



NEW PRODUCT

SLIDE WAY

NV/NVT type

NEW CONCEPT

STUDROLLER™ Completely Eliminates Slippage



Certificate No.958188



NIPPON BEARING CO., LTD.

SLIDE WAY NV type/NVT type

STUDROLLER system (Rivet Roller Structure)

The *STUDROLLER* system has been developed based on a new concept to provide a slip prevention function of the roller surface and its guiding track surface, enabling complete prevention of slip from the roller during operation. This system can cover various applications in the work site which include those with super-high acceleration/deceleration requirements.

The number of effective roller units is increased by 20 to 55%!

The contact length between the roller and the tracking surface is extended by 42 to 58%!

Accordingly, the load rating is increased by 1.4 to 2.3 times!

This makes the following possible:

Compact Size

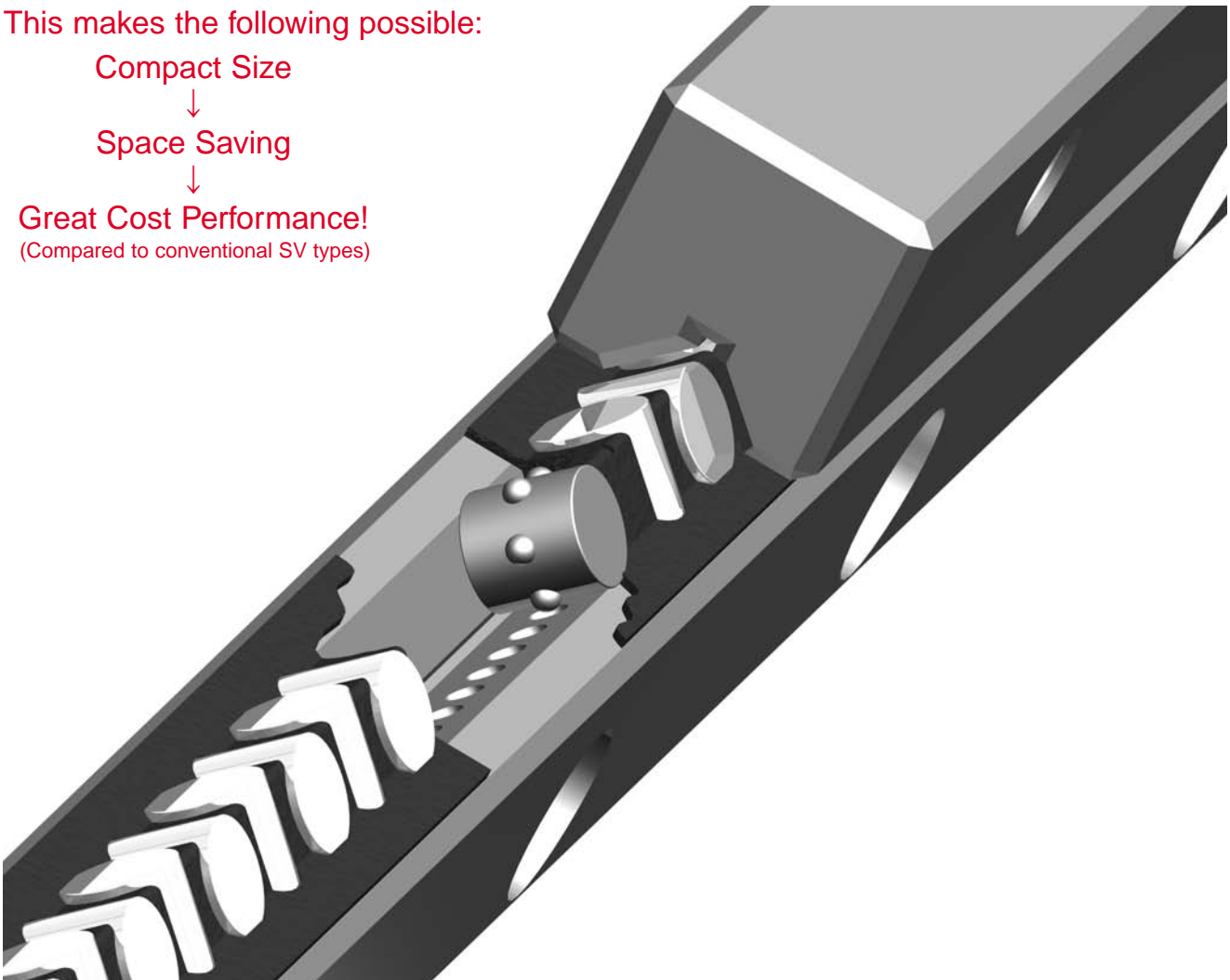


Space Saving



Great Cost Performance!

(Compared to conventional SV types)



NB's Slide Way NV and NVT types incorporate **STUDROLLER**, which has been developed based upon a new concept. By completely eliminating slippage between the roller and track surfaces, these new Slide Ways possess the smoothest and most accurate linear movement in the world.

STRUCTURE AND FEATURES

NB's Slide Way NV and NVT types consist of precisely ground tracking bases and R-retainers with built-in stud-rollers. To smooth the **STUDROLLER**, the tracking rail is optimally designed and the R-retainer incorporates the **STUDROLLER** and the precise roller. These ideas will enable slip-free operation between the raceway surface and the roller, resulting in motion with minimal frictional resistance.

Non-slip **STUDROLLER** System

The built-in **STUDROLLER** system, based on the new concept, completely eliminates slip inside the product, covering various applications including super-high acceleration/deceleration applications.

Compatibility with conventional types

The same dimensions and the same stroke as the Slide Way SV type enable complete compatibility between the two series.

Smooth movement

The optimally designed roller raceway section and the R-retainer ensure smooth, noiseless movement.

High rigidity and high-loading capacity

Based on the new tracking base design, the contact length of the roller and the raceway surface is increased by 42 to 58%, and narrowing the roller pitch increases the number of roller units to be connected. Accordingly, the load rating is 1.4 to 2.3 times greater when compared to the conventional SV type.

Figure 1 Structure of NV type

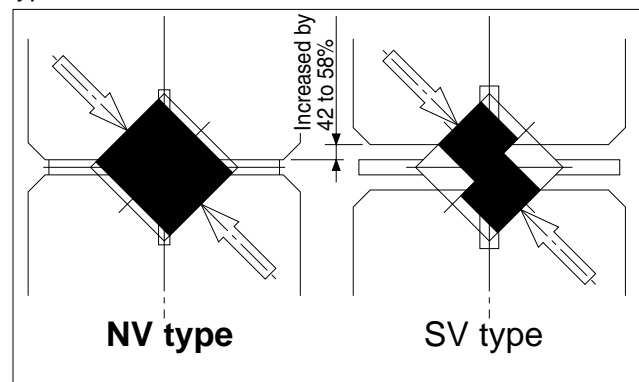
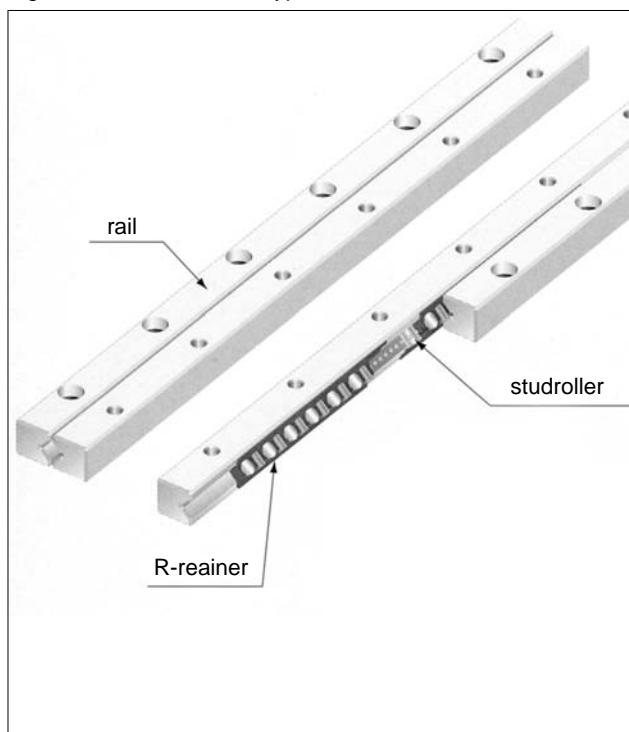
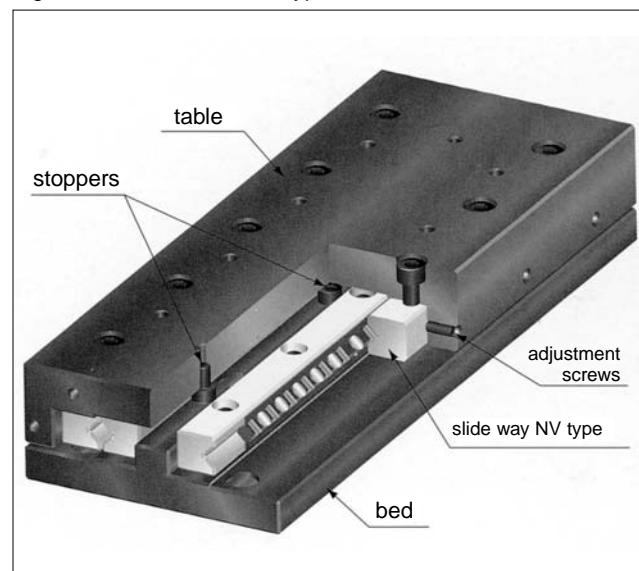


Figure 2 Structure of NVT type



TYPE

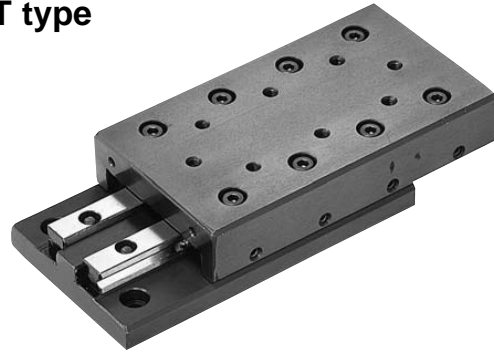
NV type



NV type

This consists of a set of four track rails and two R-retainers. Flexible table design allows a wide range of applications best suited to your purpose.

NVT type



NVT type

A slide table incorporates the NV type. The precisely machined table and bed ensure great accuracy. This table may be used as received without any troublesome accuracy or preload adjustments.

ACCURACY

NV type

The accuracy of the Slide Way NV type is represented as parallelism obtained from full-length measurement as shown in Figure 4. It is classified into three grades: High (no symbol), Precision (P) and Ultra Precision (UP). The Slide Way NV type is available for special accuracy. Please contact NB for details.

Figure 3, Parallelism

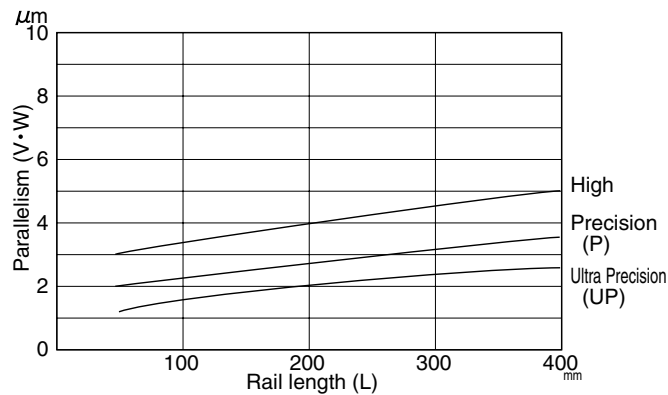


Figure 4, Accuracy Measurement

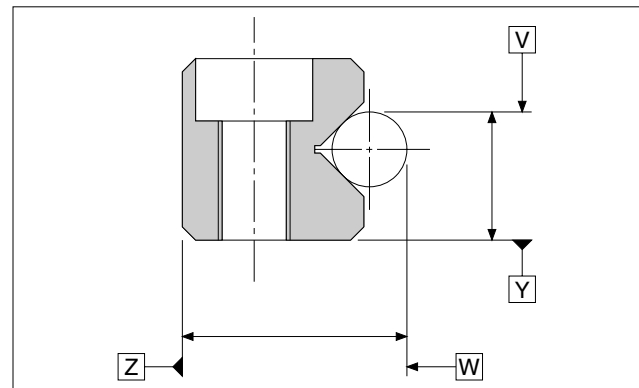
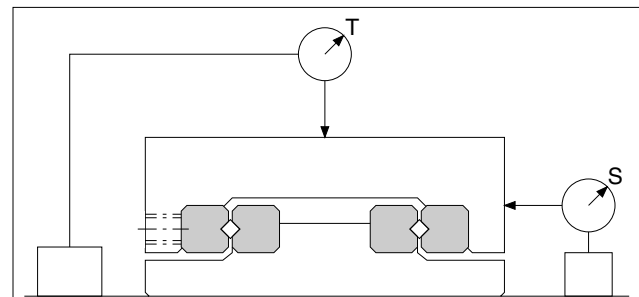


Figure 5, Accuracy Measurement



NVT type

The motion accuracy of the Slide Table NVT type is represented as deviation on the dial indicators, attached to the center of the top and the side of table, when the table run full stroke without load.

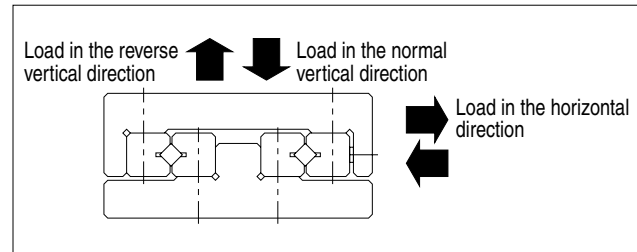
LOAD RATING

The load rating of the Slide Way NV and NVT type varies depending on the direction of load.

Table 1 Load Rating

Basic dynamic load rating	Normal vertical direction	$1.0 \times C$
	Horizontal direction	$0.9 \times C$
	Reverse vertical direction	$0.8 \times C$
Basic static load rating	Normal vertical direction	$1.0 \times C_0$
	Horizontal direction	$0.9 \times C_0$
	Reverse vertical direction	$0.8 \times C_0$

Figure 6 Direction of Load



RATED LIFE

The life of the Slide Way and Slide Table are calculated using the following equation:

Rated life

$$L = \left[\frac{1}{f_w} \cdot \frac{C}{P} \right]^{10/3} \cdot 50$$

L: rated life, f_w : load coefficient, C: basic dynamic load rating (N), P: load (N).

Load coefficient f_w

When calculating the load working on the Slide Way, it is necessary to obtain the correct values of many factors include motion speed, moment, mass of objects and uncertain elements such as vibration and impact. This is why correct calculation of load is difficult. Generally, the load coefficient f_w shown in Table 2 is used to simplify the calculation of life.

Life time

$$L_h = \frac{L \cdot 10^3}{2 \cdot \ell_s \cdot n_1 \cdot 60}$$

L_h : life time (hours), ℓ_s : stroke (m), n_1 : number of cycles per minute (cpm)

Table 2 Load coefficient f_w

Operating condition		Load coefficient f_w
Load	Speed	
No impact / vibration	15m/min or less	1.0 to 1.5
Low impact / vibration	60m/min or less	1.5 to 2.0
High impact / vibration	60m/min or more	2.0 to 3.5

MOUNTING NV TYPE

Accuracy of mounting surface

To maximize the performance of the NB Slide Way, it is recommended that accuracy of the mounting surface should be finished to be equal to or greater than the parallelism level of the Slide Way.

- Parallelism of surface 1 against surface A
- Perpendicularity of surface 2 against surface A
- Parallelism of surface 3 against surface B
- Perpendicularity of surface 4 against surface B
- Parallelism of surface 2 against surface C
- Parallelism of surface 4 against surface C

Installation Procedure

- (1) Remove burrs, stains, and dust from the surface of the track rail of tables and beds to prevent contamination during assembly.
- (2) Apply low-viscosity oil to contact surfaces, and attach the tables to the beds (Figure 9a).
- (3) Set the reference surface shown in Figure 4 onto the mounting surface with the track rail assembled. Tighten adjusting screws lightly so that almost no gap is left while the table is set in the center (Figure 9b).
- (4) Keep table in the center, tighten track rail mounting bolts lightly and peel the connection seal from both edges.
- (5) While maintaining the conditions in (4), tighten the adjusting screw on the R-retainer with the recommended torque shown in Table 3 (Figure 9c).
- (6) Move the table to one stroke end gently then, tighten the adjusting screw on the R-retainer in the same manner as in (5) (Figure 9d).
- (7) Move the table to the opposite stroke end and tighten the adjusting screw in the same manner as in (5) (Figure 9e).
- (8) Tighten the mounting bolts on track rail 1, 2 and 3 with the recommended torque shown in Table 4 (Figure 9f).
- (9) Set the dial indicators to the top and the side of the reference surface of the table (Figure 9g).
- (10) Make final adjust of pre-load. Repeat steps (5) to (7) until the indicator will show a minimum deviation.
- (11) Finally, tighten the bolt on track rail 4 with the recommended torque. Be sure to tighten the mounting bolts on the R retainer sequentially while moving the table as when tightening the adjusting screws.

Table 3 Recommended Torque for Adjusting Screw Unit/N•m

Part number	Size of screws	Torque
NV3	M4	0.05
NV4	M4	0.08
NV6	M5	0.20

Table 4 Recommended Torque for Mounting Bolts Unit/N•m

Size of screws	Torque
M3	1.4
M4	3.2
M5	6.6
M6	11.2

Figure 7 Accuracy of Mounting Surface

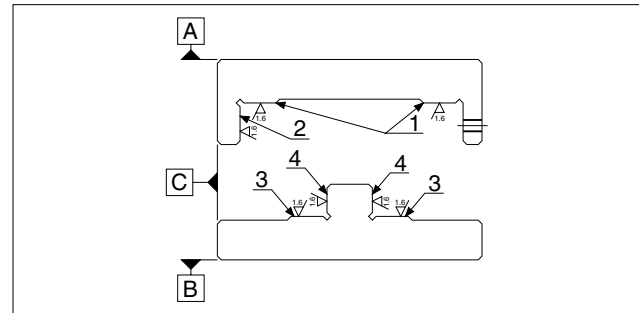


Figure 8 Example of Mounting

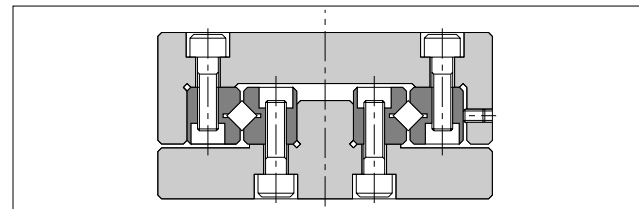
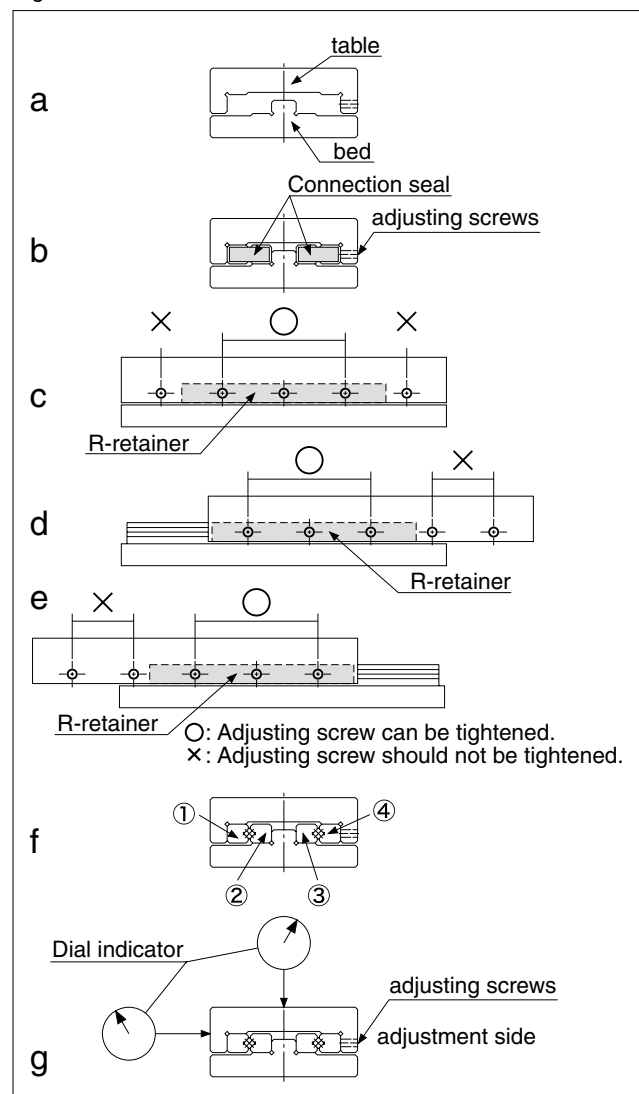


Figure 9 Installation Method



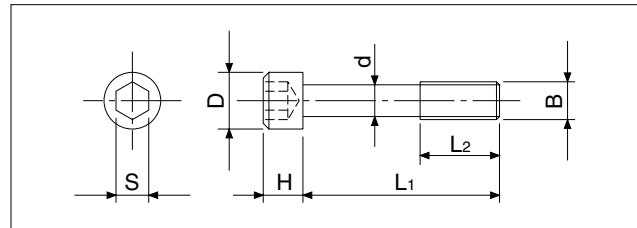
SPECIAL MOUNTING BOLT BT TYPE

To install the Slide Way using its counter bore, use of the special mounting bolt BT type is recommended.

Table 5 Special Mounting Bolt

Part number	B	d mm	D mm	H mm	L ₁ mm	L ₂ mm	S mm	Applicable track rail
BT 3	M3	2.3	5	3	12	5	2.5	NV 3
BT 4	M4	3.1	5.8	4	15	7	3	NV 4
BT 6	M5	3.9	8	5	20	8	4	NV 6

Figure 10 Special Mounting Bolt



LUBRICATION AND DUST PREVENTION

Lubrication

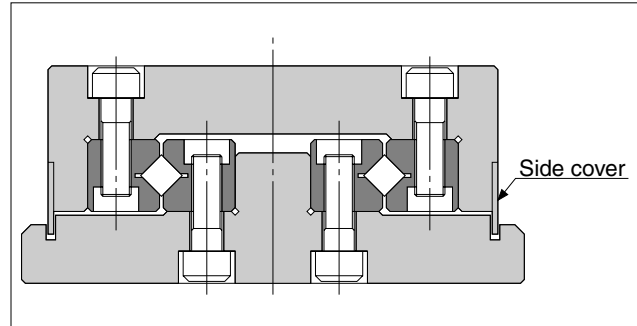
The NB Slide Way is pre-lubricated using lithium soap-based grease prior to shipment and is therefore ready for immediate use. Make sure to lubricate with a similar type of grease periodically according to the operating conditions.

NB also provides K grease for low-dust linear systems. Please contact NB for details.

Dust prevention

When dust and dirt enter the NB Slide Way, the accuracy and operating life may deteriorate. It is advisable to install an additional protective cover to protect the unit in a harsh environment (Figure 11).

Figure 11 Example of Dust Prevention Mechanism



PRECAUTIONS FOR USE

Careful handling

NV type is packaged with the track rail and R retainer in one piece. Do not separate or disassemble these components until installation/assembly is completed. Dropping the NB Slide Way may cause the rolling elements to make dents on the raceway surface. This will prevent smooth motion and will also affect accuracy. Make sure to handle the product with care.

Stopper

Over-stroke may cause the raceway surface of the track rail to be damaged and the performance of the **STUDROLLER** to drastically deteriorate. Be sure to provide an external mechanical stopper and use the product within the maximum allowable stroke.

Adjustment

Using the product without mounting surface accuracy or before adjusting the pre-load will affect the life and

motion accuracy of the product. Make sure to install and adjust the product with care.

Operating temperature

NV type contains resin parts. When using the product in high-temperature environments, the temperature must be lower than 80°C.

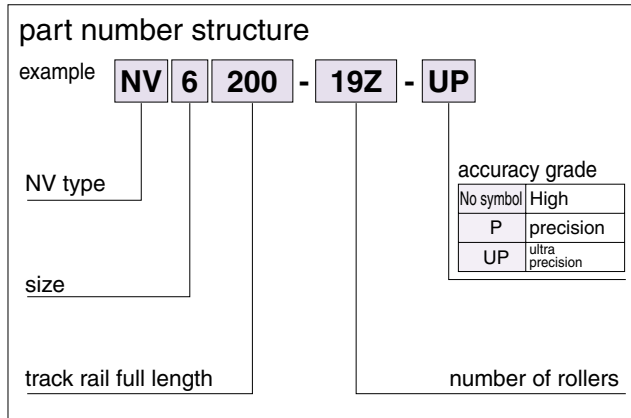
Use as a set

The mutual accuracy in the track rails is adjusted within a particular set. Note that the accuracy may be affected when the track rails of different sets are used together in combination.

Adjusting screws

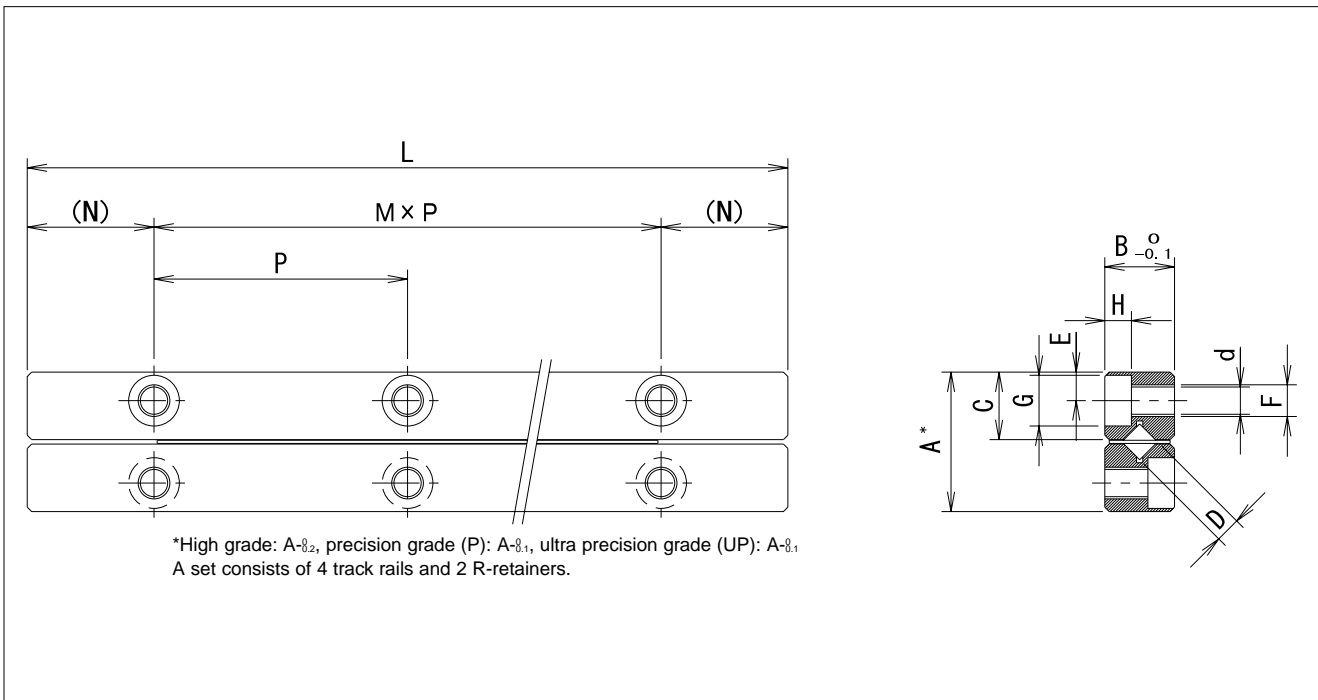
Accuracy and pre-load of the Slide Table NVT type is factory-adjusted to the optimal level. Do not touch adjusting screws and mounting screws.

NV TYPE



part number	stroke ST mm	roller diameter D mm	number of rollers Z									
				L mm	A mm	B mm	C mm	M×P mm				
NV3050- 9Z	28	3	9	50	18	8	8.65	1×25				
NV3075-13Z	52		13	75				2×25				
NV3100-19Z	60		19	100				3×25				
NV3125-23Z	83		23	125				4×25				
NV3150-29Z	90		29	150				5×25				
NV3175-35Z	105		35	175				6×25				
NV3200-41Z	117		41	200				7×25				
NV4080- 9Z	60	4	9	80	22	11	10.65	1×40				
NV4120-17Z	82		17	120				2×40				
NV4160-23Z	110		23	160				3×40				
NV4200-29Z	130		29	200				4×40				
NV4240-37Z	150		37	240				5×40				
NV6100- 9Z	63	6	9	100	31	15	15.15	1×50				
NV6150-15Z	88		15	150				2×50				
NV6200-19Z	138		19	200				3×50				
NV6250-25Z	163		25	250				4×50				
NV6300-31Z	188		31	300								5×50

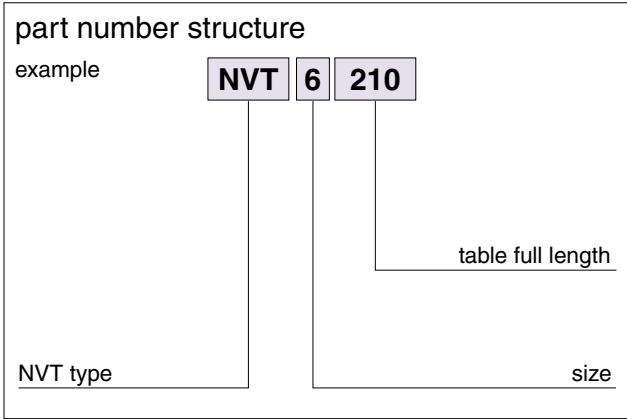
The basic static load rating represents a value at the center of stroke.



major dimensions						basic load rating		mass	size
N	E	F	d	G	H	dynamic C	static Co	g	
mm	mm		mm	mm	mm	N	N		
12.5	3.5	M4	3.3	6	3.1	6,150	8,060	97	3050
						8,440	12,090	140	3075
						12,560	20,150	192	3100
						14,480	24,190	245	3125
						16,320	28,220	290	3150
						19,850	36,280	337	3175
20	4.5	M5	4.3	8	4.2	21,540	40,310	385	3200
						11,680	15,050	265	4080
						20,050	30,100	400	4120
						27,500	45,150	530	4160
						31,010	52,680	660	4200
25	6	M6	5.2	9.5	5.2	37,710	67,730	800	4240
						29,660	37,580	650	6100
						50,950	75,160	970	6150
						60,640	93,950	1,300	6200
						69,890	112,740	1,620	6250
						87,440	150,320	1,940	6300

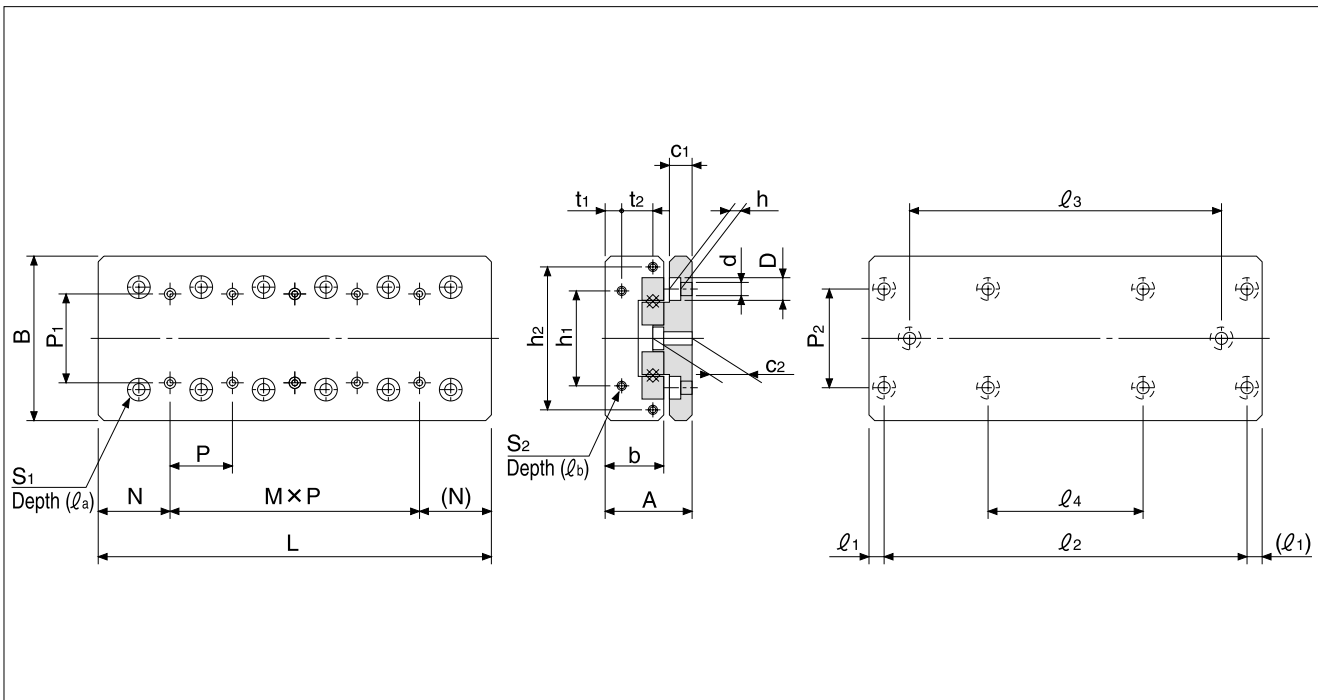
1kN \approx 102kgf

NVT TYPE



part number	stroke ST mm	dimensions				table-top mounting-hole dimensions					table-end mounting-hole dimensions					
		A mm	B mm	L mm	b mm	P ₁ mm	S ₁	ℓ _a mm	N mm	M×P mm	h ₁ mm	h ₂ mm	t ₁ mm	t ₂ mm	S ₂	ℓ _b mm
NVT3055	30	28 ^{±0.1}	60 ^{±0.1}	55	18.5	25	M4	8	27.5	—	40	—	5.5	—	M3	6
NVT3080	45			80						1×25						
NVT3105	60			105						2×25						
NVT3130	75			130						3×25						
NVT3155	90			155						4×25						
NVT3180	105			180						5×25						
NVT3205	130			205						6×25						
NVT4085	50	35 ^{±0.1}	80 ^{±0.1}	85	24	40	M5	10	42.5	—	55	—	6.5	—	M3	6
NVT4125	75			125						1×40						
NVT4165	105			165						2×40						
NVT4205	130			205						3×40						
NVT4245	155			245						4×40						
NVT6110	60	45 ^{±0.1}	100 ^{±0.1}	110	31	50	M6	12	55	—	60	92	8	15	M4	8
NVT6160	95			160						1×50						
NVT6210	130			210						2×50						
NVT6260	165			260						3×50						
NVT6310	200			310						4×50						

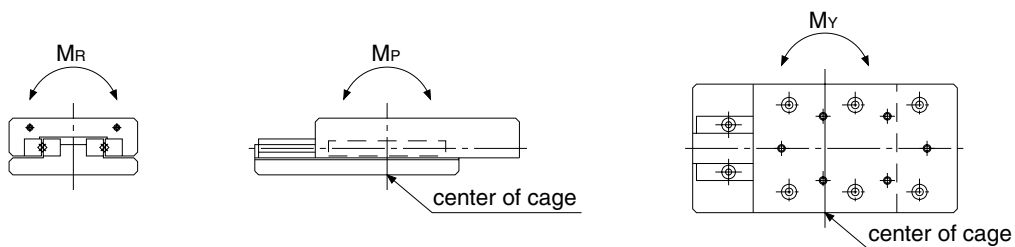
The basic static load rating represents a value at the center of stroke.



bed-surface mounting-hole dimensions								motion accuracy*		basic load rating		allowable static moment			mass g	size
P ₂ mm	d×D×h mm	c ₁ mm	c ₂ mm	l ₁ mm	l ₂ mm	l ₃ mm	l ₄ mm	T μm	S μm	C N	Co N	M _P N·m	M _Y N·m	M _R N·m		
40	4.5×8×4.5	9	15	10	35	—	—	2	5	6,150	8,060	20.0	23.3	55.9	643	3055
					60	—	—	2	5	8,440	12,090	48.9	54.3	82.8	960	3080
					85	—	—	3	6	12,560	20,150	107.0	99.7	110.6	1,260	3105
					110	—	—	3	6	14,480	24,190	166.0	157.1	138.0	1,580	3130
					135	85	—	3	6	16,320	28,220	204.9	217.2	173.1	1,860	3155
					160	110	—	3	7	19,850	36,280	326.5	341.9	229.9	2,160	3180
55	5.5×10×5.4	10.5	18	10	65	—	—	2	5	11,680	15,050	76.2	68.4	125.5	1,710	4085
					105	—	—	3	6	20,050	30,100	214.6	198.7	257.2	2,520	4125
					145	—	—	3	7	27,500	45,150	306.7	330.8	377.3	3,320	4165
					185	105	—	3	7	31,010	52,680	498.7	527.9	476.8	4,130	4205
					225	145	—	3	7	37,710	67,730	786.3	822.8	613.3	4,930	4245
60	7×11.5×7	13	23	10	90	—	—	3	6	29,660	37,580	271.9	244.7	414.7	3,300	6110
					140	—	—	3	6	50,950	75,160	665.6	614.7	740.2	4,850	6160
					190	90	—	3	7	60,640	93,950	1,097.4	1,033.6	957.9	6,310	6210
					240	140	—	3	7	69,890	112,740	1,855.0	1,771.3	1,333.0	7,790	6260
					290	190	—	3	7	87,440	150,320	2,731.7	2,638.8	1,665.0	9,260	6310

*For accuracy T and S, see page 3.

1kN≒102kgf 1N·m≒0.102kgf·m





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