

V Guide Systems - Overview

Metric Size 70° Type

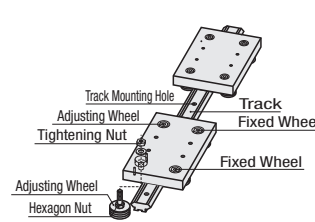
V Guide Systems

Metric Size 70° Type Wheels and Bushings / Double Sided Tracks

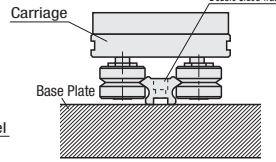
Functions and Features

- Bearing and V groove (70°) are integrated in a single unit.
- System construction can be achieved by using only one Double Sided Track.
- Sized in metric.

Basic Structure



App. Example



Load Calculation

- L = Load (N)
- LS = Thrust load applied to wheel (N)
- LR = Radial Load applied to wheel (N)
- A, B = Distance (mm)

<p>When load applied between the wheels</p> $LS_1 = \frac{L \times B}{A+B}$ $LS_2 = L - LS_1$ <p>(Ex.) L=500 (N) A=40 (mm) B=60 (mm)</p> $LS_1 = \frac{500 \times 60}{40+60} = 300(N)$ $LS_2 = 500 - 300 = 200(N)$	
<p>When load applied outside the wheels</p> $LS_1 = \frac{L \times A}{B}$ $LS_2 = L + LS_1$ <p>(Ex.) L=500 (N) A=60 (mm) B=40 (mm)</p> $LS_1 = \frac{500 \times 60}{40} = 750(N)$ $LS_2 = 500 + 750 = 1250(N)$	
<p>When radial and thrust load are combined</p> $LS_1 = LS_2 = \frac{L \times A}{B}$ $LR_1 = L + LS_1$ $LR_2 = LS_2$ <p>(Ex.) L=500 (N) A=60 (mm) B=100 (mm)</p> $LS_1 = LS_2 = \frac{500 \times 60}{100} = 300(N)$ $LR_1 = 500 + 300 = 800(N)$	

Load Factor 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.

$$LF = \frac{LS}{LS_{max}} + \frac{LR}{LR_{max}}$$

- LF = Load Factor
- LS = Thrust Load applied to wheel
- LS max = Maximum Thrust Load applied to wheel
- LR = Radial Load applied to wheel
- LR max = Maximum Radial Load applied to wheel

Part Number	Type	W/o Lubrication		With Lubrication	
		No.	LSmax(N)	LRmax(N)	LSmax(N)
MVH MVHS MVHL MVHSL	12	22.5	45	60	120
	25	100	200	320	600
	34	200	400	800	1400

Life Calculation

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

$$\text{Life (km)} = \frac{LC}{(LF)^3} \times Af$$

- LF = Load Factor
- LC = Basic Life
- Af = Adjustment Coefficient

Part Number	Type	No.	LC Basic Life km
MVH	12	50	
MVHS	25	70	
MVHL	34	100	

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

<Calculation Example>

When using MVH-34C under the conditions of LS=100 (N), LR=200 (N) and Af=0.7

$$\text{Load Factor } LF = \frac{100}{800} + \frac{200}{1400} = 0.268 \leq 1.0$$

$$\text{Life (km)} = \frac{100}{(0.268)^3} \times 0.7 = 3637 \text{ km}$$

System Assembly and Adjustments

- First, assemble the components loosely with a minimum load.
- Fully tighten the fixed wheels.
- Next, tighten mounting nuts of adjusting wheel tentatively in order to adjust them.
- Turn the hex nut in the center of Adjusting Wheel gradually by wrench to set the minimum preload, and do not leave a gap between each pair of wheels facing each other.
- Check if proper preload is applied by turning the wheels with fingers while track is fixed and carriage plate remains still. Although a slight resistance may be felt, the wheels should turn freely under a proper preload. Excessive preload results in a shorter product life.
- Make adjustments and test all the adjustable wheels in the above manner, and fully tighten the wheel nuts to the specified torque.
- After adjustment, check again in the same process as 5 to make sure of proper preload.

Millimeter Size 70° Type Wheels and Bushings



Type	Material	Surface Hardness	Seal	Operating Temp.
MVH	EN 1.3505 Equiv.	58-62HRC	No.12 Nitrile Rubber	-20°C~120°C
MVHL	EN 1.3505 Equiv.		No.24 Metal Shield	
MVHS	EN 1.4125 Equiv.	58-62HRC	Nitrile Rubber	-20°C~120°C
MVHSL				

E (Adjustable) C (Fixed)

Part Number	Type	No.	C-Fixed E=Adjustable	Applicable Rail No.	A	B	B1	C	D	E	M	M1	M2	J	K	L	N Eccentricity	O	P	Tightening Torque N·m	Thrust Load LSmax. (N)	Radial Load LRmax. (N)	Unit Price		
																							MVH	MVHSL	
MVH MVHS	(C Dimension Short)	12	C	12	12.7	10.1	5.47	5.8	9.51	5	M4x0.5	7	9	0.8	2	-	0.5	4	7	2	22.5	45			
		25	C	25	25	16.6	9	9.8	20.27	10	M8x1.0	13	17	1	5	3	-	0.75	8	13	18	100	200		
		34	C	44	34	21.3	11.5	13.8	27.13	12	M10x1.25	17	21	1.25	6	4	-	1.0	10	15	33	200	400		
MVHL MVHSL	(C Dimension Long)	12	C	12	12.7	10.1	5.47	9.5	9.51	5	M4x0.5	7	9	0.8	2	-	0.5	4	7	2	22.5	45			
		25	C	25	25	16.6	9	19	20.27	10	M8x1.0	13	17	1	5	3	-	0.75	8	13	18	100	200		
		34	C	44	34	21.3	11.5	22	27.13	12	M10x1.25	17	21	1.25	6	4	-	1.0	10	15	33	200	400		

No adjusting hexagon groove (L) for adjusting wheel (E) No.12. Thrust load and radial load values are those when lubricated. For values when not lubricated, see P.653.

Millimeter Size 70° Type Double Sided Tracks



Type	Material	Surface Treatment	Hardness
Double Sided Tracks	MVR	Black Oxide	58 - 62 HRC (70° Edge)
	MVRS	-	52HRC (70° Edge)

W1 is the dimension at the intersection of 70°. (Both ends are R machined.)
Tolerance C±0.025 is applicable to MVRS only.

Part Number	Type	No.	L Selection *	(W)	W1	F	H	H1	C	J	D	dxGxh	N	P
MVR		12	120-1020	12	13.25	3.2	6.4	1.8	8.9	1.7	4	3.5x6.2x3.1	15	45
		25	240-1140	25	26.58	4.93	10.2	2.5	15.4	2.6	6	5.5x10x5.1	30	90
		44	44	45.58	6.42	12.7	3	26.4	2.3	8	7x11x6.1	30	90	
MVRS		12	120-1020	12	12.37	3	6.2	1.8	8.5	1.7	4	3.5x6x3	15	45
		25	240-1140	25	25.74	4.5	10	2.5	15	2.5	6	5.5x10x5	30	90
		44	44	44.74	6	12.5	3	26	2.5	8	7x11x6	30	90	

* For L dimensions, please refer to the price list.

Ordering Example	Part Number	Spec.	L
	MVH12	- C	- 510
	MVRS25	- C	- 510

L (Selection)	Unit Price	
	MVR12	MVRS12
120	165	
210	255	
300	345	
390	435	
480	525	
570	615	
660	705	
750	795	
840	885	
930	975	
1020		

L (Selection)	Unit Price			
	MVR25	MVRS25	MVR44	MVRS44
240	330			
420	510			
600	690			
780	870			
960	1050			
1140				