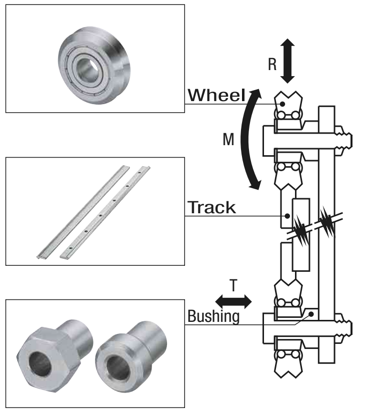
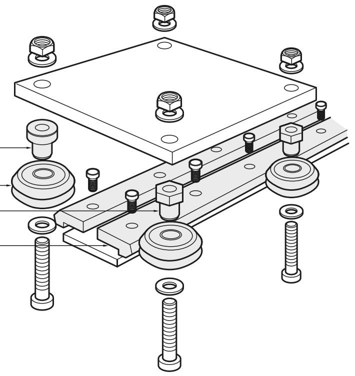
V Guide Systems - Overview

90° Type

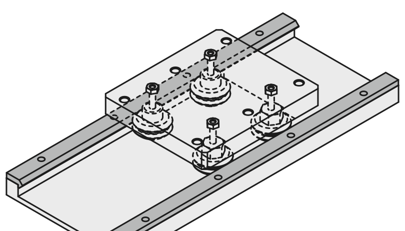
V Guide System Structure



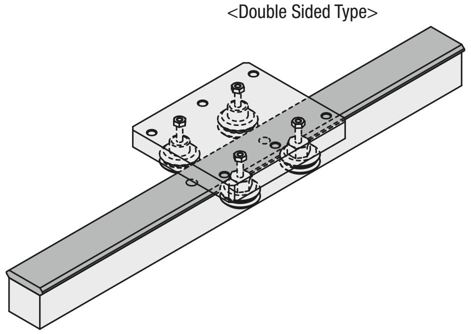


Wheel-Rail Combination Examples

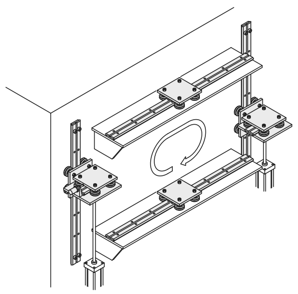
<Single Sided Type>

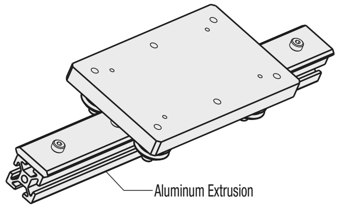


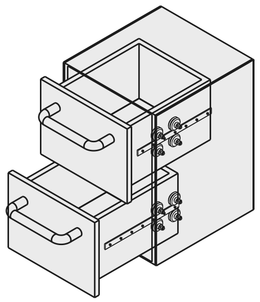
<Double Sided Type>



ex Example



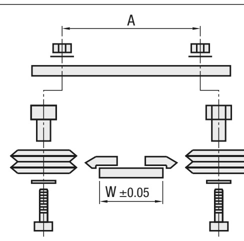




Functions and Features

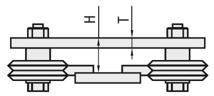
1. Bearing and V groove (90°) are integrated in a single unit.
2. When using Single Sided Tracks, there is a design freedom for the distance between tracks.
3. System construction can be achieved by using only one Double Sided Track.
4. As the wheel circumference is V shaped, they have wiping effect to clean up automatically while rotating on the track. Grease the track sliding surface for longer operational life.
5. Sized in inch dimensions.

Mounting Dimensions



Unit: mm

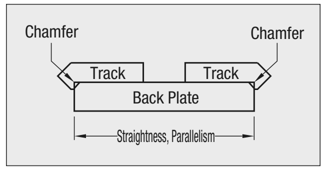
No.	A
1	2x11.104+W
2	2x17.450+W
3	2x25.399+W



Unit: mm

No.	H
1	10.787+T
2	12.790+T
3	18.567+T

Adjusting Method



1. The accuracy of this system depends on the straightness and parallelism of the support (back plate) on which the track rails are mounted.
   The corners of the back plate to which a track rail is mounted must be chamfered 0.5mm x 0.5mm.
   The straightness of the track rail depends on the straightness of the back plate.
   When mounted on precision back plate; ±0.05
2. When jointing parallel track rails, give a slight offset to the joint locations. This enables the wheels to travel smoothly over the joints.
3. As the circumference of the wheel is V-shaped, the wheel makes wiping effect when it rotates on the track rail. Therefore, it automatically cleans itself.
4. Greasing on the sliding face of the track rails extends their service life.
5. Fixed bushings determine guide system alignment. Main load must be applied on fixed bushings.
6. Adjust the eccentric bushing by rotating so that the wheel travels on the track rail smoothly, then tighten.

Load Calculation

Calculate the load factor (LF) of the wheel to which the biggest load is applied.
Select the wheel whose load factor is less than 1.

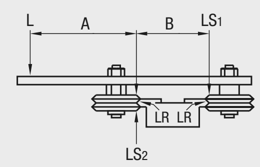
$$LF=\frac{LS}{LSmax}+\frac{LR}{LRmax}$$

LF= Load Factor
LSmax = Maximum Thrust Load
LRmax = Maximum Radial Load
LS= Thrust Load applied to wheel
LR= Radial Load applied to wheel

<Calculation Example>

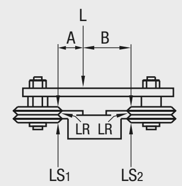
When load applied outside the wheels

$LS_1=\frac{LxA}{B}$
$LS_2=L+LS_1$
(Ex.) L=500 (N) A=60 (mm)
B=40(mm)
$LS_1=\frac{500x60}{40}=750(N)$
$LS_2=500+750=1250(N)$



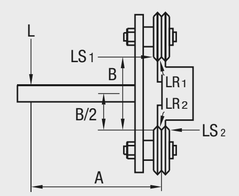
When load applied between the wheels

$LS_1=\frac{LxB}{A+B}$
$LS_2=L-LS_1$
(Ex.) L=500 (N) A=40 (mm)
B=60(mm)
$LS_1=\frac{500x60}{40+60}=300(N)$
$LS_2=500-300=200(N)$



When radial and thrust load are combined

$LS_1=LS_2=\frac{LxA}{B}$
$LR_1=L+LS_1$
$LR_2=LS_2$
(Ex.) L=500 (N) A=60 (mm)
B=100(mm)
$LS_1=LS_2=\frac{500x60}{100}=300(N)$
$LR_1=500+300=800(N)$



Life Calculation

Calculate life of the system and confirm the validation of size selection.

$$\text{Life (km)}=\frac{Lc}{(LF)^3}xAf$$

Lc= Life Span Constant
Af = Adjustment Coefficient
LF= Load Factor

<Calculation Example>
When using BVGH3 under the conditions of LS=500 (N), LR=1000 (N) and Af=1

$$\text{Load Factor } LF=\frac{500}{1701}+\frac{1000}{5900}=0.46$$

$$\text{Life (km)}=\frac{130}{(0.46)^3}x1=1335km$$

For LRmax, and LSmax, see **P.651**.

Lc= Life Constant

Wheel Size	Lc(km)
1	55
2	87
3	130

Af = Adjustment Factor	Application Conditions
1.0-0.7	Clean, Low Speed, Low Shock, Light Load
0.7-0.4	Medium Level Contamination, Medium Level Shock, Medium Load, Vibration
0.4-0.1	Severe Contamination, High Level Acceleration, Heavy Load, Vibration, High Cycle