

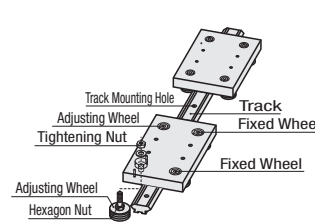
V Guide Systems - Overview

Metric Size 70° Type

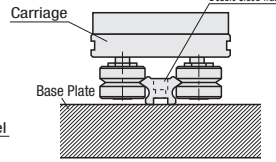
Functions and Features

- 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) $LS_1 = \frac{500 \times 60}{40+60} = 300(N)$ $LS_2 = 500 - 300 = 200(N)$</p> | |
| <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) $LS_1 = \frac{500 \times 60}{40} = 750(N)$ $LS_2 = 500 + 750 = 1250(N)$</p> | |
| <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) $LS_1 = LS_2 = \frac{500 \times 60}{100} = 300(N)$ $LR_1 = 500 + 300 = 800(N)$ $LR_2 = 300(N)$</p> | |

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.

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

- 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

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

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

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.

V Guide Systems

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

Millimeter Size 70° Type Wheels and Bushings



| Type | Material | Surface Hardness | Seal | Operating Temp. |
|-------|--------------------|------------------|----------------------|-----------------|
| MVH | SUU2 Equivalent | 58-62HRC | No.12 Nitrile Rubber | -20°C~120°C |
| MVHL | | | No.22 Metal Shield | |
| MVHS | SUS440C Equivalent | | Nitrile Rubber | |
| MVHSL | | | | |

• Nitrile Rubber: Contact
• Metal Shield: Non-contact

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 | MVHL | MVHS |
| 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 | SUU2 Equivalent | Black Oxide |
| | MVRS | SUS420J1 Equivalent | 58-62 HRC (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 |
| MVR | 25 | 1140 | 25 | 26.58 | 4.93 | 10.2 | 2.5 | 15.4 | 2.6 | 6 | 5.5x10x5.1 | 30 | 90 | | | | | | | | | | | |
| | | | | | | | | | | | | | | 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 | 25.74 | 4.5 | 10 | 2.5 | 15 | 2.5 | 6 | 5.5x10x5 | 30 | 90 |
| | | | | | | | | | | | | | | | | | | | | | | | | |

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

Ordering Example: Part Number - Spec. - L

MVH12 - 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 | | | | |