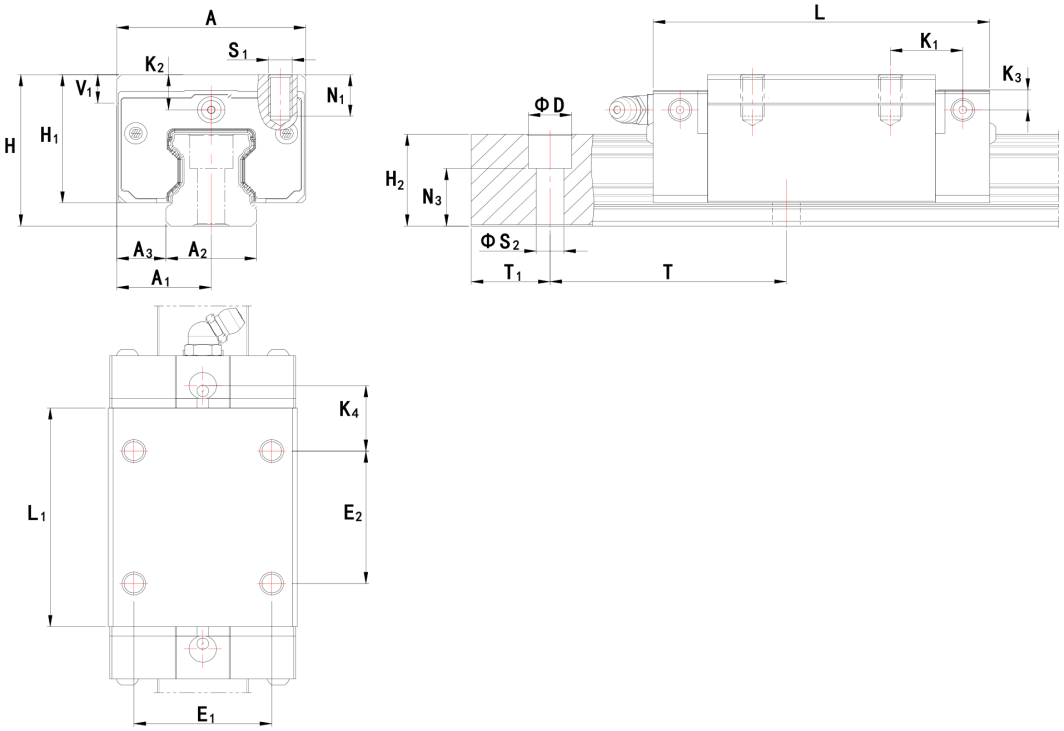
ORDERING Assign the carriage and rail order numbers using the coding system on the Ordering pages.

CARRIAGE ORDER NUMBERS

Size	Accuracy class	Carriage Order Number			
		C0	C1	C2	C3
15	N (4)	VB21.104	VB21.114		
	H (3)	VB21.103	VB21.113	VB21.123	
	P (2)		VB21.112	VB21.122	
	SP (1)		VB21.111	VB21.121	VB21.131
	UP (0)		VB21.110	VB21.120	VB21.130
25	N (4)	VB21.204	VB21.214		
	H (3)	VB21.203	VB21.213	VB21.223	
	P (2)		VB21.212	VB21.222	
	SP (1)		VB21.211	VB21.221	VB21.231
	UP (0)		VB21.210	VB21.220	VB21.230
30	N (4)	VB21.704	VB21.714		
	H (3)	VB21.703	VB21.713	VB21.723	
	P (2)		VB21.712	VB21.722	
	SP (1)		VB21.711	VB21.721	VB21.731
	UP (0)		VB21.710	VB21.720	VB21.730
35	N (4)	VB21.304	VB21.314		
	H (3)	VB21.303	VB21.313	VB21.323	
	P (2)		VB21.312	VB21.322	
	SP (1)		VB21.311	VB21.321	VB21.331
	UP (0)		VB21.310	VB21.320	VB21.330
45	N (4)	VB21.404	VB21.414		
	H (3)	VB21.403	VB21.413	VB21.423	
	P (2)		VB21.412	VB21.422	
	SP (1)		VB21.411	VB21.421	VB21.431
	UP (0)		VB21.410	VB21.420	VB21.430
55	N (4)	VB21.504	VB21.514		
	H (3)	VB21.503	VB21.513	VB21.523	
	P (2)		VB21.512	VB21.522	
	SP (1)		VB21.511	VB21.521	VB21.531
	UP (0)		VB21.510	VB21.520	VB21.530

VB21 — Dimensions

Ball Carriage · Narrow · Standard Length · Elevated



DIMENSIONS (mm)

Size	Model No.	Dimensions (mm)															
		A	A_1	A_2	A_3	L	L_1	E_1	E_2	H	H_1	H_2 1)	H_2 2)	K_1	K_2	K_3	K_4
VB15	VB21.1	34	17	15	9.5	58.2	39.2	26	26	28	23.9	16.3	16.2	11.6	7.2	7.2	10.05
VB25	VB21.2	48	24	23	12.5	86.2	57.8	35	35	40	33.9	24.45	24.25	18.4	9.3	9.3	17.3
VB30	VB21.7	60	30	28	16	97.7	67.4	40	40	45	38.35	28.55	28.35	21.7	9.05	9.05	20
VB35	VB21.3	70	35	34	18	110.5	77	50	50	55	47.4	32.15	31.85	22	13.9	13.9	20.5
VB45	VB21.4	86	43	45	20.5	137.6	97	60	60	70	60.3	40.15	39.85	29.3	18.2	18.2	27
VB55	VB21.5	100	50	53	23.5	159	115.5	75	75	80	67	48.15	47.85	32.25	19	19	32.05

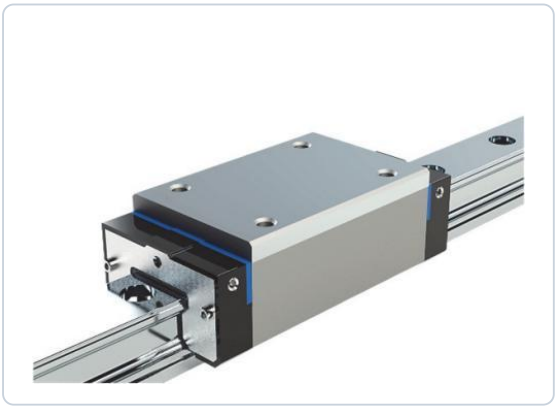
LOAD RATINGS · STATIC MOMENTS · MASS

Size	Model No.	Dimensions (mm)								Load rating (N)		Static moment (N·m)				Mass	
		N_1	N_3	D	S_1	S_2	T	T_1	V_1	C	C_0	M_t	M_{t0}	M_L	M_{L0}	Carriage kg	Rail kg/m
VB15	VB21.1	5.5	10.3	7.4	M4	4.5	60	20	5	8430	16260	80	160	60	120	0.2	1.4
VB25	VB21.2	9	15.2	11	M6	7	60	20	7.5	20020	36590	230	530	200	370	0.65	3.2
VB30	VB21.7	11	17	15	M8	9	80	20	7	27800	49780	490	870	340	610	0.95	5.0
VB35	VB21.3	12	20.5	15	M8	9	80	20	8	36970	65030	800	1410	520	920	1.55	6.8
VB45	VB21.4	18	23.5	20	M10	14	105	22.5	10	60510	103100	1650	2820	1090	1860	3	10.5
VB55	VB21.5	19	29	23	M12	16	120	30	12	76300	121800	2440	3890	1630	2590	4.7	16.2

1) H_2 dimension with protective tape 2) H_2 dimension without protective tape

VB24

Ball Carriage · Narrow · Extended · Elevated



DYNAMIC CHARACTERISTICS

Speed	**v max = 5 m/s**
Acceleration	**a max = 500 m/s²**

PRELOAD GRADES

C0	Preload 0–2 %C
C1	Preload 3 %C
C2	Preload 8 %C
C3	Preload 12 %C

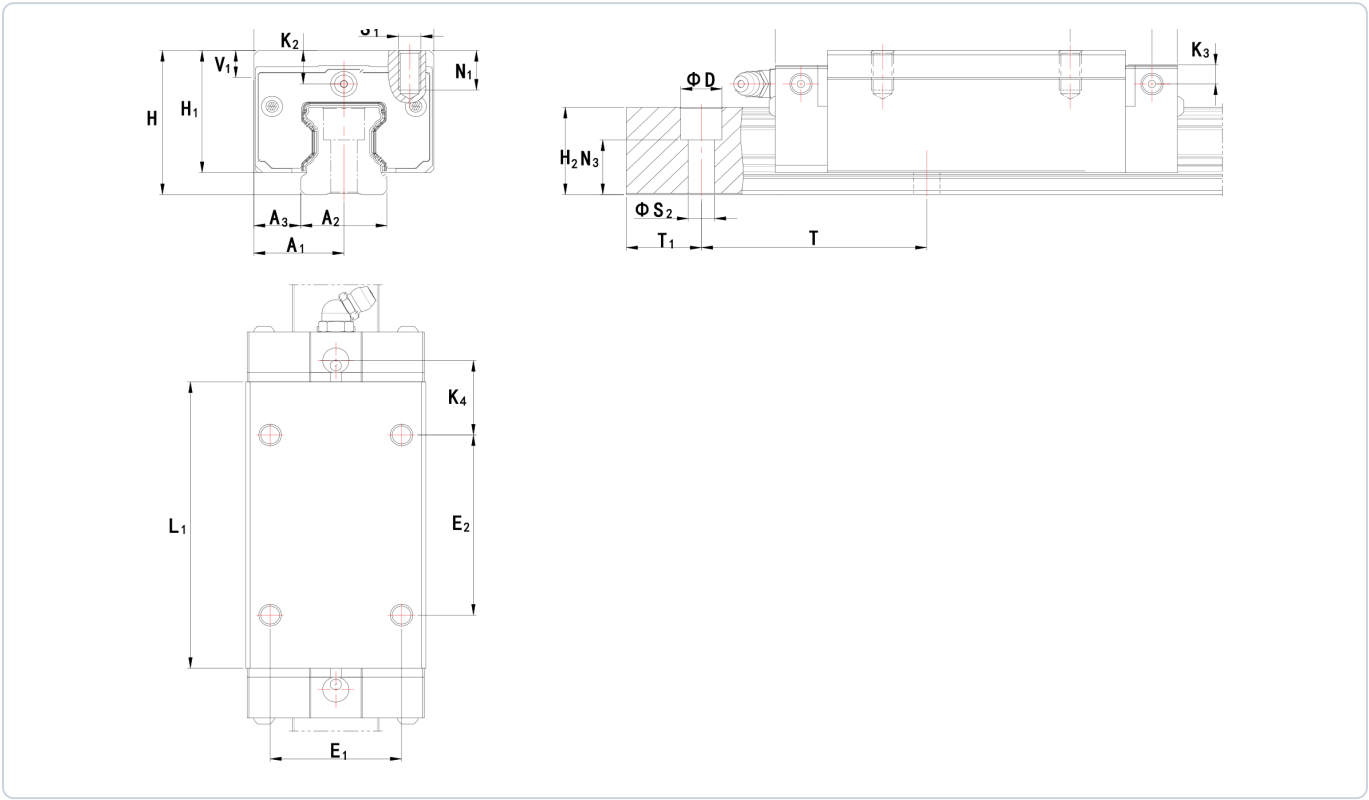
ORDERING Assign the carriage and rail order numbers using the coding system on the Ordering pages.

CARRIAGE ORDER NUMBERS

Size	Accuracy class	Carriage Order Number			
		C0	C1	C2	C3
25	N (4)	VB24.204	VB24.214		
	H (3)	VB24.203	VB24.213	VB24.223	
	P (2)		VB24.212	VB24.222	
	SP (1)		VB24.211	VB24.221	VB24.231
	UP (0)		VB24.210	VB24.220	VB24.230
30	N (4)	VB24.704	VB24.714		
	H (3)	VB24.703	VB24.713	VB24.723	
	P (2)		VB24.712	VB24.722	
	SP (1)		VB24.711	VB24.721	VB24.731
	UP (0)		VB24.710	VB24.720	VB24.730
35	N (4)	VB24.304	VB24.314		
	H (3)	VB24.303	VB24.313	VB24.323	
	P (2)		VB24.312	VB24.322	
	SP (1)		VB24.311	VB24.321	VB24.331
	UP (0)		VB24.310	VB24.320	VB24.330
45	N (4)	VB24.404	VB24.414		
	H (3)	VB24.403	VB24.413	VB24.423	
	P (2)		VB24.412	VB24.422	
	SP (1)		VB24.411	VB24.421	VB24.431
	UP (0)		VB24.410	VB24.420	VB24.430
55	N (4)	VB24.504	VB24.514		
	H (3)	VB24.503	VB24.513	VB24.523	
	P (2)		VB24.512	VB24.522	
	SP (1)		VB24.511	VB24.521	VB24.531
	UP (0)		VB24.510	VB24.520	VB24.530

VB24 — Dimensions

Ball Carriage · Narrow · Extended · Elevated



DIMENSIONS (mm)

Size	Model No.	Dimensions (mm)															
		A	A_1	A_2	A_3	L	L_1	E_1	E_2	H	H_1	H_2 1)	H_2 2)	K_1	K_2	K_3	K_4
VB25	VB24.2	48	24	23	12.5	107.9	79.5	35	50	40	33.9	24.45	24.25	21.75	9.3	9.3	20.65
VB30	VB24.7	60	30	28	16	119.7	89.4	40	60	45	38.35	28.55	28.35	22.7	9.05	9.05	21
VB35	VB24.3	70	35	34	18	139	105.5	50	72	55	47.4	32.15	31.85	25.25	13.9	13.9	23.75
VB45	VB24.4	86	43	45	20.5	174.1	133.5	60	80	70	60.3	40.15	39.85	37.55	18.2	18.2	35.25
VB55	VB24.5	100	50	53	23.5	199	155.5	75	95	80	67	48.15	47.85	42.25	19	19	42.05

LOAD RATINGS · STATIC MOMENTS · MASS

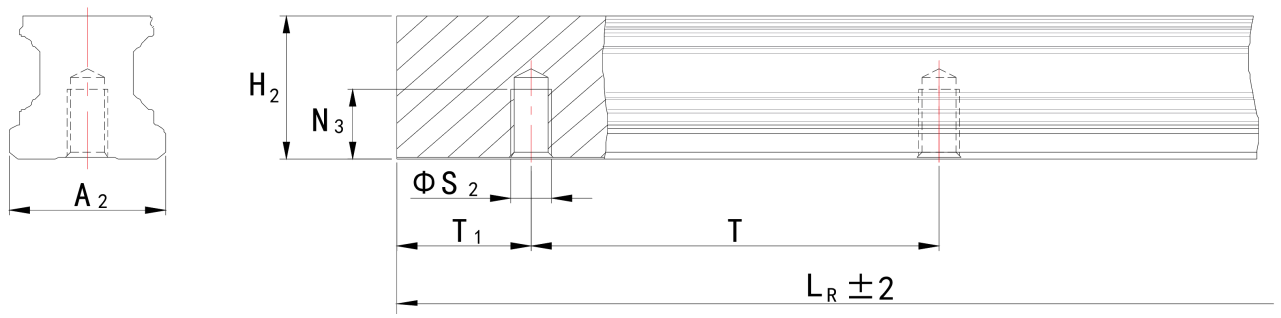
Size	Model No.	Dimensions (mm)								Load rating (N)		Static moment (N·m)				Mass	
		N_1	N_3	D	S_1	S_2	T	T_1	V_1	C	C_0	M_t	M_{t0}	M_L	M_{L0}	Carriage kg	Rail kg/m
VB25	VB24.2	9	15.2	11	M6	7	60	20	7.5	24510	48780	350	700	250	500	0.8	3.2
VB30	VB24.7	11	17	15	M8	9	80	20	7	34000	66380	600	1160	420	810	1.2	5.0
VB35	VB24.3	12	20.5	15	M8	9	80	20	8	45260	86700	980	1880	640	1220	2.1	6.8
VB45	VB24.4	18	23.5	20	M10	14	105	22.5	10	74090	137620	2020	3760	1340	2480	4.1	10.5
VB55	VB24.5	19	29	23	M12	16	120	30	12	97300	171500	3090	5450	2060	3620	6	16.2

1) H_2 dimension with protective tape 2) H_2 dimension without protective tape

VB Series — Rails Mounted from Below

Guide rail with threaded holes, bolted from below · rail mounting-hole code 4

DRAWING



DIMENSIONS (MM)

Size	Dimensions (mm)									Mass
	A_2	H_2	$L_{R\,max}$ 1)	N_3	S_2	T	$T_{1\,min}$	T_1 2)	$T_{1\,max}$	Rail kg/m
VB15	15	16.20	6000	7.5	M5	60	10	28.0	50	1.4
VB20	20	20.55	6000	9.0	M6	60	10	28.0	50	2.4
VB25	23	24.25	6000	12.0	M6	60	10	28.0	50	3.2
VB30	28	28.35	6000	15.0	M8	80	12	38.0	68	5.0
VB35	34	31.85	6000	15.0	M8	80	12	38.0	68	6.8
VB45	45	39.85	6000	19.0	M12	105	16	50.5	89	10.5
VB55	53	47.85	6000	22.0	M14	120	18	58.0	102	16.2
VB65	63	59.85	6000	25.0	M16	150	20	73.0	130	22.4

1) Maximum length of a one-piece rail 2) Recommended dimension, tolerance ±0.5 mm L_R rail length, tolerance ±2 mm

VX Series — Product Overview

The VX-Series ball guides use a four-row X-arrangement (DF) with two-point ball contact in every load direction, which keeps friction to a minimum. The single-arc raceway averages out mounting-surface errors, and carriages and rails are fully interchangeable within each accuracy class.

- Equally high load rating in all four principal load directions.
- Very low noise with excellent running smoothness.
- Dynamic performance: v max = 2 m/s, a max = 40 m/s².
- Full interchangeability — carriages and rails of the same accuracy class combine freely.

PRODUCT RANGE



VX51

Flanged · Standard Length · Standard Height



VX53

Flanged · Extended · Standard Height



VX50

Flanged · Smooth-Hole · Standard Length · Standard Height



VX54

Flanged · Smooth-Hole · Extended · Standard Height



VX22

Narrow · Standard Length · Standard Height



VX23

Narrow · Extended · Standard Height



VX21

Narrow · Standard Length · Elevated



VX24

Narrow · Extended · Elevated

VX51

Ball Carriage · Flanged · Standard Length · Standard Height



DYNAMIC CHARACTERISTICS

Speed	**v max = 2 m/s**
Acceleration	**a max = 40 m/s²**

PRELOAD GRADES

C0	Preload 0–2 %C
C1	Preload 3 %C
C2	Preload 8 %C
C3	Preload 12 %C

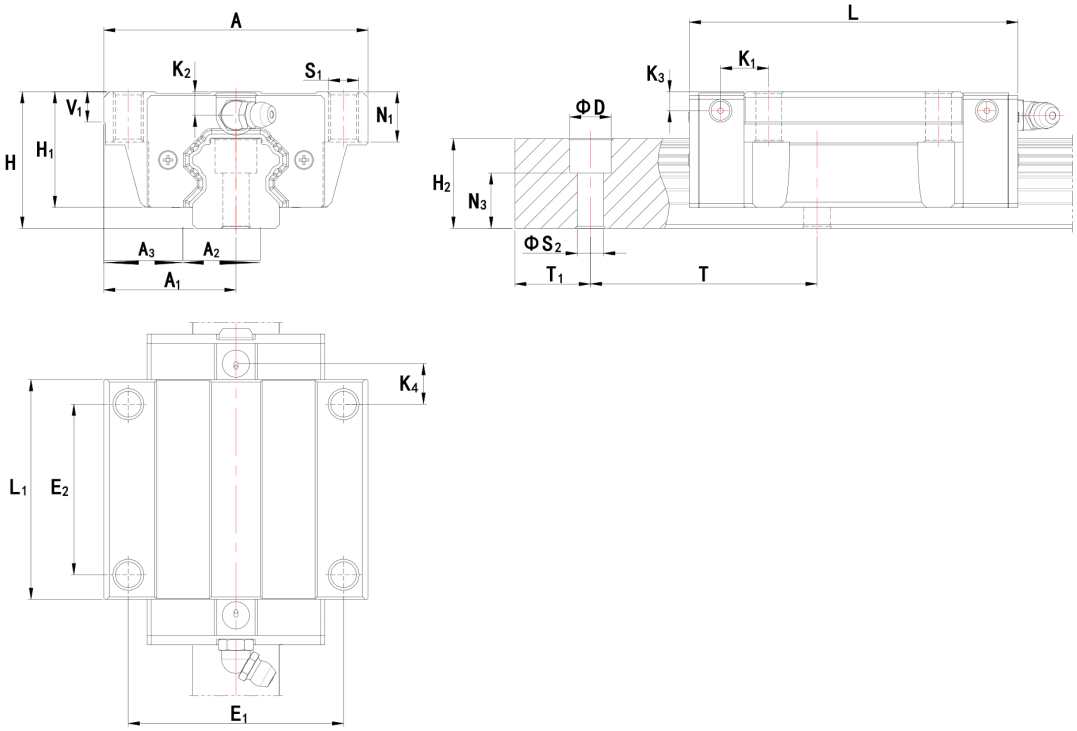
ORDERING Assign the carriage and rail order numbers using the coding system on the Ordering pages.

CARRIAGE ORDER NUMBERS

Size	Accuracy class	Carriage Order Number			
		C0	C1	C2	C3
20	N (4)	VX51.804	VX51.814		
	H (3)	VX51.803	VX51.813	VX51.823	
	P (2)		VX51.812	VX51.822	
	SP (1)		VX51.811	VX51.821	VX51.831
	UP (0)		VX51.810	VX51.820	VX51.830
25	N (4)	VX51.204	VX51.214		
	H (3)	VX51.203	VX51.213	VX51.223	
	P (2)		VX51.212	VX51.222	
	SP (1)		VX51.211	VX51.221	VX51.231
	UP (0)		VX51.210	VX51.220	VX51.230
30	N (4)	VX51.704	VX51.714		
	H (3)	VX51.703	VX51.713	VX51.723	
	P (2)		VX51.712	VX51.722	
	SP (1)		VX51.711	VX51.721	VX51.731
	UP (0)		VX51.710	VX51.720	VX51.730
35	N (4)	VX51.304	VX51.314		
	H (3)	VX51.303	VX51.313	VX51.323	
	P (2)		VX51.312	VX51.322	
	SP (1)		VX51.311	VX51.321	VX51.331
	UP (0)		VX51.310	VX51.320	VX51.330

VX51 — Dimensions

Ball Carriage · Flanged · Standard Length · Standard Height



DIMENSIONS (mm)

Size	Model No.	Dimensions (mm)															
		A	A_1	A_2	A_3	L	L_1	E_1	E_2	H	H_1	H_2 1)	H_2 2)	K_1	K_2	K_3	K_4
VX20	VX51.8	63	31.5	20	21.5	77.5	50.5	53	40	30	25.4	19.2	18.9	11.25	5.2	5.8	9.75
VX25	VX51.2	70	35	23	23.5	84	58	57	45	36	30.5	23.9	23.6	12.25	6.2	5	10.7
VX30	VX51.7	90	45	28	31	97.4	70	72	52	42	36	27.7	27.4	15	6.4	12	14.5
VX35	VX51.3	100	50	34	33	112.4	80	82	62	48	40.5	30.7	30.4	16	9	11.3	14.5

LOAD RATINGS · STATIC MOMENTS · MASS

Size	Model No.	Dimensions (mm)								Load rating (N)		Static moment (N·m)		Mass	
		N_1	N_3	D	S_1	S_2	T	T_1	V_1	C	C_0	M_{t0}	M_{L0}	Carriage kg	Rail kg/m
VX20	VX51.8	9.5	10.4	9.5	M6	6	60	20	8	17830	34380	270	200	0.40	2.31
VX25	VX51.2	14	14.6	11	M8	7	60	20	8	26260	49510	420	330	0.59	3.40
VX30	VX51.7	16	15.4	14	M10	9	80	20	8.5	36530	67380	660	530	1.09	4.63
VX35	VX51.3	18	18.4	14	M10	9	80	20	10	48570	88020	1160	810	1.56	6.53

1) H_2 dimension with protective tape 2) H_2 dimension without protective tape

VX53

Ball Carriage · Flanged · Extended · Standard Height



DYNAMIC CHARACTERISTICS

Speed	**v max = 2 m/s**
Acceleration	**a max = 40 m/s²**

PRELOAD GRADES

C0	Preload 0–2 %C
C1	Preload 3 %C
C2	Preload 8 %C
C3	Preload 12 %C

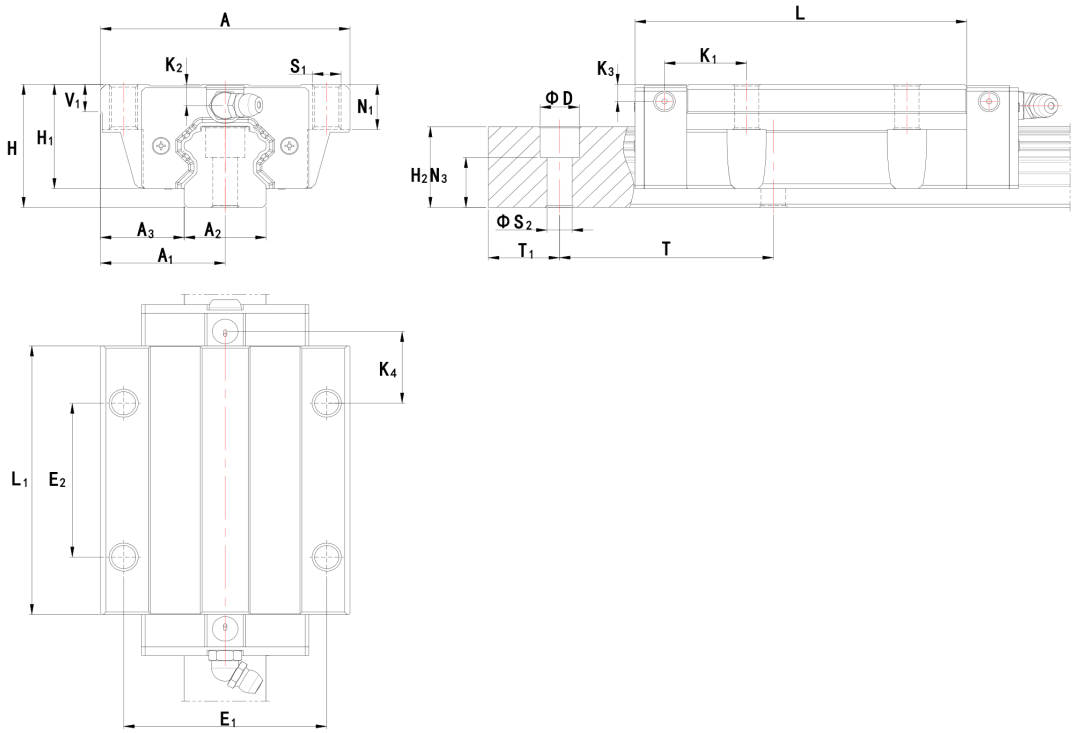
ORDERING Assign the carriage and rail order numbers using the coding system on the Ordering pages.

CARRIAGE ORDER NUMBERS

Size	Accuracy class	Carriage Order Number			
		C0	C1	C2	C3
20	N (4)	VX53.804	VX53.814		
	H (3)	VX53.803	VX53.813	VX53.823	
	P (2)		VX53.812	VX53.822	
	SP (1)		VX53.811	VX53.821	VX53.831
	UP (0)		VX53.810	VX53.820	VX53.830
25	N (4)	VX53.204	VX53.214		
	H (3)	VX53.203	VX53.213	VX53.223	
	P (2)		VX53.212	VX53.222	
	SP (1)		VX53.211	VX53.221	VX53.231
	UP (0)		VX53.210	VX53.220	VX53.230
30	N (4)	VX53.704	VX53.714		
	H (3)	VX53.703	VX53.713	VX53.723	
	P (2)		VX53.712	VX53.722	
	SP (1)		VX53.711	VX53.721	VX53.731
	UP (0)		VX53.710	VX53.720	VX53.730
35	N (4)	VX53.304	VX53.314		
	H (3)	VX53.303	VX53.313	VX53.323	
	P (2)		VX53.312	VX53.322	
	SP (1)		VX53.311	VX53.321	VX53.331
	UP (0)		VX53.310	VX53.320	VX53.330

VX53 — Dimensions

Ball Carriage · Flanged · Extended · Standard Height



DIMENSIONS (mm)

Size	Model No.	Dimensions (mm)															
		A	A_1	A_2	A_3	L	L_1	E_1	E_2	H	H_1	H_2 1)	H_2 2)	K_1	K_2	K_3	K_4
VX20	VX53.8	63	31.5	20	21.5	92.2	65.2	53	40	30	25.4	19.2	18.9	18.6	5.2	5.8	17.1
VX25	VX53.2	70	35	23	23.5	104.6	78.6	57	45	36	30.5	23.9	23.6	22.55	6.2	5	21
VX30	VX53.7	90	45	28	31	120.4	93	72	52	42	36	27.7	27.4	26.5	6.4	12	26
VX35	VX53.3	100	50	34	33	138.2	105.8	82	62	48	40.5	30.7	30.4	28.9	9	11.3	27.4

LOAD RATINGS · STATIC MOMENTS · MASS

Size	Model No.	Dimensions (mm)								Load rating (N)		Static moment (N·m)		Mass	
		N_1	N_3	D	S_1	S_2	T	T_1	V_1	C	C_0	M_{t0}	M_{L0}	Carriage kg	Rail kg/m
VX20	VX53.8	9.5	10.4	9.5	M6	6	60	20	8	21780	45840	350	350	0.52	2.31
VX25	VX53.2	14	14.6	11	M8	7	60	20	8	32140	66020	560	570	0.80	3.40
VX30	VX53.7	16	15.4	14	M10	9	80	20	8.5	44670	89850	880	920	1.44	4.63
VX35	VX53.3	18	18.4	14	M10	9	80	20	10	59390	117360	1540	1400	2.06	6.53

1) H_2 dimension with protective tape 2) H_2 dimension without protective tape

VX50

Ball Carriage · Flanged · Smooth-Hole · Standard Length · Standard Height



DYNAMIC CHARACTERISTICS

Speed	**v max = 2 m/s**
Acceleration	**a max = 40 m/s²**

PRELOAD GRADES

C0	Preload 0–2 %C
C1	Preload 3 %C
C2	Preload 8 %C
C3	Preload 12 %C

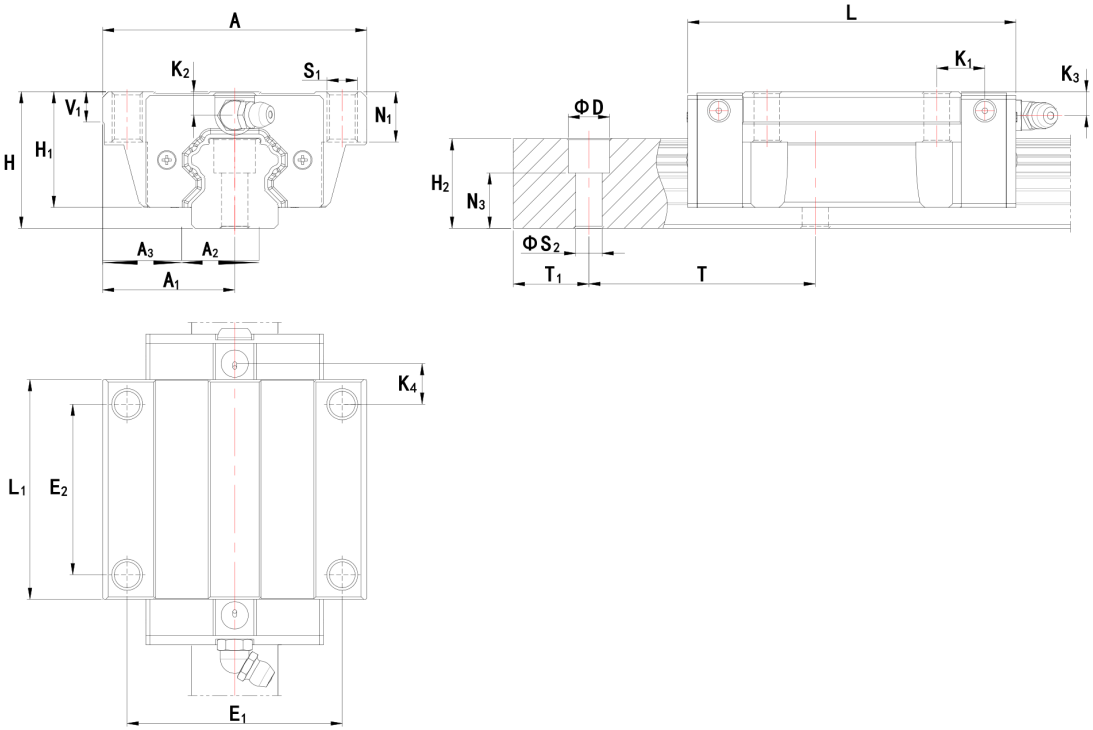
ORDERING Assign the carriage and rail order numbers using the coding system on the Ordering pages.

CARRIAGE ORDER NUMBERS

Size	Accuracy class	Carriage Order Number			
		C0	C1	C2	C3
20	N (4)	VX50.804	VX50.814		
	H (3)	VX50.803	VX50.813	VX50.823	
	P (2)		VX50.812	VX50.822	
	SP (1)		VX50.811	VX50.821	VX50.831
	UP (0)		VX50.810	VX50.820	VX50.830
25	N (4)	VX50.204	VX50.214		
	H (3)	VX50.203	VX50.213	VX50.223	
	P (2)		VX50.212	VX50.222	
	SP (1)		VX50.211	VX50.221	VX50.231
	UP (0)		VX50.210	VX50.220	VX50.230
30	N (4)	VX50.704	VX50.714		
	H (3)	VX50.703	VX50.713	VX50.723	
	P (2)		VX50.712	VX50.722	
	SP (1)		VX50.711	VX50.721	VX50.731
	UP (0)		VX50.710	VX50.720	VX50.730
35	N (4)	VX50.304	VX50.314		
	H (3)	VX50.303	VX50.313	VX50.323	
	P (2)		VX50.312	VX50.322	
	SP (1)		VX50.311	VX50.321	VX50.331
	UP (0)		VX50.310	VX50.320	VX50.330

VX50 — Dimensions

Ball Carriage · Flanged · Smooth-Hole · Standard Length · Standard Height



DIMENSIONS (mm)

Size	Model No.	Dimensions (mm)															
		A	A_1	A_2	A_3	L	L_1	E_1	E_2	H	H_1	H_2 1)	H_2 2)	K_1	K_2	K_3	K_4
VX20	VX50.8	63	31.5	20	21.5	77.5	50.5	53	40	30	25.4	19.2	18.9	11.25	5.2	5.8	9.75
VX25	VX50.2	70	35	23	23.5	84	58	57	45	36	30.5	23.9	23.6	12.25	6.2	5	10.7
VX30	VX50.7	90	45	28	31	97.4	70	72	52	42	36	27.7	27.4	15	6.4	12	14.5
VX35	VX50.3	100	50	34	33	112.4	80	82	62	48	40.5	30.7	30.4	16	9	11.3	14.5

LOAD RATINGS · STATIC MOMENTS · MASS

Size	Model No.	Dimensions (mm)								Load rating (N)		Static moment (N·m)		Mass	
		N_1	N_3	D	S_1	S_2	T	T_1	V_1	C	C_0	M_{t0}	M_{L0}	Carriage kg	Rail kg/m
VX20	VX50.8	9.5	10.4	9.5	Φ6	6	60	20	8	17830	34380	270	200	0.40	2.31
VX25	VX50.2	14	14.6	11	Φ7	7	60	20	8	26260	49510	420	330	0.59	3.40
VX30	VX50.7	16	15.4	14	Φ9	9	80	20	8.5	36350	67380	660	530	1.09	4.63
VX35	VX50.3	18	18.4	14	Φ9	9	80	20	10	48570	88020	1160	810	1.56	6.53

1) H_2 dimension with protective tape 2) H_2 dimension without protective tape

VX54

Ball Carriage · Flanged · Smooth-Hole · Extended · Standard Height



DYNAMIC CHARACTERISTICS

Speed	**v max = 2 m/s**
Acceleration	**a max = 40 m/s²**

PRELOAD GRADES

C0	Preload 0–2 %C
C1	Preload 3 %C
C2	Preload 8 %C
C3	Preload 12 %C

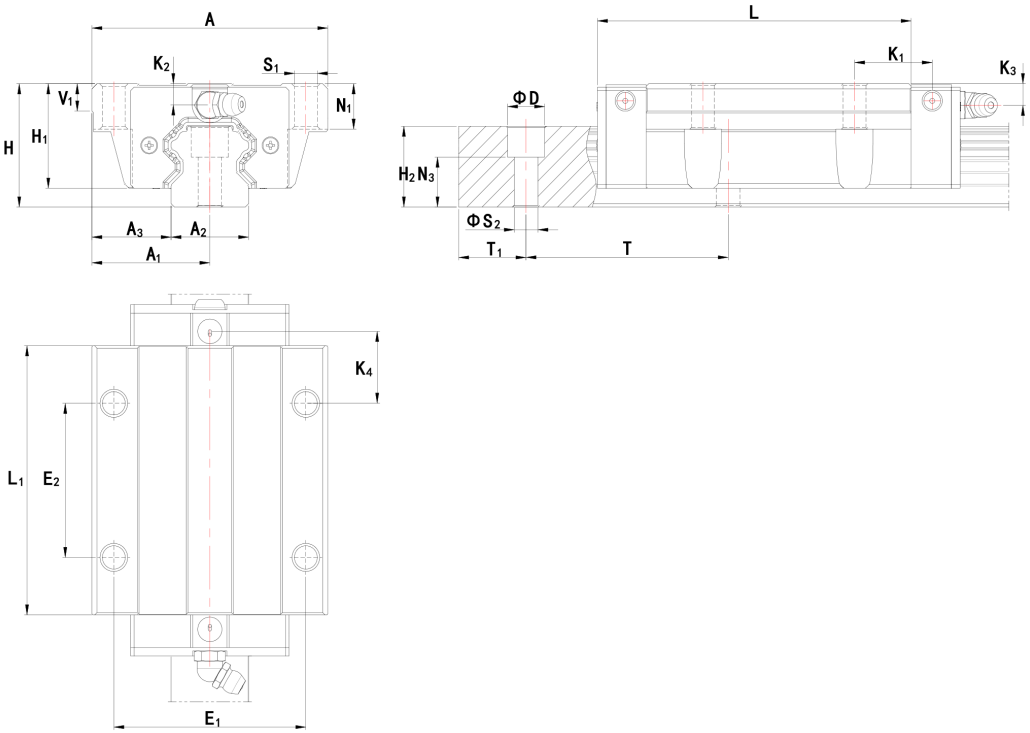
ORDERING Assign the carriage and rail order numbers using the coding system on the Ordering pages.

CARRIAGE ORDER NUMBERS

Size	Accuracy class	Carriage Order Number			
		C0	C1	C2	C3
20	N (4)	VX54.804	VX54.814		
	H (3)	VX54.803	VX54.813	VX54.823	
	P (2)		VX54.812	VX54.822	
	SP (1)		VX54.811	VX54.821	VX54.831
	UP (0)		VX54.810	VX54.820	VX54.830
25	N (4)	VX54.204	VX54.214		
	H (3)	VX54.203	VX54.213	VX54.223	
	P (2)		VX54.212	VX54.222	
	SP (1)		VX54.211	VX54.221	VX54.231
	UP (0)		VX54.210	VX54.220	VX54.230
30	N (4)	VX54.704	VX54.714		
	H (3)	VX54.703	VX54.713	VX54.723	
	P (2)		VX54.712	VX54.722	
	SP (1)		VX54.711	VX54.721	VX54.731
	UP (0)		VX54.710	VX54.720	VX54.730
35	N (4)	VX54.304	VX54.314		
	H (3)	VX54.303	VX54.313	VX54.323	
	P (2)		VX54.312	VX54.322	
	SP (1)		VX54.311	VX54.321	VX54.331
	UP (0)		VX54.310	VX54.320	VX54.330

VX54 — Dimensions

Ball Carriage · Flanged · Smooth-Hole · Extended · Standard Height



DIMENSIONS (mm)

Size	Model No.	Dimensions (mm)															
		A	A_1	A_2	A_3	L	L_1	E_1	E_2	H	H_1	H_2 1)	H_2 2)	K_1	K_2	K_3	K_4
VX20	VX54.8	63	31.5	20	21.5	92.2	65.2	53	40	30	25.4	19.2	18.9	18.6	5.2	5.8	17.1
VX25	VX54.2	70	35	23	23.5	104.6	78.6	57	45	36	30.5	23.9	23.6	22.55	6.2	5	21
VX30	VX54.7	90	45	28	31	120.4	93	72	52	42	36	27.7	27.4	26.5	6.4	12	26
VX35	VX54.3	100	50	34	33	138.2	105.8	82	62	48	40.5	30.7	30.4	28.9	9	11.3	27.4

LOAD RATINGS · STATIC MOMENTS · MASS

Size	Model No.	Dimensions (mm)								Load rating (N)		Static moment (N·m)		Mass	
		N_1	N_3	D	S_1	S_2	T	T_1	V_1	C	C_0	M_{t0}	M_{L0}	Carriage kg	Rail kg/m
VX20	VX54.8	9.5	10.4	9.5	Φ6	6	60	20	8	21780	45840	350	350	0.52	2.31
VX25	VX54.2	14	14.6	11	Φ7	7	60	20	8	32140	66020	560	570	0.80	3.40
VX30	VX54.7	16	15.4	14	Φ9	9	80	20	8.5	44670	89850	880	920	1.44	4.63
VX35	VX54.3	18	18.4	14	Φ9	9	80	20	10	59390	117360	1540	1400	2.06	6.53

1) H_2 dimension with protective tape 2) H_2 dimension without protective tape

VX22

Ball Carriage · Narrow · Standard Length · Standard Height



DYNAMIC CHARACTERISTICS

Speed	**v max = 2 m/s**
Acceleration	**a max = 40 m/s²**

PRELOAD GRADES

C0	Preload 0–2 %C
C1	Preload 3 %C
C2	Preload 8 %C
C3	Preload 12 %C

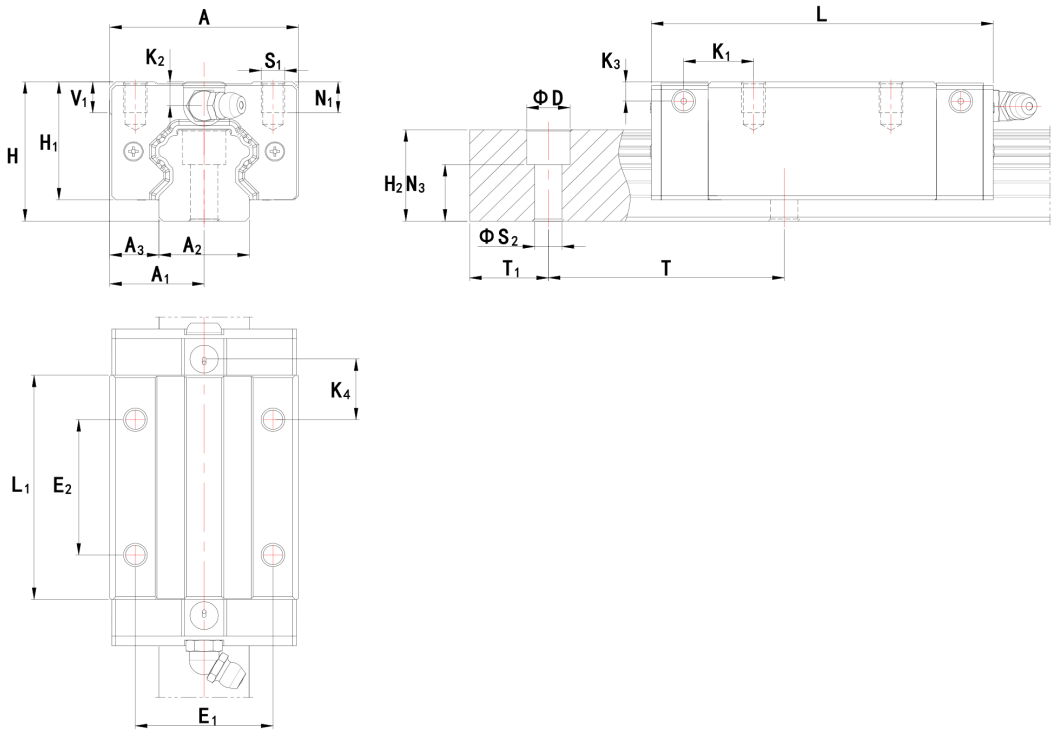
ORDERING Assign the carriage and rail order numbers using the coding system on the Ordering pages.

CARRIAGE ORDER NUMBERS

Size	Accuracy class	Carriage Order Number			
		C0	C1	C2	C3
20	N (4)	VX22.804	VX22.814		
	H (3)	VX22.803	VX22.813	VX22.823	
	P (2)		VX22.812	VX22.822	
	SP (1)		VX22.811	VX22.821	VX22.831
	UP (0)		VX22.810	VX22.820	VX22.830
25	N (4)	VX22.204	VX22.214		
	H (3)	VX22.203	VX22.213	VX22.223	
	P (2)		VX22.212	VX22.222	
	SP (1)		VX22.211	VX22.221	VX22.231
	UP (0)		VX22.210	VX22.220	VX22.230
30	N (4)	VX22.704	VX22.714		
	H (3)	VX22.703	VX22.713	VX22.723	
	P (2)		VX22.712	VX22.722	
	SP (1)		VX22.711	VX22.721	VX22.731
	UP (0)		VX22.710	VX22.720	VX22.730
35	N (4)	VX22.304	VX22.314		
	H (3)	VX22.303	VX22.313	VX22.323	
	P (2)		VX22.312	VX22.322	
	SP (1)		VX22.311	VX22.321	VX22.331
	UP (0)		VX22.310	VX22.320	VX22.330

VX22 — Dimensions

Ball Carriage · Narrow · Standard Length · Standard Height



DIMENSIONS (mm)

Size	Model No.	Dimensions (mm)															
		A	A_1	A_2	A_3	L	L_1	E_1	E_2	H	H_1	H_2 1)	H_2 2)	K_1	K_2	K_3	K_4
VX20	VX22.8	44	22	20	12	77.5	50.5	32	36	30	25.4	19.2	18.9	13.25	5.2	5.8	11.75
VX25	VX22.2	48	24	23	12.5	84	58	35	35	36	30.5	23.9	23.6	17.25	6.2	5	15.7
VX30	VX22.7	60	30	28	16	97.4	70	40	40	42	36	27.7	27.4	21	6.4	12	20.5
VX35	VX22.3	70	35	34	18	112.4	80	50	50	48	40.5	30.7	30.4	22	9	11.3	20.5

LOAD RATINGS · STATIC MOMENTS · MASS

Size	Model No.	Dimensions (mm)								Load rating (N)		Static moment (N·m)		Mass	
		N_1	N_3	D	S_1	S_2	T	T_1	V_1	C	C_0	M_{t0}	M_{L0}	Carriage kg	Rail kg/m
VX20	VX22.8	6	10.4	9.5	M5	6	60	20	8	17830	34380	270	200	0.30	2.31
VX25	VX22.2	6	14.6	11	M6	7	60	20	8	26260	49510	420	330	0.42	3.40
VX30	VX22.7	10	15.4	14	M8	9	80	20	8.5	36530	67380	660	530	0.78	4.63
VX35	VX22.3	12	18.4	14	M8	9	80	20	10.2	48570	88020	1160	810	1.14	6.53

1) H_2 dimension with protective tape 2) H_2 dimension without protective tape

VX23

Ball Carriage · Narrow · Extended · Standard Height



DYNAMIC CHARACTERISTICS

Speed	**v max = 2 m/s**
Acceleration	**a max = 40 m/s²**

PRELOAD GRADES

C0	Preload 0–2 %C
C1	Preload 3 %C
C2	Preload 8 %C
C3	Preload 12 %C

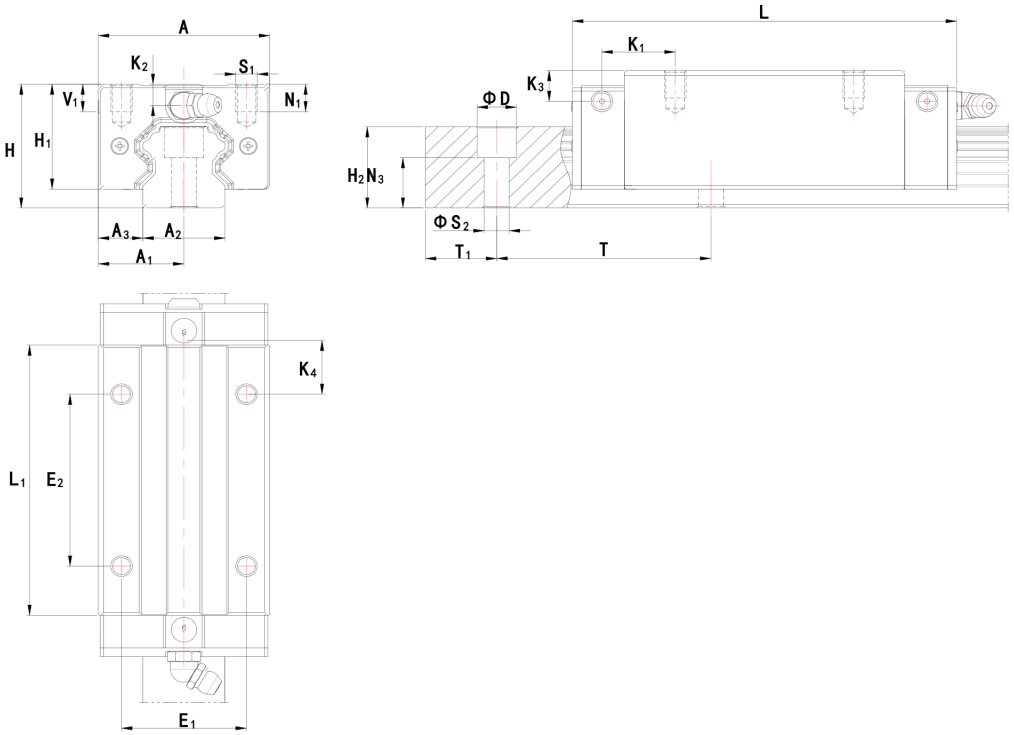
ORDERING Assign the carriage and rail order numbers using the coding system on the Ordering pages.

CARRIAGE ORDER NUMBERS

Size	Accuracy class	Carriage Order Number			
		C0	C1	C2	C3
20	N (4)	VX23.804	VX23.814		
	H (3)	VX23.803	VX23.813	VX23.823	
	P (2)		VX23.812	VX23.822	
	SP (1)		VX23.811	VX23.821	VX23.831
	UP (0)		VX23.810	VX23.820	VX23.830
25	N (4)	VX23.204	VX23.214		
	H (3)	VX23.203	VX23.213	VX23.223	
	P (2)		VX23.212	VX23.222	
	SP (1)		VX23.211	VX23.221	VX23.231
	UP (0)		VX23.210	VX23.220	VX23.230
30	N (4)	VX23.704	VX23.714		
	H (3)	VX23.703	VX23.713	VX23.723	
	P (2)		VX23.712	VX23.722	
	SP (1)		VX23.711	VX23.721	VX23.731
	UP (0)		VX23.710	VX23.720	VX23.730
35	N (4)	VX23.304	VX23.314		
	H (3)	VX23.303	VX23.313	VX23.323	
	P (2)		VX23.312	VX23.322	
	SP (1)		VX23.311	VX23.321	VX23.331
	UP (0)		VX23.310	VX23.320	VX23.330

VX23 — Dimensions

Ball Carriage · Narrow · Extended · Standard Height



DIMENSIONS (mm)

Size	Model No.	Dimensions (mm)															
		A	A_1	A_2	A_3	L	L_1	E_1	E_2	H	H_1	H_2 1)	H_2 2)	K_1	K_2	K_3	K_4
VX20	VX23.8	44	22	20	12	92.2	65.2	32	50	30	25.4	19.2	18.9	13.6	5.2	5.8	12.1
VX25	VX23.2	48	24	23	12.5	104.6	78.6	35	50	36	30.5	23.9	23.6	20.05	6.2	5	18.5
VX30	VX23.7	60	30	28	16	120.4	93	40	60	42	36	27.7	27.4	22.5	6.4	12	22
VX35	VX23.3	70	35	34	18	138.2	105.8	50	72	48	40.5	30.7	30.4	23.9	9	11.3	22.4

LOAD RATINGS · STATIC MOMENTS · MASS

Size	Model No.	Dimensions (mm)								Load rating (N)		Static moment (N·m)		Mass	
		N_1	N_3	D	S_1	S_2	T	T_1	V_1	C	C_0	M_{t0}	M_{L0}	Carriage kg	Rail kg/m
VX20	VX23.8	6	10.4	9.5	M5	6	60	20	8	21780	45840	350	350	0.39	2.31
VX25	VX23.2	6	14.6	11	M6	7	60	20	8	32140	66020	560	570	0.57	3.40
VX30	VX23.7	10	15.4	14	M8	9	80	20	8.5	44670	89850	880	920	1.03	4.63
VX35	VX23.3	12	18.4	14	M8	9	80	20	10.2	59390	117360	1540	1400	1.52	6.53

1) H_2 dimension with protective tape 2) H_2 dimension without protective tape

VX21

Ball Carriage · Narrow · Standard Length · Elevated



DYNAMIC CHARACTERISTICS

Speed	**v max = 2 m/s**
Acceleration	**a max = 40 m/s²**

PRELOAD GRADES

C0	Preload 0–2 %C
C1	Preload 3 %C
C2	Preload 8 %C
C3	Preload 12 %C

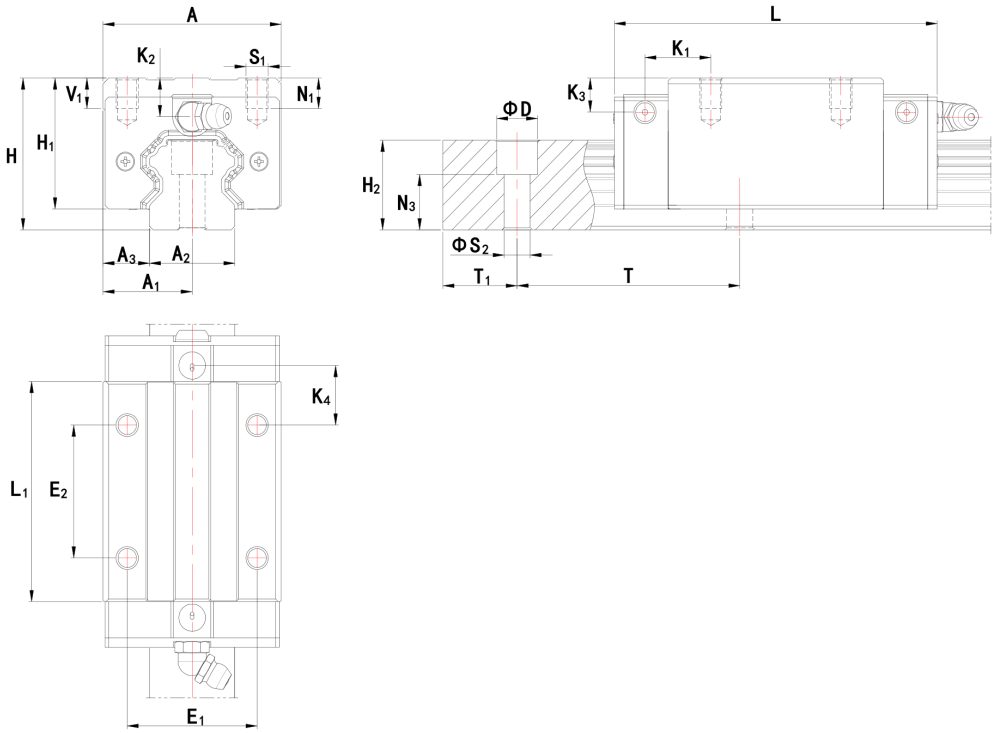
ORDERING Assign the carriage and rail order numbers using the coding system on the Ordering pages.

CARRIAGE ORDER NUMBERS

Size	Accuracy class	Carriage Order Number			
		C0	C1	C2	C3
25	N (4)	VX21.204	VX21.214		
	H (3)	VX21.203	VX21.213	VX21.223	
	P (2)		VX21.212	VX21.222	
	SP (1)		VX21.211	VX21.221	VX21.231
	UP (0)		VX21.210	VX21.220	VX21.230
30	N (4)	VX21.704	VX21.714		
	H (3)	VX21.703	VX21.713	VX21.723	
	P (2)		VX21.712	VX21.722	
	SP (1)		VX21.711	VX21.721	VX21.731
	UP (0)		VX21.710	VX21.720	VX21.730
35	N (4)	VX21.304	VX21.314		
	H (3)	VX21.303	VX21.313	VX21.323	
	P (2)		VX21.312	VX21.322	
	SP (1)		VX21.311	VX21.321	VX21.331
	UP (0)		VX21.310	VX21.320	VX21.330

VX21 — Dimensions

Ball Carriage · Narrow · Standard Length · Elevated



DIMENSIONS (mm)

Size	Model No.	Dimensions (mm)															
		A	A_1	A_2	A_3	L	L_1	E_1	E_2	H	H_1	H_2 1)	H_2 2)	K_1	K_2	K_3	K_4
VX25	VX21.2	48	24	23	12.5	84	58	35	35	40	34.5	23.9	23.6	17.25	10.2	9	15.7
VX30	VX21.7	60	30	28	16	97.4	70	40	40	45	39	27.7	27.4	21	9.4	15	20.5
VX35	VX21.3	70	35	34	18	112.4	80	50	50	55	47.5	30.7	30.4	22	16	18.3	20.5

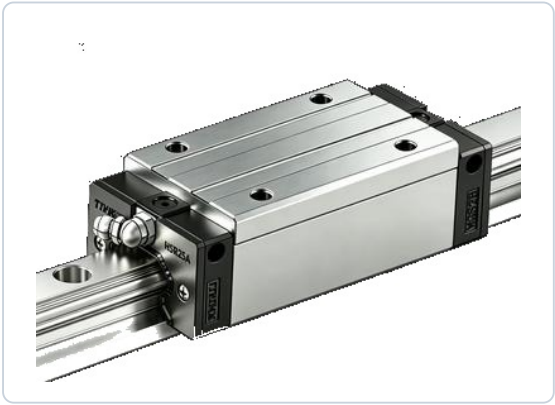
LOAD RATINGS · STATIC MOMENTS · MASS

Size	Model No.	Dimensions (mm)								Load rating (N)		Static moment (N·m)		Mass	
		N_1	N_3	D	S_1	S_2	T	T_1	V_1	C	C_0	M_{t0}	M_{L0}	Carriage kg	Rail kg/m
VX25	VX21.2	8	14.6	11	M6	7	60	20	8	26260	49510	420	330	0.51	3.40
VX30	VX21.7	10	15.4	14	M8	9	80	20	8.5	36530	67380	660	530	0.85	4.63
VX35	VX21.3	12	18.4	14	M8	9	80	20	10.2	48570	88020	1160	810	1.20	6.53

1) H_2 dimension with protective tape 2) H_2 dimension without protective tape

VX24

Ball Carriage · Narrow · Extended · Elevated



DYNAMIC CHARACTERISTICS

Speed	**v max = 2 m/s**
Acceleration	**a max = 40 m/s²**

PRELOAD GRADES

C0	Preload 0–2 %C
C1	Preload 3 %C
C2	Preload 8 %C
C3	Preload 12 %C

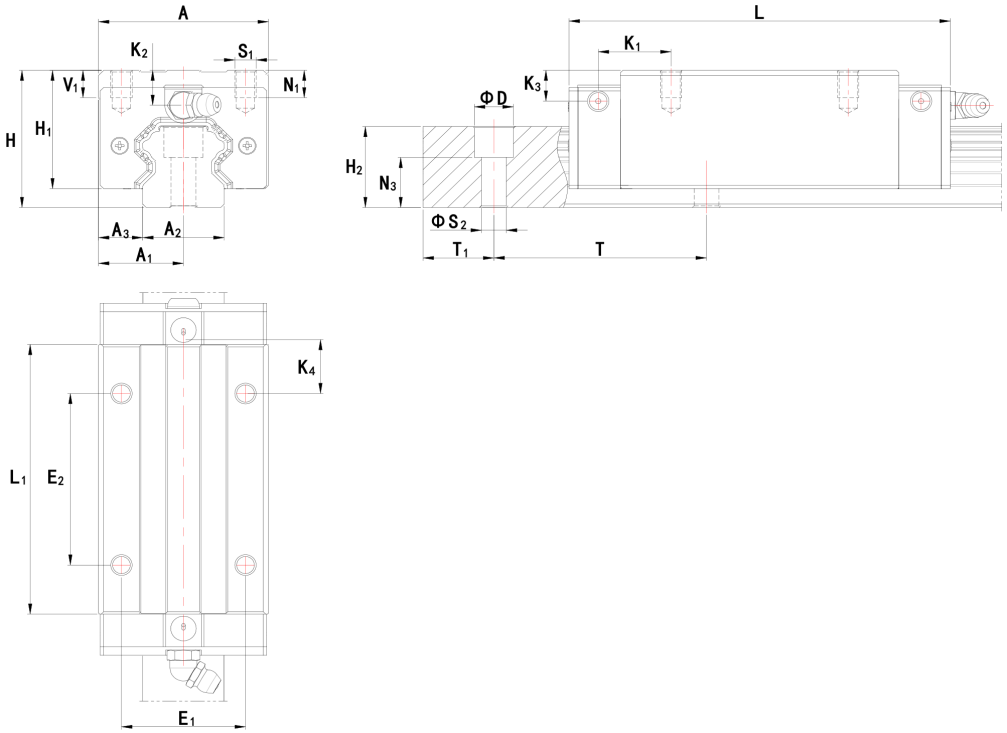
ORDERING Assign the carriage and rail order numbers using the coding system on the Ordering pages.

CARRIAGE ORDER NUMBERS

Size	Accuracy class	Carriage Order Number			
		C0	C1	C2	C3
25	N (4)	VX24.204	VX24.214		
	H (3)	VX24.203	VX24.213	VX24.223	
	P (2)		VX24.212	VX24.222	
	SP (1)		VX24.211	VX24.221	VX24.231
	UP (0)		VX24.210	VX24.220	VX24.230
30	N (4)	VX24.704	VX24.714		
	H (3)	VX24.703	VX24.713	VX24.723	
	P (2)		VX24.712	VX24.722	
	SP (1)		VX24.711	VX24.721	VX24.731
	UP (0)		VX24.710	VX24.720	VX24.730
35	N (4)	VX24.304	VX24.314		
	H (3)	VX24.303	VX24.313	VX24.323	
	P (2)		VX24.312	VX24.322	
	SP (1)		VX24.311	VX24.321	VX24.331
	UP (0)		VX24.310	VX24.320	VX24.330

VX24 — Dimensions

Ball Carriage · Narrow · Extended · Elevated



DIMENSIONS (mm)

Size	Model No.	Dimensions (mm)															
		A	A_1	A_2	A_3	L	L_1	E_1	E_2	H	H_1	H_2 1)	H_2 2)	K_1	K_2	K_3	K_4
VX25	VX24.2	48	24	23	12.5	104.6	78.6	35	50	40	34.5	23.9	23.6	20.05	10.2	9	18.5
VX30	VX24.7	60	30	28	16	120.4	93	40	60	45	39	27.7	27.4	22.5	9.4	15	22
VX35	VX24.3	70	35	34	18	138.2	105.8	50	72	55	47.5	30.7	30.4	23.9	16	18.3	22.4

LOAD RATINGS · STATIC MOMENTS · MASS

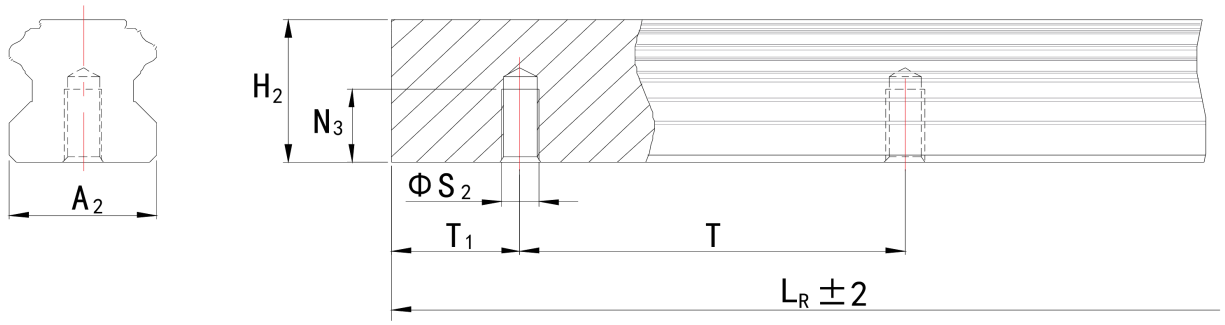
Size	Model No.	Dimensions (mm)								Load rating (N)		Static moment (N·m)		Mass	
		N_1	N_3	D	S_1	S_2	T	T_1	V_1	C	C_0	M_{t0}	M_{L0}	Carriage kg	Rail kg/m
VX25	VX24.2	8	14.6	11	M6	7	60	20	8	32140	66020	560	570	0.88	3.40
VX30	VX24.7	10	15.4	14	M8	9	80	20	8.5	44670	89850	880	920	1.47	4.63
VX35	VX24.3	12	18.4	14	M8	9	80	20	10.2	59390	117360	1540	1400	2.08	6.53

1) H_2 dimension with protective tape 2) H_2 dimension without protective tape

VX Series — Rails Mounted from Below

Guide rail with threaded holes, bolted from below · rail mounting-hole code 4

DRAWING



DIMENSIONS (MM)

Size	Dimensions (mm)									Mass
	A_2	H_2	$L_{R\,max}$ 1)	N_3	S_2	T	$T_{1\,min}$	T_1 2)	$T_{1\,max}$	Rail kg/m
VX20	20	18.9	4000	9.0	M6	60	10	28.0	50	2.31
VX25	23	23.6	4000	12.0	M6	60	10	28.0	50	3.40
VX30	28	27.4	4000	15.0	M8	80	12	38.0	68	4.63
VX35	34	30.4	4000	15.0	M8	80	12	38.0	68	6.53

1) Maximum length of a one-piece rail 2) Recommended dimension, tolerance ±0.5 mm L_R rail length, tolerance ±2 mm

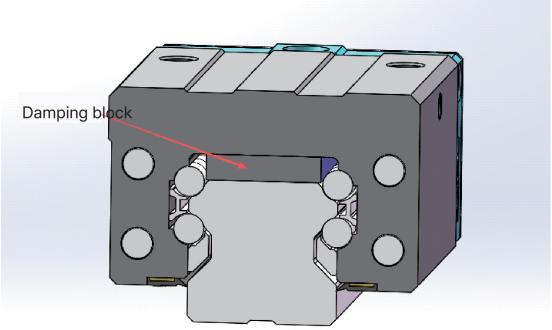
Damping Carriage

Linear guide system with integrated vibration damping

Rolling linear guide systems are key functional components of high-end CNC machine tools and intelligent equipment. They offer good high-speed performance, high wear resistance and low raceway friction. Their rolling structure, however, is susceptible to vibration sources acting on the supported table, so that table vibration settles only slowly, which impairs machining quality and shortens tool life. Studies show that a separate damper mounted under the table, with adjustable clearance to the linear guide, helps: the smaller the clearance between guide and damper, the better the damper absorbs vibration.

Design

Unlike a separate damper, VELTORK has developed a linear guide system with integrated vibration damping. A damping block is mounted inside the carriage, parallel to the top of the rail with a suitable clearance. An oil film between damping block and rail further increases the damping effect and so improves the vibration resistance of the system.



Damping block inside the carriage

Features

- Oil-film damping absorbs vibration, improving machining quality and extending tool life.
- Protects the linear guide system under overload.
- Easy installation: no extra mounting space for a damper is needed on the table.
- Low friction, high speed and high accuracy, combined with the high vibration damping of hydrostatic guides.

Advantages and Features

Why rolling linear guide systems — and what VELTORK adds

1 High positioning accuracy

With rolling friction, a linear guide system reduces the coefficient of friction to 1/40 of that of a sliding guide, and the difference between dynamic and static friction is very small. The machine therefore runs without slip, and positioning accuracy in the µm range can be achieved.

2 Low wear, long-lasting accuracy

With conventional sliding guides, back-flow of the oil film impairs the motion accuracy of the table, and insufficient lubrication during motion wears the contact surfaces of the guideway, seriously affecting accuracy. Rolling guides wear very little, so the machine keeps its accuracy for a long time.

3 Suitable for high speeds, with much lower drive power

Because friction is very low, little power is needed to move the machine, which noticeably reduces power consumption – especially with frequent reciprocating motion. The low frictional heat also makes the system suitable for high speeds.

4 Carries loads from all directions

Thanks to its special constraining design, the linear guide system carries loads from above, below, left and right at the same time – unlike sliding guides, which take only light lateral loads parallel to the contact surface and easily lose running accuracy.

5 Easy assembly and interchangeability

Simply mill or grind the mounting surfaces on the machine and fasten rail and carriage to the specified torques following the recommended steps; the high machining precision is then reproduced. Sliding guides require scraping of the guideway, which is laborious and must be repeated whenever the machine loses accuracy. Linear guide systems are interchangeable: carriages, rails or complete systems can be replaced individually to restore precise guidance.

6 Simple lubrication

Insufficient lubrication of a sliding guide causes direct metal-to-metal friction that wears the machine, and adequate lubrication is hard to achieve – oil holes must be drilled at suitable points. Linear guide carriages already carry a grease nipple, so grease can be applied directly with a grease gun, or a special fitting can be connected to an oil supply line for automatic lubrication.

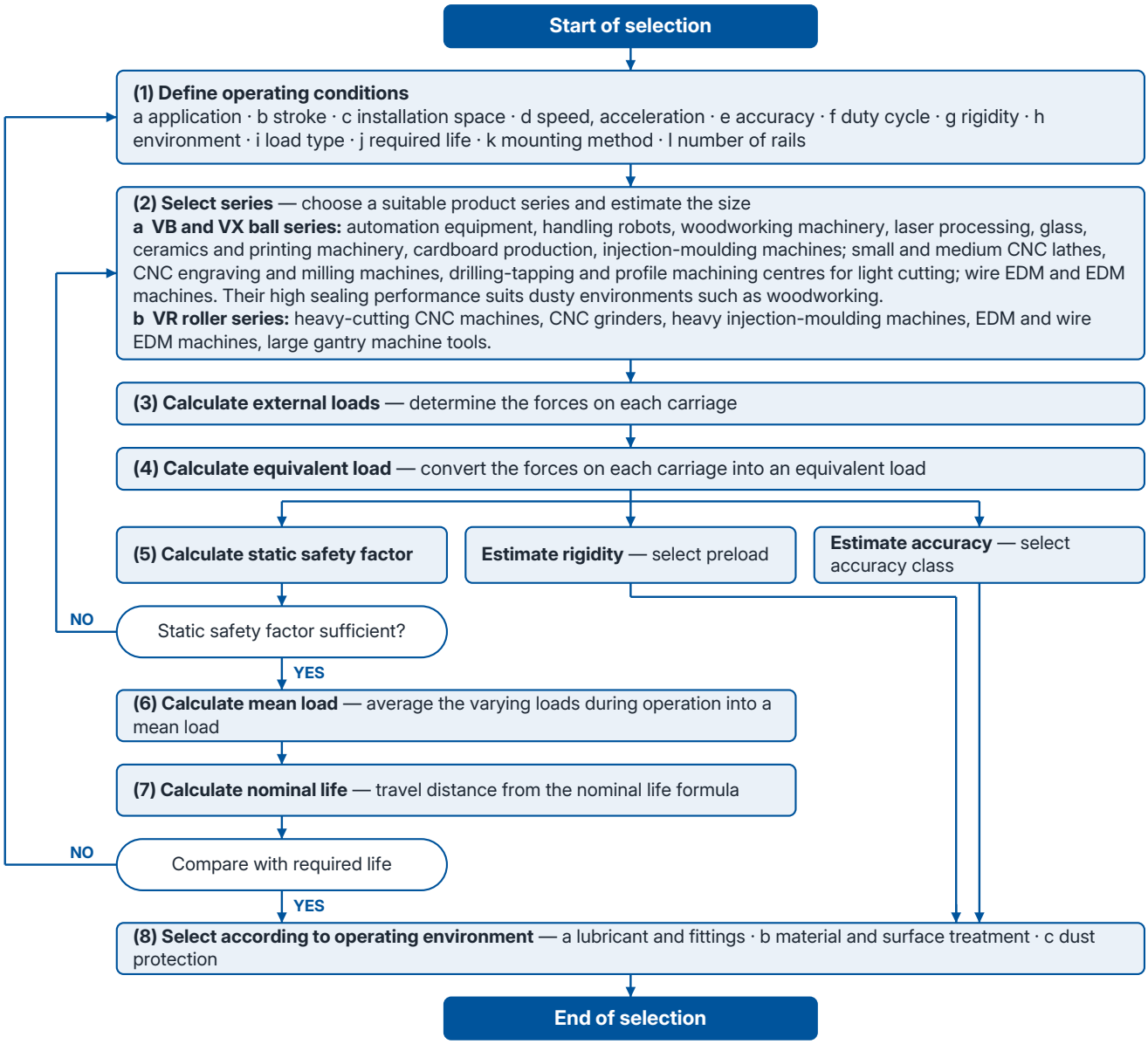
VELTORK linear guide systems use several patented lubrication technologies that make lubrication easier and improve lubricant retention. The VELTORK VX25 ball linear guide system, for example, has a unique oil-distribution structure at the side lubrication inlet: on slant-bed CNC lathes, when the carriage is lubricated automatically through the side port, the oil is distributed to the upper and lower raceway grooves – a VELTORK first. With most other brands the oil passage has to be blocked specially when ordering; otherwise, with a standard carriage mounted on an inclined side, the oil tends to run straight down to the lower groove and the upper groove is poorly lubricated.

7 Averages out mounting-surface errors

VELTORK X-type ball linear guide systems use a single-arc, four-row raceway design that averages out and absorbs mounting-surface errors. Tests show that a slide mounted on a pair of linear guide systems can reduce running error to 1/6 of the mounting-surface error.

Selection Procedure

Step by step from the application to the guide system



General Technical Data and Calculations

Valid for all VELTORK ball and roller linear guide systems

The general technical data and calculations apply to all ball and roller linear guide systems. Special technical data for the individual ball and roller carriages and rails are listed separately.

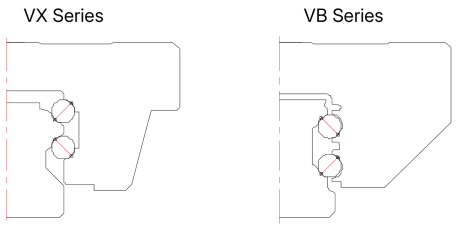
LOAD RATINGS BASED ON 50 KM AND 100 KM

In Europe, load ratings are usually defined for a nominal travel of 10^5 m = 100 km, whereas in Asia 50 km is common. The conversion factors are $C_{50} = 1.26 \cdot C_{100}$ (ball) and $C_{50} = 1.23 \cdot C_{100}$ (roller). This catalogue gives both values for the dynamic load and moment ratings (see subscript). The calculations in the following sections are based on the load rating definition C_{100}.

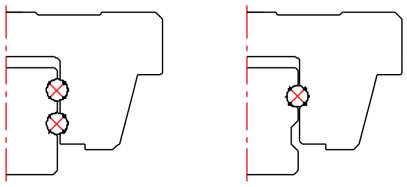
OPERATING LIMITS

Parameter	Value	Note
Speed	v_{max} = 2–5 m/s	For exact values see the individual carriage types.
Acceleration	a_{max} = 40–500 m/s²	For exact values see the individual carriage types. When $F_{comb} > 2.8 \cdot F_{pr}$: a_{max} = 50 m/s².
Temperature range	t = 0 °C to 80 °C	Briefly up to 100 °C permitted.
Friction	μ = 0.002–0.003	Coefficient of friction without seal friction.

BALL CONTACT AND FRICTION



Two-point contact — VX series (left), VB series (right)



Four-point contact — gothic-arch raceway

VELTORK VX series (X-type) and VB series (O-type) ball linear guide systems both use four ball rows, so the balls make two-point contact whatever the load direction, keeping friction to a minimum.

Other linear guide systems with two or four ball rows and four-point contact have several times the friction: because of the gothic-arch raceway profile, differential slip occurs under lateral forces, or under an equivalent preload without external load, increasing friction up to fivefold depending on raceway curvature and load. This high friction causes correspondingly high heat generation.

Forces, Moments and Load Ratings

Load directions and the definition of the catalogue ratings

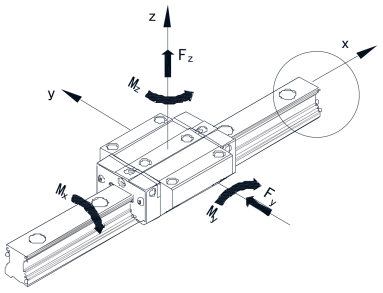
In VELTORK ball and roller linear guide systems the raceways are arranged at a 45° contact angle, giving the whole system equally high load capacity in all four main load directions. Ball carriages can take both forces and moments.

Forces in the four main directions

- Tensile force F_z (+z direction)
- Compressive force $-F_z$ (–z direction)
- Lateral force F_y (+y direction)
- Lateral force $-F_y$ (–y direction)

Moments about the three axes

- Torsional moment M_x (about x axis)
- Longitudinal moment M_y (about y axis)
- Longitudinal moment M_z (about z axis)



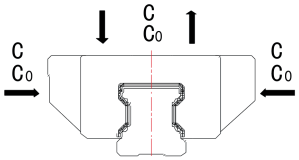
Definition of load ratings

Dynamic load rating C_{100}

The radial load, constant in magnitude and direction, that a linear rolling bearing can theoretically carry for a nominal life of 10^5 m travel (to DIN ISO 14728-1). The dynamic load ratings in the tables exceed the DIN and ISO values; they have been verified by testing.

Static load rating C_0

The static load in the load direction that produces a calculated contact stress of 4200 MPa at the centre of the most heavily loaded contact between ball and raceway. At this load, rolling element and raceway undergo a total permanent deformation at the contact point of about 0.0001 times the ball diameter (to DIN ISO 14728-1).



Definition of moment ratings

Dynamic torsional moment rating M_{t100}

Comparative dynamic moment about the x axis that causes a load equivalent to the dynamic load rating C_{100}.

Static torsional moment rating M_{t0}

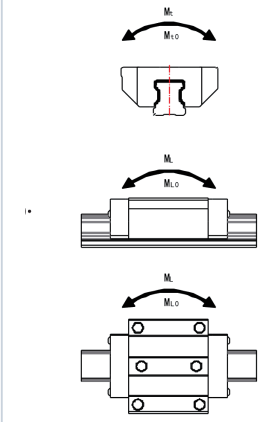
Comparative static moment about the x axis that causes a load equivalent to the static load rating C_0.

Dynamic longitudinal moment rating M_{L100}

Comparative dynamic moment about the y or z axis that causes a load equivalent to the dynamic load rating C_{100}.

Static longitudinal moment rating M_{L0}

Comparative static moment about the y or z axis that causes a load equivalent to the static load rating C_0.



Nominal Life

Definition and calculation

The nominal life is the calculated life that a single rolling bearing, or a group of identical bearings operating under the same conditions, reaches with 90% probability, using common materials of normal manufacturing quality under normal operating conditions (to DIN ISO 14728-1).

NOMINAL LIFE IN METRES

Ball linear guide systems

$$(1)\quad L = \left(\frac{C}{F_m}\right)^3 \cdot 10^5\ \mathrm{m}$$

Roller linear guide systems

$$(1)\quad L = \left(\frac{C}{F_m}\right)^{10/3} \cdot 10^5\ \mathrm{m}$$

Shocks and vibration place additional loads on the contact points between balls and raceways. These conditions are very difficult to determine precisely, but the higher the speed, the higher the additional load. The load factor f_w accounts for the effect of shocks and vibration on the life of ball linear guide systems.

Operating conditions	Speed	Load factor f_w
No shocks or vibration	v < 15 m/min	1.0–1.2
Light shocks and vibration	15 m/min ≤ v < 60 m/min	1.2–1.5
Moderate shocks and vibration	60 m/min ≤ v < 120 m/min	1.5–2.0
Heavy shocks and vibration	v ≥ 120 m/min	2.0–3.5

NOMINAL LIFE IN OPERATING HOURS

Constant stroke length and frequency. If stroke length s and stroke frequency n stay constant over the whole nominal life, the nominal life in hours is calculated with formula (2).

$$(2)\quad L_h = \frac{L}{2 \cdot s \cdot n \cdot 60}$$

Variable speed. With formula (3) the nominal life in operating hours is calculated from the mean speed v_m. For stepped speed changes, v_m is calculated from the speeds and the time fractions q_{tn} of the individual load phases, formula (4).

$$(3)\quad L_h = \frac{L}{60 \cdot V_m}$$

$$(4)\quad V_m = \frac{|V_1| \cdot q_{t1} + |v_2| \cdot q_{t2} + \cdots + |v_n| \cdot q_m}{100\%}$$

MODIFIED NOMINAL LIFE

Ball linear guide systems

$$L_{na} = a_1 \cdot \left(\frac{C_{50}}{f_w \cdot F_m}\right)^3 \cdot 50 \cdot 10^3\, m$$

Roller linear guide systems

$$L_{na} = a_1 \cdot \left(\frac{C}{F_m}\right)^{\frac{10}{3}} \cdot 10^5 m \qquad L_{ha} = \frac{L_{na}}{2 \cdot s \cdot n \cdot 60}$$

If a 90% probability of reaching the life is not sufficient, reduce the nominal life by multiplying it by factor a_1 from the table.

Probability of reaching the life (%)	L_{na}	Factor a_1
90	L_{10a}	1.00
95	L_{5a}	0.64
96	L_{4a}	0.55
97	L_{3a}	0.47
98	L_{2a}	0.37
99	L_{1a}	0.25

NOTE

DIN ISO 14728-1 limits the validity of formula (1) to an equivalent dynamic load $F_m < 0.5 \cdot C_{100}$. In our experience, however, the life formula can be applied under ideal operating conditions to loads up to $F_m = C_{100}$. If the stroke is shorter than twice the carriage length B_1 (see dimension tables), the load may need to be reduced – please consult us.

Bearing Loads for Life Calculation

Load ratios and combined equivalent load

As a rule, the dynamic and static load ratios should not be less than 4.0. Applications requiring higher rigidity and/or longer life need higher load ratios. The maximum permissible lateral forces, tensile forces and moments must be checked.

The static safety factor S_0 given under “Static safety factor” must be observed; see also the mounting instructions.

$$\text{Dynamic load ratio} = \frac{C_{100}}{F_{max}}$$

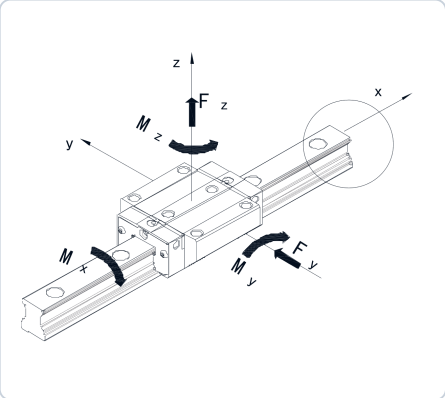
$$\text{Static load ratio} = \frac{C_0}{F_{0max}}$$

Combined equivalent bearing load

For combined vertical and horizontal external loads, the equivalent dynamic load F_{comb} is calculated with formula (5). The design of the linear guide system permits this simplified calculation.

If an external force acts on the ball carriage at any angle, first resolve it into F_y and F_z with the correct signs, then insert their values in formula (5) or (6).

$$(5)\quad F_{comb} = |F_y| + |F_z|$$

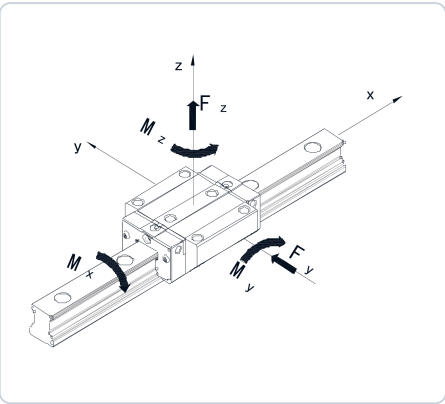


Combined equivalent load including moments

Formula (6) combines all load cases into a single reference load, the combined equivalent load. It applies only to one rail with one carriage; for other combinations the formula can be simplified.

$$(6)\quad F_{comb} = |F_y| + |F_z| + C_{100} \cdot \frac{|M_x|}{M_{t100}} + C_{100} \cdot \frac{|M_z|}{M_{l100}}$$

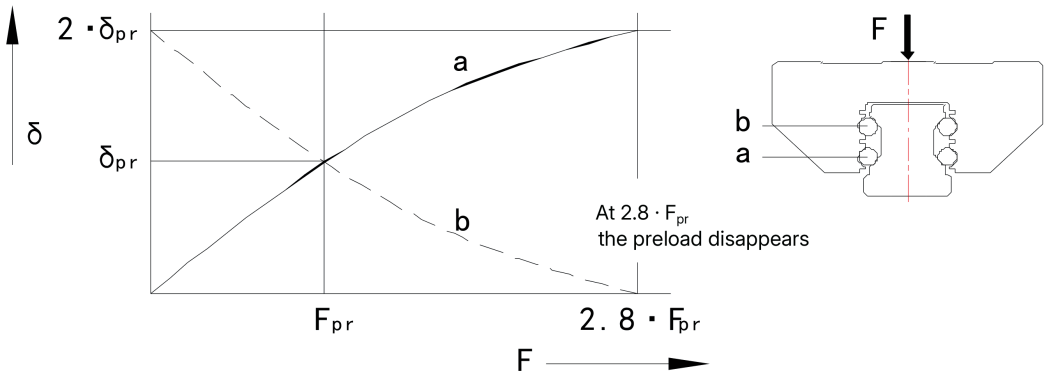
Forces and moments drawn in the coordinate system may also act in the opposite direction. If an external force acts on the ball carriage at any angle, first resolve it into F_y and F_z, then insert their values in formula (6). The design of the ball carriage permits this simplified calculation.



Taking Internal Preload into Account

Internal preload Fpr and effective equivalent load

To increase the rigidity and accuracy of the guidance system, preloaded ball carriages are recommended (see “System preload”). With ball carriages of preload classes C2 and C3 the internal preload must be taken into account, because the two ball rows a and b are preloaded against each other with an internal preload F_{pr} through a defined interference, producing a deformation δ_{pr} (see diagram).



Symbol	Designation	Symbol	Designation	Unit
a	Loaded (lower) ball row	δ_{pr}	Rolling contact deformation under F_{pr}	–
b	Unloaded (upper) ball row	F	Load on the ball carriage	N
δ	Rolling contact deformation under F	F_{pr}	Internal preload	N

Effective equivalent bearing load

If the external load exceeds 2.8 times the internal preload F_{pr}, one ball row is no longer preloaded.

CASE 1

$F_{comb} > 2.8 \cdot F_{pr}$: the internal preload F_{pr} has no influence on life.

$$(7)\ F_{eff} = F_{comb}$$

CASE 2

$F_{comb} \leq 2.8 \cdot F_{pr}$: the preload F_{pr} must be included when calculating the effective equivalent bearing load.

$$(8)\ F_{eff} = \left(\frac{F_{comb}}{2.8 \cdot F_{pr}} + 1 \right)^{\frac{3}{2}} \cdot F_{pr}$$

NOTE

With high dynamic loads the combined equivalent load should be $F_{comb} < 2.8 \cdot F_{pr}$, to prevent damage to the rolling bearing caused by slip.

Equivalent Loads and Load Ratios

Several load phases, static loads and reference values

Equivalent dynamic bearing load

For several load phases, calculate the equivalent dynamic bearing load with formula (9).

$$(9)\quad F_m = \sqrt[3]{(F_{eff\,1})^3 \cdot \frac{q_{s1}}{100\%} + (F_{eff\,2})^3 \cdot \frac{q_{s2}}{100\%} + \cdots + (F_{eff\,n})^3 \cdot \frac{q_{sn}}{100\%}}$$

Equivalent static bearing load

If the external static load combines vertical and horizontal loads acting together with a static torsional or longitudinal moment, calculate the equivalent static load F_{0comb} with formula (10). If an external force acts on the carriage at any angle, first resolve it into F_{0y} and F_{0z}, then insert their values in formula (10).

$$(10)\quad F_{0comb} = |F_{oy}| + |F_{oz}| + C_0 \cdot \frac{|M_{oy}|}{M_{lo}} + C_0 \cdot \frac{|M_{oz}|}{M_{lo}}$$

NOTE

The equivalent static bearing load F_{0comb} must not exceed the static load rating C_0. Formula (10) applies to one rail only.

Dynamic and static load ratios

The guidance system can be preselected from the ratio of the carriage load rating to the applied load. Select a suitable dynamic load ratio C_{100}/F_{max} and static load ratio C_0/F_{0max} for the application and calculate the required load ratings from them; then find the matching size and design in the dimension tables. The values below are for guidance only and assume typical customer requirements in the respective industry and application (e.g. service life, accuracy, rigidity).

REFERENCE VALUES FOR LOAD RATIOS

Machine type / sector	Application	C_{100}/F_{max}
Machine tools	General	6–9
	Turning	6–7
	Milling	6–7
	Grinding	9–10
	Engraving-milling	5
Rubber and plastics processing machines	Injection moulding	8
Woodworking and wood processing machines	Sawing, milling	5
Assembly and handling technology, industrial robots	Handling	5
Hydraulics and pneumatics	Lifting	6

Static Safety Factor and Symbols

Every design with rolling contact must be verified by calculating the static safety factor S_0. F_{0max} is the maximum load amplitude that can act on the linear guide, even if it acts only briefly; it may be the peak of a dynamic load spectrum.

$$S_0 = \frac{C_0}{F_{0max}}$$

Operating conditions	Static safety factor S_0
Overhead (suspended) mounting or applications with high risk	≥ 12
High dynamic loads at standstill, contamination	8–12
Normal machines and equipment where not all load parameters or connection accuracies are known	5–8
All load parameters fully known, vibration-free operation ensured	3–5

SYMBOLS

Symbol	Unit	Designation
a	–	Loaded (lower) ball row
a_1	–	Life factor
b	–	Unloaded (upper) ball row
C_{50}	N	Dynamic load rating (50 km)
C_{100}	N	Dynamic load rating (100 km)
C_0	N	Static load rating
F_{max}	N	Maximum dynamic load
F_{0max}	N	Maximum static load
F_{comb}	N	Combined equivalent bearing load
F_{0comb}	N	Equivalent static bearing load
F_{eff}	N	Effective equivalent bearing load
$F_{eff\,1...n}$	N	Uniform effective single load
F_m	N	Equivalent dynamic bearing load
F_{pr}	N	Preload force
F_y	N	External load from resulting force in y
F_{0y}	N	External load from static force in y
F_z	N	External load from resulting force in z
F_{0z}	N	External load from static force in z
f_w	–	Load factor

Symbol	Unit	Designation
M_t	Nm	Dynamic torsional moment rating
M_{t0}	Nm	Static torsional moment rating
M_L	Nm	Dynamic longitudinal moment rating
M_{L0}	Nm	Static longitudinal moment rating
M_x	Nm	Load from resulting moment about x
M_{0x}	Nm	Load from static moment about x
M_y	Nm	Load from resulting moment about y
M_{0y}	Nm	Load from static moment about y
M_z	Nm	Load from resulting moment about z
M_{0z}	Nm	Load from static moment about z
L	m	Nominal life (travel)
L_h	h	Nominal life (time)
L_{na}	m	Modified life (travel)
L_{ha}	h	Modified life (time)
n	min^{-1}	Stroke frequency (double strokes)
$q_{t1}...q_{tn}$	%	Time fraction of phases 1...n
s	m	Stroke length
S_0	–	Static safety factor
v_m	m/min	Mean speed
$v_1...v_n$	m/min	Speed in phases 1...n
δ	–	Rolling contact deformation under F
δ_{pr}	–	Rolling contact deformation under F_{pr}

System Preload and Accuracy

Preload classes C0–C5 · accuracy classes N to UP

Definition of preload

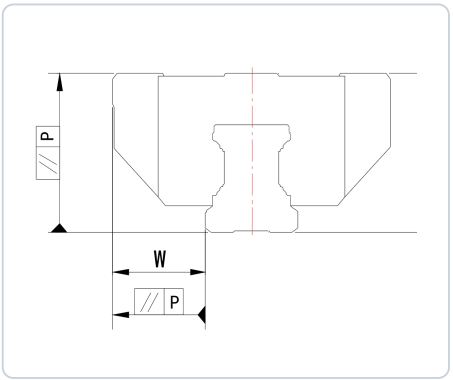
Preloading the carriage increases rigidity, so the internal preload must be included in life calculations. The preload class is chosen according to the application; rigidity charts are available on request. To avoid reducing life, the preload should not exceed 1/3 of the bearing load F. In general, carriage rigidity increases with preload; where vibration occurs, choose a correspondingly higher preload (C2 or C3).

Code	Preload class	Preload F_{pr}	Application
C0	Very light preload	0–0.02 C	For guides requiring the smoothest running, lowest friction and least sensitivity to external influences. Ball linear guide systems only; supplied in accuracy classes H and N only.
C1	Light preload	≈ 0.03 C	For precise guidance systems with low external loads and high demands on overall rigidity.
C2	Medium preload	≈ 0.08 C	For precise guidance systems with both high external loads and high demands on overall rigidity; also for single-rail systems and higher accelerations. Takes above-average moment loads without significant elastic deformation.
C3	Heavy preload	≈ 0.12 C	For high-rigidity linear guide systems, e.g. precision machine tools or moulding and casting machines. Absorbs high loads and moments with minimal elastic deformation. Supplied in accuracy classes UP, SP and P only.
C4	Extra-heavy preload	≈ 0.16 C	For guides with very high rigidity and high demands on overall rigidity. Roller linear guide systems only; supplied in accuracy classes UP, SP and P only.
C5	Ultra-heavy preload	≈ 0.19 C	For guides with extremely high rigidity and the highest demands on overall rigidity. Roller linear guide systems only; supplied in accuracy classes UP, SP and P only.

Accuracy classes

VELTORK rails are produced in five accuracy classes – N, H, P, SP and UP – which define the maximum permissible deviations in height, width and running parallelism. The accuracy class determines the positioning accuracy of the guide system in the machine.

Width accuracy W is the maximum lateral deviation between the reference sides of carriage and rail along the length; either side of the rail and the ground bottom face of the carriage can serve as reference side. **Height accuracy H** is measured between the mounting surface of the carriage and the bottom of the rail. H and W are arithmetic means measured at the centre of the carriage; ΔH and ΔW are measured with the carriages at the same position on the rail.



Accuracy Classes — Tolerances

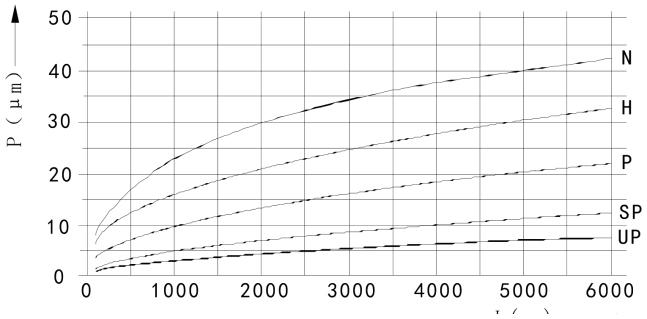
Height, width and running parallelism (values in µm)

WIDTH AND HEIGHT ACCURACY

Accuracy class	Normal N	High H	Precision P	Super precision SP	Ultra precision UP
Permissible tolerance of height H	±100	±40	±20	±10	±5
Permissible tolerance of width W	±40	±20	±10	±7	±5
Max. difference within a pair, ΔH and ΔW	30	15	7	5	3

RUNNING PARALLELISM

The parallelism tolerance between the two reference planes of rail and carriage as the carriage travels along the full rail length. The curve gives the running parallelism P (µm) against the rail length L (mm) for each accuracy class.



TOLERANCES FOR COMBINED ACCURACY CLASSES (MM)

Carriage		Rail				
		N	H	P	SP	UP
N	Tolerance of H	±100	±48	±32	±23	±19
	Tolerance of W	±40	±28	±22	±20	±19
	Max. difference of H and W on one rail	30	30	30	30	30
H	Tolerance of H	±92	±40	±24	±15	±11
	Tolerance of W	±32	±20	±14	±12	±11
	Max. difference of H and W on one rail	15	15	15	15	15
P	Tolerance of H	±88	±36	±20	±11	±7
	Tolerance of W	±28	±16	±10	±8	±7
	Max. difference of H and W on one rail	7	7	7	7	7
SP	Tolerance of H	±87	±35	±19	±10	±6
	Tolerance of W	±27	±15	±9	±7	±6
	Max. difference of H and W on one rail	5	5	5	5	5
UP	Tolerance of H	±86	±34	±18	±9	±5
	Tolerance of W	±26	±14	±8	±6	±5
	Max. difference of H and W on one rail	3	3	3	3	3

Recommended Accuracy Classes

By equipment type

The recommendations are based on the industry standards for each equipment type (ISO, DIN, GOST), practical experience with linear motion systems, and typical positioning accuracy, load and speed requirements.

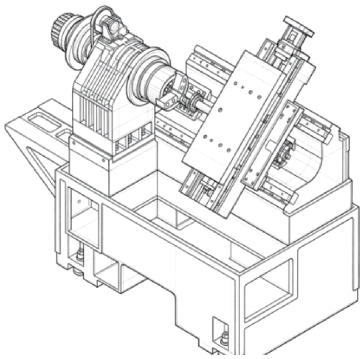
Sector	Equipment type	Accuracy class				
		N	H	P	SP	UP
Machine tools	Machining centres			●	●	
	Lathes			●		●
	Milling machines			●		●
	Boring machines			●	●	
	Jig boring machines				●	
	Grinding machines				●	
	EDM machines			●		●
	Punch presses		●	●		
	Laser machines		●	●	●	
	Woodworking machines	●		●		●
	CNC drilling machines		●	●		
	Multi-function threading machines		●		●	
	Pallet conveyors	●				
	Automatic tool changers	●				
	Wire EDM machines			●	●	
	Deburring machines				●	●
Industrial robots	Cartesian robots	●	●	●		
	Cylindrical robots	●	●			
Semiconductor equipment	Wire bonders			●		●
	Probe testers				●	●
	SMD placement machines		●			
	PCB drilling machines		●		●	●
Other equipment	Die-casting machines	●	●			
	Coordinate measuring machines				●	●
	Office equipment	●		●		
	Conveyor systems	●				
	X-Y tables		●		●	
	Coating machines	●				
	Welding machines	●	●			
	Medical equipment	●	●			
	Digitising tables		●	●	●	
	Inspection equipment			●	●	●

Accuracy Class Combinations

Carriage and rail classes, running accuracy

APPLICATION TIP

VELTORK VR25 and VR30 roller linear guide systems are particularly suitable for T6 and T7 drilling-tapping centres.



Recommended combinations

- Short stroke and small carriage spacing: carriage accuracy class higher than rail.
- Long stroke and large carriage spacing: rail accuracy class higher than carriage.

Carriage accuracy class	Rail accuracy class				
	N	H	P	SP	UP
N	✓	✓	–	–	–
H	✓	✓	–	–	–
P	–	✓	✓	–	–
SP	–	–	✓	✓	✓
UP	–	–	–	✓	✓

Criteria for running accuracy classes

SP and UP carriages offer unrivalled running accuracy and very low fluctuation thanks to optimised ball entry and exit zones. These high-precision carriages are especially effective in high-quality machining processes, measuring systems, high-precision scanners and grinding systems.

Optimising running accuracy

The following measures improve the geometric running characteristics of linear guides:

- Use carriages and rails of high accuracy classes.
- Use extended carriages.
- Use two parallel rails, or at least two carriages on one rail.
- In single-rail systems use flanged carriages.
- Very high running accuracy is possible only with tight form and position tolerances and a good surface finish of the mating structure.

Joined Rails

Rails longer than the maximum one-piece length

VELTORK one-piece rails are currently supplied up to 4 m long (6 m and longer will follow). Where the required total length exceeds the maximum one-piece length, rails with closely matched raceway profiles are selected, their ends precision-machined and the rails joined to the required length. Joined rails are shipped as separate segments; the complete rail exists only once installed.

VELTORK joined rails are delivered with joint markings engraved in sequence. Joined rails must be installed in the order marked on the rails to ensure system accuracy. Offset the joints of paired rails to avoid accuracy errors at the joints caused by differences between rails.

IMPORTANT

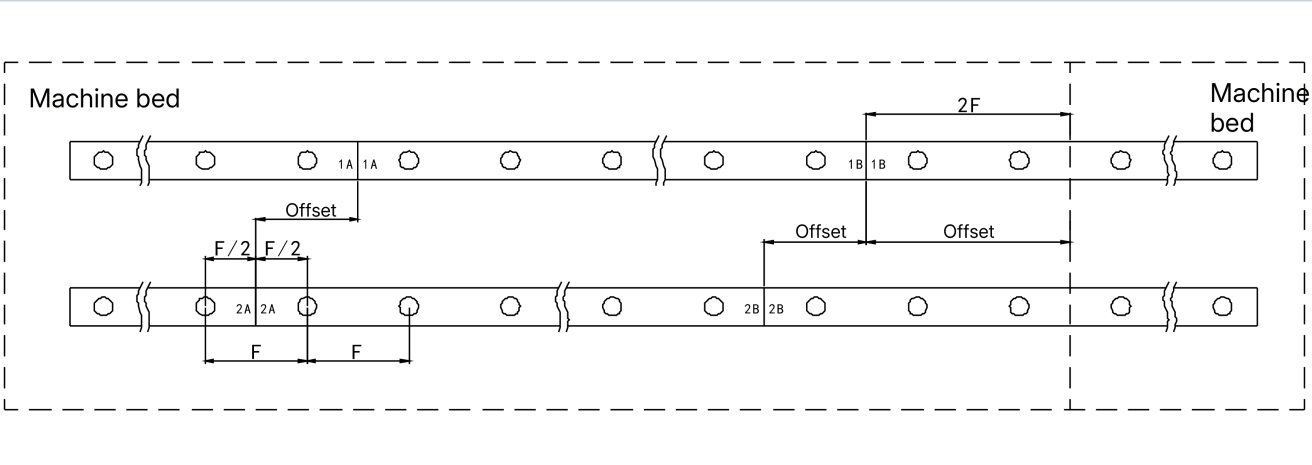
1. After matching the joint, the two mounting holes adjacent to the joint should preferably be at the standard hole pitch, to simplify automatic drilling of the mounting base and rail installation.
2. If the hole pitch at the joint differs from the standard pitch after joining, attach a drawing to the order.
3. If joined rails are mounted on a jointed machine bed, offset the rail joints from the bed joints by at least two hole pitches.
4. Fit lateral clamping elements close to each joint to keep joined rails stable in service. Within a delivered batch, rails are numbered in sequence (1, 2, ...) and each joint is marked with capital letters (A, B, ...) giving its position in the complete rail.

MAXIMUM GAP WIDTH AT THE JOINT

Size	Max. gap width (µm)	Size	Max. gap width (µm)
15	30	35	50
20	30	45	50
25	40	55	60
30	40	65	60

According to general industry practice.

JOINED RAILS — SCHEMATIC



Lubrication

Lubricants, methods and lube ports

Lubrication has a major influence on linear guide systems. Without adequate lubrication, friction in the rolling zone increases and over time becomes the main cause of shortened life.

Lubricants perform the following functions

- Reduce friction in the rolling zone, prevent seizure and reduce wear.
- Form an oil film between rolling surfaces, reducing surface stress and extending rolling fatigue life.
- Prevent corrosion.

Requirements for lubricants

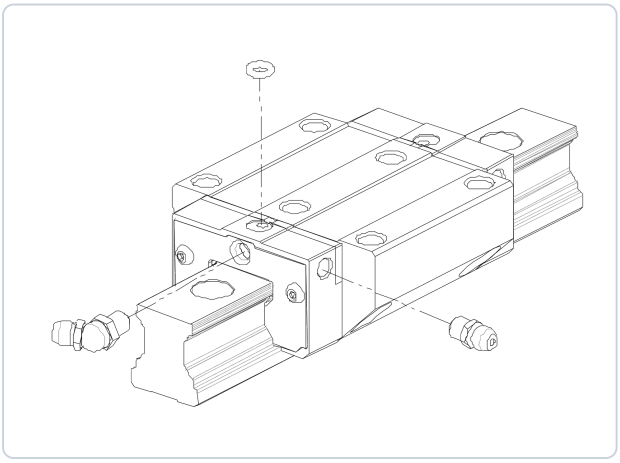
- High oil-film strength and low friction
- High wear resistance
- Excellent thermal stability
- Non-corrosive, with excellent corrosion protection
- Low dust and water content
- Viscosity does not change significantly under repeated working

Types of lubricant

Linear guide systems are generally lubricated with grease, fluid grease or oil; the choice depends on technical, economic and ecological factors. Linear guide systems must receive initial lubrication before being put into operation, unless they were pre-lubricated at the factory.

Applying lubricant to linear guide systems

Lubrication ports are provided on the top, both sides and the ends of the return units at both ends of the carriage, through which grease or oil can be supplied. For lubrication from the top, pierce the oil hole at the marked position with a pre-heated metal pin of 0.8 mm diameter.



STANDARD STROKE

Stroke > 2 × carriage length B_1: lubricating through one of the two end caps is sufficient. For vertical or inclined mounting with fluid grease or oil, lubricate through the upper end cap.

SHORT STROKE

Stroke < 2 × carriage length B_1: lubricate through both end caps.

Initial Lubrication and Relubrication

Procedure and lubricant quantities

Initial lubrication

As standard, ball and roller carriages are supplied with initial lubrication; only carriages without grease need it. Before sliding the carriage onto the rail, lubricate its seals with the respective lubricant. Lubricant reservoirs, with or without pump, must have a stirring device so that the lubricant flows freely.

1. Inject the quantity from the table below; for short strokes, into both end caps.
2. Move the carriage back and forth three times, stroke > 3 × carriage length.
3. Repeat steps 1 and 2 twice (once for oil lubrication).
4. Check that a lubricant film is visible on the rail.

Relubrication

- Relubricate when the relubrication interval is reached.
- Do not change from grease to oil lubrication when relubricating.
- With contamination, high temperatures, vibration or shock loads, shorten the lubrication intervals.
- Under normal operating conditions, relubricate at least every 2 years because of grease ageing.
- VELTORK recommends checking the lubricant every 100 km of travel or every 3–6 months.

LUBRICANT QUANTITIES — VX AND VB BALL CARRIAGES

Size	Initial lubrication (cm^3)		Relubrication (cm^3)	
	Grease / fluid grease	Oil	Grease / fluid grease	Oil
15	0.4 (3×)	0.4 (2×)	0.4 (3×)	0.4 (1×)
20	0.7 (3×)	0.7 (2×)	0.7 (3×)	0.7 (1×)
25	1.4 (3×)	1.0 (2×)	1.4 (3×)	1.0 (1×)
30	2.2 (3×)	1.1 (2×)	2.2 (3×)	1.1 (1×)
35	2.2 (3×)	1.2 (2×)	2.2 (3×)	1.2 (1×)
45	4.7 (3×)	2.2 (2×)	4.7 (3×)	2.2 (1×)
55	9.4 (3×)	3.6 (2×)	9.4 (3×)	3.6 (1×)
65	15.4 (3×)	6.0 (2×)	15.4 (3×)	6.0 (1×)

LUBRICANT QUANTITIES — VR ROLLER CARRIAGES

Size	Initial lubrication (cm^3)		Relubrication (cm^3)	
	Grease / fluid grease	Oil	Grease / fluid grease	Oil
25	0.8 (3×)	0.8 (2×)	0.8 (3×)	1.2 (1×)
30	0.9 (3×)	1.1 (2×)	0.9 (3×)	1.3 (1×)
35	0.9 (3×)	1.3 (2×)	0.9 (3×)	1.3 (1×)
45	1.0 (3×)	1.5 (2×)	1.0 (3×)	1.5 (1×)
55	2.5 (3×)	2.0 (2×)	2.5 (3×)	2.0 (1×)
65	2.7 (3×)	4.0 (2×)	2.7 (3×)	4.0 (1×)

Figures in brackets: number of strokes per filling.

Oil Delivery Rates and Grease Nipples

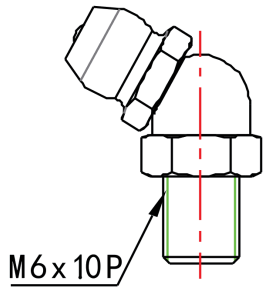
OIL DELIVERY RATE — SINGLE-LINE PISTON DISTRIBUTORS

Size	Delivery rate (cm³/h)	
	Grease / fluid grease	Oil
15	0.2	–
20	0.2	–
25	0.3	0.3
30	0.3	0.4
35	0.3	0.3
45	0.4	0.5
55	0.5	0.6
65	0.6	0.8

Influence of grease on friction

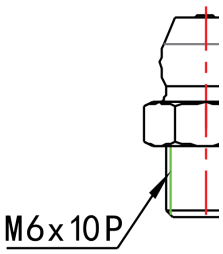
During initial running and after relubrication, the coefficient of friction rises temporarily because of the fresh grease. After a short running-in period it falls back to its original low value. The influence of grease on friction depends greatly on the properties of the grease; consistency and base-oil viscosity can be taken as approximate guide values.

Grease nipples



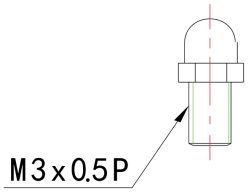
Suitable for
VR 25–65
VB 25–65
VX 20–35

No. 01 grease nipple · M6×1 · 45°



Suitable for
VR 25–65
VB 25–65
VX 20–35

No. 02 grease nipple · M6×1 · straight

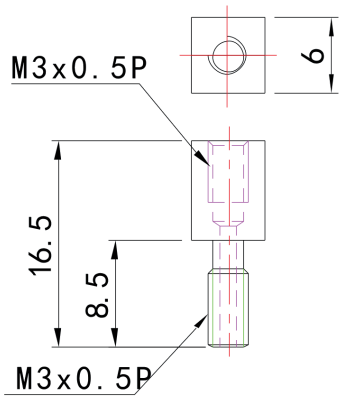


Suitable for
VB 15
VB 20

No. 03 grease nipple · M3×0.5

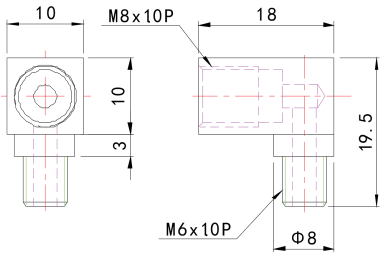
Oil Lubrication Fittings

Pipe and push-in tube fittings



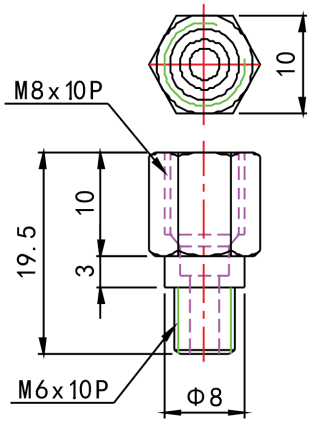
Suitable for
VB 15
VB 20

No. 22 fitting · M3×0.5



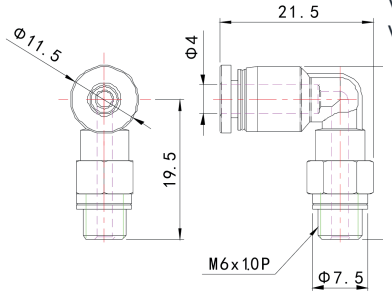
Suitable for
VR 25–65
VB 25–65
VX 20–35

No. 23 fitting · M8×1 · 90°



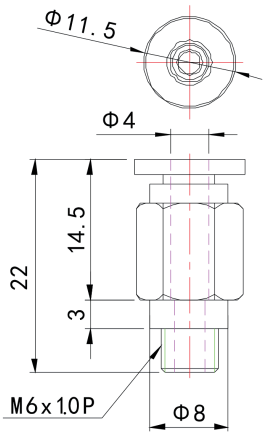
Suitable for
VR 25–65
VB 25–65
VX 20–35

No. 24 fitting · M8×1 · straight



Suitable for
VR 25–65
VB 25–65
VX 20–35

No. 33 tube fitting · Ø4 · 90°



Suitable for
VR 25–65
VB 25–65
VX 20–35

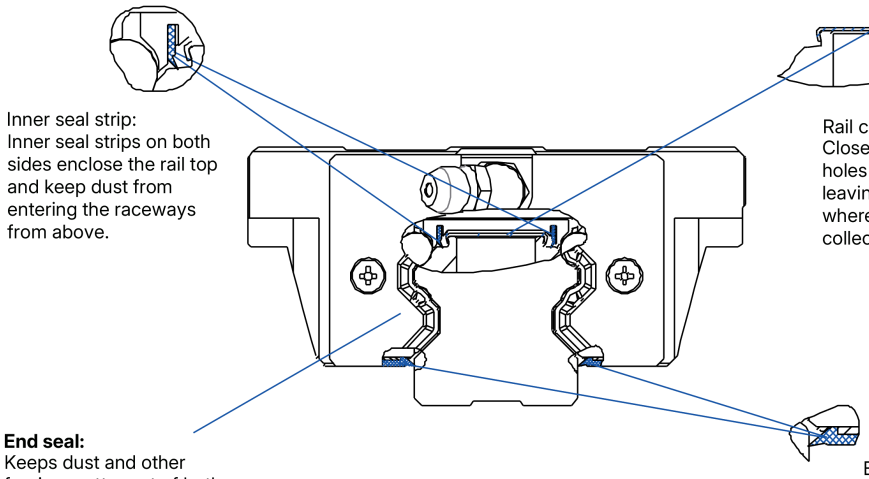
No. 34 tube fitting · Ø4 · straight

Further fittings with the codes 01–19 (grease) and 21–99 (oil) are listed under position **Lubrication fitting** in the order number. Customer-specific fittings on request.

Seals

Sealing of carriage and rail

VELTORK VX and VB ball linear guide systems and VR roller linear guide systems all offer outstanding sealing. Seals and dust protection on the carriage ends, underside and interior and on the rail top effectively ensure the service life of the linear guide system.

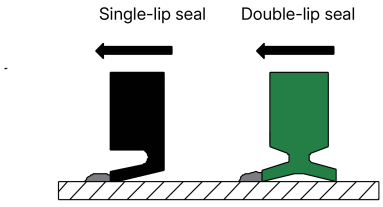


End seals

The end seal protects the carriage interior from dirt particles, chips and liquids and prevents lubricant from escaping. The optimised lip geometry keeps friction to a minimum.

Standard end seal (black). Sufficient for most applications, with a very good wiping action and long relubrication intervals.

Double-lip end seal (green). Recommended where the rail is exposed to large amounts of metal chips, wood chips or metalworking fluids. Outstanding wiping action, but higher friction and somewhat shorter relubrication intervals.

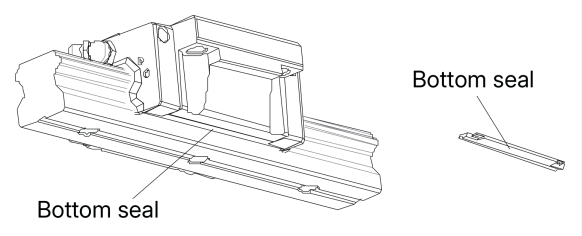


Single-lip and double-lip seal

Bottom Seals, Inner Seals and Rail Sealing

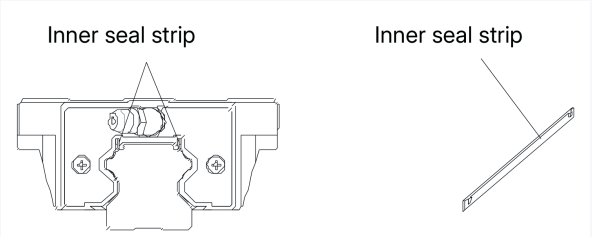
Bottom seal strip

Fitted as standard together with the standard end seal, it keeps dust and dirt from entering the carriage from below.



Inner seal strip

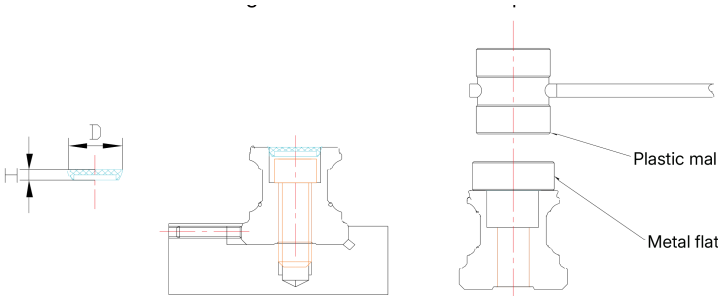
Protects the rolling elements reliably from dust: even if dust gets into the carriage, it can hardly pass the inner seal strip into the recirculation channels, greatly extending life in very dusty environments.



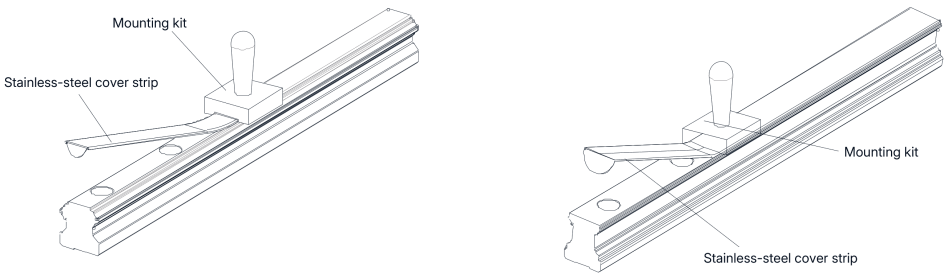
Rail sealing

In service, chips or foreign matter can collect in the rail mounting holes and be drawn into the carriage by the negative pressure created as it moves. VELTORK rails are normally supplied with plastic hole plugs; a stainless-steel cover strip over the entire rail top is also available and gives better wiping.

1 Hole plugs — close the counterbored mounting holes flush with the rail top



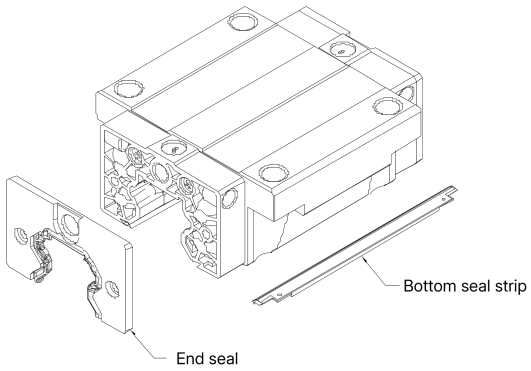
2 Stainless-steel cover strip — leaves the rail top smooth and flat so that no foreign matter can collect



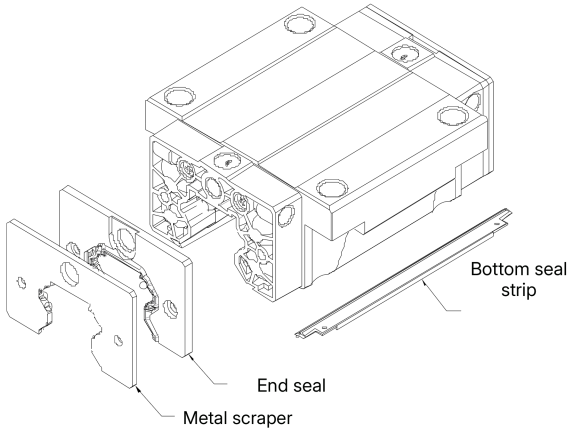
Dust Protection Kits

Seal combinations — position Seals in the order number

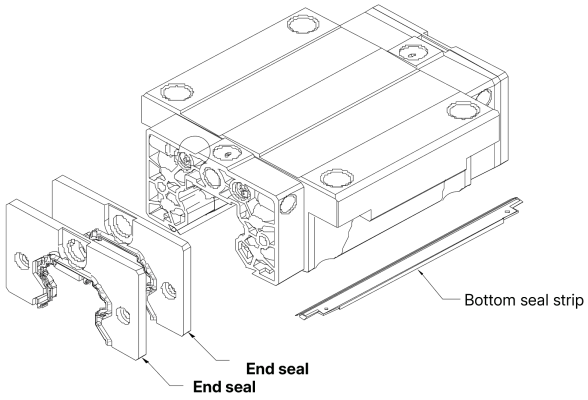
VELTORK offers dust protection kits for different applications. The standard kit is supplied when no code is given.



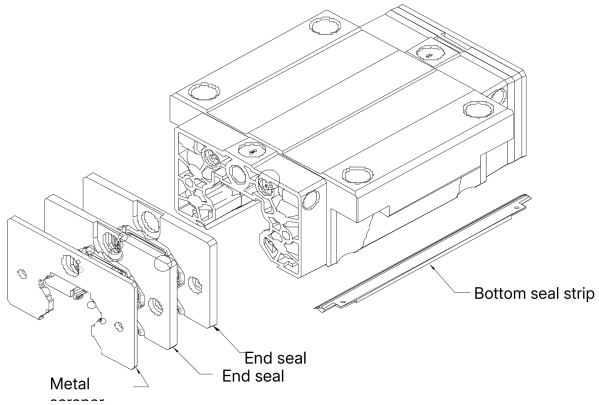
00 / no code **Standard dust protection**
end seal + bottom seal



ZZ
end seal + metal scraper + bottom seal



DD
double end seal + bottom seal

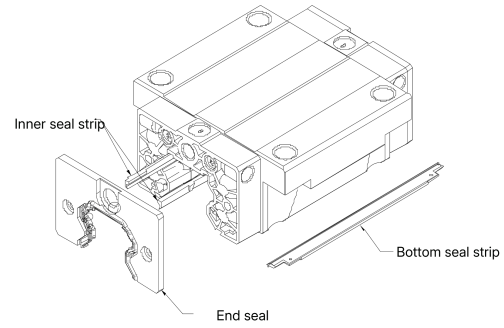


KK
double end seal + metal scraper + bottom seal

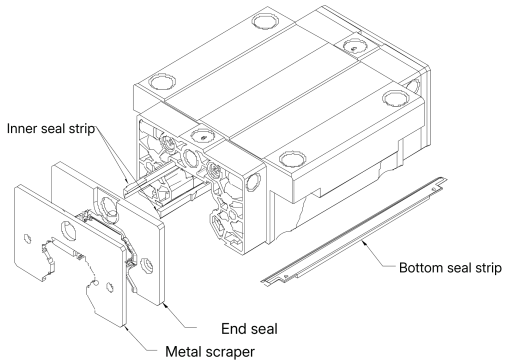
High Dust Protection Kits

With inner seal strips

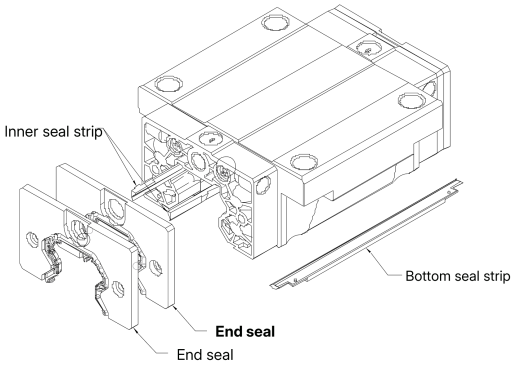
Building on the kits above, VELTORK adds inner seals to the carriage, reliably protecting the rolling elements from dust.



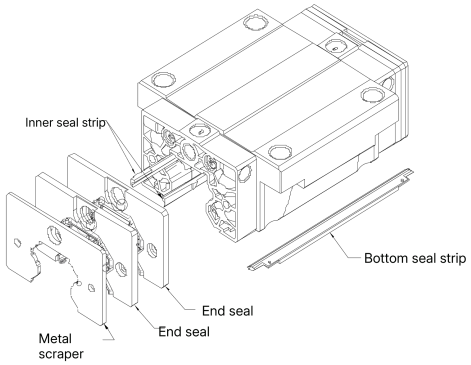
SH
end seal + bottom seal + inner seal strip



ZH
end seal + metal scraper + bottom seal + inner seal strip



DH
double end seal + bottom seal + inner seal strip



KH
double end seal + metal scraper + bottom seal + inner seal strip

Mounting Instructions

Valid for all ball and roller linear guide systems

VELTORK linear guide systems are high-quality products. Handle them with care during transport and installation.

SAFETY

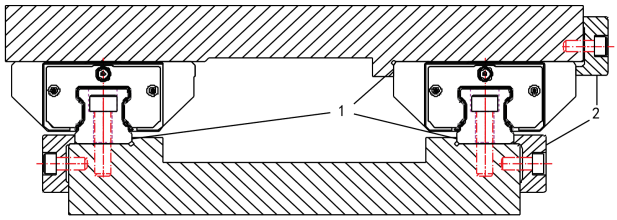
With overhead (suspended) or vertical mounting, the carriage could fall off the rail if rolling elements are missing or broken. **Secure the carriage against falling!**

Mounting examples

Rail

Both rail sides are ground reference edges. Optional lateral fixing: **1** reference shoulder, **2** clamping strip, **3** wedge.

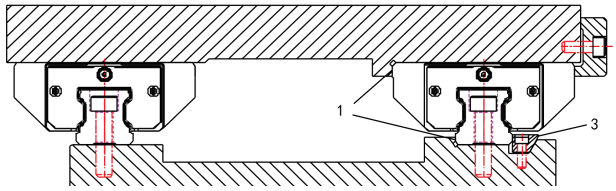
- Rails without lateral fixing must be aligned for straightness and parallelism during mounting, preferably with a straightedge.
- Without additional lateral fixing, see the individual types for the permissible lateral force.



Both rails and both carriages located

Carriage

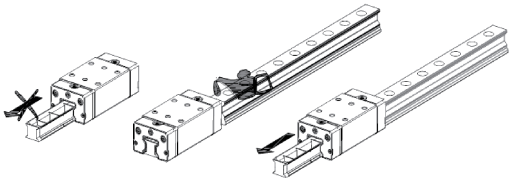
Each carriage has a ground reference edge on one side (see dimension V_1 in the drawings). Optional additional fixing: **1** reference shoulder, **2** clamping strip.



Only one rail and one carriage located

Mounting the carriage

- Clean and degrease the mounting surfaces first.
- Before sliding the carriage on, grease its seal lips and the rail chamfers.
- Leave the mounting rail in the carriage until it is pushed onto the rail – otherwise rolling elements may be lost!
- After mounting, the carriage must move smoothly.
- Use the mounting rail when pulling a carriage off the rail, and always keep removed carriages on the mounting rail.

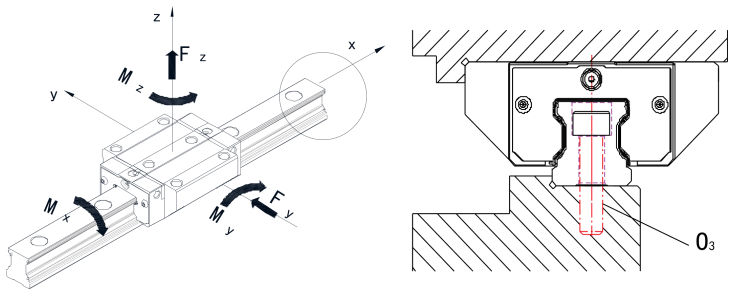


Fastening — Screw Connections

Maximum static tensile force and moment

The screw connections of carriage and rail determine the maximum static tensile force $F_{0z\ max}$, the maximum static moment $M_{0x\ max}$ and the maximum static lateral force $F_{0y\ max}$ (without locating strip) that can be transmitted to the linear guide. The maximum load of a linear guide system is therefore determined not only by the static load rating C_0 to ISO 14728-2 and the static moment of the rolling contact M_{t0}, but also by the screw connections.

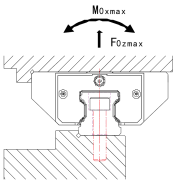
Carriages are usually fastened with 4 or 6 screws. Rails have one or two rows of screws at regular spacing; the screws directly under the carriage carry the highest load. If carriage and rail are fastened with screws of the same strength class, the joint between rail and base (O_3) is decisive for the maximum transmissible force and moment.



The table values for strength class 12.9 are taken from DIN 637 (for class 8.8 screws, values approx. 40% lower). VELTORK's values offer a higher safety margin than the standard. The screw connections were calculated with the catalogue dimensions (screw size, carriage length, clamping length, engagement depth, hole diameter, rail hole spacing, rail width, etc.); special screw connections must be recalculated to VDI 2230.

The table values apply only if

- screw size, number of screws and connection dimensions are as in the catalogue
- carriage and rail screws have the same strength class
- the mating structure is steel
- tensile force F_z or moment M_x is static and they do not occur together
- no lateral force F_y or longitudinal moment M_y/M_z is superimposed



NOTE

If these conditions are not met, the screw connection must be recalculated to VDI 2230. If loads approach the limits, VELTORK recommends checking the screw connection as well. The specified maximum static loads must not be exceeded — otherwise the guide lifts off the mating structure and the screw connection fails.

Maximum Static Tensile Force and Moment

Strength class 12.9 — for class 8.8 screws, values approx. 40% lower (to DIN 637)

BALL LINEAR GUIDE SYSTEMS — VB



Standard length



Extended

Size	Standard length		Extended	
	$F_{0z\,max}$ (N)	$M_{0x\,max}$ (Nm)	$F_{0z\,max}$ (N)	$M_{0x\,max}$ (Nm)
15	7 050	47	8 060	54
20	11 700	106	13 400	121
25	17 100	180	19 500	205
30	32 400	420	37 100	480
35	32 100	510	36 700	580
45	78 100	1 680	89 300	1 920
55	107 800	2 690	123 200	3 080
65	152 300	4 490	174 100	5 130

ROLLER LINEAR GUIDE SYSTEMS — VR



Standard length

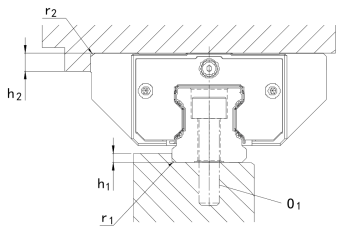


Extended

Size	Standard length		Extended	
	$F_{0z\,max}$ (N)	$M_{0x\,max}$ (Nm)	$F_{0z\,max}$ (N)	$M_{0x\,max}$ (Nm)
25	22 200	230	28 500	300
30	39 400	520	50 600	710
35	39 000	620	50 700	810
45	69 900	1 500	92 300	1 920
55	113 000	2 820	149 000	3 720
65	155 000	4 650	206 000	6 170

Shoulder Heights, Corner Radii, Tightening Torques

The shoulder heights h_1, h_2 and corner radii r_1, r_2 of the mounting base depend on the rail and carriage dimensions. VELTORK recommends the values below.



SHOULDER HEIGHTS AND CORNER RADII (MM)

Size	h_1	h_2	$r_{1\,max}$	$r_{2\,max}$
VX20	3.5	5.0	0.5	0.5
VX25	5.0	5.0	1.0	1.0
VX30	5.0	5.0	1.0	1.0
VX35	6.0	6.0	1.0	1.0
VB15	3.5	4.0	0.4	0.6
VB20	4.0	5.0	0.6	0.6
VB25	5.0	5.0	0.8	0.8
VB30	5.0	6.0	0.8	0.8
VB35	6.0	6.0	0.8	0.8
VB45	8.0	8.0	0.8	0.8
VB55	10.0	10.0	1.2	1.0
VB65	10.0	14.0	1.2	1.0
VR25	5.0	5.0	0.8	0.8
VR30	5.5	6.0	0.8	0.8
VR35	6.0	6.0	0.8	0.8
VR45	7.0	8.0	0.8	0.8
VR55	9.0	10.0	1.2	1.0
VR65	9.0	14.0	1.2	1.0

TIGHTENING TORQUES FOR RAIL SCREWS, SCREWED FROM ABOVE (NM)

Size	Screw	Strength class		
		8.8	10.9	12.9
15	M4	3.1	4.6	5.4
20	M5	6.4	9.4	11
25	M6	11	16	18
30	M8	26	38	44
35	M8	26	38	44
45	M12	88	110	130
55	M14	140	200	220
65	M16	210	310	340

Mounting Tolerances

Basics, principle and calculation

Basics

Mounting tolerances generate constraining forces, which increase running resistance, heat generation and loads on the mating structure and reduce accuracy and service life. They can also cause thermal expansion, deformation or settling. The magnitude of constraining forces depends largely on the rigidity of rails and mating structure and can be determined exactly only by numerical calculation. The surrounding structure must be rigid enough to take the resulting loads; if the mating surfaces are not stable, the internal constraining forces of the rolling elements and the screw loads increase (see DIN 637).

Principle

The more rigid the rails and structure, the tighter the permissible tolerances must be to avoid constraining forces.

Calculation

If the permissible height deviations S_1 and S_2 and the parallelism deviation P_1 calculated on the following pages are observed, the effect on service life can in principle be neglected.

INPUT PARAMETERS

- Rigidity of mating structure (mounting class)
- Rail rigidity (size, design, preload)
- Geometry (distances a, b)
- Accuracy class

→

RESULT — MOUNTING TOLERANCES

- Permissible transverse height deviation S_1
- Permissible longitudinal height deviation S_2
- Parallelism deviation P_1

If S_1, S_2 or P_1 are negative or cannot be met

- Choose a higher accuracy class.
- Lower the mounting class by reducing the rigidity of the mating structure.
- Increase carriage spacing a and/or b.
- Change the mounting concept, e.g. by alignment or adjustment.
- Calculate the reduction in service life.

Mounting Classes and Height Deviation

Transverse direction

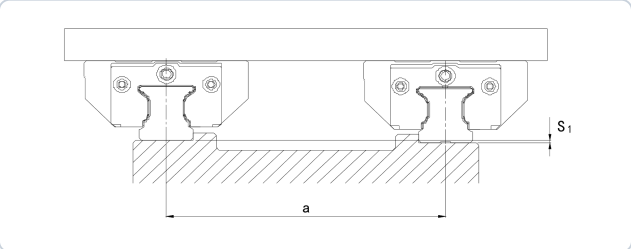
The mounting factor f accounts for the rigidity of the mating structure.

Mounting class	Description	Typ. accuracy	Factor f	Typical application
Self-aligning	Highly flexible surrounding structure	H / P	2.0	VX series for assembly and handling automation
Standard	Flexible surrounding structure	H / P	2.0	VB and VR series for assembly and handling automation
Precision	Rigid surrounding structure	P / SP	1.5	Machine tools: cutting, forming and parting
Ultra-precision	Highly rigid surrounding structure	SP / UP	1.0	High-precision machine tools: cutting, forming and parting

Permissible transverse height deviation

$$S_1 = f \cdot a \cdot Y - T_{S1}$$

a = rail centre distance [mm]
f = mounting factor (mounting class)
S_1 = permissible height deviation [mm]
T_{S1} = transverse accuracy class tolerance [mm]
Y = transverse calculation factor



Calculation factor	for preload class			
	C0	C1	C2	C3
Y	$4.3 \cdot 10^{-4}$	$2.8 \cdot 10^{-4}$	$1.7 \cdot 10^{-4}$	$1.2 \cdot 10^{-4}$

TRANSVERSE ACCURACY CLASS TOLERANCE (MM)

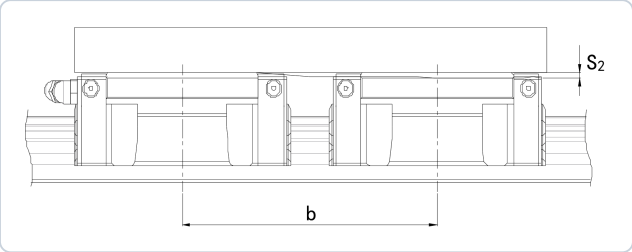
Carriage	Rail				
	N	H	P	SP	UP
N	0.200	0.096	0.064		
H	0.184	0.080	0.048	0.030	0.022
P	0.176	0.072	0.040	0.022	0.014
SP		0.070	0.038	0.020	0.012
UP		0.068	0.036	0.018	0.010

Longitudinal Height and Parallelism Deviation

Permissible longitudinal height deviation

$$S_2 = f \cdot b \cdot X - T_{S2}$$

b = carriage centre distance [mm]
f = mounting factor (mounting class)
S_2 = permissible height deviation [mm]
T_{S2} = longitudinal accuracy class tolerance [mm]
X = longitudinal calculation factor



Calculation factor	Standard length	Extended
X	$4.3 \cdot 10^{-5}$	$3.0 \cdot 10^{-5}$

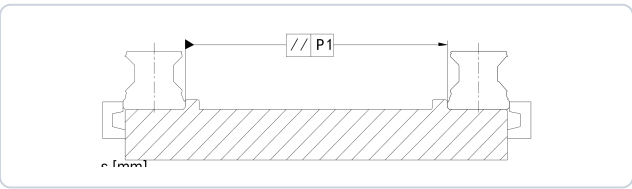
LONGITUDINAL ACCURACY CLASS TOLERANCE (MM) — SAME FOR ALL RAIL CLASSES

Carriage class	N	H	P	SP	UP
T_{S2}	0.030	0.015	0.007	0.005	0.003

Permissible parallelism deviation

$$P_1 = f \cdot P_{pr}$$

f = mounting factor (mounting class)
P_1 = permissible parallelism deviation [mm]
P_{pr} = parallelism deviation for the preload class [mm]



PARALLELISM DEVIATION FOR THE PRELOAD CLASS (MM)

Size	Preload class			
	C0	C1	C2	C3
15	0.015	0.009	0.005	0.004
20	0.018	0.011	0.006	0.004
25	0.019	0.012	0.007	0.005
30	0.021	0.014	0.009	0.006
35	0.023	0.015	0.010	0.007
45	0.028	0.019	0.012	0.009
55	0.035	0.025	0.016	0.011
65	0.043	0.035	0.022	0.016

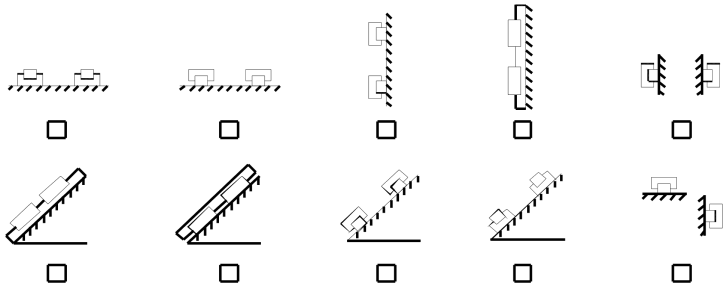
Selection Form — 1 Carriage per Rail

Appendix 01 · please complete and send to VELTORK sales

Customer:		Date:
Tel.:	Fax:	Contact:
Machine model:		Customer drawing no.:
Order code:		

Mounting axis: ☐ X ☐ Y ☐ Z ☐ Other ( )

Mounting position:



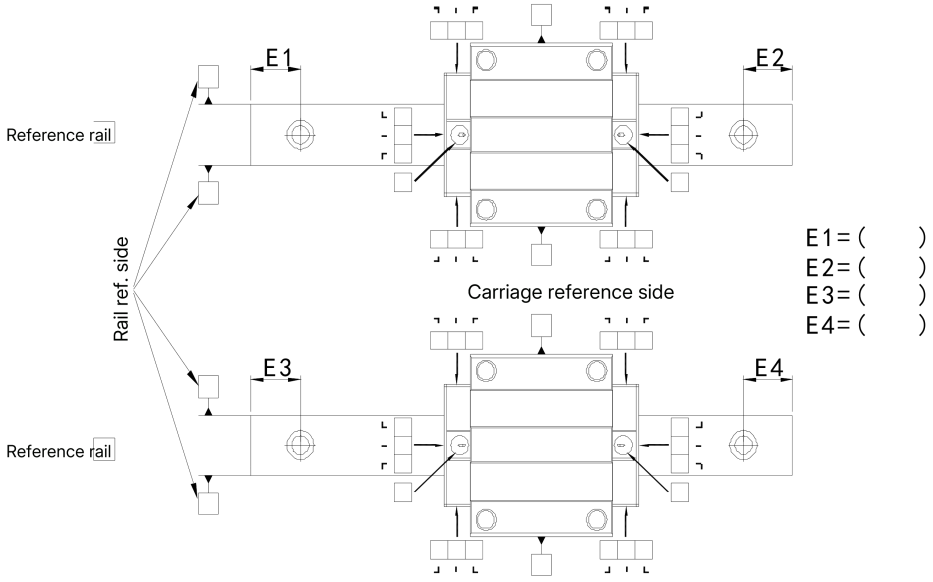
Lubrication: ☐ Grease — nipple no. ( ) ☐ straight ☐ angled
☐ Oil — fitting no. ( ) ☐ straight ☐ angled

Carriage seals: ☐ Standard ☐ ZZ ☐ KK ☐ DD ☐ SH ☐ ZH ☐ KH ☐ DH

Rail protection: ☐ Hole plugs ☐ Stainless-steel cover strip ☐ Mounted from below

Rails per axis: ☐ I (1) ☐ II (2) ☐ III (3) ☐ Other ( )

Tick the box for each required direction; enter end-hole spacings E1–E4.



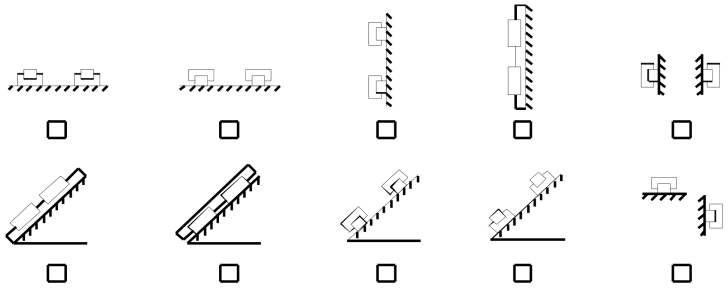
Selection Form — 2 Carriages per Rail

Appendix 02 · please complete and send to VELTORK sales

Customer:		Date:
Tel.:	Fax:	Contact:
Machine model:		Customer drawing no.:
Order code:		

Mounting axis: ☐ X ☐ Y ☐ Z ☐ Other ( )

Mounting position:



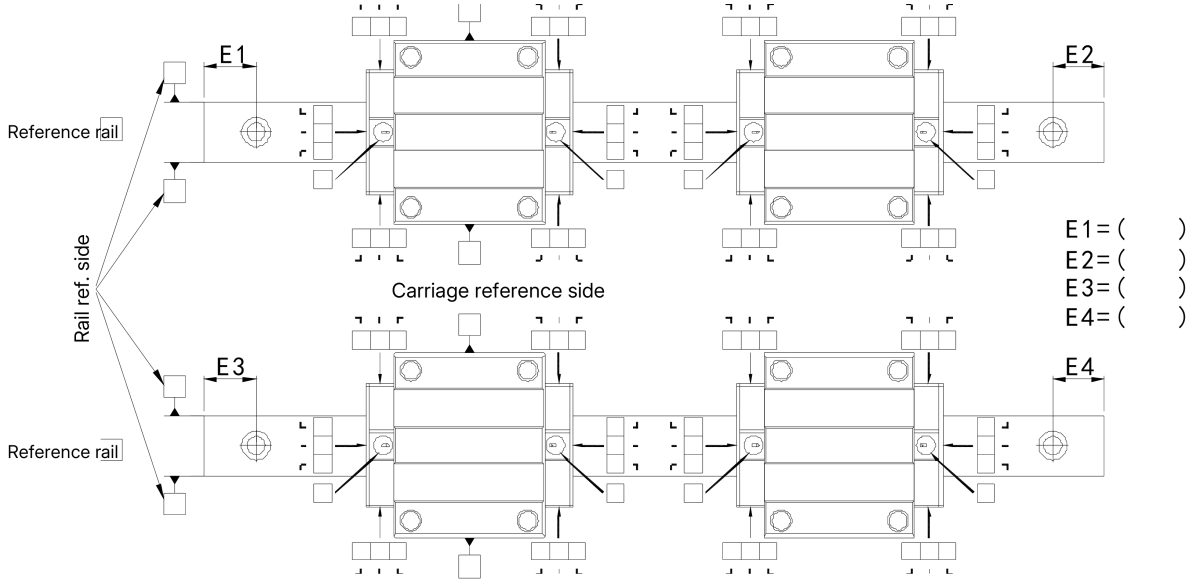
Lubrication: ☐ Grease — nipple no. ( ) ☐ straight ☐ angled
☐ Oil — fitting no. ( ) ☐ straight ☐ angled

Carriage seals: ☐ Standard ☐ ZZ ☐ KK ☐ DD ☐ SH ☐ ZH ☐ KH ☐ DH

Rail protection: ☐ Hole plugs ☐ Stainless-steel cover strip ☐ Mounted from below

Rails per axis: ☐ I (1) ☐ II (2) ☐ III (3) ☐ Other ( )

Tick the box for each required direction; enter end-hole spacings E1–E4.



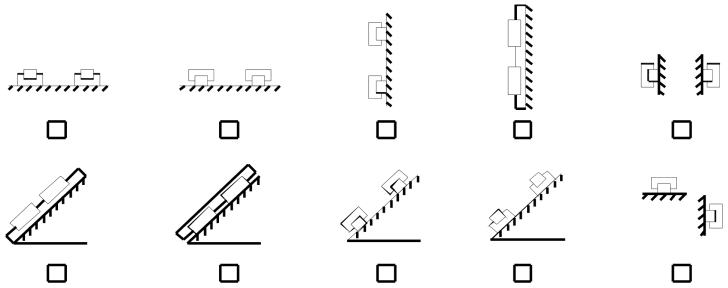
Selection Form — 3 Carriages per Rail

Appendix 03 · please complete and send to VELTORK sales

Customer:		Date:
Tel.:	Fax:	Contact:
Machine model:		Customer drawing no.:
Order code:		

Mounting axis: ☐ X ☐ Y ☐ Z ☐ Other ( )

Mounting position:



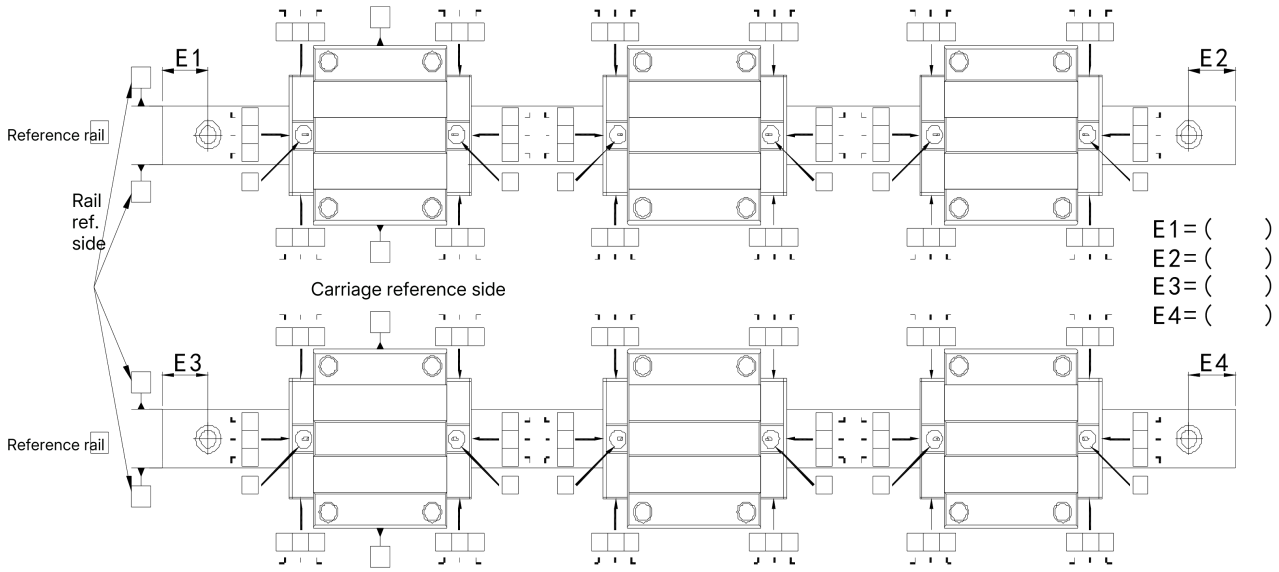
Lubrication: ☐ Grease — nipple no. ( ) ☐ straight ☐ angled
☐ Oil — fitting no. ( ) ☐ straight ☐ angled

Carriage seals: ☐ Standard ☐ ZZ ☐ KK ☐ DD ☐ SH ☐ ZH ☐ KH ☐ DH

Rail protection: ☐ Hole plugs ☐ Stainless-steel cover strip ☐ Mounted from below

Rails per axis: ☐ I (1) ☐ II (2) ☐ III (3) ☐ Other ( )

Tick the box for each required direction; enter end-hole spacings E1–E4.



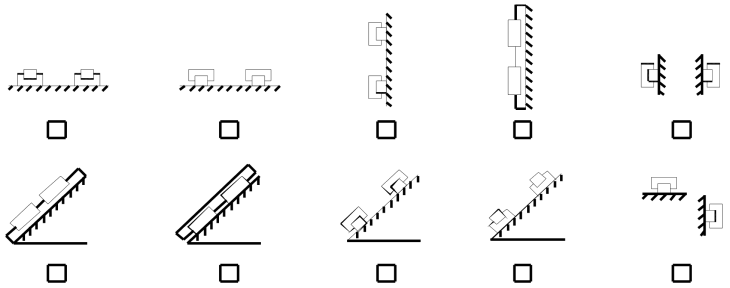
Selection Form — 4 Carriages per Rail

Appendix 04 · please complete and send to VELTORK sales

Customer:		Date:
Tel.:	Fax:	Contact:
Machine model:		Customer drawing no.:
Order code:		

Mounting axis: ☐ X ☐ Y ☐ Z ☐ Other ( )

Mounting position:



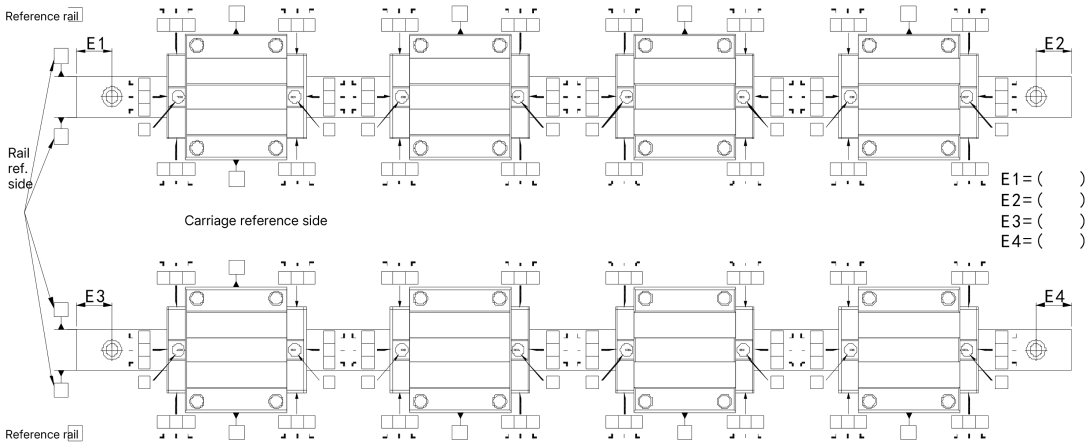
Lubrication: ☐ Grease — nipple no. ( ) ☐ straight ☐ angled
☐ Oil — fitting no. ( ) ☐ straight ☐ angled

Carriage seals: ☐ Standard ☐ ZZ ☐ KK ☐ DD ☐ SH ☐ ZH ☐ KH ☐ DH

Rail protection: ☐ Hole plugs ☐ Stainless-steel cover strip ☐ Mounted from below

Rails per axis: ☐ I (1) ☐ II (2) ☐ III (3) ☐ Other ( )

Tick the box for each required direction; enter end-hole spacings E1–E4.



VELTORK

Precision in linear motion.

Ball and roller linear guides with interchangeable mounting dimensions — engineered, verified and quality-controlled to one group standard, and delivered with consistent quality worldwide.

PRODUCT RANGE IN THIS CATALOGUE

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Flanged and narrow carriages · sizes 25–65 · preload C1–C3

VB — **O-type ball guide**
Flanged and narrow carriages · sizes 15–65 · preload C0–C3

VX — **X-type ball guide**
Flanged, smooth-hole and narrow carriages · sizes 20–35 · preload C0–C3

All data in this catalogue are nominal values for guidance and were compiled with care; no liability is accepted for errors or omissions. Load ratings and moments are calculated values under the stated conditions — verify every application by a service-life calculation. Confirm mounting dimensions against the released drawing or 3D model before machining mating parts. Specifications, order codes and dimensions may change without notice as part of continuous product development. Reproduction, in whole or in part, only with written permission.

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