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SLIDE WAY

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GONIO WAY

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SLIDE WAY

The NB slide way is a non-recirculating linear motion bearing utilizing precision rollers. It is used primarily in optical and measurement equipment where high precision movement is required.

STRUCTURE AND ADVANTAGES

The NB slide way NV type comprises of precisely ground rails and R-retainers with built-in STUDROLLERS and precision rollers. The rails have been optimally designed so that the STUDROLLERS move smoothly, and the STUDROLLERS and precision rollers incorporated in the R-retainers enable slip-free operation between the raceway surface and the rollers resulting in motion with minimal frictional resistance. SV and SVW types consist of precision ground rails and precision caged-rollers. Since caged-rollers do not recirculate, there is only a minimum frictional resistance fluctuation. Also, there is a minimum difference between the static and dynamic frictional resistances.

Non-slip! STUDROLLER System (Rivet Roller Structure)

The STUDROLLER system is based on a new concept to provide complete prevention of roller cage slippage during operation. This system permits usage in all orientations and positions.

Figure G-1 STUDROLLER System



Suitable for Minute Motion

Because the frictional resistance is extremely small and there is only little difference between the static and dynamic frictional resistances, the NB slide way is well suited for minute motion, resulting in highly accurate linear movement.

Low-Speed Stability

Since the frictional resistance fluctuation is small even under low-load conditions, stable motion is obtained at from low to high speeds.

High Rigidity and High Load Capacity

Compared to the ball elements, the rollers provide a larger contact area and less elastic deformation, thus the NB slide way has high rigidity and high load capacity. With new NV rail design, the roller contact area is increased by 30 to 58% (Figure G-2). The number of effective rollers is increased by narrowing the roller pitch. Thus, the NV type has the load rating that is 1.3 to 2.5 times that of the SV type.

Low Noise

The slide way never produces recirculation noise nor roller-contact noise due to a use of roller cage, resulting in quiet motion.

All Stainless Steel Type Available

The anti-corrosion SVS/SVWS/NVS-RNS slide ways have all stainless steel components, making them ideal for use in clean room applications.

Figure G-2 Roller Contact Profile

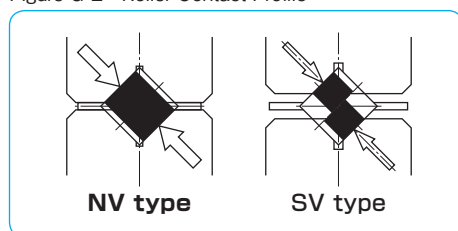


Figure G-3 Structure of NV type

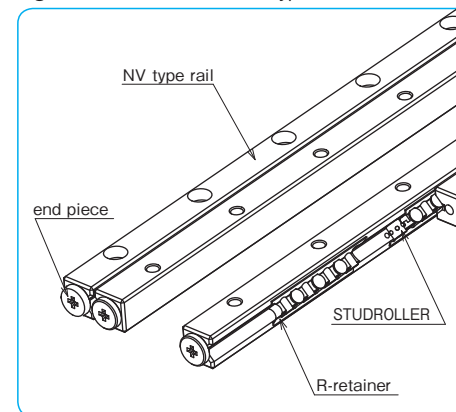
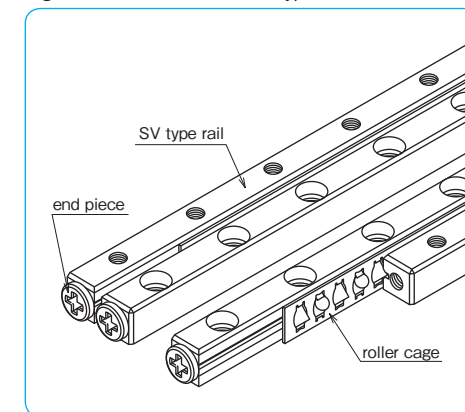


Figure G-4 Structure of SV type



※To the NV type, fastening plates are attached for the purpose of maintaining the center position of the R-retainer before assembly. Please see Installation Procedure on page G-7 and remove the fastening plates before use.

TYPES

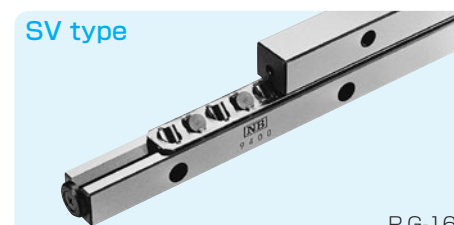
NV type NVS-RNS type



P.G-12

The NV slide way consists of a set of four rails, two R-retainers, and eight end pieces. It permits flexible design of the table which will best suit your application. The NVS-RNS type has all stainless steel components, which is suitable for anti-corrosion, high temperature and vacuum requirements.

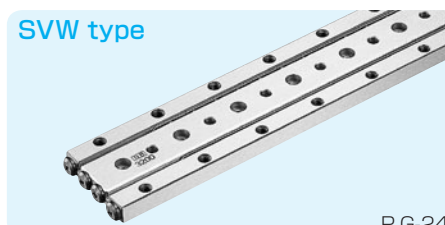
SV type



P.G-16

The SV slide way consists of a set of four rails, two R type roller cages, which have precision rollers in a cross arrangement, and eight end pieces. The all stainless steel option makes it suitable for use in corrosive environments.

SVW type



P.G-24

The SVW slide way consists of two SV-type rails, one W type rail, two R type roller cages, and eight end pieces. The use of a W-type rail serves for a compact design. The SVWS type is also available with all stainless steel components.

ACCURACY

The accuracy of the slide way is represented as parallelism measured across the full length with a method shown in Figure G-6. It is classified as high (blank), precision (P), or ultra precision (UP). Special accuracies can also be accommodated. Please contact NB for details.

Figure G-5 Parallelism

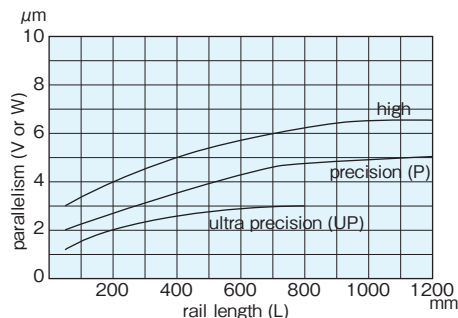
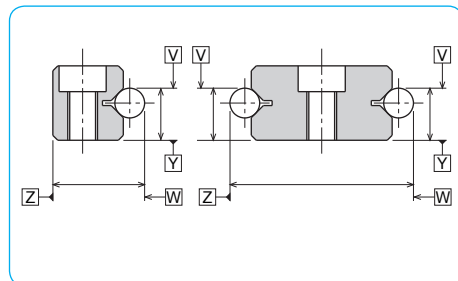


Figure G-6 Accuracy Measurement Method



Ultra precision grade is available from size 1 to size 9.

RATED LIFE

The life of the slide way and the slide table is calculated with the following equations:

Rated Life

$$L = \left(\frac{f_T \cdot C}{f_W \cdot P} \right)^{10/3} \cdot 50$$

L: rated life (km) f_T: temperature coefficient f_W: applied load coefficient
 C: basic dynamic load rating (N) P: applied load (N)
 ※ Please refer to page Eng-5 for the coefficients.

Life Time

$$L_h = \frac{L \cdot 10^3}{2 \cdot l_s \cdot n \cdot 60}$$

L_h: life time (hr) l_s: stroke length (m)
 n: number of cycles per minute (cpm)

LOAD RATING

The load rating for the slide way is obtained using the equations listed in Table G-1.

Table G-1 Load Rating

condition	double-rail parallel usage
direction of load	
basic dynamic load rating C	$C = \left\{ 2P \left(\frac{Z}{2} - 1 \right) \right\}^{1/36} \cdot \left(\frac{Z}{2} \right)^{3/4} \cdot 2^{7/9} \cdot C_1$
basic static load rating C ₀	$C_0 = \frac{Z}{2} \cdot C_{01} \cdot 2$
allowable load F	$F = \frac{Z}{2} \cdot F_1 \cdot 2$

C: basic dynamic load rating (N)
 C₀: basic static load rating (N)
 F: allowable load (N)
 C₁: basic dynamic load rating per roller (N)
 C₀₁: basic static load rating per roller (N)
 F₁: allowable load per roller (N)
 Z: number of rollers per cage
 Z/2: number of effective rollers (round down to whole number)
 P: roller pitch (mm)

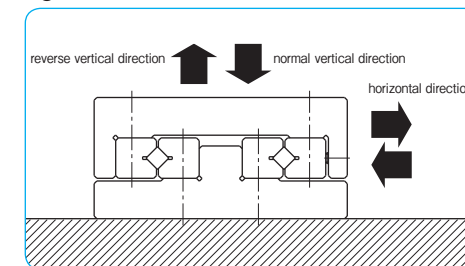
The load rating of the NV type differs depending on the direction of the load.

Table G-2 Change of Load Rating Corresponding to Load Direction

basic dynamic load rating	normal vertical direction	1.0×C
	horizontal direction	0.85×C
	reverse vertical direction	0.7×C
basic static load rating	normal vertical direction	1.0×C ₀
	horizontal direction	0.85×C ₀
	reverse vertical direction	0.7×C ₀

※ There may be a difference depending on the size. Please contact NB for details.
 Consideration has been given to holes for STUDROLLERS in the raceway surface in calculation of load ratings.

Figure G-7 Direction of Load



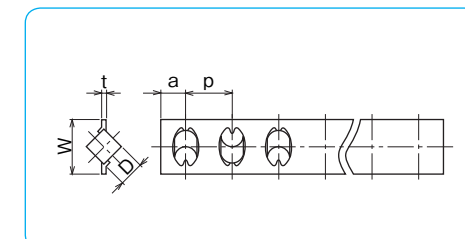
R·RS TYPE

— Standard Roller Cage —
 part number structure

example **RS 6 - 15Z**

specification
 R: standard roller
 RS: stainless steel roller

number of rollers
 size



part number		D	t	W	p	a	C ₁	C ₀₁	F ₁
standard	anti-corrosion	mm	mm	mm	mm	mm	N	N	N
R 1	RS 1	1.5	0.2	3.8	2.5	2	154	119	39.6
R 2	RS 2	2	0.3	5.6	4	2.5	360	293	97.6
R 3	RS 3	3	0.4	7.6	5	3	824	649	216
R 4	RS 4	4	0.4	10.4	7	4.5	1,660	1,320	440
R 6	RS 6	6	0.7	14	8.5	5.5	3,840	2,960	986
R 9	RS 9	9	0.7	19	14	7.5	9,330	7,070	2,350
R12	RS12	12	1.0	25	20	10	18,900	14,500	4,830

cage material: stainless steel C₁: dynamic load rating per roller C₀₁: static load rating per roller
 F₁: allowable load per roller

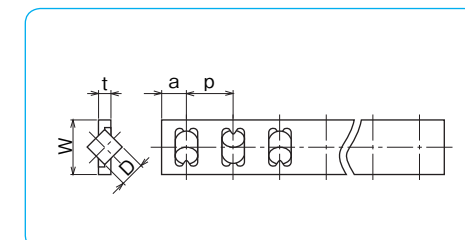
RA·RAS TYPE

— Aluminum Roller Cage —
 part number structure

example **RAS 6 - 15Z**

specification
 RA: standard roller
 RAS: stainless steel roller

number of rollers
 size



part number		D	t	W	p	a	C ₁	C ₀₁	F ₁
standard	anti-corrosion	mm	mm	mm	mm	mm	N	N	N
RA3	RAS3	3	1.2	7.6	5	3	824	649	216
RA4	RAS4	4	1.4	10.4	7	4.5	1,660	1,320	440
RA6	RAS6	6	2.1	14	8.5	5.5	3,840	2,960	986
RA9	RAS9	9	3.0	20	14	7.5	9,330	7,070	2,350

cage material: aluminum alloy C₁: dynamic load rating per roller C₀₁: static load rating per roller
 F₁: allowable load per roller

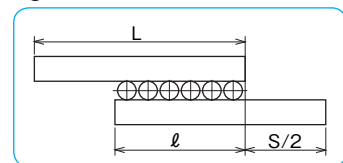
STROKE

Please contact NB for a non-standard stroke length for the NV type. When the stroke of SV type or SVW type is changed, the stroke length must be determined and the load rating should be re-estimated as follows.

Stroke of SV type, SVW type

When the slide way moves along the rail, the cage moves half the distance traveled by the slide way in the same direction. Therefore, although the work may be fixed on the table, the distance between the load center and the cage center will change. To achieve stable accuracy, determine the stroke and the length of the rail as follows.

Figure G-8



Rail Length (L)
When the stroke is 400mm or over
 $S \leq L/1.5$
When the stroke is less than 400 mm,
 $S \leq L$

l: cage length (mm) S: stroke (mm)
L: rail length (mm)

Cage length (l)
 $l \leq L - \frac{S}{2}$
Number of rollers (Z)
 $Z = \frac{l - 2a}{p} + 1$

a,p: Please refer to roller cage dimensions (page G-5)

LUBRICATION AND DUST PREVENTION

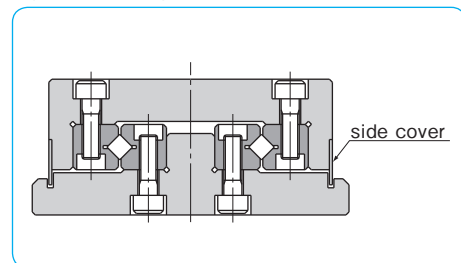
Lubrication

The slide way is pre-lubricated with lithium soap-based grease No.00 prior to shipment for immediate use. Make sure to relubricate with a similar type of grease periodically according to the operating conditions. NB also provides low dust generation grease. Please refer to page Eng-40 for details.

Dust Prevention

Foreign particles or dust in the slide way affects the motion accuracy and shortens the life time. In a harsh environment please provide side covers for dust prevention. (refer to Figure G-9)

Figure G-9 Example of Dust Prevention Mechanism



MOUNTING

Example

Figure G-10 NV type, SV type

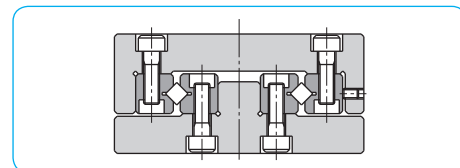
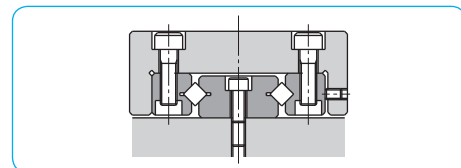


Figure G-11 SVW type

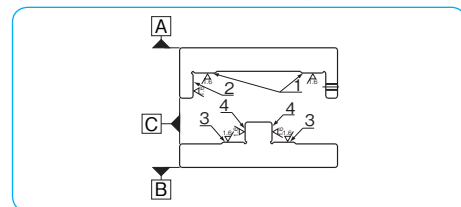


Accuracy of Mounting Surface

To maximize the performance of the NB slide way, it is recommended that the accuracy of the mounting surface to be equal to or greater than the degree of parallelism 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

Figure G-12 Accuracy of Mounting Surface



SHAPE OF MOUNTING SURFACE

Slide way NV and SV types are generally mounted by contacting the reference surface of the rail to the shoulder provided on the mounting surface. For the shoulder shape, provide relief at the corner as shown in Figure G-13 so that it does not interfere with the reference corner of the rail.

If it is necessary to mount NV or SV types without relief, then it can be used with rounded corners as shown in Figure G-14. Table G-3 shows the corner radius of the mounting surface.

Figure G-13 Relief on the Mounting Surface

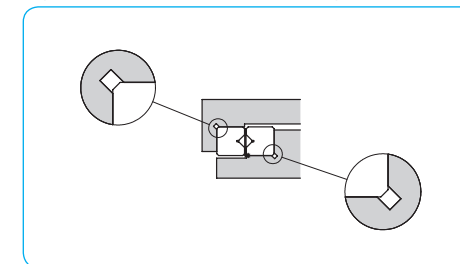


Figure G-14 Corner Radius

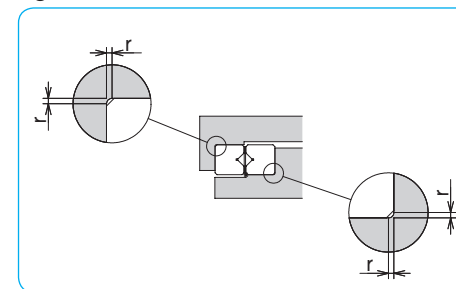


Table G-3 Maximum Corner Radius unit: mm

part number	maximum corner radius r
NV1, SV1	0.1
NV2, SV2	
NV3, SV3	0.2
NV4, SV4	0.4
NV6, SV6	0.7
NV9, SV9	0.8
NV12, SV12	1.0

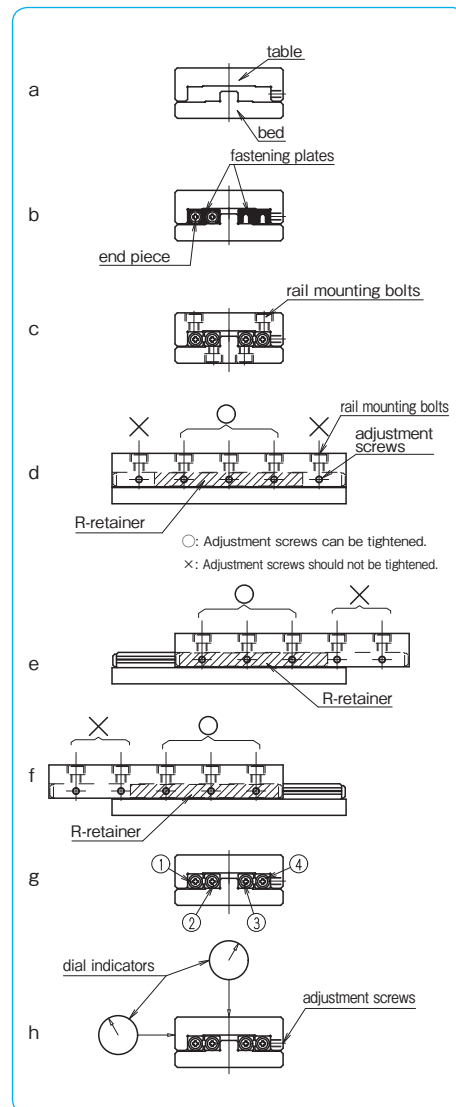
INSTALLATION PROCEDURE OF NV TYPE

Installation Procedure

※Please read "Use and Handling Precautions" before installation.

- (1) Remove burrs, scratches, and dust from the rail-mounting surface of the bed and the table, be careful to prevent contamination during assembly.
- (2) Apply low-viscosity oil to the contact surfaces, and align the bed and the table. (Figure G-13a)
- (3) Set the reference surface onto the mounting surface with the rails fastened. Set the table in the center position, and tighten the adjustment screws lightly so that almost no gap remains. (Figure G-13b)
- (4) Keep the table in the center, tighten the rail mounting bolts lightly, loosen the end pieces of both ends, and remove the fastening plates. Following this, lightly retighten the end pieces.
- (5) While maintaining the conditions of (4), gently move the assembly through its stroke to check if the maximum stroke is secured, and if there is no irregularity.
- (6) Move the table to the center and tighten only the adjustment screws on the R-retainer with the recommended torque shown in Table G-3. (Figure G-13c)
- (7) Gently move the table to one stroke end, and check that the table has surely come into contact with the external mechanical stopper. Following this, tighten the adjustment screws in the same manner as (6). (Figure G-13d)
- (8) Move the table to the opposite stroke end, and tighten in the same manner as (6). (Figure G-13e)
- (9) Fasten the mounting screws on rails 1, 2, and 3 by tightening with the recommended torque shown in Table G-4. (Figure G-13f)
- (10) Set the dial indicators to the center of the table and to the side (reference surface) of the table. (Figure G-13g)
- (11) Perform the final preload adjustment. While moving the table back and forth, repeat steps (6) to (8) until the dial indicators show a minimum deviation.
- (12) Fasten rail 4 securely with the recommended torque. As for the adjustment screws, successively tighten the rail mounting bolts on the R-retainer by moving the table.
- (13) Recheck the motion accuracy while moving the table.
- (14) Tighten the end pieces finally.

Figure G-15 Installation Method



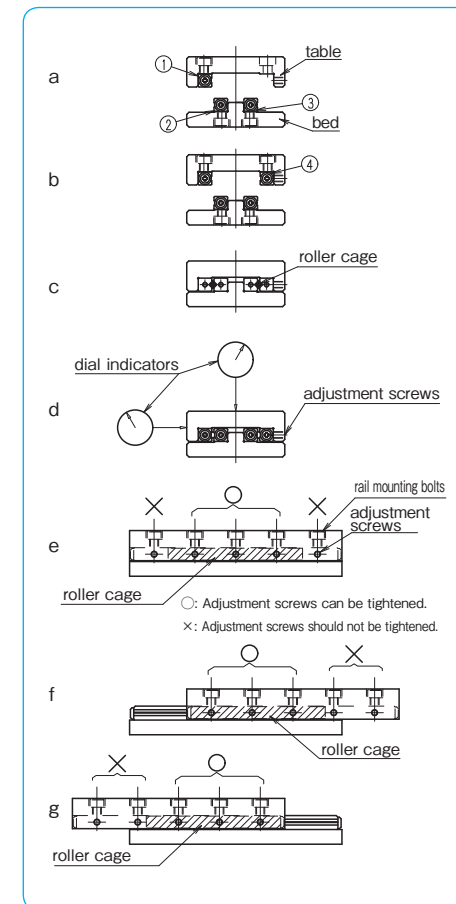
As d, e, f in the Figure shows it is recommended to match the position and pitch of adjustment screws with rail mounting bolts, and also the height of them with the same as the center of raceway groove.

INSTALLATION PROCEDURE OF SV TYPE

Installation Procedure

- (1) Remove burrs, scratches, and dust from the rail-mounting surface of the bed and the table, be careful to prevent contamination during assembly.
- (2) Apply low-viscosity oil to contact surfaces. Attach rails ①-③ by tightening bolts with the recommended torque (Table G-4). (Figure G-14a)
- (3) Temporarily attach rail ④ on the adjustment side. (Figure G-14b)
- (4) Remove end pieces on one end. Carefully insert roller cages between rails. (Figure G-14c)
- (5) Re-attach end pieces.
- (6) Move the table slowly to each stroke end to position roller cages at the center of the rails.
- (7) Set the dial indicators to the center of the table and to the side (reference surface) of the table. (Figure G-14d)
- (8) Move the table to one stroke end. Lightly tighten adjustment screws on the roller cage. (Figure G-14e)
- (9) Move the table to the opposite stroke end. Similarly lightly tighten adjustment screws on the roller cage. (Figure G-14f)
- (10) Move table to the center and lightly tighten center adjustment screws. (Figure G-14g)
- (11) Repeat steps (8) ~ (10) until the indicators show a minimum deviation. Please do not apply an excessive preload.
- (12) Make final adjustment of preload. Repeat steps (8) ~ (10) and tighten the adjustment screws with the recommended torque listed in Table G-3.
- (13) Fasten the rail ④ securely with the recommended torque. As with the adjustment screws, successively tighten the rail mounting bolts by moving the table.

Figure G-16 Installation Method



As e, f, g in the Figure shows it is recommended to match the position and pitch of adjustment screws with rail mounting bolts, and also the height of them with the same as the center of raceway groove.

Table G-4 Recommended Torque for Adjustment Screw Unit:N·m

part number	size	torque
NV1, SV1	M2	0.008
NV2, SV2	M3	0.012
NV3, SV3	M4	0.05
NV4, SV4	M4	0.08
NV6, SV6	M5	0.20
NV9, SV9	M6	0.40
NV12, SV12	M6	0.80

Table G-5 Recommended Torque for Rail Mounting Bolt Unit:N·m

size	torque
M2	0.4
M3	1.4
M4	3.2
M5	6.6
M6	11.2
M8	27.6
M10	55.0

(for steel alloy screw)

SPECIAL MOUNTING SCREW BT TYPE

In case of mounting slide way by screws from the counterbore side, threaded holes become the pilot holes. Thus, pilot hole's clearance will be less than a standard clearance hole for a screw. NB offers reduced shoulder screws for mounting SlideWay from bottom when larger screw clearance is required due to preload adjustment or inaccuracy of mating threaded holes. This special mounting screw made of alloy steel is stocked, and custom stainless steel version is available as a special order. Please contact NB for details.

Figure G-17 Special Mounting Screw

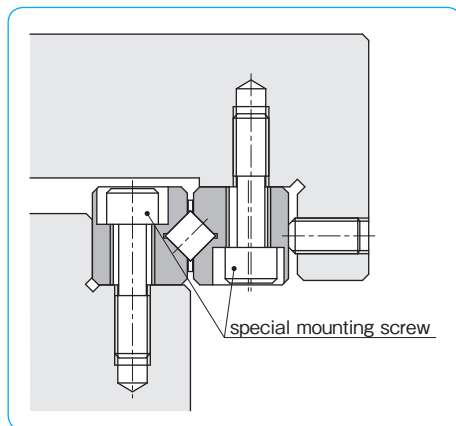
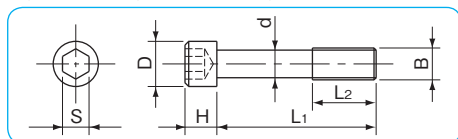


Table G-6 Special Mounting Screw

part number	B	d mm	D mm	H mm	L1 mm	L2 mm	S mm	applicable size
BT 3	M3	2.3	5	3	12	5	2.5	NV 3, SV 3
BT 4	M4	3.1	5.8	4	15	7	3	NV 4, SV 4
BT 6	M5	3.9	8	5	20	8	4	NV 6, SV 6
BT 9	M6	4.6	8.5	6	30	12	5	NV 9, SV 9
BT12	M8	6.25	11.3	8	40	17	6	NV12, SV12

USE AND HANDLING PRECAUTIONS

Careful Handling

Dropping the slide way causes the rolling elements to make dents in the raceway surface. This will prevent smooth motion and will also affect accuracy. Be sure to handle the product with care. The NV type is packaged as a set of rails and R-retainers. Do not separate or disassemble until assembly/installation is completed. Precision is not guaranteed if disassembled.

Fastening Plates

For the NV type, fastening plates are attached to both end faces of the rails to maintain the R-retainer center position prior to assembly. The fastening plates are not required after the NV type is mounted to a table and bed, however, when removal of the NV type is necessary such as when it will be reassembled, be sure to return the R-retainer to the proper center position, secure the fastening plates with the end pieces, and then remove the NV type.

Specified Allowable Stroke

For the NV type, exceeding the specified stroke (over-stroke) shall cause the raceway surface of the rail to be damaged and the performance of the STUDROLLER to drastically deteriorate. Be sure to provide external mechanical stoppers.

Adjustment

Using the product with insufficient accuracy of the mounting surface or before adjusting the preload will cause the motion accuracy of the product to drop and will have a negative influence upon product life and accuracy. Make sure to assemble, install, and adjust the product with care.

Caution against Excess Preload

It is essential to give preload on the Slide Way products in order to assure rigidity and accuracy. However, excess preload causes damage on the raceways and roller cages/R-retainers. On installation, please follow the installation procedure and recommended torque on page G-9.

Operating Temperature

The NV type uses resin parts. Please use the product in environments that are lower than 80°C .

Use as a Set

The accuracy of the rails has been matched within each set. Note that the accuracy will be affected when the rails of different sets are combined.

Allowable Load

The allowable load is a load under which the sum of elastic deformations of the rolling element and the raceway in the contact area subject to the maximum contact stress is small enough to guarantee smooth rolling movement. When very smooth and highly accurate linear motion is required, make sure to use the product within the allowable load.

Cage Slippage

For the SV/SVW type, the cage can slip under high-speed motion, vertical application, unbalanced-loading, and vibrating conditions. It is advised that the stroke be set with sufficient margin and an excessive preload should be avoided. It is also recommended that the rails be cycled to perform the maximum stroke several times, so that the cage returns to its center position.

End Pieces

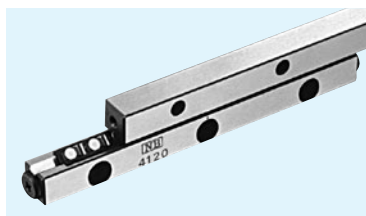
End pieces are attached to each end of the slide way to prevent removal of the cage. Do not use them as a mechanical stopper.

Knock Pin Hole

When using SVW type knock pin holes to attach a slide way, please do the hole-machining on the mounting surface after attaching the W type rail. After machining, remove the chips completely and wash as required.

NV TYPE

-NV1/NV2/NV3-

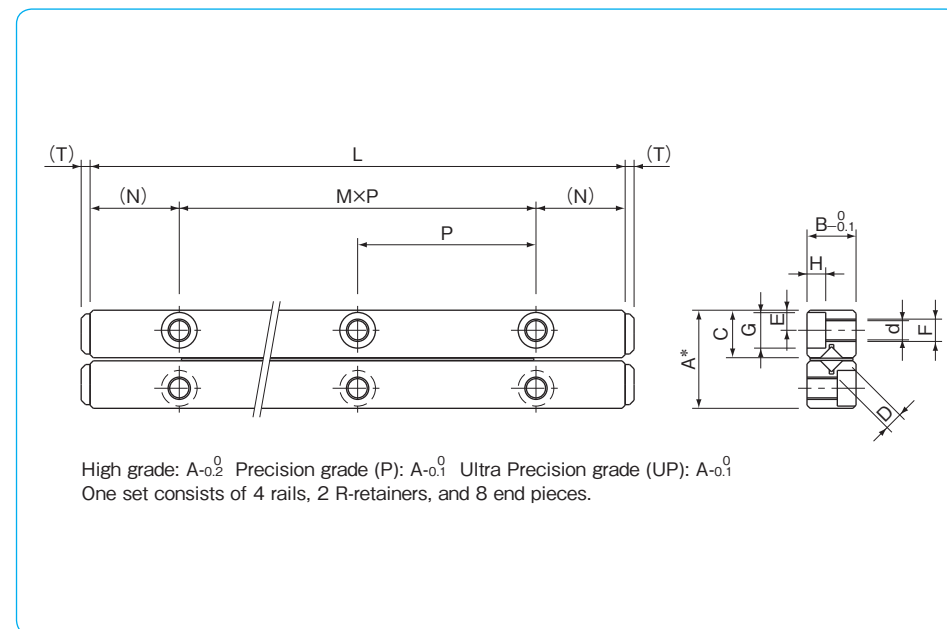


part number structure

example **NVS 2 150-41Z-UP**

specification NV: standard NVS: anti-corrosion	size	rail length	number of rollers	accuracy grade blank: high P: precision UP: ultra precision
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※Stainless steel rollers are used for anti-corrosion type.

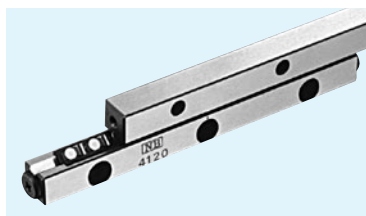


part number		stroke	roller diameter	number of rollers	L	A	B	C
standard	anti-corrosion	ST mm	D mm	Z	mm	mm	mm	mm
NV 1020- 5Z	NVS 1020- 5Z	12	1.5	5	20	8.5	4	4.03
1030- 7Z	1030- 7Z	23		7	30			
1040-11Z	1040-11Z	28		11	40			
1050-15Z	1050-15Z	34		15	50			
1060-19Z	1060-19Z	40		19	60			
1070-23Z	1070-23Z	45		23	70			
1080-27Z	1080-27Z	51		27	80			
NV 2030- 5Z	NVS 2030- 5Z	18		5	30			
2045- 9Z	2045- 9Z	25	9	45				
2060-15Z	2060-15Z	30	15	60				
2075-19Z	2075-19Z	40	19	75				
2090-23Z	2090-23Z	50	23	90				
2105-27Z	2105-27Z	65	27	105				
2120-33Z	2120-33Z	70	33	120				
2135-37Z	2135-37Z	80	37	135				
2150-41Z	2150-41Z	90	41	150				
2165-47Z	2165-47Z	95	47	165				
2180-51Z	2180-51Z	100	51	180				
NV 3050- 9Z	NVS 3050- 9Z	25	3	9	18	8	8.65	
3075-13Z	3075-13Z	48		13				75
3100-19Z	3100-19Z	60		19				100
3125-23Z	3125-23Z	83		23				125
3150-29Z	3150-29Z	90		29				150
3175-35Z	3175-35Z	103		35				175
3200-41Z	3200-41Z	113		41				200
3225-43Z	3225-43Z	150		43				225

major dimensions								basic load rating				allowable		mass		size
M x P	N	E	F	d	G	H	T	dynamic C	static Co	load F	load N	mass (one set)	size			
mm	mm	mm	mm	mm	mm	mm	mm	N	N	N	N	g				
1x10	5	1.8	M2	1.65	3	1.4	0.8	734	849	283	9	1020				
2x10								1,250	1,690	566	13	1030				
3x10								1,720	2,540	849	18	1040				
4x10								2,160	3,390	1,130	22	1050				
5x10								2,560	4,240	1,410	26	1060				
6x10								2,960	5,090	1,690	31	1070				
7x10								3,330	5,940	1,980	35	1080				
1x15								7.5	2.5	M3	2.55	4.4	2	1.2	1,360	1,520
2x15	2,330	3,050	1,010	49	2045											
3x15	3,990	6,110	2,030	62	2060											
4x15	4,740	7,630	2,540	74	2075											
5x15	5,460	9,160	3,050	91	2090											
6x15	6,160	10,600	3,560	103	2105											
7x15	6,830	12,200	4,070	120	2120											
8x15	7,490	13,700	4,580	132	2135											
9x15	8,130	15,200	5,090	149	2150											
10x15	9,370	18,300	6,110	161	2165											
11x15	9,970	19,800	6,620	174	2180											
1x25	12.5	3.5	M4	3.3	6	3.1	2	6,150	8,060	2,680	97	3050				
2x25								8,440	12,100	4,030	140	3075				
3x25								12,500	20,100	6,720	192	3100				
4x25								14,400	24,200	8,060	245	3125				
5x25								16,300	28,200	9,410	290	3150				
6x25								19,800	36,300	12,100	337	3175				
7x25								21,500	40,300	13,400	385	3200				
8x25								23,200	44,300	14,700	434	3225				

NV TYPE

-NV4/NV6/NV9/NV12-



part number structure

example **NV 6 200- 19Z -UP**

specification
NV: standard
NVS: anti-corrosion

size

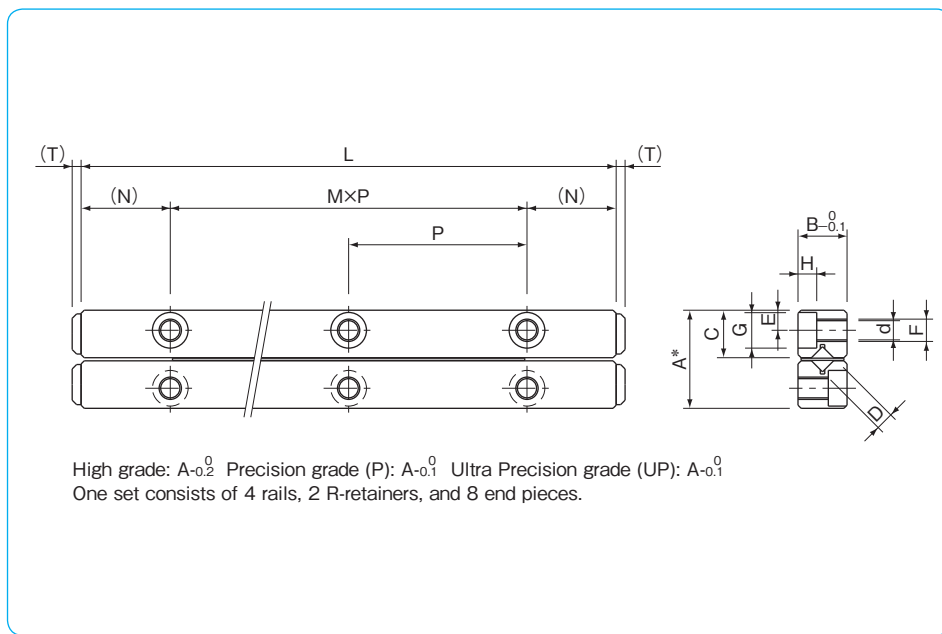
accuracy grade
blank: high
P: precision
UP: ultra precision
 The UP grade is not available for NV 12

number of rollers

rail length

※Stainless steel rollers are used for anti-corrosion type.

part number		stroke	roller diameter	number of rollers	L	A	B	C
standard	anti-corrosion	ST mm	D mm	Z	mm	mm	mm	mm
NV4080- 9Z	NVS4080- 9Z	60	4	9	80	22	11	10.65
4120-17Z	4120-17Z	75		17	120			
4160-23Z	4160-23Z	105		23	160			
4200-29Z	4200-29Z	130		29	200			
4240-37Z	4240-37Z	143		37	240			
4280-43Z	4280-43Z	170		43	280			
NV6100- 9Z	NVS6100- 9Z	63	6	9	100	31	15	15.15
6150-15Z	6150-15Z	85		15	150			
6200-19Z	6200-19Z	135		19	200			
6250-25Z	6250-25Z	158		25	250			
6300-31Z	6300-31Z	180		31	300			
6350-35Z	6350-35Z	230		35	350			
6400-39Z	6400-39Z	275	39	400				
NV9200-13Z	—	120	9	13	200	44	22	21.5
9300-21Z	—	170		21	300			
9400-29Z	—	220		29	400			
9500-35Z	—	300		35	500			
NV12300-15Z	—	180	12	15	300	58	28	28.5
12400-21Z	—	230		21	400			
12500-27Z	—	280		27	500			
12600-31Z	—	380		31	600			

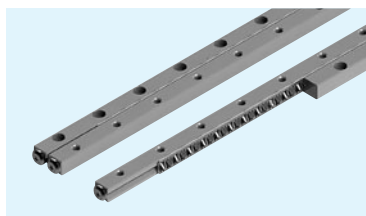


major dimensions								basic load rating		allowable	mass	size
M x P	N	E	F	d	G	H	T	dynamic C	static Co	load F	(one set) g	
mm	mm	mm	mm	mm	mm	mm	mm	N	N	N		
1 x 40	20	4.5	M5	4.3	8	4.2	2	12,100	15,700	5,250	265	4080
2 x 40								20,700	31,500	10,500	400	4120
3 x 40								28,500	47,200	15,700	530	4160
4 x 40								32,100	55,100	18,300	660	4200
5 x 40								39,000	70,900	23,600	800	4240
6 x 40								45,600	86,600	28,800	930	4280
1 x 50	25	6	M6	5.2	9.5	5.2	3	29,600	37,500	12,500	650	6100
2 x 50								50,900	75,100	25,000	970	6150
3 x 50								60,600	93,900	31,300	1,300	6200
4 x 50								69,800	112,000	37,500	1,620	6250
5 x 50								87,400	150,000	50,100	1,940	6300
6 x 50								95,800	169,000	56,300	2,360	6350
7 x 50								104,000	187,000	62,600	2,780	6400
1 x 100	50	9	M8	6.8	10.5	6.2	4	96,100	128,000	42,600	2,720	9200
2 x 100								143,000	213,000	71,100	4,080	9300
3 x 100								186,000	298,000	99,500	5,440	9400
4 x 100								226,000	384,000	128,000	6,790	9500
2 x 100								228,000	317,000	105,000	6,770	12300
3 x 100								271,000	397,000	132,000	9,040	12400
4 x 100	352,000	555,000	185,000	11,300	12500							
5 x 100	391,000	635,000	211,000	13,560	12600							

1N=0.102kgf

NVS-RNS TYPE

—Special Environments Type—



part number structure

example **NVS 4 200-RNS 27Z - P**

specification
NVS: anti-corrosion

size

rail length

accuracy grade
blank: high
P: precision
UP: ultra precision

number of rollers

cage type
RNS: stainless steel cage
stainless steel roller
RN: stainless steel cage
standard roller

part number	stroke ST mm	roller diameter D mm	number of rollers Z	major dimensions												
				L mm	A mm	B mm	C mm	M×P mm	N mm	E mm						
NVS 2030-RNS 7Z	15	2	7	30	12	6	5.7	1×15	7.5	2.5						
2045-RNS11Z	20		11	45				2×15								
2060-RNS13Z	30		13	60				3×15								
2075-RNS17Z	40		17	75				4×15								
2090-RNS21Z	50		21	90				5×15								
2105-RNS23Z	65		23	105				6×15								
2120-RNS27Z	70		27	120				7×15								
2135-RNS31Z	80		31	135				8×15								
2150-RNS33Z	90		33	150				9×15								
2165-RNS37Z	95		37	165				10×15								
2180-RNS43Z	100	43	180	11×15												
NVS 3050-RNS 9Z	20	3	9	50	18	8	8.65	1×25	12.5	3.5						
3075-RNS13Z	38		13	75				2×25								
3100-RNS17Z	55		17	100				3×25								
3125-RNS21Z	70		21	125				4×25								
3150-RNS25Z	85		25	150				5×25								
3175-RNS29Z	103		29	175				6×25								
3200-RNS33Z	113		33	200				7×25								
3225-RNS35Z	150		35	225				8×25								
NVS 4080-RNS 9Z	58		4	9				80			22	11	10.65	1×40	20	4.5
4120-RNS17Z	60			17				120						2×40		
4160-RNS21Z	98	21		160	3×40											
4200-RNS27Z	115	27		200	4×40											
4240-RNS31Z	143	31		240	5×40											
4280-RNS37Z	170	37		280	6×40											

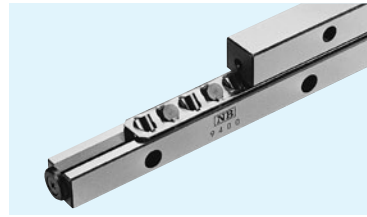
※Some specification values are different from those of NV standard type. Please contact NB for details.

High: A-0.2 Precision (P): A-0.1 Ultra Precision (UP): A-0.0
One set consists of 4 rails, 2 cages, and 8 end pieces.

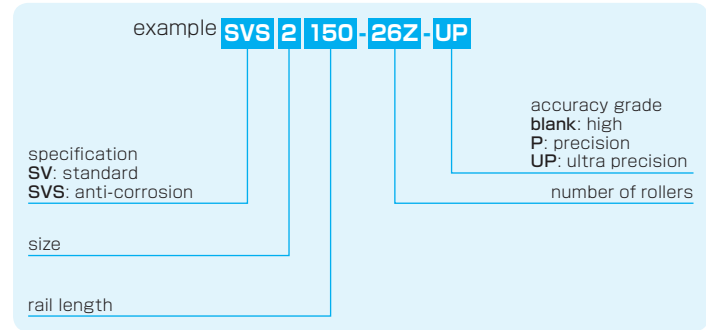
F	d mm	G mm	H mm	T mm	basic load rating		allowable load F N	mass (one set) g	size
					dynamic C N	static Co N			
M3	2.55	4.4	2	1.2	2,320	3,050	1,010	30	2030
					3,190	4,580	1,520	44	2045
					3,190	4,580	1,520	58	2060
					4,000	6,110	2,030	73	2075
					4,760	7,630	2,540	87	2090
					5,490	9,160	3,050	101	2105
					6,190	10,600	3,560	115	2120
					6,870	12,200	4,070	130	2135
					6,870	12,200	4,070	144	2150
					7,530	13,700	4,580	158	2165
8,800	16,800	5,600	173	2180					
M4	3.3	6	3.1	2	6,150	8,060	2,680	102	3050
					8,460	12,100	4,030	151	3075
					10,600	16,100	5,370	200	3100
					12,600	20,100	6,720	249	3125
					14,500	24,200	8,060	297	3150
					16,400	28,200	9,410	346	3175
					18,200	32,200	10,700	395	3200
					19,900	36,300	12,100	443	3225
					12,100	15,700	5,250	269	4080
					20,800	31,500	10,500	405	4120
24,800	39,300	13,100	536	4160					
M5	4.3	8	4.2	2	32,200	55,100	18,300	670	4200
					35,800	63,000	21,000	801	4240
					39,200	70,900	23,600	935	4280

SV TYPE

-SV1/SV2-



part number structure



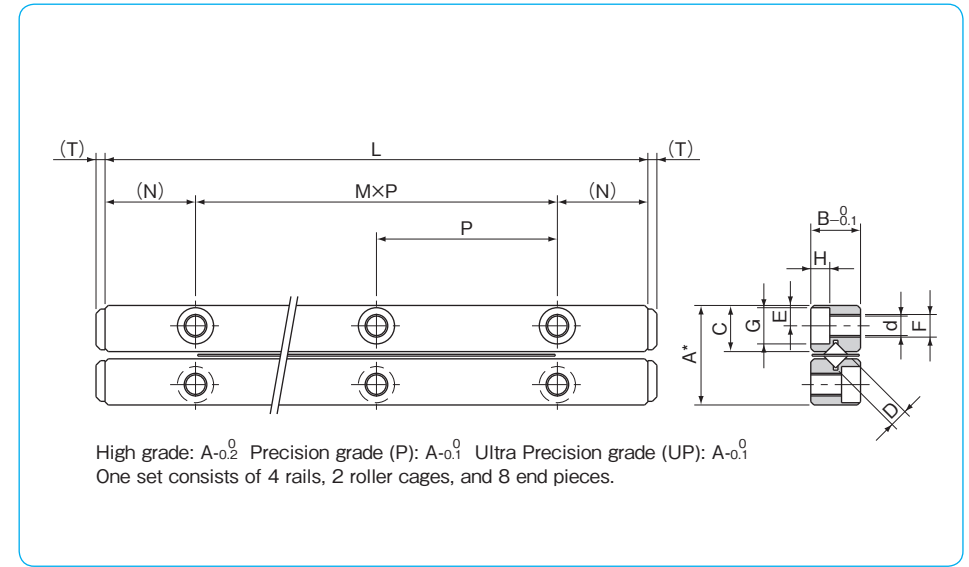
※Stainless steel rollers are used for anti-corrosion type. (refer to page G-5)

part number		stroke	roller diameter	number of rollers	L	A	B	C
standard	anti-corrosion	ST mm	D mm	Z	mm	mm	mm	mm
SV 1020-5Z	SVS 1020-5Z	12	1.5	5	20	8.5	4	3.8
1030-7Z	1030-7Z	20		7	30			
1040-10Z	1040-10Z	27		10	40			
1050-13Z	1050-13Z	32		13	50			
1060-16Z	1060-16Z	37		16	60			
1070-19Z	1070-19Z	42		19	70			
1080-21Z	1080-21Z	50		21	80			
SV 2030-5Z	SVS 2030-5Z	18		5	30			
2045-8Z	2045-8Z	24	8	45				
2060-11Z	2060-11Z	30	11	60				
2075-13Z	2075-13Z	44	13	75				
2090-16Z	2090-16Z	50	16	90				
2105-18Z	2105-18Z	64	18	105				
2120-21Z	2120-21Z	70	21	120				
2135-23Z	2135-23Z	84	23	135				
2150-26Z	2150-26Z	90	26	150				
2165-29Z	2165-29Z	95	29	165				
2180-32Z	2180-32Z	100	32	180				

※Maximum Rail Length (standard type only)

part number	Max. length
SV1	200mm
SV2	450mm

※Please contact NB for details.



major dimensions								dynamic C N	static Co N	allowable load F N	mass (one set) g	size
M × P mm	N mm	E mm	F	d mm	G mm	H mm	T mm					
1 × 10	5	1.8	M2	1.65	3	1.4	0.8	464	476	158	11	1020
2 × 10								641	714	237	14	1030
3 × 10								959	1,190	396	18	1040
4 × 10								1,100	1,420	475	22	1050
5 × 10								1,380	1,900	633	26	1060
6 × 10								1,510	2,140	712	30	1070
7 × 10								1,650	2,380	792	34	1080
1 × 15	7.5	2.5	M3	2.55	4.4	2	1.2	1,090	1,170	390	28	2030
2 × 15								1,900	2,340	780	42	2045
3 × 15								2,270	2,930	976	55	2060
4 × 15								2,620	3,510	1,170	69	2075
5 × 15								3,280	4,680	1,560	83	2090
6 × 15								3,590	5,270	1,750	96	2105
7 × 15								3,900	5,860	1,950	110	2120
8 × 15								4,210	6,440	2,140	123	2135
9 × 15								4,790	7,610	2,530	137	2150
10 × 15								5,080	8,200	2,730	151	2165
11 × 15								5,640	9,370	3,120	165	2180

1N ≒ 0.102kgf

SV TYPE

-SV3/SV4-



part number structure

example **SVS 4 200-RAS 19Z-UP**

specification
SV: standard
SVS: anti-corrosion

size

rail length

accuracy grade
blank: high
P: precision
UP: ultra precision

number of rollers

cage type
blank: standard cage
RA(RAS): aluminum cage

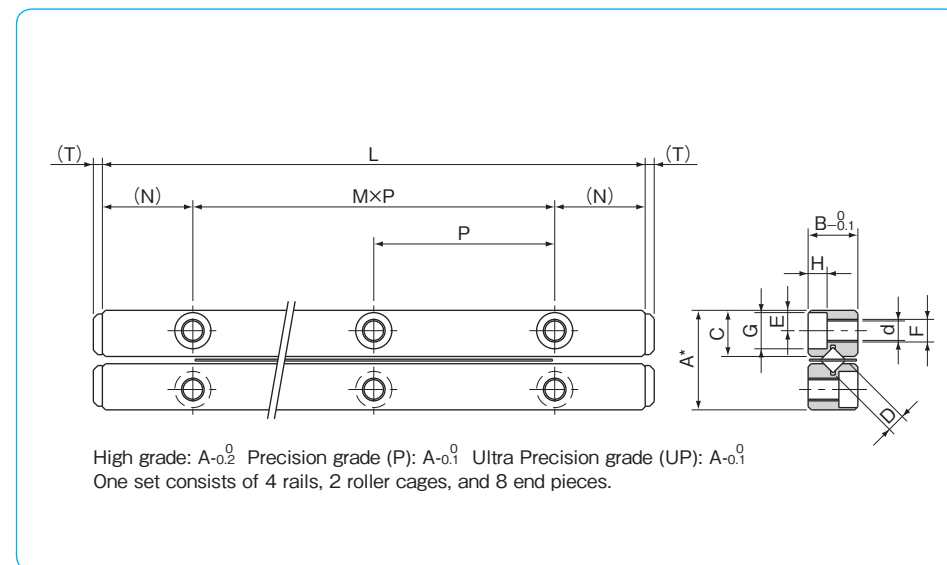
※Stainless steel rollers are used for anti-corrosion type. (refer to page G-5)

part number		stroke	roller diameter	number of rollers	L	A	B	C
standard	anti-corrosion	ST mm	D mm	Z	mm	mm	mm	mm
SV 3050-7Z	SVS 3050-7Z	28	3	7	50	18	8	8.3
3075-10Z	3075-10Z	48		10	75			
3100-14Z	3100-14Z	58		14	100			
3125-17Z	3125-17Z	78		17	125			
3150-21Z	3150-21Z	88		21	150			
3175-24Z	3175-24Z	105		24	175			
3200-28Z	3200-28Z	115		28	200			
3225-31Z	3225-31Z	135		31	225			
3250-35Z	3250-35Z	145		35	250			
3275-38Z	3275-38Z	165		38	275			
3300-42Z	3300-42Z	175		42	300			
3325-45Z	3325-45Z	195		45	325			
3350-49Z	3350-49Z	205		49	350			
SV 4080-7Z	SVS 4080-7Z	58		4	7			
4120-11Z	4120-11Z	82	11		120			
4160-15Z	4160-15Z	105	15		160			
4200-19Z	4200-19Z	130	19		200			
4240-23Z	4240-23Z	150	23		240			
4280-27Z	4280-27Z	175	27		280			
4320-31Z	4320-31Z	200	31		320			
4360-35Z	4360-35Z	225	35		360			
4400-39Z	4400-39Z	250	39		400			
4440-43Z	4440-43Z	270	43		440			
4480-47Z	4480-47Z	295	47		480			

※Maximum Rail Length (standard type only)

part number	Max. length
SV3	700mm
SV4	700mm

※Please contact NB for details.



major dimensions								basic load rating		allowable	mass	size
M × P	N	E	F	d	G	H	T	dynamic C N	static Co N	load F N	(one set) g	
mm	mm	mm		mm	mm	mm	mm					
1 × 25	12.5	3.5	M4	3.3	6	3.1	2	3,490	3,890	1,290	94	3050
2 × 25								5,230	6,490	2,160	135	3075
3 × 25								6,810	9,080	3,020	187	3100
4 × 25								7,560	10,300	3,450	234	3125
5 × 25								9,000	12,900	4,320	281	3150
6 × 25								10,300	15,500	5,180	327	3175
7 × 25								11,700	18,100	6,040	374	3200
8 × 25								12,300	19,400	6,480	421	3225
9 × 25								13,600	22,000	7,340	468	3250
10 × 25								14,800	24,600	8,200	514	3275
11 × 25								16,000	27,200	9,070	561	3300
12 × 25								16,600	28,500	9,500	608	3325
13 × 25								17,800	31,100	10,300	655	3350
1 × 40								20	4.5	M5	4.3	8
2 × 40	10,600	13,200	4,400	385	4120							
3 × 40	13,800	18,400	6,160	510	4160							
4 × 40	16,800	23,700	7,920	635	4200							
5 × 40	19,700	29,000	9,680	770	4240							
6 × 40	22,400	34,300	11,400	905	4280							
7 × 40	25,100	39,600	13,200	1,020	4320							
8 × 40	27,600	44,800	14,900	1,160	4360							
9 × 40	30,200	50,100	16,700	1,280	4400							
10 × 40	32,600	55,400	18,400	1,410	4440							
11 × 40	35,000	60,700	20,200	1,540	4480							

1N≒0.102kgf

SV TYPE

-SV6/SV9-



part number structure

example **SVS 6 200-RAS 16Z-UP**

specification
SV: standard
SVS: anti-corrosion

size

rail length

accuracy grade
blank: high
P: precision
UP: ultra precision

number of rollers

cage type
blank: standard cage
RA(RAS): aluminum cage

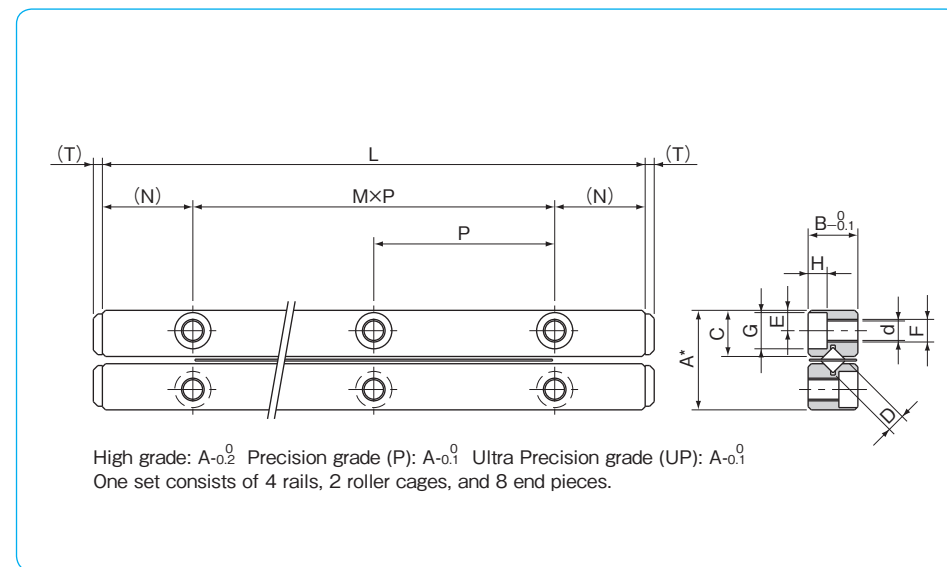
※Stainless steel rollers are used for anti-corrosion type. (refer to page G-5)

part number		stroke	roller diameter	number of rollers	L	A	B	C
standard	anti-corrosion	ST mm	D mm	Z	mm	mm	mm	mm
SV 6100-8Z	SVS 6100-8Z	55	6	8	100	31	15	14.2
6150-12Z	6150-12Z	85		12	150			
6200-16Z	6200-16Z	120		16	200			
6250-20Z	6250-20Z	150		20	250			
6300-24Z	6300-24Z	185		24	300			
6350-28Z	6350-28Z	215		28	350			
6400-32Z	6400-32Z	245		32	400			
6450-36Z	6450-36Z	280		36	450			
6500-40Z	6500-40Z	310		40	500			
6600-49Z	6600-49Z	360		49	600			
SV 9200-10Z	SVS 9200-10Z	115	9	10	200	44	22	20.2
9300-15Z	9300-15Z	175		15	300			
9400-20Z	9400-20Z	235		20	400			
9500-25Z	9500-25Z	295		25	500			
9600-30Z	9600-30Z	355		30	600			
9700-35Z	9700-35Z	415		35	700			
9800-40Z	9800-40Z	475		40	800			
9900-45Z	9900-45Z	535		45	900			
91000-50Z	91000-50Z	595		50	1,000			

※Maximum Rail Length (standard type only)

part number	Max. length
SV6	700mm

※Please contact NB for details.

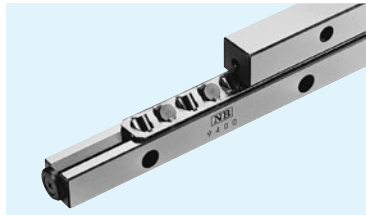


major dimensions								basic load rating		allowable	mass	size
M × P	N	E	F	d	G	H	T	dynamic C N	static Co N	load F N	(one set) g	
mm	mm	mm	mm	mm	mm	mm	mm					
1 × 50	25	6	M6	5.2	9.5	5.2	3	20,700	23,600	7,880	628	6100
2 × 50								28,500	35,500	11,800	942	6150
3 × 50								35,700	47,300	15,700	1,260	6200
4 × 50								42,500	59,200	19,700	1,570	6250
5 × 50								49,000	71,000	23,600	1,880	6300
6 × 50								55,300	82,800	27,600	2,200	6350
7 × 50								61,400	94,700	31,500	2,510	6400
8 × 50								67,300	106,000	35,400	2,830	6450
9 × 50								73,100	118,000	39,400	3,140	6500
11 × 50								84,200	142,000	47,300	3,770	6600
1 × 100	50	9	M8	6.8	10.5	6.2	4	60,900	70,700	23,500	2,720	9200
2 × 100								79,300	98,900	32,900	4,030	9300
3 × 100								104,000	141,000	47,000	5,380	9400
4 × 100								120,000	169,000	56,400	6,700	9500
5 × 100								143,000	212,000	70,500	8,050	9600
6 × 100								158,000	240,000	79,900	9,230	9700
7 × 100								180,000	282,000	94,000	10,500	9800
8 × 100								193,000	311,000	103,000	11,900	9900
9 × 100								214,000	353,000	117,000	13,000	91000

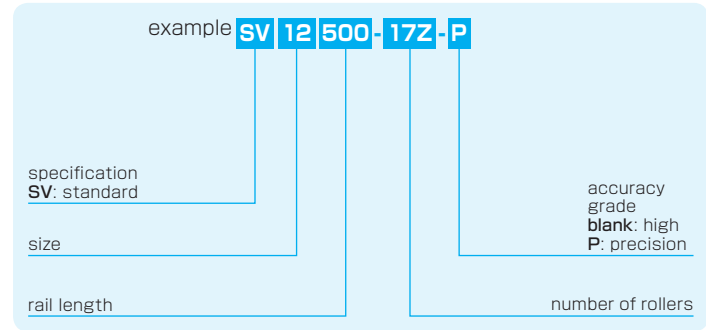
1N≒0.102kgf

SV TYPE

-SV12-

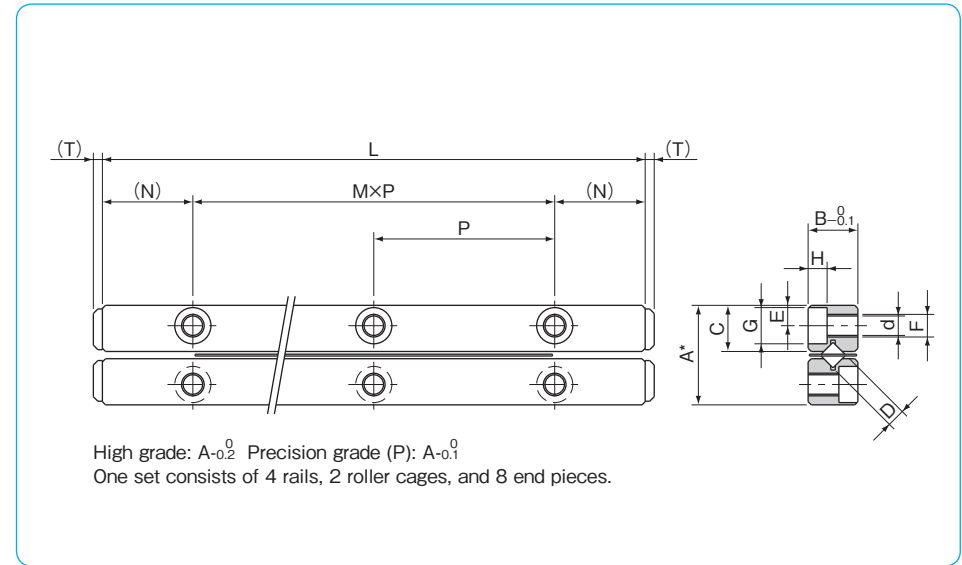


part number structure



※Stainless steel rollers are used for anti-corrosion type. (refer to page G-5)

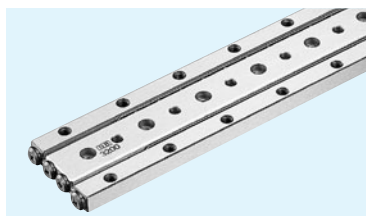
part number		stroke ST mm	roller diameter D mm	number of rollers Z	L mm	A mm	B mm	C mm
standard	anti-corrosion							
SV 12300-10Z	SVS 12300-10Z	200	12	10	300	58	28	27
12400-14Z	12400-14Z	240		14	400			
12500-17Z	12500-17Z	320		17	500			
12600-21Z	12600-21Z	360		21	600			
12700-24Z	12700-24Z	440		24	700			
12800-28Z	12800-28Z	480		28	800			
12900-31Z	12900-31Z	560		31	900			
121000-34Z	121000-34Z	640		34	1,000			
121100-38Z	—	680		38	1,100			
121200-42Z	—	720		42	1,200			



major dimensions								basic load rating dynamic C N	static Co N	allowable load F N	mass (one set) g	size
M×P mm	N mm	E mm	F	d mm	G mm	H mm	T mm					
2×100	50	12	M10	8.5	13.5	8.2	4	124,000	145,000	48,300	6,880	12300
3×100								162,000	203,000	67,600	9,090	12400
4×100								180,000	232,000	77,200	11,400	12500
5×100								214,000	290,000	96,600	13,700	12600
6×100								247,000	348,000	115,000	15,800	12700
7×100								279,000	406,000	135,000	18,200	12800
8×100								294,000	435,000	144,000	20,500	12900
9×100								324,000	493,000	164,000	22,800	121000
10×100								354,000	551,000	183,000	25,000	121100
11×100								382,000	609,000	202,000	27,300	121200

1N≒0.102kgf

SVW TYPE



part number structure

example **SVWS 4 200-RAS 19Z-UP**

specification
SVW: standard
SVWS: anti-corrosion

size

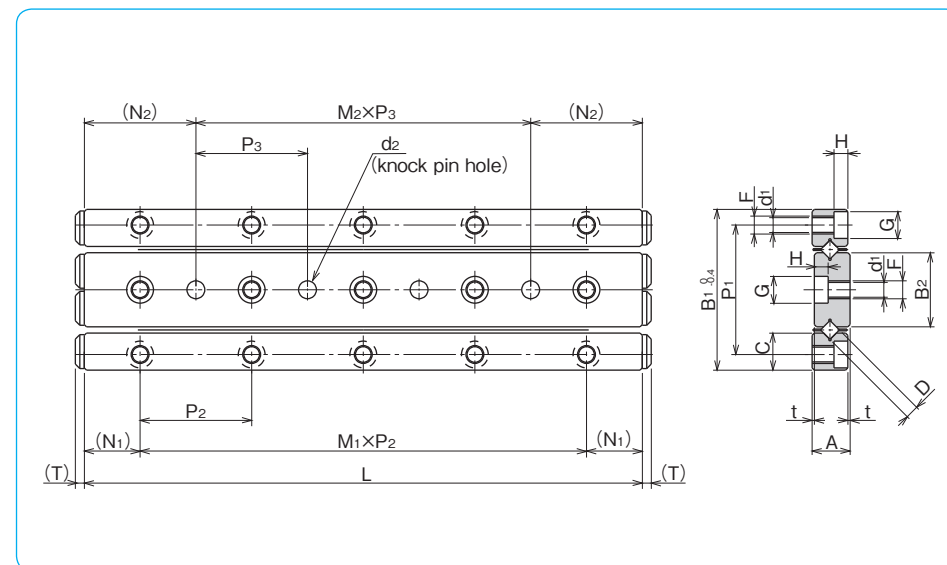
rail length

accuracy grade
blank: high
P: precision
UP: ultra precision

number of rollers

cage type
blank: standard cage
RA: aluminum cage
standard: standard roller
RAS: aluminum cage
stainless steel: stainless steel roller

* Refer to page G-5 for information on cage types.
 ** Aluminum cage is not available for size 1 and 2.



part number		stroke	roller diameter	number of rollers	L	A	t	B ₁	B ₂	C	P ₁	M ₁ × P ₂
standard	anti-corrosion	ST mm	D mm	Z	mm	mm	mm	mm	mm	mm	mm	mm
SVW 1020- 5Z	SVWS 1020- 5Z	12	1.5	5	20	4.5	0.5	17	7.6	3.8	13.4	1 × 10
1030- 7Z	1030- 7Z	20		7	30							2 × 10
1040-10Z	1040-10Z	27		10	40							3 × 10
1050-13Z	1050-13Z	32		13	50							4 × 10
1060-16Z	1060-16Z	37		16	60							5 × 10
1070-19Z	1070-19Z	42		19	70							6 × 10
1080-21Z	1080-21Z	50		21	80							7 × 10
SVW 2030- 5Z	SVWS 2030- 5Z	18	2	5	30	6.5	0.5	24	11	5.5	19	1 × 15
2045- 8Z	2045- 8Z	24		8	45							2 × 15
2060-11Z	2060-11Z	30		11	60							3 × 15
2075-13Z	2075-13Z	44		13	75							4 × 15
2090-16Z	2090-16Z	50		16	90							5 × 15
2105-18Z	2105-18Z	64		18	105							6 × 15
2120-21Z	2120-21Z	70		21	120							7 × 15
SVW 3050- 7Z	SVWS 3050- 7Z	28	3	7	50	8.5	0.5	36	16.6	8.3	29	1 × 25
3075-10Z	3075-10Z	48		10	75							2 × 25
3100-14Z	3100-14Z	58		14	100							3 × 25
3125-17Z	3125-17Z	78		17	125							4 × 25
3150-21Z	3150-21Z	88		21	150							5 × 25
3175-24Z	3175-24Z	105		24	175							6 × 25
3200-28Z	3200-28Z	115		28	200							7 × 25
SVW 4080- 7Z	SVWS 4080- 7Z	58	4	7	80	11.5	0.5	44	20.4	10.2	35	1 × 40
4120-11Z	4120-11Z	82		11	120							2 × 40
4160-15Z	4160-15Z	105		15	160							3 × 40
4200-19Z	4200-19Z	130		19	200							4 × 40
4240-23Z	4240-23Z	150		23	240							5 × 40
4280-27Z	4280-27Z	175		27	280							6 × 40

major dimensions									basic load rating				allowable		mass		size
N ₁	F	d ₁	G	H	M ₂ × P ₃	N ₂	d ₂	T	dynamic C	static Co	load F	load N	mass (one set) g	size			
mm	mm	mm	mm	mm	mm	mm	mm	mm	N	N	N	N	g				
5	M2	1.65	3	1.4	—	10	2 ^{+0.010} ₀	0.8	464	476	158	11	1020				
					1 × 10				641	714	237	14	1030				
					2 × 10				959	1,190	396	18	1040				
					3 × 10				1,100	1,420	475	22	1050				
					4 × 10				1,380	1,900	633	26	1060				
					5 × 10				1,510	2,140	712	30	1070				
					6 × 10				1,650	2,380	792	34	1080				
7.5	M3	2.55	4.4	2	—	15	3 ^{+0.010} ₀	1.2	1,090	1,170	390	28	2030				
					1 × 15				1,900	2,340	780	42	2045				
					2 × 15				2,270	2,930	976	55	2060				
					3 × 15				2,620	3,510	1,170	69	2075				
					4 × 15				3,280	4,680	1,560	83	2090				
					5 × 15				3,590	5,270	1,750	96	2105				
					6 × 15				3,900	5,860	1,950	110	2120				
12.5	M4	3.3	6	3.1	—	25	4 ^{+0.012} ₀	2	3,490	3,890	1,290	94	3050				
					1 × 25				5,230	6,490	2,160	135	3075				
					2 × 25				6,810	9,080	3,020	187	3100				
					3 × 25				7,560	10,300	3,450	234	3125				
					4 × 25				9,000	12,900	4,320	281	3150				
					5 × 25				10,300	15,500	5,180	327	3175				
					6 × 25				11,700	18,100	6,040	374	3200				
20	M5	4.3	8	4.2	—	40	5 ^{+0.012} ₀	2	7,110	7,920	2,640	255	4080				
					1 × 40				10,600	13,200	4,400	385	4120				
					2 × 40				13,800	18,400	6,160	510	4160				
					3 × 40				16,800	23,700	7,920	635	4200				
					4 × 40				19,700	29,000	9,680	770	4240				
					5 × 40				22,400	34,300	11,400	905	4280				

1N≐0.102kgf

SLIDE TABLE

The NB slide table is a precision table equipped with a slide way. Its high-precision and low-friction characteristics make it well suited for use in electronics automatic-assembly machines, optical measurement devices, etc.

STRUCTURE AND ADVANTAGES

The NB slide table consists of a slide way sandwiched between an accurately machined table and a bed. Stoppers are provided inside the table.

High Accuracy

The mounting surfaces of the table and bed are precision finished to ensure high precision linear motion, resulting in a high performance slide way.

Low Friction

Its non-recirculating mechanism provides stable motion at from low to high speeds.

Compact and High Rigidity

Being designed compactly, the NB slide table holds the high load capacity and high rigidity characteristics.

Figure G-18 Structure of NVT type

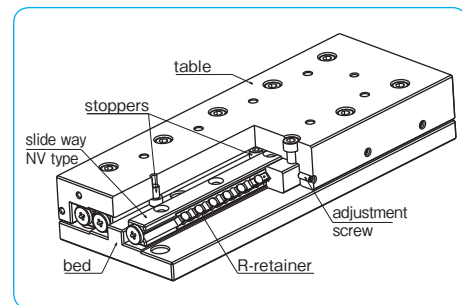
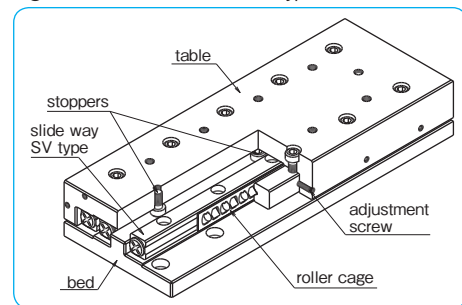


Figure G-20 Structure of SVT type



No Need for Adjustment

The table is carefully assembled so that the accuracy and preload are optimized, it can be used immediately without any further adjustment.

Ease of Mounting

Standardized mounting holes are provided in the table and bed. High precision linear motion can be achieved simply by mounting.

Figure G-19 Structure of NYT type

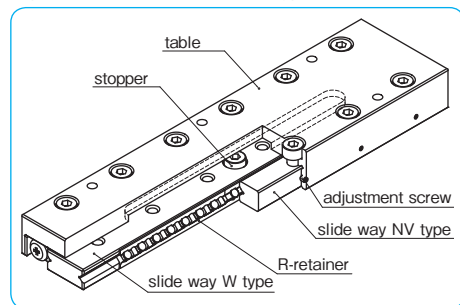
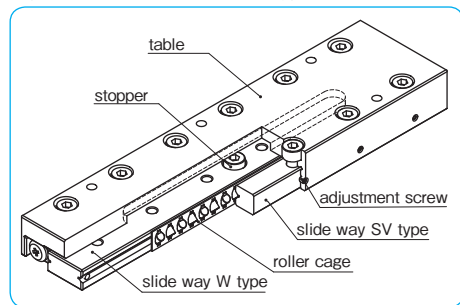


Figure G-21 Structure of SYT type



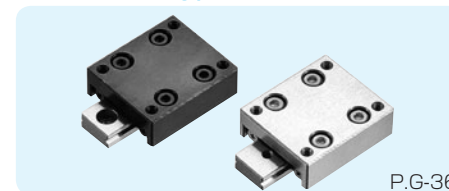
TYPES

NVT·NVTS type



P.G-32

NYT·NYTS type



P.G-36

SVT·SVTS type



P.G-40

SYT·SYTS type



P.G-46

The NVT type slide table incorporates the NV type slide way. The table and bed have been precision machined to provide a high degree of accuracy and the product can be used, without any need for troublesome accuracy or preload adjustments. In the NVTS type, the anti-corrosion NVS type slide way is sandwiched between an accurately machined aluminum table and bed.

The NYT/NYTS type is a thin, compact slide table, utilizing the studroller system. Either tapped or counterbore mounting type (D type) is available. The anti-corrosion type NYTS slide table is made of all stainless steel components except for R-retainer.

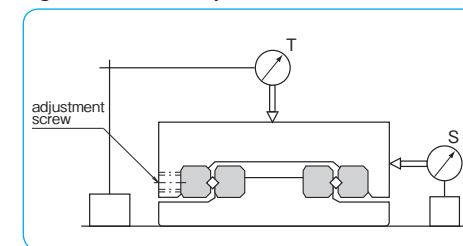
In the SVT type slide table, the SV type slide way is sandwiched between an accurately machined steel table and bed. In the SVTS type, the anti-corrosion SVS type slide way is sandwiched between an accurately machined aluminum table and bed.

The SYT/SYTS type is a thin, compact slide table. Either tapped or counterbore type (D type) is available for the mounting hole. The anti-corrosion SYTS type slide table is made of all stainless steel components, making it suitable for use in clean rooms.

ACCURACY

The motion accuracy of a slide table is measured by placing indicators at the center of the top and side surface of the table, as illustrated in Figure G-22. It is expressed in terms of the indicator deviation when the table is moved the full stroke without any load. For accuracy, please see the dimension tables.

Figure G-22 Accuracy Measurement Method



RATED LIFE

The life of an NB slide table is calculated using the following equations.

Rated Life

$$L = \left(\frac{f_T \cdot C}{f_w \cdot P} \right)^{10/3} \cdot 50$$

L: rated life(km) f_T: temperature coefficient f_w: applied load coefficient
 C: basic dynamic load rating(N) P: applied load(N)
 ※Please refer to page Eng-5 for the coefficients.

Life Time

$$L_h = \frac{L \cdot 10^3}{2 \cdot l_s \cdot n \cdot 60}$$

L_h: life time (hr) l_s: stroke length (m)
 n: number of cycles per minute (cpm)

LOAD RATING

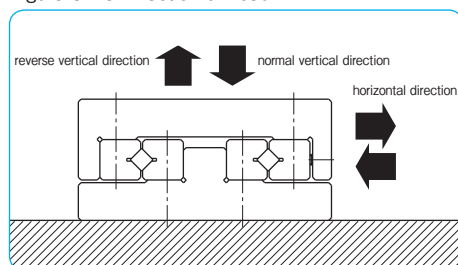
The load rating of the slide table NVT type and NYT type differs depending on the direction of the load.

Table G-7 Change of Load Rating Corresponding to Load Direction

basic dynamic load rating	normal vertical direction	1.0×C
	horizontal direction	0.85×C
	reverse vertical direction	0.74×C
basic static load rating	normal vertical direction	1.0×C ₀
	horizontal direction	0.84×C ₀
	reverse vertical direction	0.68×C ₀

※There may be a difference depending on the size. Please contact NB for details.
 Consideration has been given to holes for STUDROLLERS in the raceway surface in calculation of load ratings.

Figure G-23 Direction of Load



USE AND HANDLING PRECAUTIONS

Careful Handling

Dropping the slide table causes the rolling elements to make dents in the raceway surface. This will prevent smooth motion and will also affect accuracy. Be sure to handle the product with care.

Dust Prevention

Dust and foreign particles affect the accuracy and lifetime of a slide table. A slide table used in a harsh environment should be protected with a cover.

Lubrication

The slide table is prelubricated with lithium soap based grease No.00 prior to shipment for immediate use. Make sure to relubricate with a similar type of grease periodically depending on the operating conditions.

Cage Slippage

For the SVT/SYT type, the cage can slip under high-speed motion, vertical application, unbalanced-loading, and vibrating conditions. It is advised

that the motion speed be kept under 0.5m/s under general operating conditions. It is also recommended that the rails be cycled to perform the maximum stroke several times, so that the cage returns to its central position.

Adjustment/Installation Screw

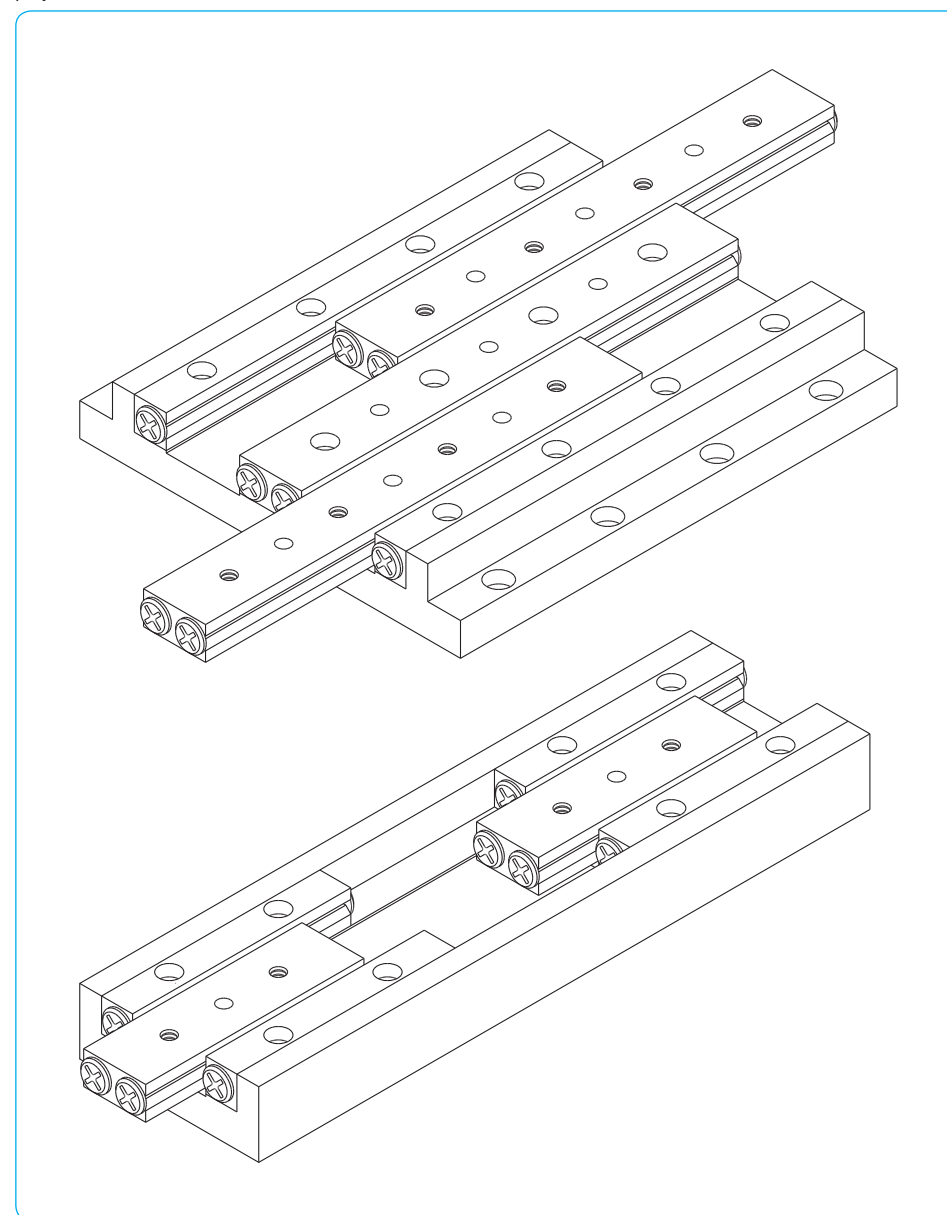
The NB slide table is adjusted to achieve optimum accuracy and preload. The adjustment screw and rail installation screws should be kept untouched.

Allowable Load

The allowable load is a load under which the sum of elastic deformations of the rolling element and the raceway in the contact area subject to the maximum contact stress is small enough to guarantee smooth rolling movement. When very smooth and highly accurate linear motion is required, make sure to use the product within the allowable load.

SPECIAL REQUIREMENTS

NB can machine tables to meet special requirements, including tables with a micrometer head and tables for projectors. Please contact NB for details.

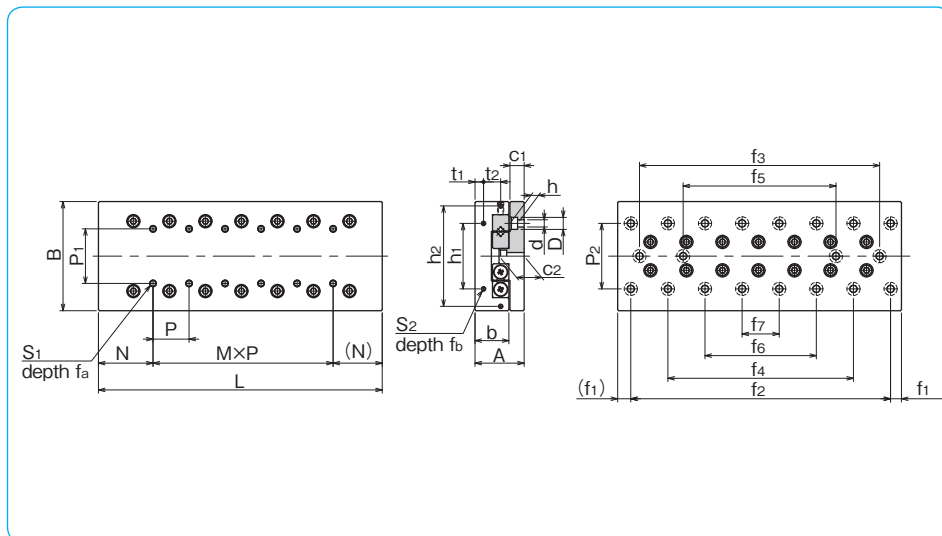
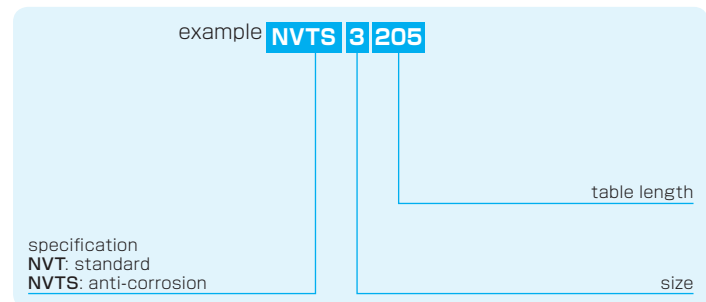


NVT TYPE

-NVT1/NVT2/NVT3-



part number structure



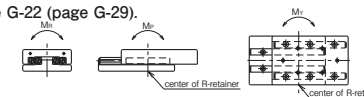
part number		stroke	major dimensions				table-top mounting hole dimensions				table-end mounting hole dimensions						
standard	anti-corrosion	ST mm	A mm	B mm	L mm	b mm	P ₁ mm	S ₁	f _a mm	N mm	M×P mm	h ₁ mm	h ₂ mm	t ₁ mm	t ₂ mm	S ₂	f _b mm
NVT1025	NVTS1025	12			25												
1035	1035	18			35					1×10							
1045	1045	25			45					2×10							
1055	1055	32	17 ^{±0.1}	30 ^{-0.4}	55	11	10	M2	4	12.5	3×10	12	-	2.5	-	M2	6
1065	1065	40			65						4×10						
1075	1075	45			75						5×10						
1085	1085	50			85						6×10						
NVT2035	NVTS2035	18			35												
2050	2050	30			50						1×15						
2065	2065	40			65						2×15						
2080	2080	50			80						3×15						
2095	2095	60			95						4×15						
2110	2110	70	21 ^{±0.1}	40 ^{-0.4}	110	14	15	M3	6	17.5	5×15	16	-	3.4	-	M2	6
2125	2125	80			125						6×15						
2140	2140	90			140						7×15						
2155	2155	100			155						8×15						
2170	2170	110			170						9×15						
2185	2185	120			185						10×15						
NVT3055	NVTS3055	30			55												
3080	3080	45			80						1×25						
3105	3105	60			105						2×25						
3130	3130	75			130						3×25						
3155	3155	90			155						4×25						
3180	3180	105			180						5×25						
3205	3205	130			205						6×25						
3230	3230	155			230						7×25						

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

bed-surface mounting hole dimensions											accuracy ※(deviation)		basic load rating dynamic static		allowable load	allowable static moment			mass		size
P ₂ mm	d×D×h mm	c ₁ mm	c ₂ mm	f ₁ mm	f ₂ mm	f ₃ mm	f ₄ mm	f ₅ mm	f ₆ mm	f ₇ mm	T μm	S μm	C N	Co N	F N	M _P N·m	M _Y N·m	M _R N·m	NVT g	NVTS g	size
22	2.5×4.5×2.5	5.5	9	3.5	18	-	-	-	-	-	2	4	734	849	283	3.73	3.18	5.73	87	39	1025
					28	-	-	-	-	-	2	4	1,250	1,690	566	1.77	4.24	1.93	124	55	1035
					38	-	-	-	-	-	2	4	1,720	2,540	849	9.09	10.3	7.67	160	71	1045
					48	-	28	-	-	-	2	5	2,160	3,390	1,130	14.1	16.7	9.61	195	87	1055
					58	-	38	-	-	-	2	5	2,560	4,240	1,410	24.9	26.7	15.3	231	103	1065
					68	-	48	-	-	-	2	5	2,960	5,090	1,690	33.1	36.7	17.2	267	119	1075
30	3.5×6.5×3.5	6.5	10.9	5	25	-	-	-	-	-	2	4	1,360	1,520	509	10.1	8.8	13.7	200	95	2035
					40	-	-	-	-	2	4	2,330	3,050	1,010	18.9	18.7	18.6	287	140	2050	
					55	-	-	-	-	2	5	3,190	4,580	1,520	36.9	35.7	32.4	377	182	2065	
					70	-	40	-	-	-	2	5	3,990	6,110	2,030	53.2	53.8	37.3	455	225	2080
					85	-	55	-	-	-	2	5	4,740	7,630	2,540	80.3	79.9	51.1	550	260	2095
					100	-	70	-	-	-	3	6	5,460	9,160	3,050	104	106	56.0	640	295	2110
40	4.5×8×4.5	9	15	10	115	-	85	-	-	-	3	6	6,160	10,600	3,560	130	135	60.9	730	340	2125
					130	-	100	-	70	-	3	6	6,830	12,200	4,070	171	176	74.7	810	370	2140
					145	-	115	-	85	-	3	6	8,130	15,200	5,090	235	244	88.4	890	410	2155
					160	-	130	-	100	-	3	7	8,750	16,800	5,600	275	289	93.3	980	450	2170
					175	-	145	-	115	85	3	7	9,370	18,300	6,110	317	338	98.3	1,070	490	2185
					35	-	-	-	-	-	2	5	6,150	8,060	2,680	20.8	37.2	27.3	643	303	3055
					60	-	-	-	-	-	2	5	8,440	12,100	4,030	125	119	140	960	445	3080
					85	-	-	-	-	-	3	6	10,500	16,100	5,370	188	186	167	1,260	590	3105
					110	-	-	-	-	-	3	6	14,400	24,200	8,060	300	319	195	1,580	725	3130
					135	85	-	-	-	-	3	6	16,300	28,200	9,410	508	505	308	1,860	860	3155
160	110	-	-	-	-	3	7	18,100	32,200	10,700	630	635	335	2,160	1,000	3180					
185	135	85	-	-	-	3	7	19,800	36,300	12,100	763	779	362	2,460	1,140	3205					
210	160	110	-	-	-	3	7	21,500	40,300	13,400	906	936	390	2,780	1,310	3230					

※For accuracy (T, S), refer to Figure G-22 (page G-29).

1N≒0.102kgf 1N·m≒0.102kgf·m

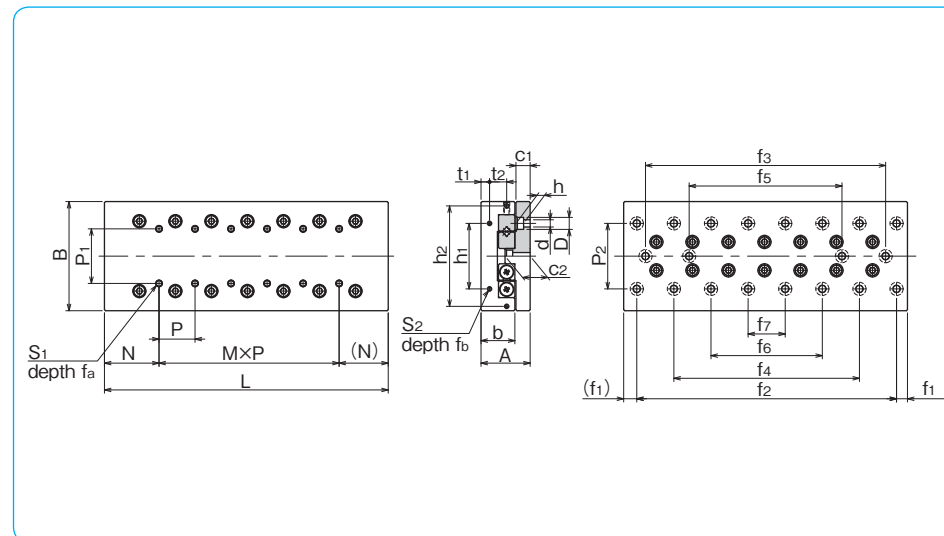
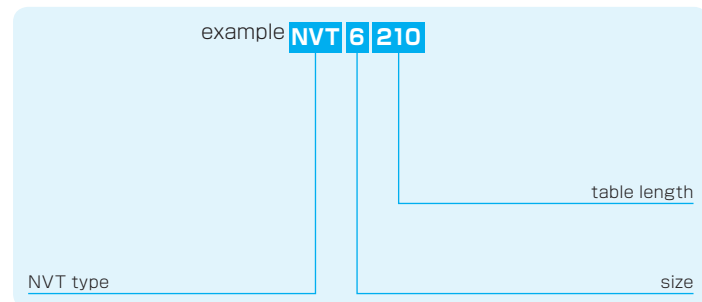


NVT TYPE

-NVT4/NVT6/NVT9-



part number structure



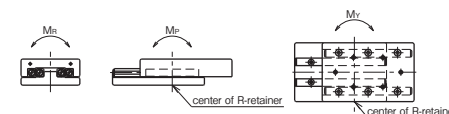
part number		stroke	major dimensions				table-top mounting hole dimensions					table-end mounting hole dimensions					
standard	anti-corrosion	ST mm	A mm	B mm	L mm	b mm	P ₁ mm	S ₁	f _a mm	N mm	M×P mm	h ₁ mm	h ₂ mm	t ₁ mm	t ₂ mm	S ₂	f _b mm
NVT4085	NVTS4085	50	35±0.1	80±0.1	85	24	40	M5	10	42.5	—	55	—	6.5	—	M3	6
4125	4125	75			1×40												
4165	4165	105			165						2×40						
4205	4205	130			205						3×40						
4245	4245	155			245						4×40						
4285	4285	185	285	5×40													
NVT6110	NVTS6110	60	45±0.1	100±0.1	110	31	50	M6	12	55	—	60	92	8	15	M4	8
6160	6160	95			1×50												
6210	6210	130			210						2×50						
6260	6260	165			260						3×50						
6310	6310	200			310						4×50						
6360	6360	235			360						5×50						
6410	6410	265	410	6×50													
NVT9210	—	130	60±0.1	145±0.1	210	43	85	M8	16	105.5	—	90	135	11	20	M4	8
9310	—	180			310						1×100						
9410	—	220			410						2×100						
9510	—	300			510						3×100						

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

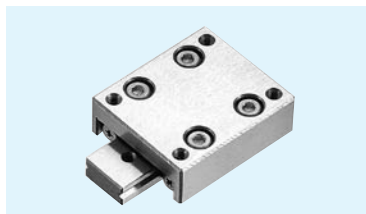
bed-surface mounting hole dimensions											accuracy ※(deviation)		basic load rating		allowable load		allowable static moment			mass		size
P ₂ mm	d×D×h mm	c ₁ mm	c ₂ mm	f ₁ mm	f ₂ mm	f ₃ mm	f ₄ mm	f ₅ mm	f ₆ mm	f ₇ mm	T μm	S μm	C N	Co N	F N	M _P N·m	M _Y N·m	M _R N·m	NVT g	NVTS g	size	
55	5.5×10×5.4	10.5	18	10	65	—	—	—	—	—	2	5	12,100	15,700	5,250	156	147	239	1,710	790	4085	
					105	—	—	—	—	—	3	6	20,700	31,500	10,500	327	357	320	2,520	1,160	4125	
					145	—	—	—	—	—	3	7	24,700	39,300	13,100	656	660	559	3,320	1,530	4165	
					185	105	—	—	—	—	3	7	32,100	55,100	18,300	1,270	1,250	874	4,130	1,900	4205	
					225	145	—	—	—	—	3	7	39,000	70,900	23,600	1,740	1,780	956	4,930	2,270	4245	
					265	185	—	—	—	—	3	7	42,400	78,700	26,200	2,380	2,400	1,190	5,730	2,630	4285	
60	7×11.5×7	13	23	10	90	—	—	—	—	—	3	6	29,600	37,500	12,500	213	310	256	3,300	1,720	6110	
					140	—	—	—	—	—	3	6	40,700	56,300	18,700	963	941	936	4,850	2,510	6160	
					190	90	—	—	—	—	3	7	60,600	93,900	31,300	1,960	1,990	1,350	6,310	3,290	6210	
					240	140	—	—	—	—	3	7	69,800	112,000	37,500	2,710	2,790	1,610	7,790	4,080	6260	
					290	190	—	—	—	—	3	7	78,800	131,000	43,800	4,490	4,420	2,460	9,260	4,860	6310	
					340	240	140	—	—	—	4	8	87,400	150,000	50,100	5,630	5,610	2,710	10,900	5,740	6360	
90	9×14×9	16	29	55	390	290	190	—	—	—	4	8	104,000	187,000	62,600	7,540	7,700	2,970	12,460	6,620	6410	
					100	—	—	—	—	—	3	6	96,100	128,000	42,600	1,700	2,110	2,260	12,550	—	9210	
					200	—	—	—	—	—	3	6	143,000	213,000	71,100	6,550	6,580	5,330	18,000	—	9310	
					300	—	—	—	—	—	3	7	186,000	298,000	99,500	12,600	12,700	7,770	24,010	—	9410	
400	—	—	—	—	—	3	7	206,000	341,000	113,000	18,700	18,600	10,200	30,100	—	9510						

※For accuracy (T, S), refer to Figure G-22 (page G-29).

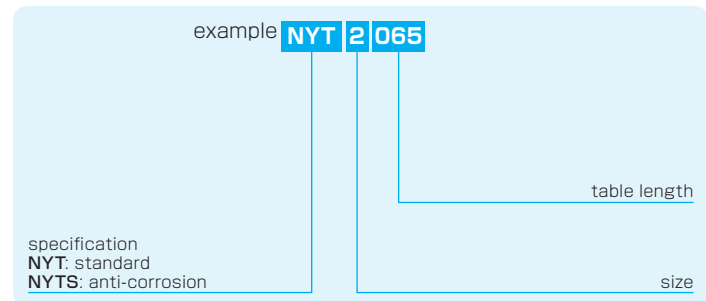
1N≒0.102kgf 1N·m≒0.102kgf·m



NYT TYPE

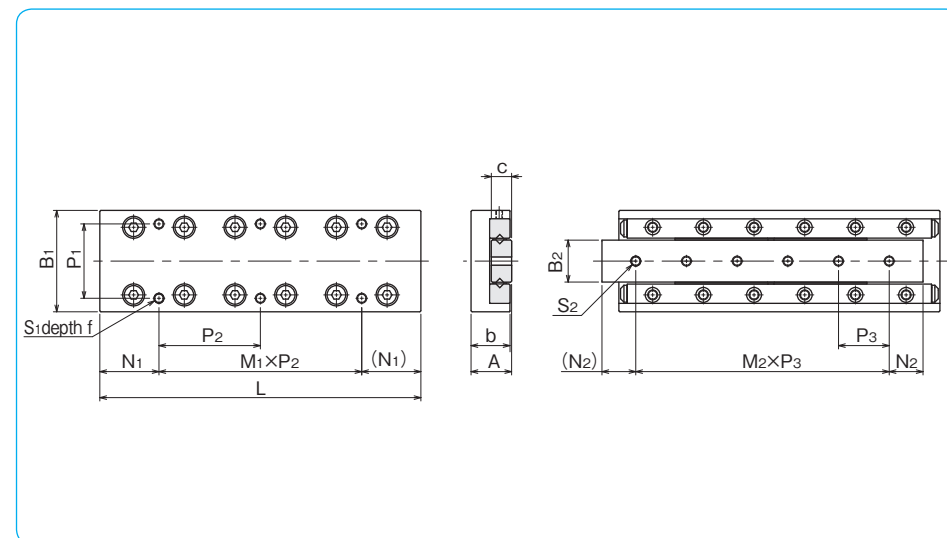


part number structure



part number		stroke	major dimensions						table-top mounting hole dimensions				
standard	anti-corrosion	ST mm	A mm	B ₁ mm	L mm	b mm	B ₂ mm	c mm	P ₁ mm	S ₁ mm	f mm	N ₁ mm	M ₁ ×P ₂ mm
NYT 1025	NYTS 1025	12	8±0.1	20±0.1	25	7.5	6.6	4	14	M2.6	3	3.5	1×18
1035	1035	18			35							1×28	
1045	1045	25			45							1×20	
1055	1055	32			55							1×30	
1065	1065	40			65							2×20	
1075	1075	45			75							1×30	
1085	1085	50			85							2×30	
NYT 2035	NYTS 2035	18	12±0.1	30±0.1	35	11.5	12.4	6	22	M3	5	3.5	1×28
2050	2050	30			50							1×43	
2065	2065	40			65							1×30	
2080	2080	50			80							1×45	
2095	2095	60			95							2×30	
2110	2110	70			110							1×45	
2125	2125	80			125							2×45	
NYT 3055	NYTS 3055	30	16±0.1	40±0.1	55	15.5	16.7	8	30	M4	7	7.5	1×40
3080	3080	45			80							1×65	
3105	3105	60			105							1×50	
3130	3130	75			130							1×75	
3155	3155	90			155							2×50	
3180	3180	105			180							1×75	
3205	3205	130			205							2×75	

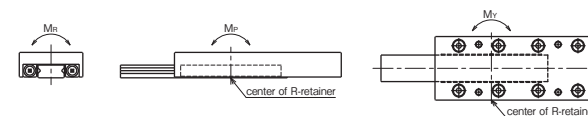
The basic static load rating is the value at the center of the stroke.



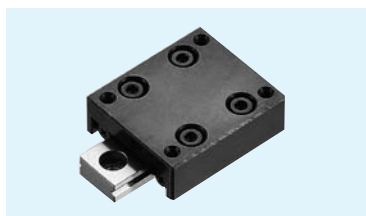
S ₂	bed-surface mounting hole dimensions		accuracy ※(deviation)		basic load rating		allowable load F N	allowable static moment			mass g	size
	N ₂ mm	M ₂ ×P ₃ mm	T μm	S μm	dynamic C N	static C ₀ N		M _P N·m	M _Y N·m	M _R N·m		
M2.6	5	2×7.5	2	4	734	849	283	3.73	3.18	3.18	25	1025
	7.5	2×10	2	4	1,250	1,690	566	1.77	4.24	1.07	35	1035
	7.5	3×10	2	5	1,720	2,540	849	9.09	10.3	4.26	45	1045
	7.5	4×10	2	5	2,160	3,390	1,130	14.1	16.7	5.33	55	1055
	7.5	5×10	2	5	2,560	4,240	1,410	24.9	26.7	8.52	65	1065
	7.5	6×10	2	5	2,960	5,090	1,690	33.1	36.7	9.59	76	1075
	7.5	7×10	2	5	3,330	5,940	1,980	47.8	50.7	12.7	86	1085
M3	7.5	1×20	2	4	1,360	1,520	509	10.1	8.80	9.93	84	2035
	10	2×15	2	4	2,330	3,050	1,010	18.9	18.7	13.4	120	2050
	10	3×15	2	5	3,190	4,580	1,520	36.9	35.7	23.4	157	2065
	10	4×15	2	5	3,990	6,110	2,030	53.2	53.8	26.9	190	2080
	10	5×15	2	5	4,740	7,630	2,540	80.3	79.9	36.9	225	2095
	10	6×15	2	5	5,460	9,160	3,050	104	106	40.4	265	2110
	10	7×15	2	5	6,160	10,600	3,560	130	135	44.0	305	2125
M4	10	1×35	2	5	6,150	8,060	2,680	20.8	37.2	17.0	228	3055
	15	2×25	2	5	8,440	12,100	4,030	125	119	87.2	345	3080
	15	3×25	3	5	10,500	16,100	5,370	188	186	104	450	3105
	15	4×25	3	5	14,400	24,200	8,060	300	319	121	570	3130
	15	5×25	3	5	16,300	28,200	9,410	508	505	191	665	3155
	15	6×25	3	5	18,100	32,200	10,700	630	635	208	780	3180
	15	7×25	3	5	19,800	36,300	12,100	763	779	225	890	3205

※For accuracy (T, S), refer to Figure G-22 (page G-29).

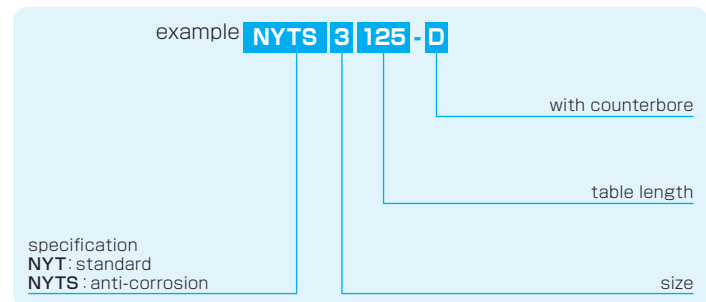
1N≒0.102kgf 1N·m≒0.102kgf·m



NYT-D TYPE

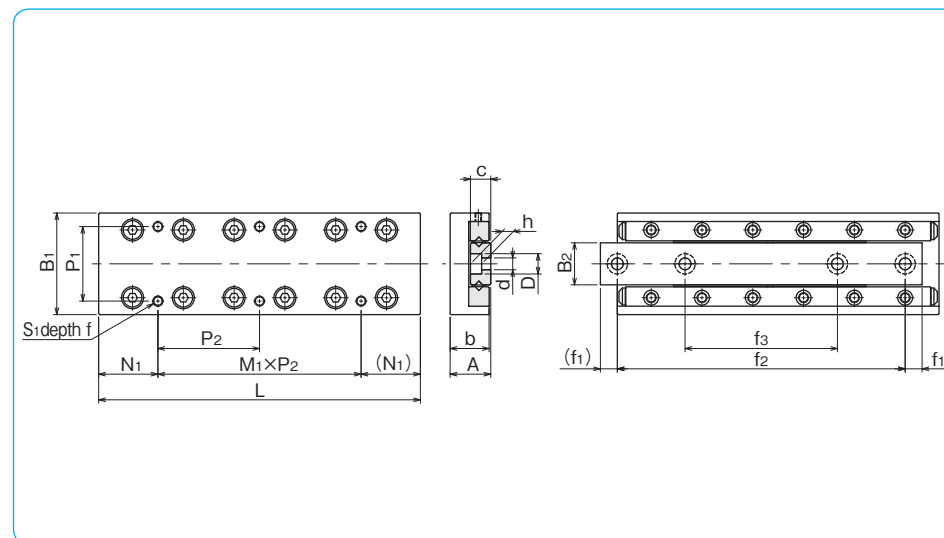


part number structure



part number		stroke ST mm	major dimensions						table-top mounting hole dimensions				
standard	anti-corrosion		A	B ₁	L	b	B ₂	c	P ₁	S ₁	f	N ₁	M ₁ ×P ₂
NYT 1025-D	NYTS 1025-D	12	8±0.1	20±0.1	25	7.5	6.6	4	14	M2.6	3	3.5	1×18
1035-D	1035-D	18			35							1×28	
1045-D	1045-D	25			45							1×20	
1055-D	1055-D	32			55							1×30	
1065-D	1065-D	40			65							2×20	
1075-D	1075-D	45			75							1×30	
1085-D	1085-D	50			85							2×30	
NYT 2035-D	NYTS 2035-D	18			12±0.1							30±0.1	35
2050-D	2050-D	30	50	1×43									
2065-D	2065-D	40	65	1×30									
2080-D	2080-D	50	80	1×45									
2095-D	2095-D	60	95	2×30									
2110-D	2110-D	70	110	1×45									
2125-D	2125-D	80	125	2×45									
NYT 3055-D	NYTS 3055-D	30	16±0.1	40±0.1		55	15.5	16.7	8	30	M4		7
3080-D	3080-D	45			80	1×65							
3105-D	3105-D	60			105	1×50							
3130-D	3130-D	75			130	1×75							
3155-D	3155-D	90			155	2×50							
3180-D	3180-D	105			180	1×75							
3205-D	3205-D	130			205	2×75							

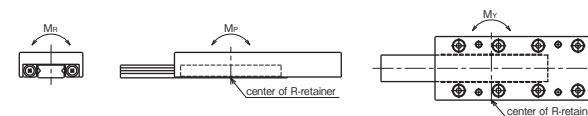
The basic static load rating is the value at the center of the stroke.



bed-surface mounting hole dimensions d×D×h	bed-surface mounting hole dimensions			accuracy ※(deviation)		basic load rating		allowable load F N	allowable static moment			mass g	size
	f ₁	f ₂	f ₃	T μm	S μm	dynamic C N	static Co N		M _P N·m	M _Y N·m	M _R N·m		
2.5×4.1×2.2	3.5	18	—	2	4	734	849	283	3.73	3.18	3.18	25	1025
	5	25	—	2	4	1,250	1,690	566	1.77	4.24	1.07	35	1035
	3.5	38	25	2	5	1,720	2,540	849	9.09	10.3	4.26	45	1045
	3.5	48	29	2	5	2,160	3,390	1,130	14.1	16.7	5.33	55	1055
	5	55	31	2	5	2,560	4,240	1,410	24.9	26.7	8.52	65	1065
	5	65	35	2	5	2,960	5,090	1,690	33.1	36.7	9.59	76	1075
	5	75	40	2	5	3,330	5,940	1,980	47.8	50.7	12.7	86	1085
	3.5×6×3.3	5	25	—	2	4	1,360	1,520	509	10.1	8.80	9.93	84
7.5		35	—	2	4	2,330	3,050	1,010	18.9	18.7	13.4	120	2050
5		55	33	2	5	3,190	4,580	1,520	36.9	35.7	23.4	157	2065
5		70	40	2	5	3,990	6,110	2,030	53.2	53.8	26.9	190	2080
5		85	45	2	5	4,740	7,630	2,540	80.3	79.9	36.9	225	2095
7.5		95	50	2	5	5,460	9,160	3,050	104	106	40.4	265	2110
7.5		110	55	2	5	6,160	10,600	3,560	130	135	44.0	305	2125
4.5×7.5×4.3		7.5	40	—	2	5	6,150	8,060	2,680	20.8	37.2	17.0	228
	6	68	43	2	5	8,440	12,100	4,030	125	119	87.2	345	3080
	7.5	90	55	3	5	10,500	16,100	5,370	188	186	104	450	3105
	7.5	115	65	3	5	14,400	24,200	8,060	300	319	121	570	3130
	7.5	140	95	3	5	16,300	28,200	9,410	508	505	191	665	3155
	7.5	165	85	3	5	18,100	32,200	10,700	630	635	208	780	3180
	7.5	190	90	3	5	19,800	36,300	12,100	763	779	225	890	3205

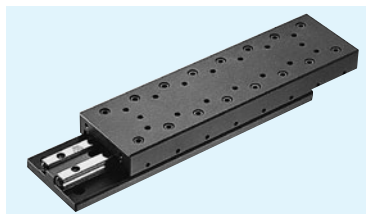
※For accuracy (T, S), refer to Figure G-22 (page G-29).

1N≒0.102kgf 1N·m≒0.102kgf·m

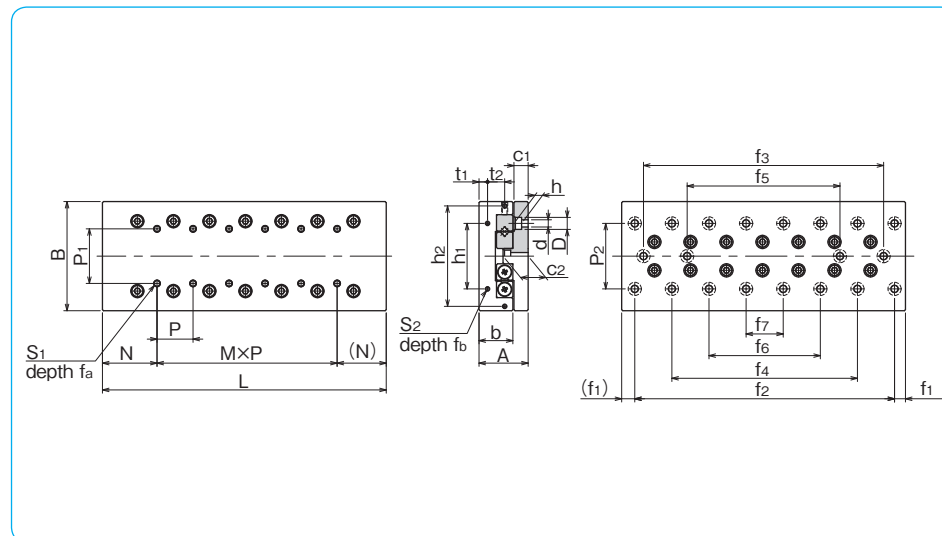
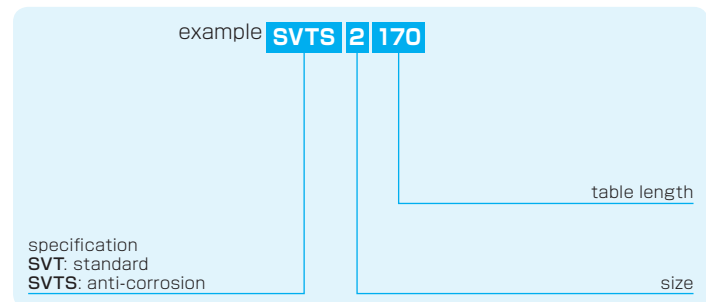


SVT TYPE

-SVT1/SVT2-



part number structure

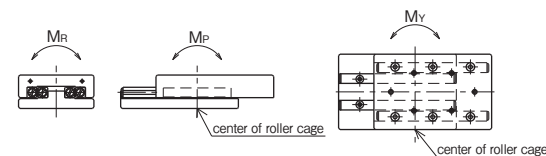


part number		stroke	major dimensions				table-top mounting hole dimensions					table-end mounting hole dimensions					
standard	anti-corrosion	ST mm	A mm	B mm	L mm	b mm	P ₁ mm	S ₁	f _a mm	N mm	M×P mm	h ₁ mm	h ₂ mm	t ₁ mm	t ₂ mm	S ₂	f _b mm
SVT 1025	SVTS 1025	12			25						—						
1035	1035	18			35					1×10							
1045	1045	25			45					2×10							
1055	1055	32	17 ^{±0.1}	30 ^{-0.4}	55	11	10	M2	4	12.5	3×10	12	—	2.5	—	M2	6
1065	1065	40			65						4×10						
1075	1075	45			75						5×10						
1085	1085	50			85						6×10						
SVT 2035	SVTS 2035	18			35						—						
2050	2050	30			50						1×15						
2065	2065	40			65						2×15						
2080	2080	50			80						3×15						
2095	2095	60			95						4×15						
2110	2110	70	21 ^{±0.1}	40 ^{-0.4}	110	14	15	M3	6	17.5	5×15	16	—	3.4	—	M2	6
2125	2125	80			125						6×15						
2140	2140	90			140						7×15						
2155	2155	100			155						8×15						
2170	2170	110			170						9×15						
2185	2185	120			185						10×15						

bed-surface mounting hole dimensions													accuracy ※(deviation)		basic load rating		allowable load		allowable static moment			mass		size
P ₂ mm	d×D×h mm	c ₁ mm	c ₂ mm	f ₁ mm	f ₂ mm	f ₃ mm	f ₄ mm	f ₅ mm	f ₆ mm	f ₇ mm	T μm	S μm	C N	Co N	F N	M _P N·m	M _Y N·m	M _R N·m	SVT g	SVTS g				
22	2.5×4.5×2.5	5.5	9	3.5	18	—	—	—	—	—	2	4	464	476	158	1.79	1.47	3.22	82	36	1025			
					28	—	—	—	—	—	—	—	2	4	805	952	316	3.08	3.5	6.45	120	50	1035	
					38	—	—	—	—	—	—	—	—	2	4	959	1,190	396	6.98	6.4	8.06	158	69	1045
					48	—	28	—	—	—	—	—	—	2	5	1,100	1,420	475	9.53	8.81	9.68	190	83	1055
					58	—	38	—	—	—	—	—	—	2	5	1,240	1,660	554	12.4	11.6	11.2	225	98	1065
					68	—	48	—	—	—	—	—	—	2	5	1,510	2,140	712	19.3	18.3	14.5	260	113	1075
					78	—	58	—	—	—	—	—	—	2	5	1,650	2,380	792	23.4	22.3	16.1	295	128	1085
					25	—	—	—	—	—	—	—	—	—	2	4	1,090	1,170	390	7.04	5.78	10.5	195	90
30	3.5×6.5×3.5	6.5	10.9	5	40	—	—	—	—	—	2	4	1,510	1,750	585	12.1	10.7	15.8	280	133	2050			
					55	—	—	—	—	—	—	—	2	5	1,900	2,340	780	19.1	17.1	21.1	370	175	2065	
					70	—	40	—	—	—	—	—	—	2	5	2,620	3,510	1,170	27.4	29.6	31.6	450	220	2080
					85	—	55	—	—	—	—	—	—	2	5	2,950	4,100	1,360	37.4	39.9	36.9	540	250	2095
					100	—	70	—	—	—	—	—	—	3	6	3,280	4,680	1,560	61.7	58.1	42.2	630	285	2110
					115	—	85	—	—	—	—	—	—	3	6	3,590	5,270	1,750	76.1	72.1	47.5	720	330	2125
					130	—	100	—	70	—	—	—	—	3	6	4,210	6,440	2,140	92	95.9	58.1	800	360	2140
					145	—	115	—	85	—	—	—	—	3	6	4,500	7,030	2,340	109	113	63.3	880	400	2155
					160	—	130	—	100	—	—	—	—	3	7	4,790	7,610	2,530	148	143	68.6	970	440	2170
					175	—	145	—	115	85	—	—	—	3	7	5,080	8,200	2,730	170	164	73.9	1,060	480	2185

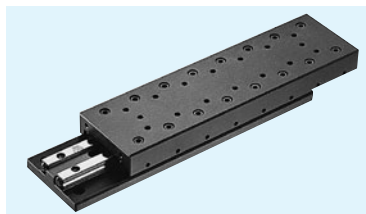
※For accuracy (T, S), refer to Figure G-22 (page G-29).

1N ≒ 0.102kgf 1N·m ≒ 0.102kgf·m

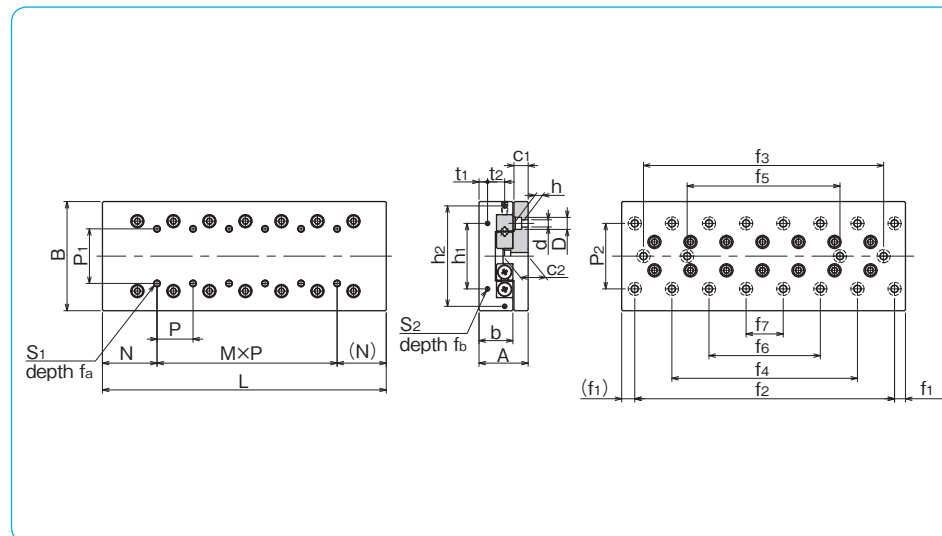
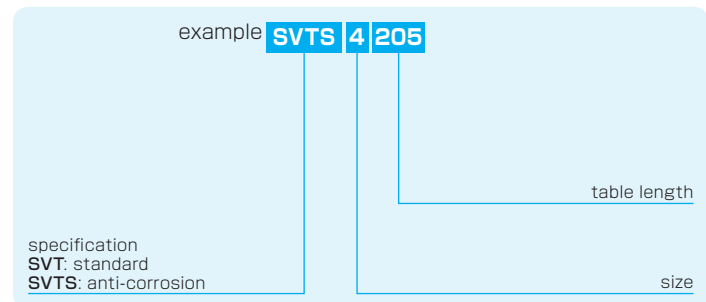


SVT TYPE

-SVT3/SVT4-



part number structure

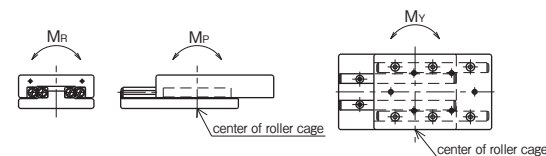


part number		stroke	major dimensions				table-top mounting hole dimensions					table-end mounting hole dimensions					
standard	anti-corrosion	ST mm	A mm	B mm	L mm	b mm	P1 mm	S1	fa mm	N mm	M×P mm	h1 mm	h2 mm	t1 mm	t2 mm	S2	fb mm
SVT 3055	SVTS 3055	30			55						—						
3080	3080	45			80						1×25						
3105	3105	60			105						2×25						
3130	3130	75			130						3×25						
3155	3155	90	28 ^{±0.1}	60 ^{±0.1}	155	18.5	25	M4	8	27.5	4×25	40	—	5.5	—	M3	6
3180	3180	105			180						5×25						
3205	3205	130			205						6×25						
3230	3230	155			230						7×25						
3255	3255	180			255						8×25						
3280	3280	205			280						9×25						
3305	3305	230			305						10×25						
SVT 4085	SVTS 4085	50			85						—						
4125	4125	75			125						1×40						
4165	4165	105			165						2×40						
4205	4205	130			205						3×40						
4245	4245	155	35 ^{±0.1}	80 ^{±0.1}	245	24	40	M5	10	42.5	4×40	55	—	6.5	—	M3	6
4285	4285	185			285						5×40						
4325	4325	210			325						6×40						
4365	4365	235			365						7×40						
4405	4405	265			405						8×40						

bed-surface mounting hole dimensions											accuracy ※(deviation)		basic load rating		allowable load		allowable static moment			mass		size
P2 mm	d×D×h mm	c1 mm	c2 mm	f1 mm	f2 mm	f3 mm	f4 mm	f5 mm	f6 mm	f7 mm	T μm	S μm	C N	Co N	F N	Mp N·m	My N·m	MR N·m	SVT g	SVTS g	size	
40	4.5×8×4.5	9	15	10	35	—	—	—	—	—	2	5	3,490	3,890	1,290	19.4	22.2	54.5	640	300	3055	
					60	—	—	—	—	—	2	5	5,230	6,490	2,160	53.0	58.0	90.9	955	440	3080	
					85	—	—	—	—	—	3	6	6,030	7,780	2,590	103	95.7	109	1,250	580	3105	
					110	—	—	—	—	—	3	6	7,560	10,300	3,450	170	160	145	1,570	715	3130	
					135	85	—	—	—	—	3	6	9,000	12,900	4,320	210	220	181	1,850	850	3155	
					160	110	—	—	—	—	3	7	10,300	15,500	5,180	302	314	218	2,150	990	3180	
					185	135	85	—	—	—	3	7	11,000	16,800	5,610	355	367	236	2,450	1,130	3205	
					210	160	110	—	—	—	3	7	11,700	18,100	6,040	472	455	254	2,740	1,270	3230	
					235	185	135	—	—	—	3	7	12,900	20,700	6,910	537	552	290	3,040	1,410	3255	
					260	210	160	110	—	—	3	7	13,600	22,000	7,340	606	622	309	3,360	1,540	3280	
285	235	185	135	—	—	3	7	14,200	23,300	7,770	757	735	372	3,660	1,680	3305						
55	5.5×10×5.4	10.5	18	10	65	—	—	—	—	—	2	5	7,110	7,920	2,640	96.0	84.9	159	1,700	780	4085	
					105	—	—	—	—	—	3	6	10,600	13,200	4,400	217	199	265	2,500	1,140	4125	
					145	—	—	—	—	—	3	7	13,800	18,400	6,160	296	316	371	3,300	1,510	4165	
					185	105	—	—	—	—	3	7	16,800	23,700	7,920	488	513	477	4,100	1,870	4205	
					225	145	—	—	—	—	3	7	19,700	29,000	9,680	729	759	584	4,900	2,240	4245	
					265	185	—	—	—	—	3	7	22,400	34,300	11,400	1,010	1,050	690	5,700	2,600	4285	
					305	225	145	—	—	—	4	8	25,100	39,600	13,200	1,350	1,390	796	6,500	3,000	4325	
					345	265	185	—	—	—	4	8	27,600	44,800	14,900	1,730	1,780	902	7,300	3,300	4365	
					385	305	225	—	—	—	4	8	28,900	47,500	15,800	2,160	2,100	955	8,100	3,700	4405	

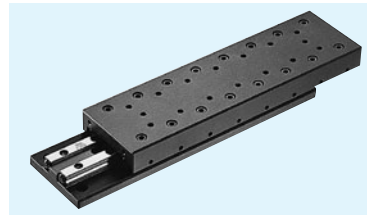
※For accuracy (T, S), refer to Figure G-22 (page G-29).

1N ≃ 0.102kgf 1N·m ≃ 0.102kgf·m

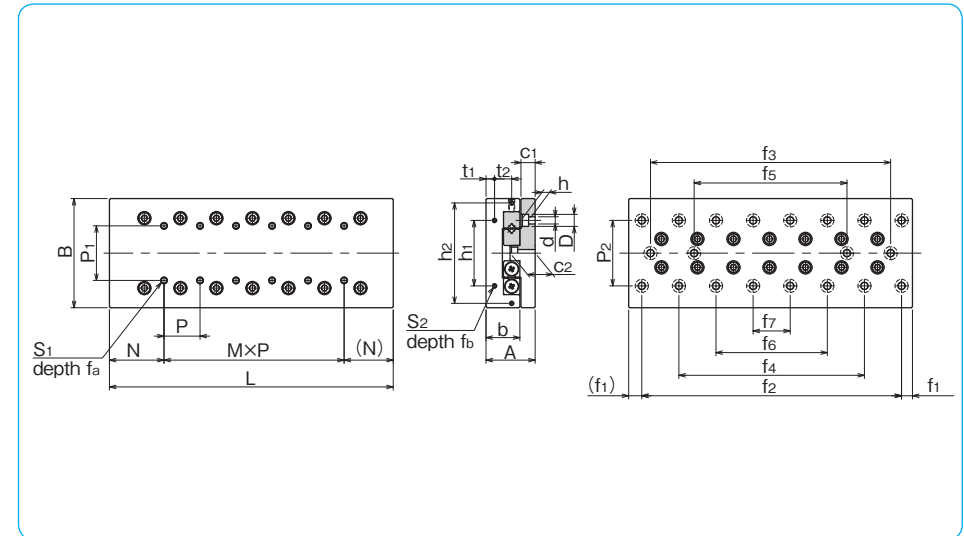
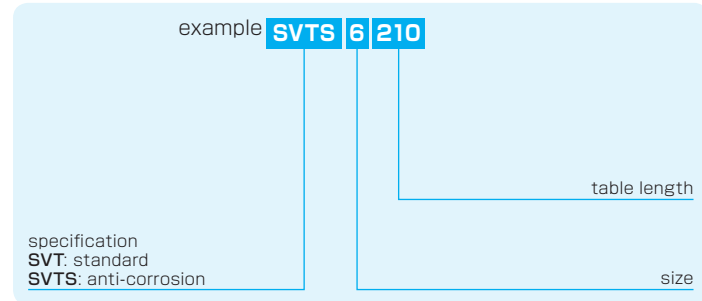


SVT TYPE

-SVT6/SVT9-



part number structure

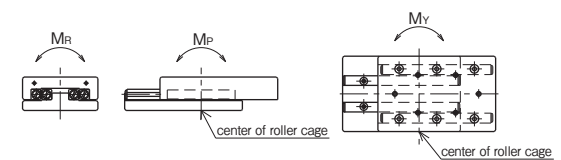


part number		stroke ST mm	major dimensions				table-top mounting hole dimensions					table-end mounting hole dimensions					
standard	anti-corrosion		A mm	B mm	L mm	b mm	P ₁ mm	S ₁ mm	f _a mm	N mm	M×P mm	h ₁ mm	h ₂ mm	t ₁ mm	t ₂ mm	S ₂ mm	f _b mm
SVT 6110	SVTS 6110	60			110					—							
6160	6160	95			160					1×50							
6210	6210	130			210					2×50							
6260	6260	165			260					3×50							
6310	6310	200	45 ^{±0.1}	100 ^{±0.1}	310	31	50	M6	12	55	4×50	60	92	8	15	M4	8
6360	6360	235			360					5×50							
6410	6410	265			410					6×50							
6460	6460	300			460					7×50							
6510	6510	335			510					8×50							
SVT 9210	—	130			210					—							
9310	—	180			310					1×100							
9410	—	350			410					2×100							
9510	—	450			510					3×100							
9610	—	550	60 ^{±0.1}	145 ^{±0.1}	610	43	85	M8	16	105	4×100	90	135	11	20	M4	8
9710	—	650			710					5×100							
9810	—	750			810					6×100							
9910	—	850			910					7×100							
91010	—	950			1,010					8×100							

bed-surface mounting hole dimensions											accuracy ※(deviation)		basic load rating		allowable load		allowable static moment			mass		size		
P ₂ mm	d×D×h mm	c ₁ mm	c ₂ mm	f ₁ mm	f ₂ mm	f ₃ mm	f ₄ mm	f ₅ mm	f ₆ mm	f ₇ mm	T μm	S μm	C N	Co N	F N	M _P N·m	M _Y N·m	M _R N·m	SVT g	SVTS g				
60	7×11.5×7	13	23	10	90	—	—	—	—	—	3	6	16,500	17,700	5,910	260	230	400	3,280	1,705	6110			
					140	—	—	—	—	—	—	—	—	3	6	24,700	29,600	9,860	588	539	666	4,820	2,480	6160
					190	90	—	—	—	—	—	—	—	3	7	32,200	41,400	13,800	1,040	978	933	6,270	3,255	6210
					240	140	—	—	—	—	—	—	—	3	7	39,200	53,200	17,700	1,630	1,540	1,200	7,740	4,030	6260
					290	190	—	—	—	—	—	—	—	3	7	45,800	65,100	21,600	2,340	2,240	1,460	9,200	4,805	6310
					340	240	140	—	—	—	—	—	—	4	8	52,200	76,900	25,600	2,750	2,850	1,730	10,740	5,580	6360
					390	290	190	—	—	—	—	—	—	4	8	58,400	88,800	29,500	3,660	3,770	2,000	12,190	6,355	6410
					440	340	240	—	—	—	—	—	—	4	8	64,400	100,000	33,500	4,700	4,830	2,260	13,800	7,130	6460
					490	390	290	190	—	—	—	—	—	4	8	70,200	112,000	37,400	5,870	6,010	2,530	15,300	7,905	6510
					90	9×14×9	16	29	55	100	—	—	—	—	—	3	7	51,100	56,500	18,800	1,610	1,440	2,030	12,520
200	—	—	—	—						—	—	—	3	7	79,300	98,900	32,900	3,150	3,360	3,560	17,950	—	9310	
300	100	—	—	—						—	—	—	—	4	8	79,300	98,900	32,900	4,110	3,840	3,560	23,950	—	9410
400	200	—	—	—						—	—	—	—	4	8	96,600	127,000	42,300	6,420	6,080	4,580	30,090	—	9510
500	300	100	—	—						—	—	—	—	4	9	112,000	155,000	51,700	7,760	8,090	5,600	35,990	—	9610
600	400	200	—	—						—	—	—	—	4	9	128,000	183,000	61,100	10,800	11,200	6,620	41,890	—	9710
700	500	300	100	—						—	—	—	—	5	10	136,000	197,000	65,800	14,400	13,900	7,130	47,790	—	9810
800	600	400	200	—						—	—	—	—	5	10	151,000	226,000	75,200	18,500	17,900	8,140	53,690	—	9910
900	700	500	300	100						—	—	—	—	5	10	165,000	254,000	84,600	23,100	22,400	9,160	59,590	—	91010

※For accuracy (T, S), refer to Figure G-22 (page G-29).

1N ≅ 0.102kgf 1N · m ≅ 0.102kgf · m

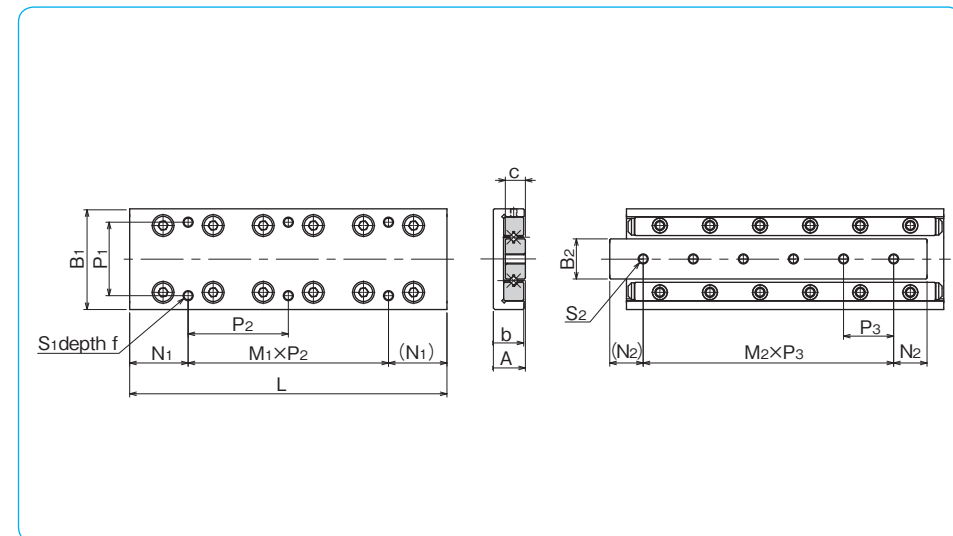
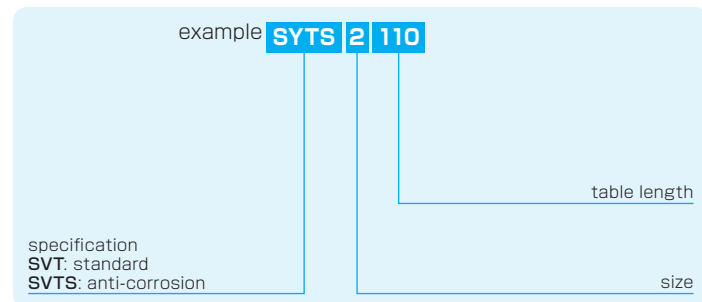


SYT TYPE

-SYT1/SYT2-



part number structure

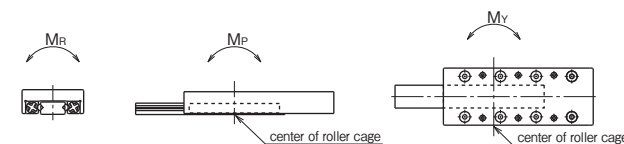


part number		stroke ST mm	major dimensions						table-top mounting hole dimensions		
standard	anti-corrosion		A mm	B ₁ mm	L mm	b mm	B ₂ mm	c mm	P ₁ mm	S ₁	f mm
SYT 1025	SYTS 1025	12	8±0.1	20±0.1	25	7.5	6.6	4	14	M2.6	3
1035	1035	18			35						
1045	1045	25			45						
1055	1055	32			55						
1065	1065	40			65						
1075	1075	45			75						
1085	1085	50			85						
SYT 2035	SYTS 2035	18	12±0.1	30±0.1	35	11.5	12	6	22	M3	5
2050	2050	30			50						
2065	2065	40			65						
2080	2080	50			80						
2095	2095	60			95						
2110	2110	70			110						
2125	2125	80			125						

N ₁ mm	M ₁ ×P ₂ mm	bed-surface mounting hole dimensions		accuracy ※(deviation)		basic load rating		allowable load F N	allowable static moment			mass g	size	
		S ₂	N ₂ mm	M ₂ ×P ₃ mm	T μm	S μm	dynamic C N		static Co N	M _P N·m	M _Y N·m			M _R N·m
3.5	1×18	M2.6	5	2×7.5	2	4	464	476	158	1.79	1.47	1.79	22	1025
3.5	1×28		7.5	2×10	2	4	805	952	316	3.08	3.50	3.58	33	1035
12.5	1×20		7.5	3×10	2	5	959	1,190	396	6.98	6.40	4.48	42	1045
12.5	1×30		7.5	4×10	2	5	1,100	1,420	475	9.53	8.81	5.37	52	1055
12.5	2×20		7.5	5×10	2	5	1,240	1,660	554	12.4	11.6	6.27	63	1065
22.5	1×30		7.5	6×10	2	5	1,510	2,140	712	19.3	18.3	8.06	72	1075
12.5	2×30		7.5	7×10	2	5	1,650	2,380	792	23.4	22.3	8.96	83	1085
3.5	1×28	M3	7.5	1×20	2	4	1,090	1,170	390	7.04	5.78	7.63	79	2035
3.5	1×43		10	2×15	2	4	1,510	1,750	585	12.1	10.7	11.4	113	2050
17.5	1×30		10	3×15	2	5	1,900	2,340	780	19.1	17.1	15.2	150	2065
17.5	1×45		10	4×15	2	5	2,620	3,510	1,170	27.4	29.6	22.8	185	2080
17.5	2×30		10	5×15	2	5	2,950	4,100	1,360	37.4	39.9	26.7	215	2095
32.5	1×45		10	6×15	2	5	3,280	4,680	1,560	61.7	58.1	30.5	255	2110
17.5	2×45		10	7×15	2	5	3,590	5,270	1,750	76.1	72.1	34.3	295	2125

※For accuracy (T, S), refer to Figure G-22 (page G-29).

1N ≒ 0.102kgf 1N · m ≒ 0.102kgf · m

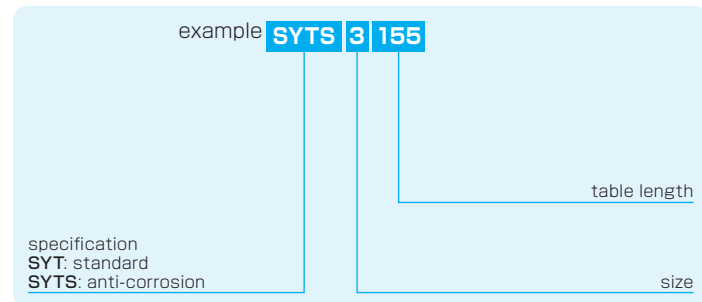


SYT TYPE

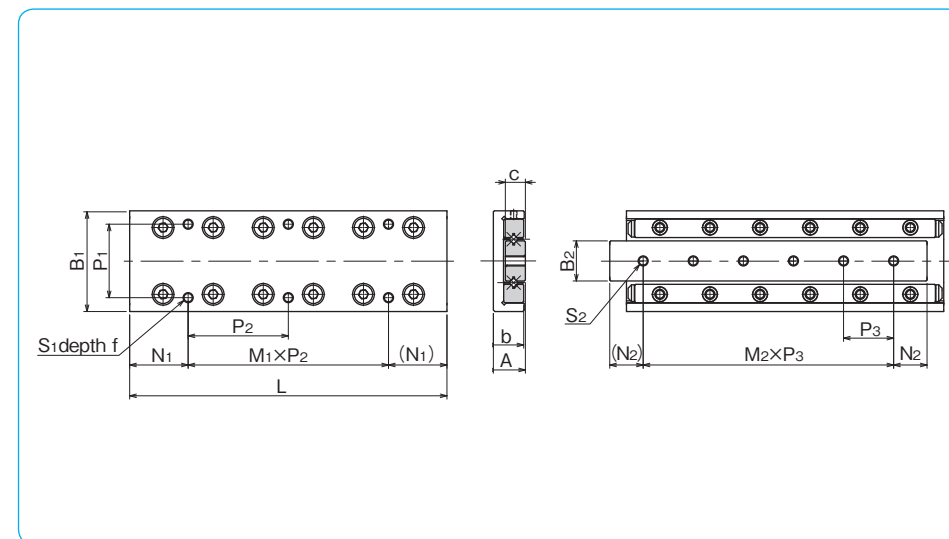
-SYT3-



part number structure



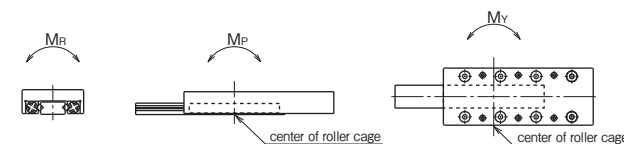
part number		stroke ST mm	major dimensions						table-top mounting hole dimensions		
standard	anti-corrosion		A mm	B ₁ mm	L mm	b mm	B ₂ mm	c mm	P ₁ mm	S ₁	f mm
SYT 3055	SYTS 3055	30	16±0.1	40±0.1	55	15.5	16	8	30	M4	7
3080	3080	45			80						
3105	3105	60			105						
3130	3130	75			130						
3155	3155	90			155						
3180	3180	105			180						
3205	3205	130			205						



N ₁ mm		M ₁ ×P ₂ mm		bed-surface mounting hole dimensions		accuracy ※(deviation)		basic load rating		allowable load	allowable static moment			mass	size
N ₁	M ₁ ×P ₂	S ₂	N ₂	M ₂ ×P ₃	T μm	S μm	dynamic C N	static Co N	F N	M _P N·m	M _Y N·m	M _R N·m	g		
7.5	1×40	M4	10	1×35	2	5	3,490	3,890	1,290	19.4	22.2	33.8	225	3055	
7.5	1×65		15	2×25	2	5	5,230	6,490	2,160	53.0	58.0	56.4	340	3080	
27.5	1×50		15	3×25	3	5	6,030	7,790	2,590	103	95.7	67.7	440	3105	
27.5	1×75		15	4×25	3	5	7,560	10,300	3,450	170	160	90.3	560	3130	
27.5	2×50		15	5×25	3	5	9,000	12,900	4,320	210	220	112	655	3155	
52.5	1×75		15	6×25	3	5	10,300	15,500	5,180	302	314	135	770	3180	
27.5	2×75		15	7×25	3	5	11,000	16,800	5,610	355	367	146	880	3205	

※For accuracy (T, S), refer to Figure G-22 (page G-29).

1N≐0.102kgf 1N·m≐0.102kgf·m

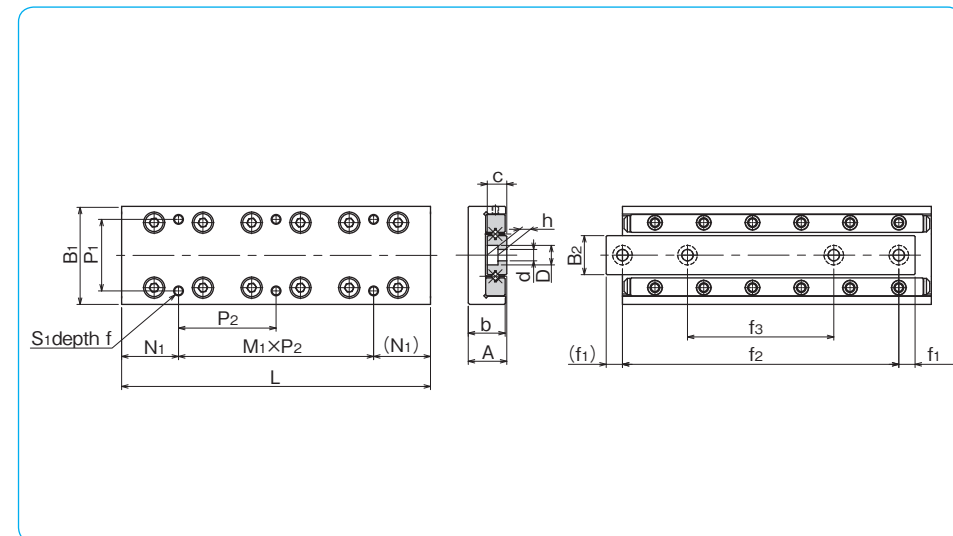
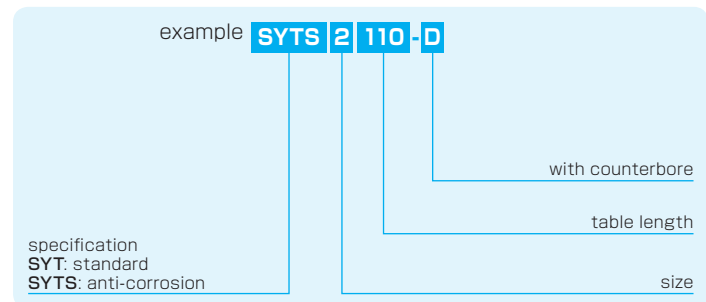


SYT-D TYPE

-SYT1/SYT2-



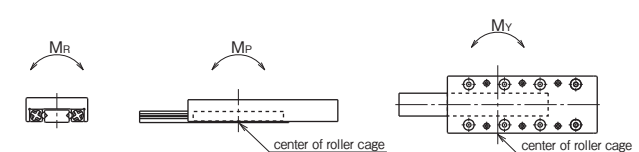
part number structure



part number		stroke ST mm	major dimensions						table-top mounting hole dimensions			
standard	anti-corrosion		A mm	B ₁ mm	L mm	b mm	B ₂ mm	c mm	P ₁ mm	S ₁ mm	f mm	N ₁ mm
SYT1025-D	SYTS1025-D	12	8±0.1	20±0.1	25	7.5	6.6	4	14	M2.6	3	3.5
1035-D	1035-D	18			35							3.5
1045-D	1045-D	25			45							12.5
1055-D	1055-D	32			55							12.5
1065-D	1065-D	40			65							12.5
1075-D	1075-D	45			75							22.5
1085-D	1085-D	50			85							12.5
SYT2035-D	SYTS2035-D	18	12±0.1	30±0.1	35	11.5	12	6	22	M3	5	3.5
2050-D	2050-D	30			50							3.5
2065-D	2065-D	40			65							17.5
2080-D	2080-D	60			80							17.5
2095-D	2095-D	60			95							17.5
2110-D	2110-D	70			110							32.5
2125-D	2125-D	80			125							17.5

M ₁ ×P ₂ mm	bed-surface mounting hole dimensions			accuracy ※(deviation)		basic load rating		allowable load F N	allowable static moment			mass g	size		
	d×D×h mm	f ₁ mm	f ₂ mm	f ₃ mm	T μm	S μm	C N		Co N	M _P N·m	M _Y N·m			M _R N·m	
1×18	2.5×4.1×2.2	3.5	18	—	2	4	464	476	158	1.79	1.47	1.79	22	1025	
1×28		5	25	—	2	4	805	952	316	3.08	3.50	3.58	33	1035	
1×20		3.5	38	25	2	5	959	1,190	396	6.98	6.40	4.48	42	1045	
1×30		3.5	48	29	2	5	1,100	1,420	475	9.53	8.81	5.37	52	1055	
2×20		5	55	31	2	5	1,240	1,660	554	12.4	11.6	6.27	63	1065	
1×30		5	65	35	2	5	1,510	2,140	712	19.3	18.3	8.06	72	1075	
2×30		5	75	40	2	5	1,650	2,380	792	23.4	22.3	8.96	83	1085	
1×28		3.5×6×3.3	5	25	—	2	4	1,090	1,170	390	7.04	5.78	7.63	79	2035
1×43			7.5	35	—	2	4	1,510	1,750	585	12.1	10.7	11.4	113	2050
1×30			5	55	33	2	5	1,900	2,340	780	19.1	17.1	15.2	150	2065
1×45	5		70	40	2	5	2,620	3,510	1,170	27.4	29.6	22.8	185	2080	
2×30	5		85	45	2	5	2,950	4,100	1,360	37.4	39.9	26.7	215	2095	
1×45	7.5		95	50	2	5	3,280	4,680	1,560	61.7	58.1	30.5	255	2110	
2×45	7.5		110	55	2	5	3,590	5,270	1,750	76.1	72.1	34.3	295	2125	

※For accuracy (T, S), refer to Figure G-22 (page G-29). 1N ≐ 0.102kgf 1N · m ≐ 0.102kgf · m

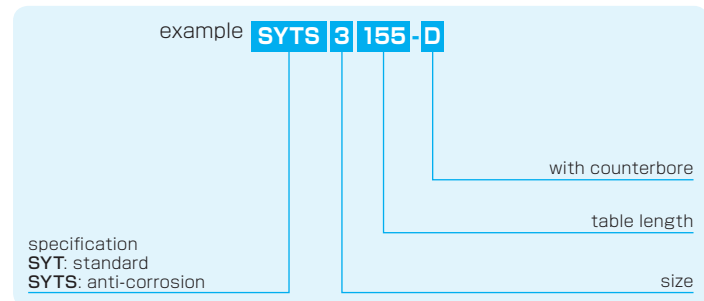


SYT-D TYPE

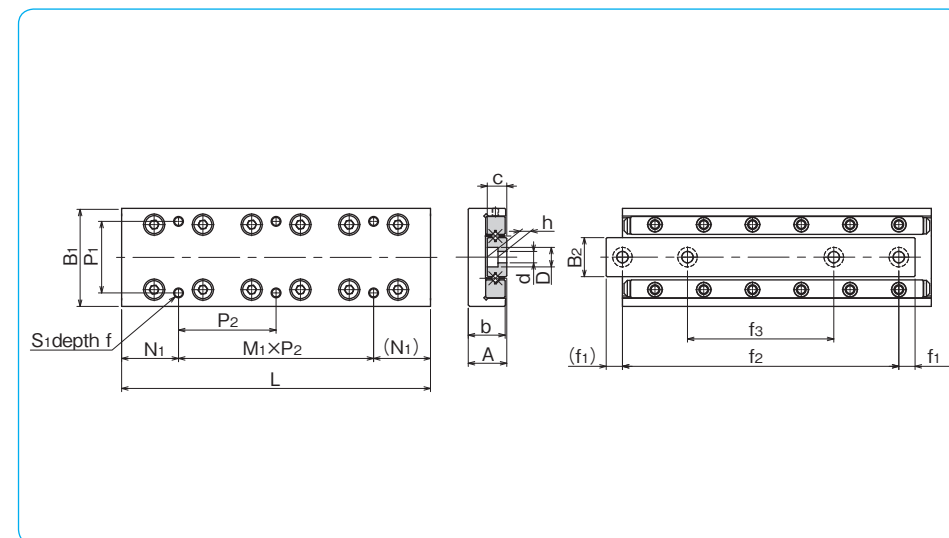
-SYT3-



part number structure



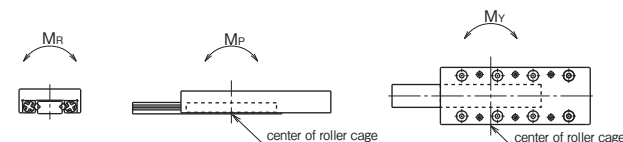
part number		stroke ST mm	major dimensions						table-top mounting hole dimensions			
standard	anti-corrosion		A mm	B ₁ mm	L mm	b mm	B ₂ mm	c mm	P ₁ mm	S ₁	f mm	N ₁ mm
SYT3055-D	SYTS3055-D	30	16±0.1	40±0.1	55	15.5	16	8	30	M4	7	7.5
3080-D	3080-D	45			80							7.5
3105-D	3105-D	60			105							27.5
3130-D	3130-D	75			130							27.5
3155-D	3155-D	90			155							27.5
3180-D	3180-D	105			180							52.5
3205-D	3205-D	130			205							27.5



M ₁ × P ₂ mm	bed-surface mounting hole dimensions			accuracy ※(deviation)		basic load rating		allowable load F N	allowable static moment			mass g	size	
	d × D × h mm	f ₁ mm	f ₂ mm	f ₃ mm	T μm	S μm	dynamic C N		static Co N	M _P N · m	M _Y N · m			M _R N · m
1 × 40	4.5 × 7.5 × 4.3	7.5	40	—	2	5	3,490	3,890	1,290	19.4	22.2	33.8	225	3055
1 × 65		6	68	43	2	5	5,230	6,490	2,160	53.0	58.0	56.4	340	3080
1 × 50		7.5	90	55	3	5	6,030	7,780	2,590	103	95.7	67.7	440	3105
1 × 75		7.5	115	65	3	5	7,560	10,300	3,450	170	160	90.3	560	3130
2 × 50		7.5	140	95	3	5	9,000	12,900	4,320	210	220	112	655	3155
1 × 75		7.5	165	85	3	5	10,300	15,500	5,180	302	314	135	770	3180
2 × 75		7.5	190	90	3	5	11,000	16,800	5,610	355	367	146	880	3205

※For accuracy (T, S), refer to Figure G-22 (page G-29).

1N ≅ 0.102kgf 1N · m ≅ 0.102kgf · m



MINIATURE SLIDE

The NB miniature slide SYBS type is a limited stroke table with the most compact envelope dimensions, featuring two ball raceway grooves. The SYBS type utilizes balls as the rolling elements. The ultra compact design contributes greatly to the creation of smaller and lighter industrial machinery and equipment of all types.

STRUCTURE AND ADVANTAGES

The NB miniature slide incorporates a unique integrated ball cage between the table and bed. All components have been produced with high precision machining.

Ultra Compact Design

The table height of the SYBS type is 3.2~8mm and the width is 6~17mm. This compact size when compared with conventional slide tables helps to realize the miniaturization of machinery and equipment.

Low Friction • Low Noise

Since the rolling ball elements do not recirculate, the frictional resistance will not vary significantly resulting in smooth, high precision operation. Additionally, the

ball cage greatly reduces the contact noise of the rolling elements bringing about a low-noise operation.

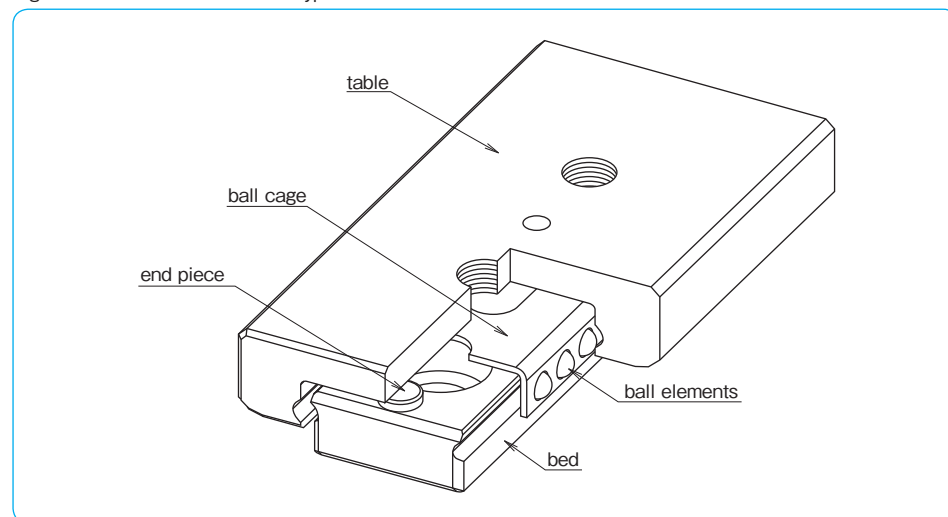
High Accuracy

The ball raceway grooves of each of the bed and table are processed through simultaneous precision machining resulting in minimal processing errors, and bringing about extremely smooth, precision linear movement.

Stainless Steel Structure

The SYBS type is made of all stainless steel components. This allows for use in corrosive or high temperature applications. The SYBS is a perfect component for vacuum or clean room environments.

Figure G-24 Structure of SYBS type



ACCURACY

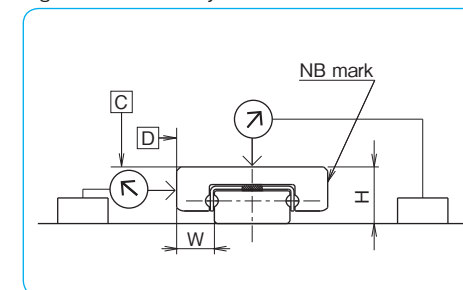
Table G-8 shows the accuracy of the SYBS miniature slide.

The deviation is measured as Figure G-25 illustrates. Dial indicators are placed to the center of the table's top and the reference surface side (opposite from the NB mark) and then the table is moved the full stroke without any load.

Table G-8 Accuracy unit: mm

item	tolerance
height H	±0.020
width W	±0.025
deviation from center of surface C	0.004
deviation from center of surface D	0.006

Figure G-25 Accuracy Measurement Method



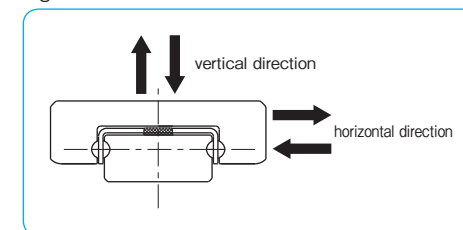
LOAD RATING

The load rating of the miniature slide varies depending on the direction of the applied load.

Table G-9 Change of Load Rating Corresponding to Load Direction

basic dynamic load rating	vertical direction	1.00×C
	horizontal direction	1.19×C
basic static load rating	vertical direction	1.00×Co
	horizontal direction	1.19×Co

Figure G-26 Direction of Load



RATED LIFE

The life of an NB miniature slide is calculated using the following equations:

Rated Life

$$L = \left(\frac{f_r}{f_w} \cdot \frac{C}{P} \right)^3 \cdot 50$$

L: rated life (km) f_r : temperature coefficient
 f_w : applied load coefficient C: basic dynamic load rating (N)
 P: applied load (N)
 * Refer to page Eng-5 for the coefficient.

Life Time

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

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

MOUNTING

Mounting Surface Profile

In most general installations, the miniature slide is mounted by pushing the reference surface of the bed and table against a shoulder that is set up on the mounting surface. Machined undercuts should be used in the corners of the shoulder (as illustrated in Figure G-27) so that the corners will not interfere with the reference surfaces of the bed and table. Table G-10 lists the recommended shoulder heights of the mounting reference surfaces.

When installing the miniature slide table without providing machined undercuts, the corner radius should be realigned as illustrated in Figure G-28. Table G-11 lists the values of the corner radius of the mounting surface.

Figure G-27 Mounting Surface Profile-1

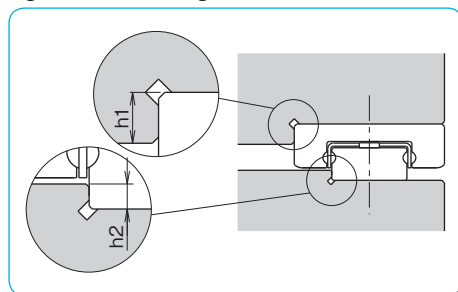


Table G-10 Shoulder Height on Mounting Reference Surface
unit : mm

part number	shoulder height for table h1	shoulder height for bed h2
SYBS 6	1.0	0.5
SYBS 8	1.2	0.8
SYBS12	1.5	0.8
SYBS17	2.5	1

Figure G-28 Mounting Surface Profile-2

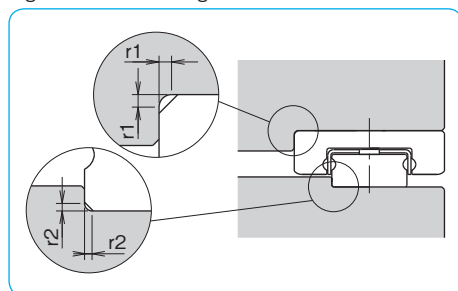


Table G-11 Maximum Corner Radius
unit : mm

part number	mounting surface for table	mounting surface for bed
	r1	r2
SYBS 6	0.1	0.05
SYBS 8	0.15	0.1
SYBS12	0.15	0.1
SYBS17	0.3	0.3

Recommended Torque Value

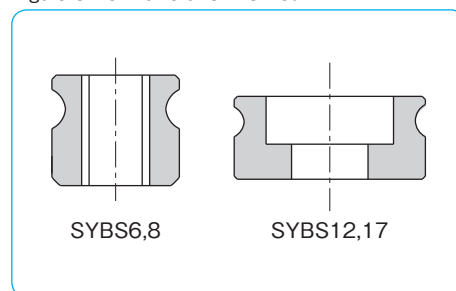
The bed should be tightened with a consistent torque by using a torque wrench. Table G-12 lists the recommended torque.

Table G-12 Recommended Torque
unit : N · m

size	torque
M1	0.03
M1.6	0.15
M2	0.3

(for stainless steel screw A2-70)

Figure G-29 Profile of SYBS Bed



Mounting Example and Mounting Screw

All the mounting holes are for SYBS6,8,12 fully through-hole. Mount SYBS6,8,12 as illustrated in Figure G-30 after considering the size of mounting screw, the maximum penetration depth, and the height of the bed. Make certain that the mounting screws do not interfere with the ball cage; otherwise, the accuracy and travel life will be affected adversely. Special screws for SYBS type are available from NB. Please refer to Table G-13 for dimensions of mounting screws.

Figure G-30 Mounting Example

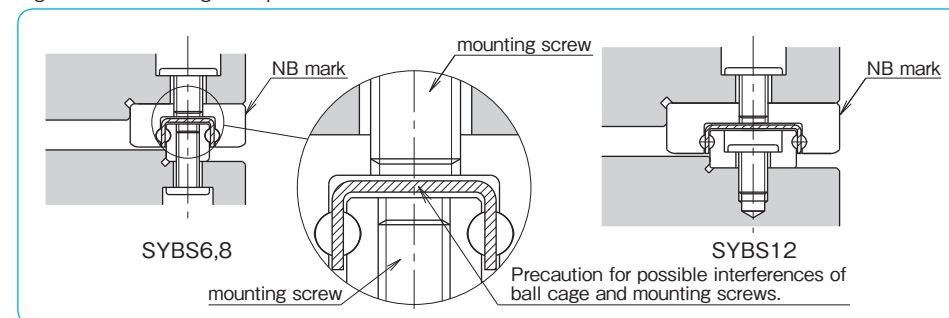
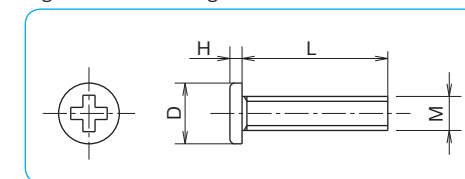


Table G-13 Mounting Screw (stainless steel)

M (size)	D mm	H mm	pitch mm	L mm
M1	1.8	0.45	0.25	5
M1.4	2.5	0.5	0.3	6
M1.6	2.3	0.5	0.35	4, 5, 6
M2	3	0.6	0.4	6

Figure G-31 Mounting Screw



USE AND HANDLING PRECAUTIONS

Preload

The SYBS miniature slide is provided with a slightly positive clearance type only.

End Piece

On both ends of the SYBS miniature slide bed section, screws are attached to prevent the ball cage from escaping. Please note that the screws are designed only to prevent the ball cage from escaping and are not intended for the use as a mechanical stopper. The ball cage may become deformed on contact with the stopper and this will result in a negative affect of the accuracy and travel life.

Lubrication

NB miniature slide SYBS type is supplied with an initial application of lithium soap grease No.0 and therefore is ready for immediate use. Make sure to relubricate with a similar type of grease periodically according to the operating conditions. For use in clean rooms or vacuum environments, miniature slide tables without grease or with customer specified grease are available. NB also provides low

dust generation grease. Please refer to page Eng-41 for details.

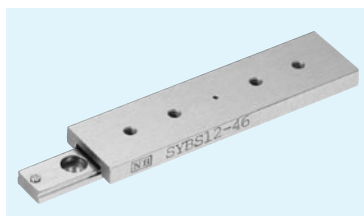
Cage Slippage

For the SYBS type, the cage can slip under high-speed motion, vertical application, unbalanced-loading, and vibrating conditions. It is advised that the motion speed be kept under 0.5m/s under general operating conditions. It is also recommended that the table be cycled to perform the maximum stroke several times, so that the cage returns to its center position.

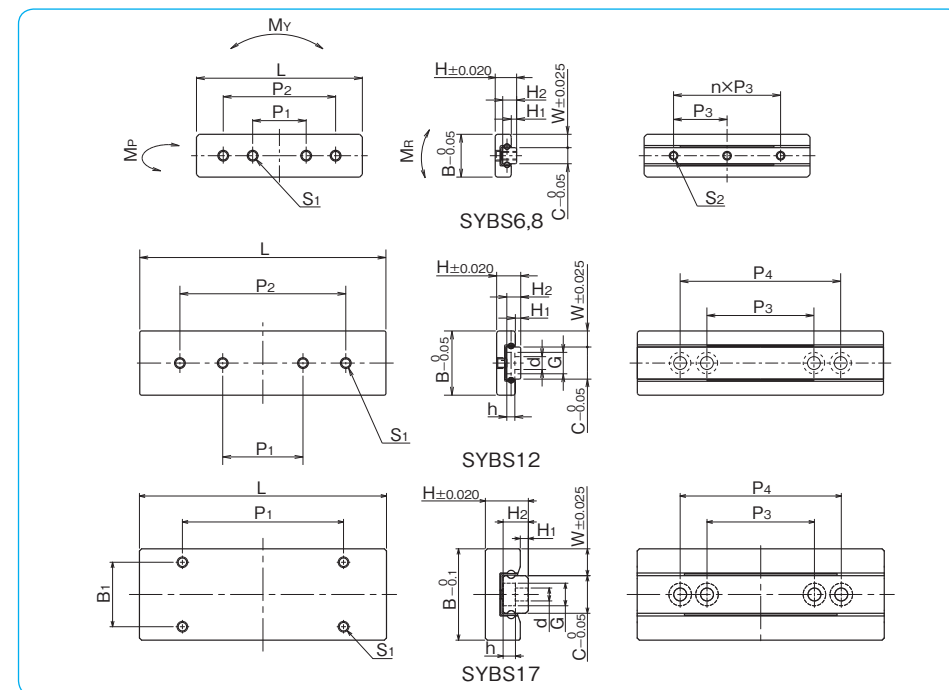
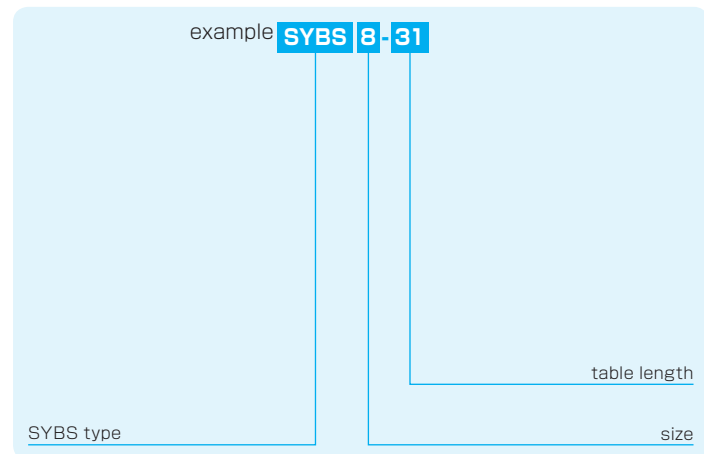
Allowable Load

The allowable load is a load under which the sum of elastic deformation of the rolling element and the raceway in the contact area subject to the maximum contact stress is small enough to guarantee smooth rolling movement. When very smooth and highly accurate liner motion is required, make sure to use the product within the allowable load values.

SYBS TYPE



part number structure



part number	major dimensions				stroke	B	tabel-top dimensions				S1 maximum screw penetration depth mm
	H	W	H ₁	stroke			L	P ₁	P ₂	B ₁	
SYBS 6-13	3.2	2	0.7	5	6	13	6.0	—	—	M1.4	0.5
SYBS 6-21				12		21	10.0	—	—		
SYBS 8-11	4	2.5	1	4	8	11	5.5	—	—	M1.6	0.7
SYBS 8-21				12		21	10.0	—	—		
SYBS 8-31				18		31	10.0	21	—		
SYBS12-23	4.5	3	1	12	12	23	8.0	—	—	M2	1.2
SYBS12-31				18		31	15.0	—	—		
SYBS12-46				28		46	15.0	31	—		
SYBS17-23				14		23	10.0	—	—		
SYBS17-31	8	5	1.5	19	17	31	20.0	—	12	M2	3
SYBS17-46				29		46	30.0	—	—		

※1: Custom mounting screws are provided with the SYBS-12 type only. Other screw sizes are also available. (Please refer to page G-57)

H ₂	C	bed-surface dimensions				n	P ₄	basic load rating		allowable load	allowable static moment			mass g	size
		d×G×h	S ₂	P ₃	S ₂			C	C ₀		F	M _P	M _Y		
2.0	2	—	M1	7	1	—	154	180	60.1	0.21	0.25	0.21	1.4	6-13	
				7	2	—	229	315	105	0.57	0.69	0.37	2.2	6-21	
2.6	3	—	M1.6	5	1	—	201	211	70.4	0.23	0.28	0.35	2.0	8-11	
				10	1	—	368	493	164	1.02	1.22	0.83	3.7	8-21	
2.6	6	2.4×4×1.5 ^{※1}	—	10	2	—	473	704	234	1.97	2.35	1.19	5.5	8-31	
				15	—	—	404	563	187	1.30	1.55	1.80	7.6	12-23	
				15	—	—	473	704	234	1.97	2.35	2.25	10.2	12-31	
				20	—	30	658	1,120	375	4.80	5.72	3.60	15.2	12-46	
4.7	7	2.4×4.2×2.3	—	15	—	—	775	888	296	2.09	2.49	3.33	19.2	17-23	
				15	—	—	984	1,240	414	3.80	4.53	4.66	26.2	17-31	
				20	—	30	1,350	1,950	651	8.75	10.4	7.32	38.4	17-46	

1N≐0.102kgf 1N·m≐0.102kgf·m

GONIO WAY

The NB gonio way is a curved cross roller slide way. It is a curved motion bearing utilizing low-friction, non-recirculating precision rollers. It is used when there is a need to change the gradient or obtain an accurate gradient angle without changing the center of rotation in high-precision optical and measurement equipment.

STRUCTURE AND ADVANTAGES

The NB gonio way RVF type consists of curved tracking bases with precisely ground V-grooves and flat installation surfaces, as well as curved roller cages. The NB gonio way RV type consists of curved rails with precisely machined V-grooves and curved roller cages. Precision rollers are employed as the rolling elements, since the rolling elements do not recirculate, the frictional resistance will not vary significantly, providing curved movement with extremely low frictional resistance.

Low Frictional Resistance and Minute Motion

The precision grinding and curved roller cage allow for extremely low frictional resistance. The negligible difference between static and dynamic frictions allows the gonio way to follow minute movements accurately, realizing curved movement of high accuracy.

Low Noise

Since NB gonio way employs a non-recirculating design, there is no noise from the circulating area. In addition, the curved roller cage realizes quiet operation without contact noise between the rolling elements.

High Rigidity and High Load Capacity

The rollers provide a larger contact area and less

elastic deformation compared to the ball elements. Additionally, since the rollers do not recirculate, the effective number of rotating elements is larger, resulting in high rigidity and high load capacity.

Flat Installation Surface

The flat installation surfaces of the RVF type do not require complicated machining of tables and beds when installing the product. As a result, machining costs can be reduced greatly.

Same Rotation Center

The curved V-grooves, which are finished with a precise grinding process, provide an accurate center of rotation. Furthermore, the products are composed to provide identical rotation centers when products of each size are installed to two axes. (refer to Table G-19.)

Figure G-32 Structure of Gonio Way RVF type

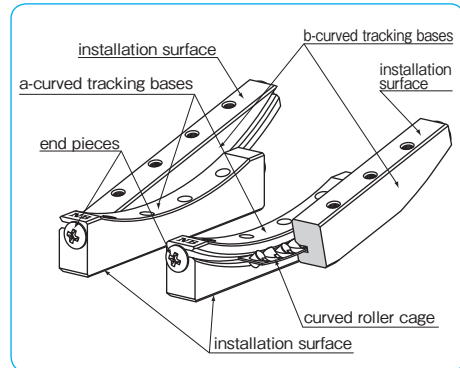
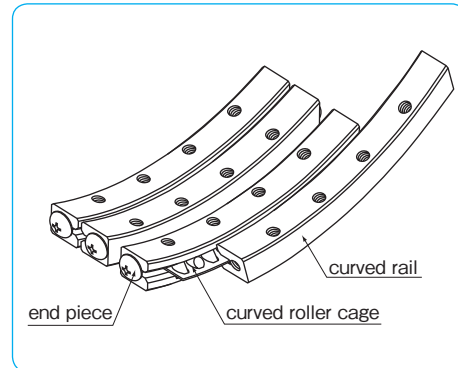


Figure G-33 Structure of Gonio Way RV type



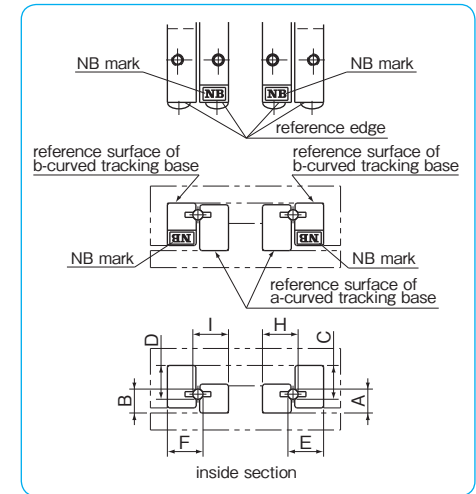
ACCURACY OF RVF TYPE

The accuracies of the gonio way RVF type are represented by mutual dimensional errors of four rails, which are measured along the overall length using the procedure as shown in Figure G-34.

Table G-14 Accuracy unit: μm

part number	mutual error between A and B mutual error between C and D	mutual error between E and F mutual error between H and I
RVF2050- 70	10	10
RVF2050- 87		
RVF2050-103		
RVF2050-120		
RVF3070- 85		
RVF3070-110		
RVF3100-125		
RVF3100-160		

Figure G-34 Accuracy Measuring Method



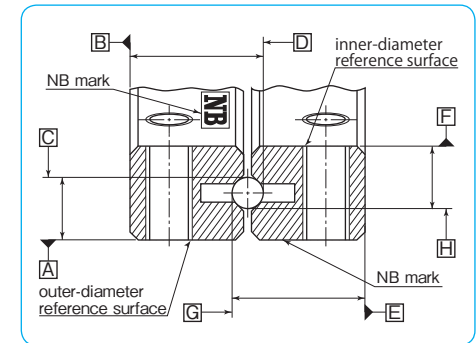
ACCURACY OF RV TYPE

The accuracies of the gonio way RV type are represented by mutual dimensional errors of four rails, which are measured along the overall length using the procedure as shown in Figure G-35.

Table G-15 Accuracy unit: μm

part number	accuracy
RV2040- 50	10
RV2060- 60	
RV3070- 90	
RV3070-110	
RV3100-160	

Figure G-35 Accuracy Measuring Method



The reference surfaces are located on the opposite side of the NB mark. There are inner reference surface and outer reference surface in one set of RV.

RATED LIFE

The life of a gonio way is obtained using the following equations.

Rated Life

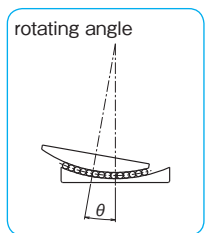
$$L = \frac{90}{\theta} \times \left(\frac{f_r}{f_w} \times \frac{C}{P} \right)^{\frac{10}{3}}$$

L: travel life (10⁶cycles) θ: rotating angle (degree)
 C: basic dynamic load rating (N) P: applied load (N)
 f_r: temperature coefficient f_w: applied load coefficient
 ※Refer to page Eng-5 for the coefficients.

Life Time

$$L_h = \frac{L \times 10^6}{60 \times n}$$

L_h: life time (hr)
 n: number of cycles per minute (cpm)



MOUNTING OF RVF TYPE

Accuracy of Mounting Surface

To maximize the performance of NB gonio way, it is important to finish the installation surface with high accuracies.

- Parallelism of surface 1 against surface A
- Perpendicularity of surface 2 against surface A
- Perpendicularity of surface 5 against surface A
- Parallelism of surface 3 against surface B
- Perpendicularity of surface 4 against surface B
- Perpendicularity of surface 6 against surface B
- Parallelism of surface 2 against surface C
- Parallelism of surface 4 against surface C

Figure G-36 Accuracy of Mounting Surface

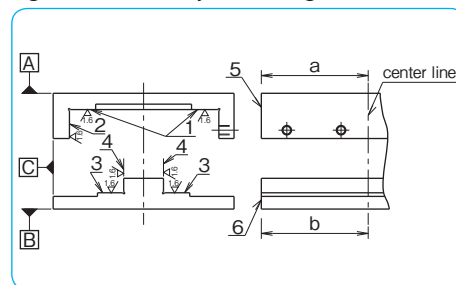
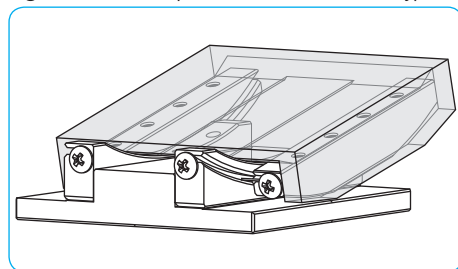


Figure G-37 Example of Installation of RVF type

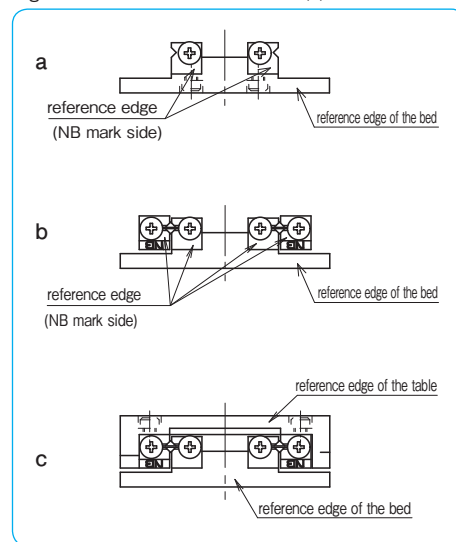


Installation Procedure

Setting the curved tracking bases temporarily

- (1) Remove burrs, stains, and dust from the installation surfaces of the curved tracking bases of tables and beds. Foreign particles must be kept out of the assembly work as well.
- (2) Apply low viscosity oil to contact surfaces, check the reference edges of an a-curved tracking base and bed, and then tighten the screws temporarily. (Figure G-38a)
- (3) Align the reference edges (NB mark side) of a b-curved tracking base and an a-curved tracking base to the same orientation. Then, insert the curved roller cages between the curved tracking bases at the center area. Make sure that the curved roller cages will not interfere with the curved raceway grooves of the curved roller tracking bases. (Figure G-38b)
- (4) Check the reference edge of the table, set the table over the b-curved tracking base, and then secure the table temporarily. (Figure G-38c)

Figure G-38 Installation Method (1)



Setting four curved tracking bases in parallel position

- (5) Move the table to the maximum stroke ends of both sides and adjust the setting so that the curved roller cage is positioned at the center of the curved tracking base.
- (6) Move the table to the center position and tighten the adjustment screws with ※slightly strong torque by using a torque wrench. (Figure G-39d)
※"Slightly strong torque" here means slightly stronger than the torque at which the oscillation of the dial indicator is stabilized at the minimum value when the table is moved right and left, or when pressure is applied to the rolling direction while the dial indicator is attached to the side face (reference side) of the table. (Figure G-39i)
- (7) Move the table to the maximum stroke end of one side and tighten the adjustment screws on the curved roller cage with the same torque as in step (6). (Figure G-39e)
- (8) Move the table to the maximum stroke end of the other side and tighten the adjustment screws with a torque wrench by repeating the procedure above. (Figure G-39f)

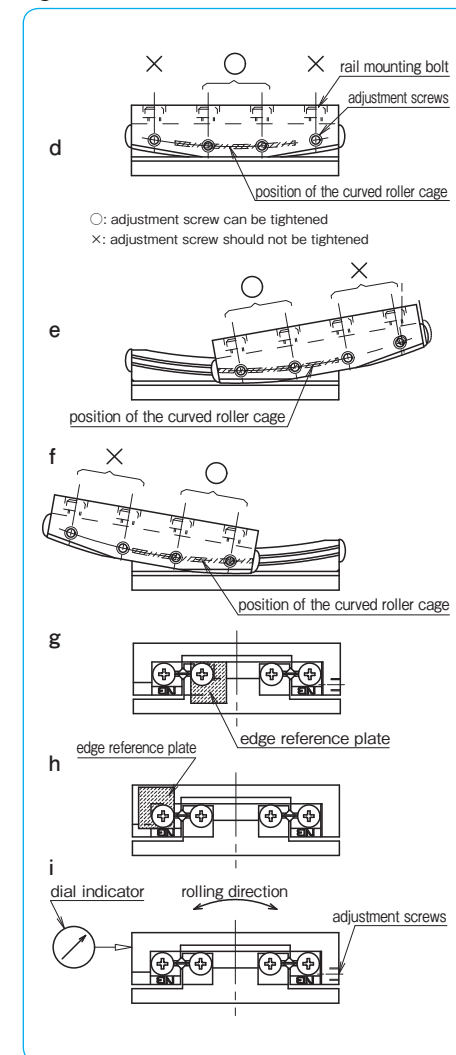
Securing the curved tracking bases

- (9) Mount an edge reference plate between the reference edge of the a-curved tracking base and end piece, press it against the reference edge of the bed, and then tighten only the rail mounting bolts in the middle. (Figure G-39g)
- (10) Repeat the procedure above to mount an edge reference plate between the reference edge of the b-curved tracking base and the end piece. Press it against the reference edge of the bed, and then tighten only the rail mounting bolts in the middle. (Figure G-39h) In order to maintain parallelism of curved tracking bases, do not cycle the table during this process and make sure that there is no clearance between the edge of the table and the edge reference plate.
- (11) Secure the rest of the rail mounting bolts on the curved roller cage one by one by moving the table as instructed in steps (7) and (8).

Adjusting the preload

- (12) Move the table to the right and left with the test indicator attached to the side face of the table (reference side). Or, apply pressure in the rolling direction and confirm that the oscillation of the indicator is stabilized at the minimum level. (Figure G-39i)
- (13) Return the rail mounting bolts on the b-curved tracking base at the adjustment screw side to the temporary setting.
- (14) Return the table to the center position, slightly loosen the adjustment screws in the middle, and then gradually loosen the adjustment screws on the curved roller cage while moving the table as instructed in steps (7) and (8) Make sure not to reduce the preload too much.
- (15) Finally, secure the b-curved tracking base at the adjustment screw side, which has been installed temporarily. Secure the rail mounting bolts on the curved roller cage one by one by moving the table as instructed above.

Figure G-39 Installation Method (2)



As d, e, f in the Figure shows it is recommended to match the position and pitch of adjustment screws with rail mounting bolts, and also the height of them with the same as the center of raceway groove.

Table G-16 Recommended Torque for Rail Mounting Bolts unit:N·m

size	tightening torque
M2.5	0.5
M3	1.1

(for stainless steel screw A2-70)

MOUNTING OF RV TYPE

Accuracy of Mounting Surface

The accuracy of surfaces 1, 2, 3, and 4 (Figure G-40) directly affect the motion accuracy. To maximize the performance of NB gonio way, it is important to finish the installation surface with high accuracies.

Figure G-40 Accuracy of Mounting Surface

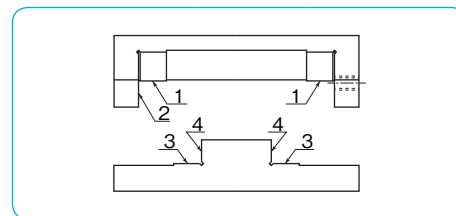
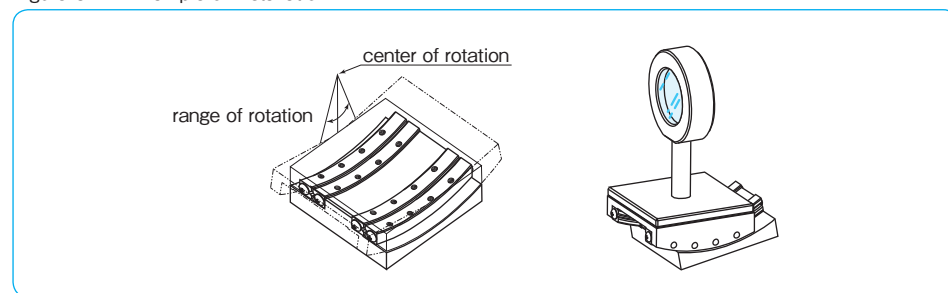


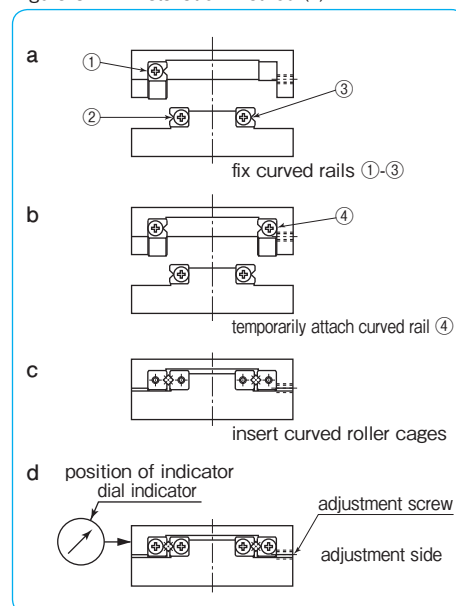
Figure G-41 Example of Installation



Installation Procedure

- (1) Remove burrs, dirt, dust, etc. from the table and the installation surfaces of the bed.
- (2) Apply a low viscosity oil to contact surfaces. Fix the rail ①inner-diameter reference surface, ②outer-diameter reference surface and ③outer-diameter reference surface by tightening bolts to the specified torque. (Table G-17, Figure G-42a)
- (3) Temporarily attach the rail ④inner-diameter reference surface on curved rail to the adjustment side. (Figure G-42b)
- (4) Remove the end pieces on one side of the rails and insert roller cages to the center. (Figure G-42c)
- (5) Re-attach end pieces.
- (6) Move the table to the right and left (in the direction of the stroke) to position roller cages at the center of the curved rails.
- (7) Set an indicator at the side of the table on the reference surface. (Figure G-42d)
- (8) Move the table to one of the stroke ends and tighten the adjustment screws slightly. (Figure G-43e)

Figure G-42 Installation Method (1)



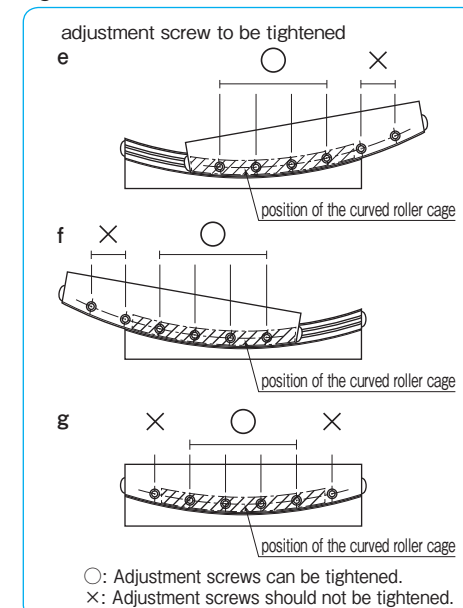
- (9) Move the table fully to the other stroke end and tighten the adjustment screws slightly. (Figure G-43f)
- (10) Move the table to the center and lightly tighten adjustment screws. (Figure G-43g)
- (11) Repeat steps (8)~(10) until there is no clearance around the table. If there is no clearance, the indicator will show a minimum fluctuation value when the table is moved to the right and left. Exercise care so as not to apply an excessive preload.
- (12) Repeat steps (8)~(10) and tighten the adjustment screws uniformly by using a torque wrench.
- (13) Fix the rail ④inner-diameter reference surface. Tighten the rail mounting bolts sequentially by moving the table in the same manner as with the adjustment screws.

Table G-17 Recommended Torque for Rail Mounting Bolt unit:N·m

size	torque
M3	1

(for stainless steel screw A2-70)

Figure G-43 Installation Method (2)



SHAPE OF MOUNTING SURFACE

Slide way RVF and RV types are generally mounted by contacting the reference surface of the rail to the shoulder provided on the mounting surface. For the shoulder shape, provide relief at the corner as shown in Figure G-44 so that it does not interfere with the reference corner of the rail. If it is necessary to mount RVF or RV types without relief, then it can be used with rounded corners as shown in Figure G-45. Table G-18 shows the corner radius of the mounting surface.

Figure G-44 Relief on the Mounting Surface

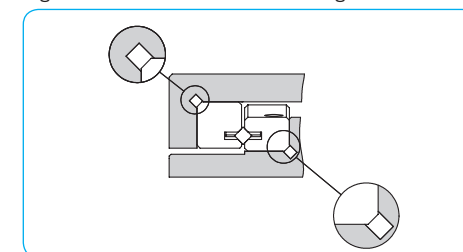


Figure G-45 Corner Radius

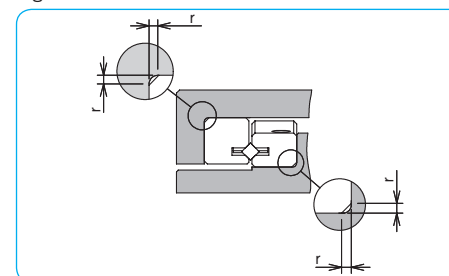


Table G-18 Maximum Corner Radius unit : mm

part number	maximum corner radius r
RVF2 RV2	0.05
RVF3 RV3	0.1

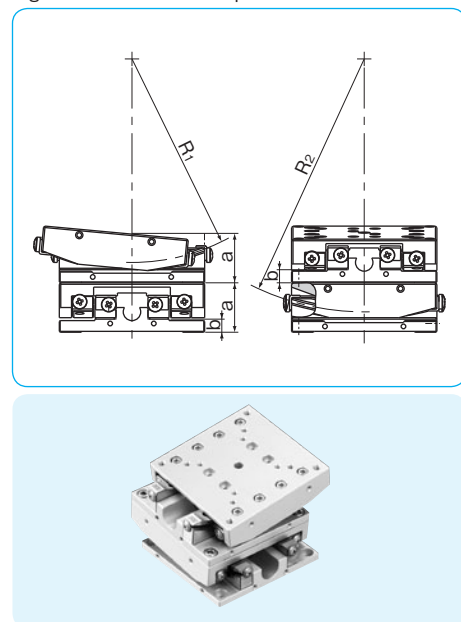
RVF TYPE 2 AXES AND SPECIAL SPECIFICATIONS

When incorporating RVF type units onto two axes as illustrated in Figure G-44, adjust the height of one lifting axis as instructed in Table G-17. Then, adjust dimension b (the height of the installation surface of the a-curved tracking base) in Figure G-44 according to the table in order to obtain the identical rotation center for the two axes. In addition, requests can be made for custom specifications including table units fitted for two axes, non-standard lengths for curved tracking bases, the radius of rotation, the rotation range, and the number of rollers. Contact NB for further information.

Table G-19 Two Axes Specification unit:mm

part number combination	a	R ₁	R ₂
RVF2050- 70	17	70	87
RVF2050- 87			
RVF2050-103	17	103	120
RVF2050-120			
RVF3070- 85	25	85	110
RVF3070-110			
RVF3100-125	35	125	160
RVF3100-160			

Figure G-46 Two Axes Specification



USE AND HANDLING PRECAUTIONS

Lubrication

NB gonio ways are lubricated using lithium soap No.00 based grease prior to shipment, so they can be used immediately. Make sure to relubricate with a similar type of grease periodically according to the operating conditions. NB also provides low dust generation grease for the linear system. Please refer to page Eng-41 for further details.

Dust Prevention

If a foreign matter, such as dust and dirt, enters the inside of the NB gonio way, it will deteriorate the accuracy and life of the system. A gonio way used in a harsh environment should be protected with a cover.

Operating Environment

The recommended operating temperature range of the NB gonio way is -20°C to 110°C.

Adjustment

Inaccuracy in mounting surface or improper adjustment of preload will reduce the motion accuracy, resulting in skewing and shortening of gonio way life. The adjustment should be carried out carefully.

Cage Slippage

For the NB Gonio Way, the cage can slip under high-speed motion, vertical application, unbalanced-loading, and vibrating conditions. It is recommended that the rotation range be set with sufficient margin and an excessive preload should be avoided. It is also recommended that the rails be cycled to perform the maximum stroke several times, so that the cage returns to its center position.

End Pieces

End pieces are attached to each end of the NB gonio way to prevent removal of the curved roller cage. Do not use as a mechanical stopper.

Careful Handling

Dropping the NB gonio way causes the rolling elements to make dents in the raceway surface. This will prevent smooth motion and will also affect accuracy. Be sure to handle the product with care.

Use as a Set

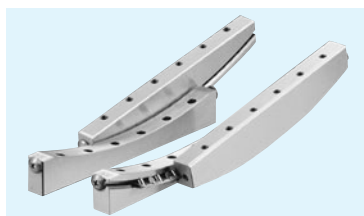
The accuracy of the rails has been matched within each set. Note that the accuracy will be affected when the rails of different sets are combined.

Allowable Load

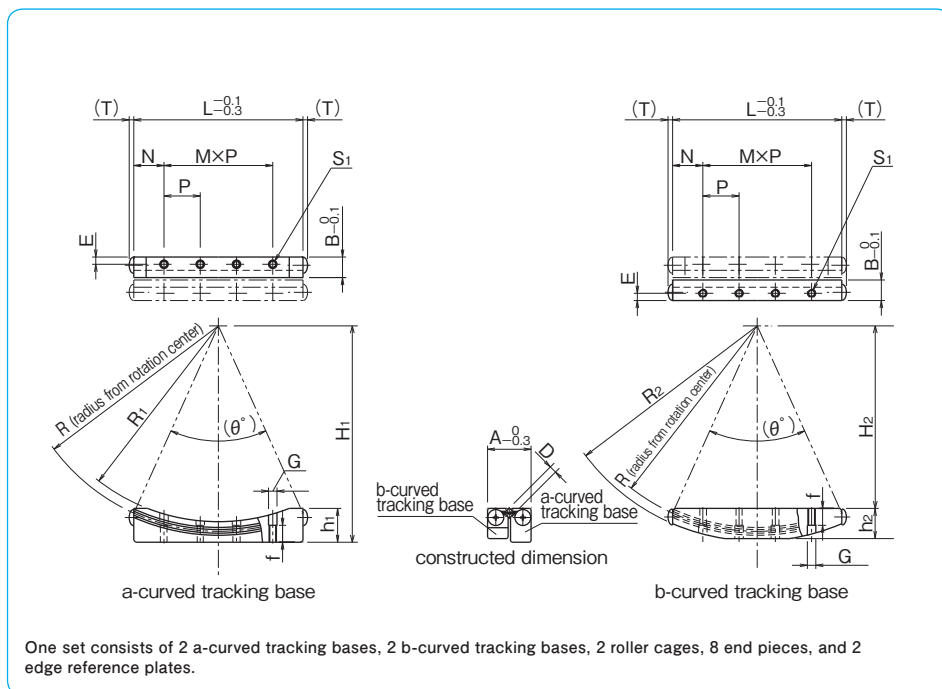
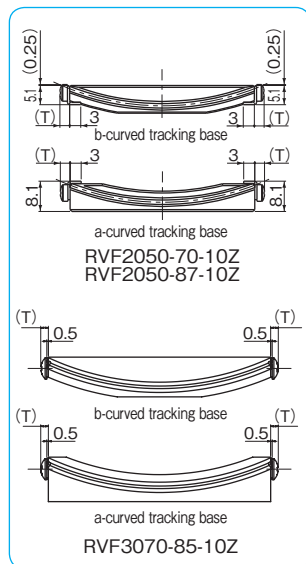
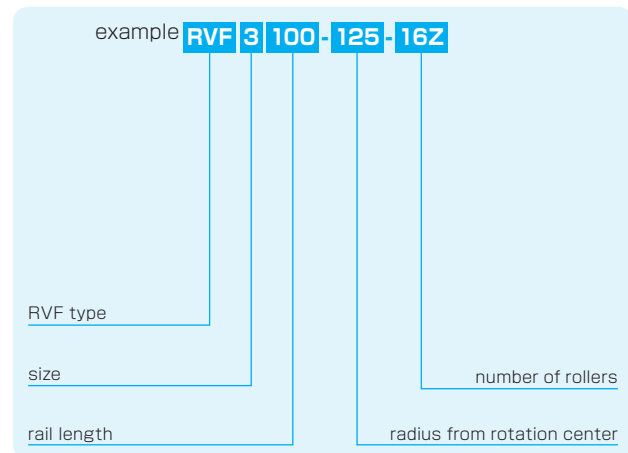
The allowable load is a load under which the sum of elastic deformation of the rolling element and the raceway in the contact area subject to the maximum contact stress is small enough to guarantee smooth rolling movement. When very smooth and highly accurate motion is required, make sure to use the product within the allowable load.

RVF TYPE

– Gonio Way flat-installation-surface –



part number structure



part number	rotation range	roller diameter D mm	number of rollers Z	major dimensions									
				L mm	R mm	R ₁ mm	R ₂ mm	H ₁ mm	H ₂ mm	h ₁ mm	h ₂ mm	A mm	B mm
RVF2050- 70-10Z	± 5°	2	10	50	70	67	73	72.5	64.5	7.5	7.5	15	7.25
RVF2050- 87-10Z			87		84	89.5	89.5	81.5	7.5	7.5			
RVF2050-103-10Z			103		100	106	105.5	97.5	7.5	8			
RVF2050-120- 9Z			9		120	117	123	122.5	114.5	7.5	8		
RVF3070- 85-10Z	± 10°	3	10	70	85	81	89	89.5	75.5	14	12.5	18	8.5
RVF3070-110-10Z			110		106	114	114.5	100.5	12.8	12.5			
RVF3100-125-16Z			16		125	121	129	129.5	110.5	17.5	18		
RVF3100-160-14Z			14		160	156	164	164.5	145.5	15	18		

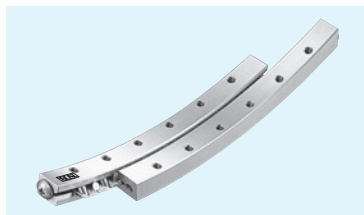
※ Please refer to page G-72 for information on cage dimensions.

M×P mm	N mm	E mm	S ₁	f mm	G mm	T mm	θ°	basic load rating		allowable load F N	mass (one set) g	part number
								dynamic C N	static Co N			
3×12.5	6.25	2.5	M2.5	4	3	2.7	41.8°	1,180	2,400	800	66	RVF2050- 70-10Z
							33.4°	1,060	2,430	810	70	RVF2050- 87-10Z
3×13	5.5	2.5	M2.5	4	3	1.5	28.1°	998	2,440	815	70	RVF2050-103-10Z
							24.0°	751	1,970	657	70	RVF2050-120- 9Z
3×15	12.5	3	M3	7	3.5	1.9	48.6°	2,680	5,530	1,840	182	RVF3070- 85-10Z
							37.1°	2,440	5,620	1,870	182	RVF3070-110-10Z
5×15	12.5	3	M3	7	3.5	1.9	47.2°	3,520	8,850	2,950	327	RVF3100-125-16Z
							36.4°	2,860	7,890	2,630	323	RVF3100-160-14Z

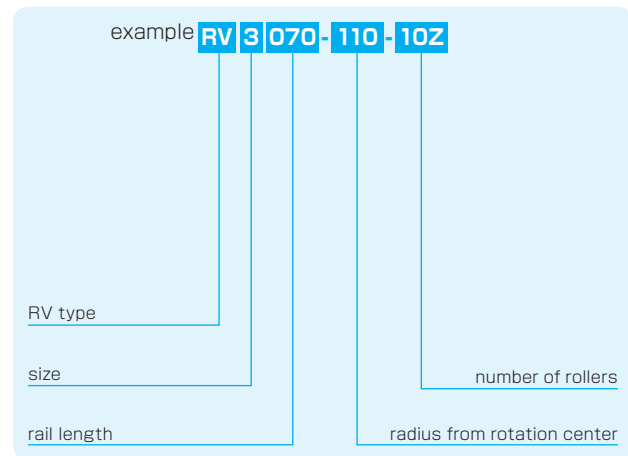
1N≒0.102kgf

RV TYPE

— Gonio Way —

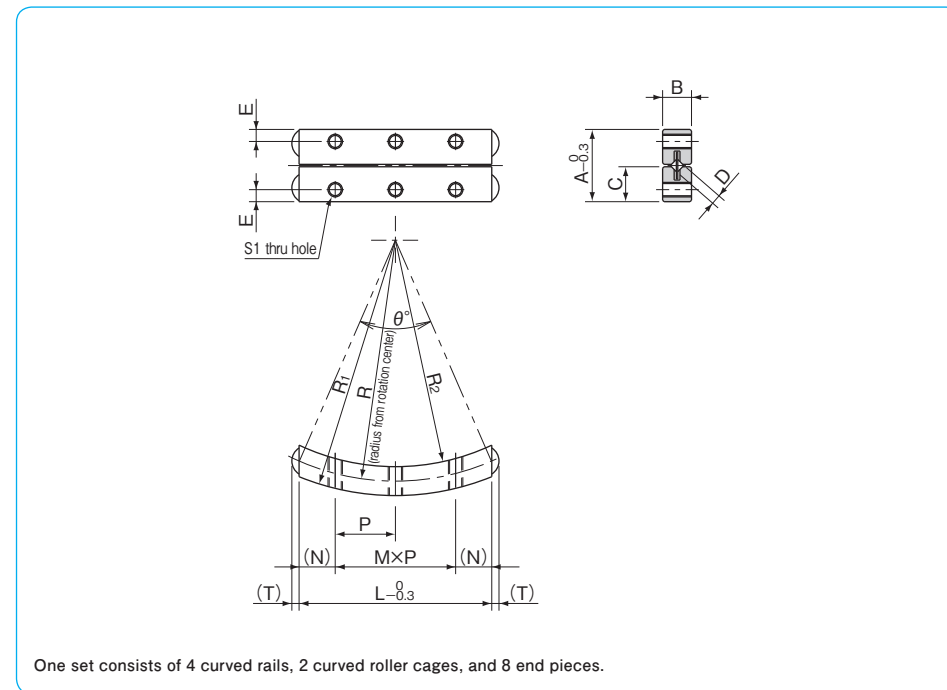


part number structure



part number	rotation range	roller diameter D mm	number of rollers Z	major dimensions						
				L mm	R mm	R ₁ mm	R ₂ mm	A mm	B mm	C mm
RV2040- 50- 7Z	±10°	2	7	40	50	53	47	15	6	7.25
RV2060- 60-12Z			12	60	60	63	57			
RV3070- 90-11Z	±10°	3	11	70	90	94	86	18	8	8.5
RV3070-110-10Z			10	70	110	114	106			
RV3100-160-14Z			14	100	160	164	156			

※ Please refer to page G-72 for information on cage dimensions.

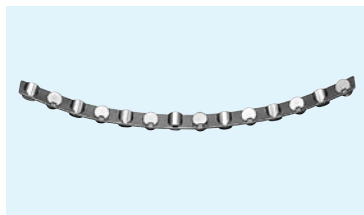


M×P mm	N mm	E mm	S ₁	T mm	θ°	basic load rating		allowable load F N	mass (one set) g	part number
						dynamic C N	static Co N			
2×12.5	7.5	2.5	M3	1.5	47.2°	820	1,440	482	49	RV2040- 50- 7Z
3×12.5	11.25				60.0°	1,490	2,800	936	75	RV2060- 60-12Z
3×15	12.5	3	M3	1.9	45.8°	2,640	5,550	1,850	137	RV3070- 90-11Z
3×15					37.1°	2,440	5,620	1,870	135	RV3070-110-10Z
5×15					36.4°	2,860	7,890	2,630	193	RV3100-160-14Z

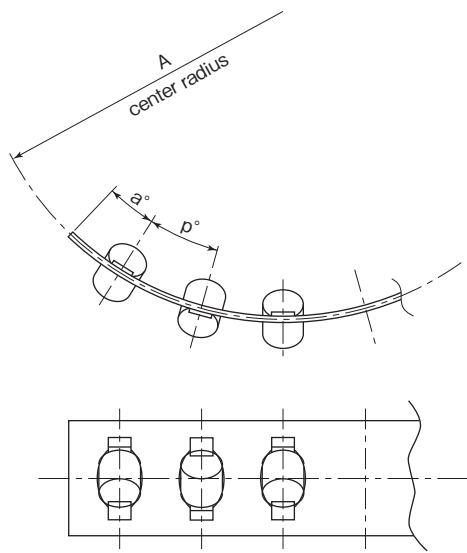
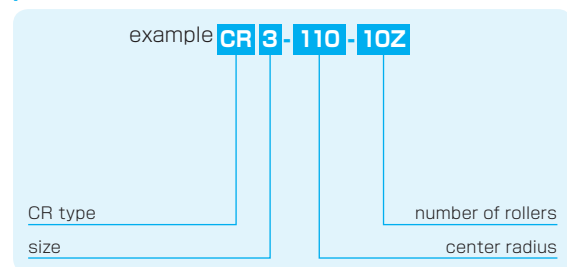
1N≒0.102kgf

CR TYPE

— Standard Curved Roller Cage —



part number structure



part number	roller diameter D mm	center radius A mm	t mm	w mm	p°	a°	applicable type
CR2- 50- 7Z	2	50	0.3	5.6	4.6°	2.9°	RV
CR2- 60-12Z		60			3.8°	2.4°	RV
CR2- 70-10Z		70			3.3°	2.0°	RVF
CR2- 87-10Z		87			2.6°	1.6°	RVF
CR2-103-10Z		103			2.2°	1.4°	RVF
CR2-120- 9Z		120			1.9°	1.2°	RVF
CR3- 85-10Z	3	85	0.4	7.2	3.4°	2.0°	RVF
CR3- 90-11Z		90			3.2°	1.9°	RV
CR3-110-10Z		110			2.6°	1.5°	RVF,RV
CR3-125-16Z		125			2.3°	1.3°	RVF
CR3-160-14Z		160			1.8°	1.0°	RVF,RV