



Rod End

THK General Catalog

A Product Descriptions

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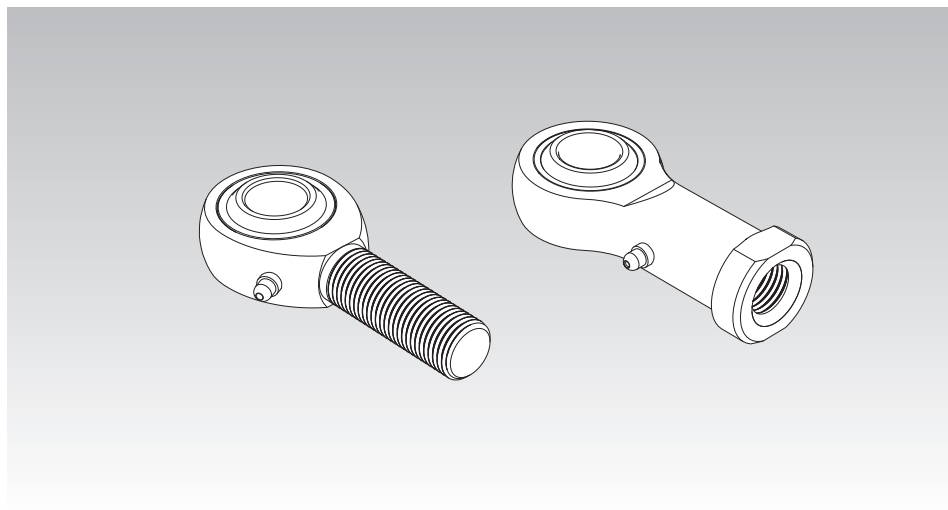
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THK A23-1

Features of the Rod End



Features

The Rod End is a self-aligning plain bearing that uses a spherical inner ring which has the same level of accuracy and hardness as bearing steel balls. With the combination of a spherical inner ring whose sliding surface is mirror-finished and a rationally designed holder, the Rod End ensures play-free, extremely smooth rotation and oscillation.

A23-2 **THK**

Types of the Rod End

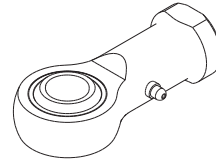
Types and Features

Type Provided with a Female Threading - Model PHS

Specification Table → **A 23-6**

With model PHS, a copper alloy with high conformability is inserted between the chromate treated steel holder and the spherical inner ring, in which only the circumference of the spherical area is hard chrome plated. This structure ensures high rigidity, high wear resistance and high corrosion resistance.

The grease nipple on the holder allows grease to be applied to the sliding surface as necessary.



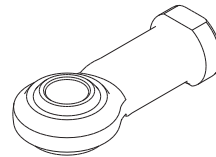
Model PHS

No Lubrication Type - Model NHS-T

Specification Table → **A 23-8**

This no lubrication rod end uses self-lubricating synthetic resin formed between the steel holder and the spherical inner ring.

Since the clearance on the sliding surface is minimized, an accurate link motion is achieved.

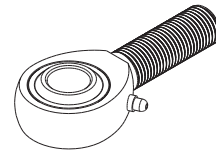


Model NHS-T

Male thread Type - Model POS

Specification Table → **A 23-10**

This model is a highly rigid rod end that is basically the same as the female threading type model PHS, but has a male thread on the holder end.

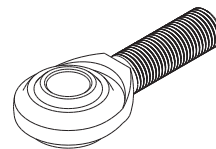


Model POS

No Lubrication, Male thread Type - Model NOS-T

Specification Table → **A 23-12**

This model is a no lubrication rod end that is basically the same as the female threading type model NHS-T, but has a male thread on the holder end.



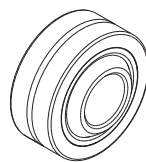
Model NOS-T

Standard Type - Model PB

With model PB, a copper alloy with high conformability is inserted between the steel outer ring and the spherical inner ring, in which only the spherical area is hard chrome plated. This structure makes this model a highly rigid Spherical Plain Bearing with high corrosion resistance and high wear resistance.

The oil groove and the greasing hole on the outer ring allow grease to be applied to the sliding surface as necessary.

Specification Table⇒ **A23-14**



Model PB

A23-4

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Selecting a Rod End

[Permissible Load P]

The static load capacity (C_s) indicated in the specification tables, is presented as a guide for the mechanical strength of the Rod End. Select a bearing while taking into account the safety factor (f_s) indicated in Table1 according to the type of the load.

Table1 Safety Factor (f_s)

| Type of load | Lower limit of f_s |
|--|----------------------|
| Constant load in a constant direction | 2 to 3 |
| Fluctuating load in a constant direction | 3 to 5 |
| Load in varying directions | 5 to 8 |

According to the type of load, select a bearing that satisfies the following equation from a mechanical strength's viewpoint.

$$P \leq \frac{C_s}{f_s} \quad \dots\dots(1)$$

- P : Permissible Load (N)
 C_s : Static load capacity (N)
 f_s : Safety factor (see Table1)

[Dynamic Load Capacity C_d]

The dynamic load capacity refers to the upper limit of load that the spherical area can receive without showing seizure while the Rod End is rotating or oscillating. The dynamic load capacity is obtained from the following approximation formula using the static load capacity (C_s)^(note 1) indicated in the specification table.

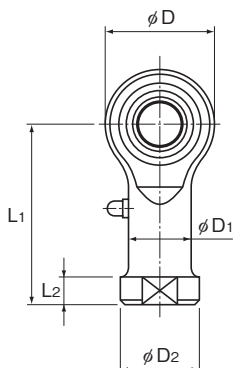
$$C_d = \frac{C_s}{\sqrt[3]{n}} \quad \dots\dots(2)$$

- C_d : Dynamic load capacity (N)
 C_s : Static load capacity (N)
 n : Revolutions per minute (min⁻¹)

The selected bearing must meet both the permissible load obtained from equation (1) and the dynamic load capacity obtained from equation (2).

Note1) Static load capacity (C_s) refers to the value obtained by multiplying the projected area on the spherical section by the permissible surface pressure, and is used to obtain the dynamic load capacity.

Model PHS (Female Threading Type)



| Model No. | Outer dimensions | | | Threaded S ₁ JIS Class 2 | Holder Dimensions | | | |
|-----------|------------------|---------------|--------------------------------------|---|-------------------|----------------|----------------|-----------|
| | Length L | Diameter D | Width B ₁ 0 -0.1 | | W 0 -0.2 | D ₁ | D ₂ | B ±0.1 |
| PHS 5 | 35 | 16 | 8 | M5×0.8 | 9 | 9 | 11 | 6 |
| PHS 6 | 39 | 18 | 9 | M6×1 | 11 | 10 | 13 | 6.75 |
| PHS 8 | 47 | 22 | 12 | M8×1.25 | 14 | 12.5 | 16 | 9 |
| PHS 10 | 56 | 26 | 14 | M10×1.5 | 17 | 15 | 19 | 10.5 |
| PHS 12 | 65 | 30 | 16 | M12×1.75 | 19 | 17.5 | 22 | 12 |
| PHS 14 | 74 | 34 | 19 | M14×2 | 22 | 20 | 25 | 13.5 |
| PHS 16 | 83 | 38 | 21 | M16×2 | 22 | 22 | 27 | 15 |
| PHS 18 | 92 | 42 | 23 | M18×1.5 | 27 | 25 | 31 | 16.5 |
| PHS 20 | 100 | 46 | 25 | M20×1.5 | 30 | 27.5 | 34 | 18 |
| PHS 22 | 109 | 50 | 28 | M22×1.5 | 32 | 30 | 37 | 20 |
| PHS 25 | 124 | 60 | 31 | M24×2 | 36 | 33.5 | 42 | 22 |
| PHS 30 | 145 | 70 | 37 | M30×2 | 41 | 40 | 50 | 25 |

[Material]

Holder : S35C (Chromate treatment)

Spherical inner ring : SUJ2, 58 HRC or higher

(Hard chrome plated except for the inner surface of the inner ring)

Bush : copper alloy

[Fitting with the Shaft]

| Condition | Dimensional tolerance of the shaft |
|--------------------|------------------------------------|
| Normal load | h7 |
| Indeterminate load | p6 |

Model number coding

PHS10 L

Model number

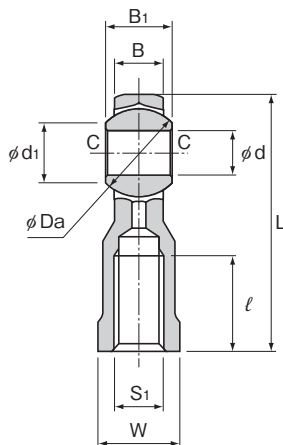
Left-hand thread

A23-6

THK

To download a desired data, search for the corresponding model number in the Technical site.

<https://tech.thk.com>



Unit: mm

| | | | | Grease nipple | Spherical inner ring dimensions | | | | Permissible tilt angles | | | Static applied load Radial C _s N | Mass g |
|----------------|----------------|-----|---------|---------------|---------------------------------|--|------|------------------|-------------------------|------------------|----|---|-----------|
| L ₁ | L ₂ | l | d H7 | | Ball diameter Da mm (inch) | d ₁ | C | α ₁ ° | α ₂ ° | α ₃ ° | | | |
| | 27 | 4 | 14 | PB107 | 5 | 11.112(⁷ / ₁₆) | 7.7 | 0.3 | 8 | 13 | 30 | 5590 | 16.5 |
| | 30 | 5 | 14 | | 6 | 12.7(¹ / ₂) | 9 | 0.3 | 8 | 13 | 30 | 6860 | 25 |
| | 36 | 5 | 17 | | 8 | 15.875(⁵ / ₈) | 10.4 | 0.5 | 8 | 14 | 25 | 9800 | 43 |
| | 43 | 6.5 | 21 | | 10 | 19.05(³ / ₄) | 12.9 | 0.5 | 8 | 14 | 25 | 13200 | 72 |
| | 50 | 6.5 | 24 | | 12 | 22.225(⁷ / ₈) | 15.4 | 0.5 | 8 | 13 | 25 | 16700 | 107 |
| | 57 | 8 | 27 | | 14 | 25.4(1) | 16.9 | 0.7 | 10 | 16 | 24 | 20600 | 160 |
| | 64 | 8 | 33 | | 16 | 28.575(1 ¹ / ₈) | 19.4 | 0.7 | 9 | 15 | 24 | 25000 | 210 |
| | 71 | 10 | 36 | | 18 | 31.75(1 ¹ / ₄) | 21.9 | 0.7 | 9 | 15 | 24 | 29400 | 295 |
| | 77 | 10 | 40 | | 20 | 34.925(1 ³ / ₈) | 24.4 | 0.7 | 9 | 15 | 24 | 34300 | 380 |
| | 84 | 12 | 43 | | 22 | 38.1(1 ¹ / ₂) | 25.8 | 0.7 | 10 | 15 | 23 | 41200 | 490 |
| | 94 | 12 | 48 | A-M6F | 25 | 42.862(1 ¹¹ / ₁₆) | 29.6 | 0.8 | 9 | 15 | 23 | 72500 | 750 |
| | 110 | 15 | 56 | | 30 | 50.8(2) | 34.8 | 0.8 | 10 | 17 | 23 | 92200 | 1130 |

[Clearance]

Unit: mm

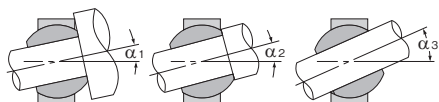
| | |
|------------------|---------------|
| Radial clearance | 0.035 or less |
| Axial clearance | 0.1 or less |

[Lubrication]

Apply lubricant before using the product. The holder has a greasing hole and an oil groove; they allow grease to be replenished through the grease nipple as necessary.

[Identification of Left-hand Thread]

If the female threading is left-hand, symbol "L" is added. The actual product is marked with symbol "L" on the holder.

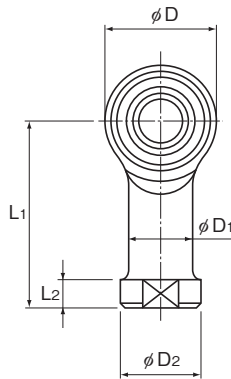


Permissible Tilt Angles

THK

A23-7

Model NHS-T (No Lubrication Type)



| Model No. | Outer dimensions | | | Threaded S ₁ JIS Class 2 | Holder Dimensions | | | |
|-----------|------------------|---------------|--------------------------------------|---|-------------------|----------------|----------------|-------------------|
| | Length L | Diameter D | Width B ₁ 0 -0.1 | | W 0 -0.2 | D ₁ | D ₂ | B +0.1 -0.4 |
| NHS 3T | 27 | 12 | 6 | M3×0.5 | 7 | 6.5 | 8 | 4.5 |
| NHS 4T | 31 | 14 | 7 | M4×0.7 | 8 | 8 | 9.5 | 5.3 |
| NHS 5T | 35 | 16 | 8 | M5×0.8 | 9 | 9 | 11 | 6 |
| NHS 6T | 39 | 18 | 9 | M6×1 | 11 | 10 | 13 | 6.75 |
| NHS 8T | 47 | 22 | 12 | M8×1.25 | 14 | 12.5 | 16 | 9 |
| NHS 10T | 56 | 26 | 14 | M10×1.5 | 17 | 15 | 19 | 10.5 |
| NHS 12T | 65 | 30 | 16 | M12×1.75 | 19 | 17.5 | 22 | 12 |
| NHS 14T | 74 | 34 | 19 | M14×2 | 22 | 20 | 25 | 13.5 |
| NHS 16T | 83 | 38 | 21 | M16×2 | 22 | 22 | 27 | 15 |
| NHS 18T | 92 | 42 | 23 | M18×1.5 | 27 | 25 | 31 | 16.5 |
| NHS 20T | 100 | 46 | 25 | M20×1.5 | 30 | 27.5 | 34 | 18 |
| NHS 22T | 109 | 50 | 28 | M22×1.5 | 32 | 30 | 37 | 20 |

[Material]

Holder : S35C (Chromate treatment)
For NHS3T and NHS4T, S20C

Spherical inner ring: SUJ2, 58 HRC or higher
(Hard chrome plated except for the inner surface of the inner ring)

Bush : Self-lubricating synthetic resin

[Fitting with the Shaft]

| Condition | Dimensional tolerance of the shaft |
|--------------------|------------------------------------|
| Normal load | h7 |
| Indeterminate load | p6 |

Model number coding

NHS10T L

Model number

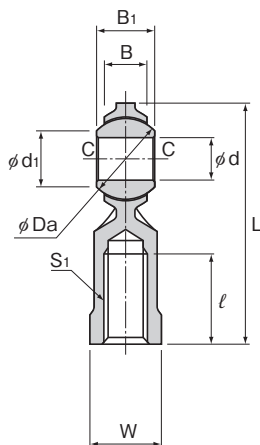
Left-hand thread

A23-8

THK

To download a desired data, search for the corresponding model number in the Technical site.

<https://tech.thk.com>



Unit: mm

| | | | | Spherical inner ring dimensions | | | | Permissible tilt angles | | | Static applied load Radial C_s N | Mass g |
|-------|-------|-----|-----------|----------------------------------|-------|-----|------------------|-------------------------|------------------|-------|--|-----------|
| L_1 | L_2 | l | d H7 | Ball diameter D_a mm (inch) | d_1 | C | α_1° | α_2° | α_3° | | | |
| 21 | 3 | 10 | 3 | 9.525 ($3/8$) | 7.4 | 0.3 | 8 | 10 | 42 | 1570 | 6.5 | |
| 24 | 4 | 12 | 4 | 10.319 ($13/32$) | 7.6 | 0.3 | 9 | 11 | 35 | 2250 | 10 | |
| 27 | 4 | 14 | 5 | 11.112 ($7/16$) | 7.7 | 0.3 | 8 | 13 | 30 | 3920 | 16.5 | |
| 30 | 5 | 14 | 6 | 12.7 ($1/2$) | 9 | 0.3 | 8 | 13 | 30 | 5000 | 25 | |
| 36 | 5 | 17 | 8 | 15.875 ($5/8$) | 10.4 | 0.5 | 8 | 14 | 25 | 7450 | 43 | |
| 43 | 6.5 | 21 | 10 | 19.05 ($3/4$) | 12.9 | 0.5 | 8 | 14 | 25 | 9410 | 72 | |
| 50 | 6.5 | 24 | 12 | 22.225 ($7/8$) | 15.4 | 0.5 | 8 | 13 | 25 | 11000 | 107 | |
| 57 | 8 | 27 | 14 | 25.4 (1) | 16.9 | 0.7 | 10 | 16 | 24 | 15200 | 160 | |
| 64 | 8 | 33 | 16 | 28.575 ($1 1/8$) | 19.4 | 0.7 | 9 | 15 | 24 | 20200 | 210 | |
| 71 | 10 | 36 | 18 | 31.75 ($1 1/4$) | 21.9 | 0.7 | 9 | 15 | 24 | 25200 | 295 | |
| 77 | 10 | 40 | 20 | 34.925 ($1 3/8$) | 24.4 | 0.7 | 9 | 15 | 24 | 27800 | 380 | |
| 84 | 12 | 43 | 22 | 38.1 ($1 1/2$) | 25.8 | 0.7 | 10 | 15 | 23 | 35900 | 490 | |

[Clearance]

Unit: mm

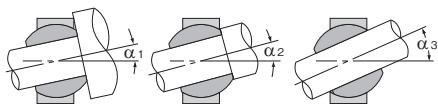
| | |
|------------------|---------------|
| Radial clearance | 0.035 or less |
| Axial clearance | 0.1 or less |

[Initial Lubrication]

This model can be used without lubrication. However, if desiring to provide initial lubrication, apply oil or grease to the spherical area.

[Identification of Left-hand Thread]

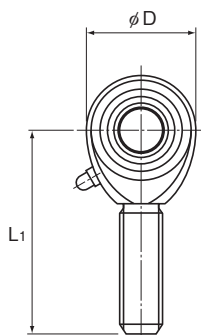
If the female threading is left-hand, symbol "L" is added. The actual product is marked with symbol "L" on the holder.



Permissible Tilt Angles

THK **A23-9**

Model POS (Male Thread Type)



| Model No. | Outer dimensions | | | Threaded S_1 JIS Class 2 | Holder Dimensions | |
|-----------|------------------|---------------|-----------------------------|----------------------------------|-------------------|-------|
| | Length L | Diameter D | Width B_1 0 -0.1 | | B ± 0.1 | L_1 |
| POS 5 | 41 | 16 | 8 | M5×0.8 | 6 | 33 |
| POS 6 | 45 | 18 | 9 | M6×1 | 6.75 | 36 |
| POS 8 | 53 | 22 | 12 | M8×1.25 | 9 | 42 |
| POS 10 | 61 | 26 | 14 | M10×1.5 | 10.5 | 48 |
| POS 12 | 69 | 30 | 16 | M12×1.75 | 12 | 54 |
| POS 14 | 77 | 34 | 19 | M14×2 | 13.5 | 60 |
| POS 16 | 85 | 38 | 21 | M16×2 | 15 | 66 |
| POS 18 | 93 | 42 | 23 | M18×1.5 | 16.5 | 72 |
| POS 20 | 101 | 46 | 25 | M20×1.5 | 18 | 78 |
| POS 22 | 109 | 50 | 28 | M22×1.5 | 20 | 84 |
| POS 25 | 124 | 60 | 31 | M24×2 | 22 | 94 |
| POS 30 | 145 | 70 | 37 | M30×2 | 25 | 110 |

[Material]

Holder : S35C (Chromate treatment)

Spherical inner ring : SUJ2, 58 HRC or higher

(Hard chrome plated except for the inner surface of the inner ring)

Bush : copper alloy

[Fitting with the Shaft]

| Condition | Dimensional tolerance of the shaft |
|--------------------|------------------------------------|
| Normal load | h7 |
| Indeterminate load | p6 |

Model number coding

POS10 L

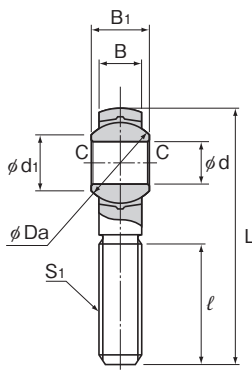
Model number |

Left-hand thread

A23-10 THK

To download a desired data, search for the corresponding model number in the Technical site.

<https://tech.thk.com>



Unit: mm

| | l | Grease nipple (Greasing hole) | Spherical inner ring dimensions | | | | Permissible tilt angles | | | Static applied load Radial C_s N | Mass g |
|--|-----|----------------------------------|---------------------------------|--|-------|-----|-------------------------|------------------|------------------|--|-----------|
| | | | d H7 | Ball diameter Da mm (inch) | d_1 | C | α_1° | α_2° | α_3° | | |
| | 20 | PB107 | 5 | 11.112(⁷ / ₁₆) | 7.7 | 0.3 | 8 | 13 | 30 | 3430 | 12.5 |
| | 22 | | 6 | 12.7(¹ / ₂) | 9 | 0.3 | 8 | 13 | 30 | 4900 | 19 |
| | 25 | | 8 | 15.875(⁵ / ₈) | 10.4 | 0.5 | 8 | 14 | 25 | 6860 | 32 |
| | 29 | | 10 | 19.05(³ / ₄) | 12.9 | 0.5 | 8 | 14 | 25 | 10800 | 54 |
| | 33 | | 12 | 22.225(⁷ / ₈) | 15.4 | 0.5 | 8 | 13 | 25 | 16700 | 85 |
| | 36 | | 14 | 25.4(1) | 16.9 | 0.7 | 10 | 16 | 24 | 20600 | 126 |
| | 40 | | 16 | 28.575(¹ / ₅) | 19.4 | 0.7 | 9 | 15 | 24 | 25000 | 185 |
| | 44 | | 18 | 31.75(¹ / ₄) | 21.9 | 0.7 | 9 | 15 | 24 | 29400 | 260 |
| | 47 | | 20 | 34.925(¹ / ₈) | 24.4 | 0.7 | 9 | 15 | 24 | 34300 | 340 |
| | 51 | | 22 | 38.1(¹ / ₂) | 25.8 | 0.7 | 10 | 15 | 23 | 41200 | 435 |
| | 57 | A-M6F | 25 | 42.862(¹ / ₁₆) | 29.6 | 0.8 | 9 | 15 | 23 | 72500 | 650 |
| | 66 | | 30 | 50.8(2) | 34.8 | 0.8 | 10 | 17 | 23 | 92200 | 1070 |

[Clearance]

Unit: mm

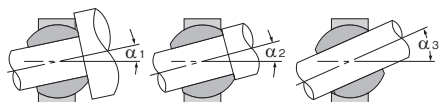
| | |
|------------------|---------------|
| Radial clearance | 0.035 or less |
| Axial clearance | 0.1 or less |

[Lubrication]

Apply lubricant before using the product. The holder has a greasing hole and an oil groove; they allow grease to be replenished through the grease nipple as necessary. To lubricate the product, replenish grease from the holder greasing hole for models POS5 and 6, or from the grease nipple for other models.

[Identification of Left-hand Thread]

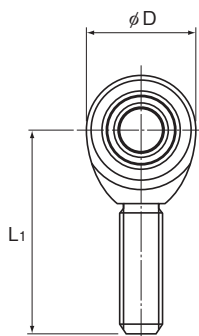
If the male thread is left-hand, symbol "L" is added. The actual product is marked with symbol "L" on the holder.



Permissible Tilt Angles

THK **A23-11**

Model NOS-T (No Lubrication, Male Thread Type)



| Model No. | Outer dimensions | | | Threaded S_1 JIS Class 2 | Holder Dimensions | |
|-----------|------------------|---------------|-----------------------------|----------------------------------|-------------------|-------|
| | Length L | Diameter D | Width B_1 0 -0.1 | | B +0.1 -0.4 | L_1 |
| NOS 3T | 33 | 12 | 6 | M3×0.5 | 4.5 | 27 |
| NOS 4T | 37 | 14 | 7 | M4×0.7 | 5.3 | 30 |
| NOS 5T | 41 | 16 | 8 | M5×0.8 | 6 | 33 |
| NOS 6T | 45 | 18 | 9 | M6×1 | 6.75 | 36 |
| NOS 8T | 53 | 22 | 12 | M8×1.25 | 9 | 42 |
| NOS 10T | 61 | 26 | 14 | M10×1.5 | 10.5 | 48 |
| NOS 12T | 69 | 30 | 16 | M12×1.75 | 12 | 54 |
| NOS 14T | 77 | 34 | 19 | M14×2 | 13.5 | 60 |
| NOS 16T | 85 | 38 | 21 | M16×2 | 15 | 66 |
| NOS 18T | 93 | 42 | 23 | M18×1.5 | 16.5 | 72 |
| NOS 20T | 101 | 46 | 25 | M20×1.5 | 18 | 78 |
| NOS 22T | 109 | 50 | 28 | M22×1.5 | 20 | 84 |

[Material]

Holder : S35C (Chromate treatment)
For NOS3T and NOS4T, S20C

Spherical inner ring: SUJ2, 58 HRC or higher

(Hard chrome plated except for the
inner surface of the inner ring)

Bush : Self-lubricating synthetic resin

[Fitting with the Shaft]

| Condition | Dimensional tolerance of the shaft |
|--------------------|------------------------------------|
| Normal load | h7 |
| Indeterminate load | p6 |

Model number coding

NOS10T L

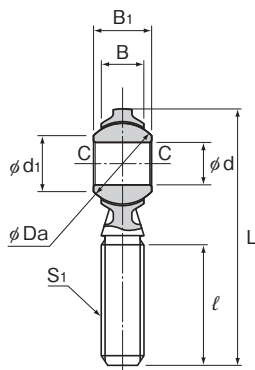
Model number

Left-hand thread

A23-12 THK

To download a desired data, search for
the corresponding model number in the Technical site.

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Unit: mm

| | | Spherical inner ring dimensions | | | | Permissible tilt angles | | | Static applied load Radial C _s N | Mass g |
|--|----|---------------------------------|-------------------------------|----------------|-----|-------------------------|------------------|------------------|---|-----------|
| | ℓ | d H7 | Ball diameter Da mm (inch) | d ₁ | C | α ₁ ° | α ₂ ° | α ₃ ° | | |
| | 15 | 3 | 9.525 ^(3/8) | 7.4 | 0.3 | 8 | 10 | 42 | 1570 | 4.5 |
| | 17 | 4 | 10.319 ^(13/32) | 7.6 | 0.3 | 9 | 11 | 35 | 2250 | 7 |
| | 20 | 5 | 11.112 ^(7/16) | 7.7 | 0.3 | 8 | 13 | 30 | 3430 | 12.5 |
| | 22 | 6 | 12.7 ^(1/2) | 9 | 0.3 | 8 | 13 | 30 | 4900 | 19 |
| | 25 | 8 | 15.875 ^(5/8) | 10.4 | 0.5 | 8 | 14 | 25 | 6860 | 32 |
| | 29 | 10 | 19.05 ^(3/4) | 12.9 | 0.5 | 8 | 14 | 25 | 9410 | 54 |
| | 33 | 12 | 22.225 ^(7/8) | 15.4 | 0.5 | 8 | 13 | 25 | 11000 | 85 |
| | 36 | 14 | 25.4(1) | 16.9 | 0.7 | 10 | 16 | 24 | 15200 | 126 |
| | 40 | 16 | 28.575 ^(1 1/8) | 19.4 | 0.7 | 9 | 15 | 24 | 20200 | 185 |
| | 44 | 18 | 31.75 ^(1 1/4) | 21.9 | 0.7 | 9 | 15 | 24 | 25200 | 260 |
| | 47 | 20 | 34.925 ^(1 3/8) | 24.4 | 0.7 | 9 | 15 | 24 | 27800 | 340 |
| | 51 | 22 | 38.1 ^(1 1/2) | 25.8 | 0.7 | 10 | 15 | 23 | 35900 | 435 |

[Clearance]

Unit: mm

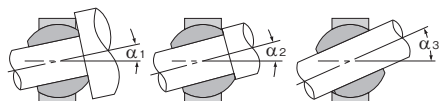
| | |
|------------------|---------------|
| Radial clearance | 0.035 or less |
| Axial clearance | 0.1 or less |

[Initial Lubrication]

This model can be used without lubrication. However, if desiring to provide initial lubrication, apply oil or grease to the spherical area.

[Identification of Left-hand Thread]

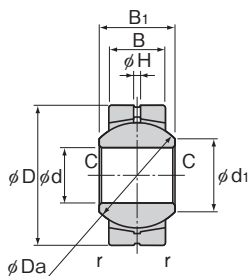
If the male thread is left-hand, symbol "L" is added.



Permissible Tilt Angles

THK A23-13

Model PB (Standard Type)



Unit: mm

| Model No. | Main dimensions | | | | | | | Ball diameter Da mm (inch) | Permissible tilt angles | | | Static applied load Radial Cs N | Mass g |
|-----------|---------------------------|---------------------------|-------------------------------|-------------------------------------|------|-----|------|----------------------------------|-------------------------|-----|-----|--|-----------|
| | Inner diameter d H7 | Outer diameter D h6 | Outer ring width B ±0.1 | Inner ring width B1 0 -0.1 | d1 | H | C, r | | α1° | α2° | α3° | | |
| PB 5 | 5 | 16 | 6 | 8 | 7.7 | 1 | 0.3 | 11.112(7/16) | 8 | 13 | 30 | 7840 | 8.5 |
| PB 6 | 6 | 18 | 6.75 | 9 | 9 | 1 | 0.3 | 12.7(1/2) | 8 | 13 | 30 | 9800 | 13 |
| PB 8 | 8 | 22 | 9 | 12 | 10.4 | 1 | 0.5 | 15.875(5/8) | 8 | 14 | 25 | 16700 | 24 |
| PB 10 | 10 | 26 | 10.5 | 14 | 12.9 | 1.2 | 0.5 | 19.05(3/4) | 8 | 14 | 25 | 23500 | 39 |
| PB 12 | 12 | 30 | 12 | 16 | 15.4 | 1.5 | 0.5 | 22.225(7/8) | 8 | 13 | 25 | 31400 | 58 |
| PB 14 | 14 | 34 | 13.5 | 19 | 16.9 | 1.5 | 0.7 | 25.4(1) | 10 | 16 | 24 | 40200 | 84 |
| PB 16 | 16 | 38 | 15 | 21 | 19.4 | 2.5 | 0.7 | 28.575(1 1/8) | 9 | 15 | 24 | 50000 | 111 |
| PB 18 | 18 | 42 | 16.5 | 23 | 21.9 | 2.5 | 0.7 | 31.75(1 1/4) | 9 | 15 | 24 | 61800 | 160 |
| PB 20 | 20 | 46 | 18 | 25 | 24.4 | 2.5 | 0.7 | 34.925(1 3/8) | 9 | 15 | 24 | 73500 | 210 |
| PB 22 | 22 | 50 | 20 | 28 | 25.8 | 2.5 | 0.7 | 38.1(1 1/2) | 10 | 15 | 23 | 88200 | 265 |
| PB 25 | 25 | 56 | 22 | 31 | 29.6 | 3 | 0.8 | 42.862(1 7/16) | 9 | 15 | 23 | 111000 | 390 |
| PB 30 | 30 | 66 | 25 | 37 | 34.8 | 3 | 0.8 | 50.8(2) | 10 | 17 | 23 | 148000 | 610 |

[Material]

Outer ring : S35C
Spherical inner ring : SUJ2, 58 HRC or higher
(Hard chrome plated except for the inner surface of the inner ring)

Bush : copper alloy

[Clearance]

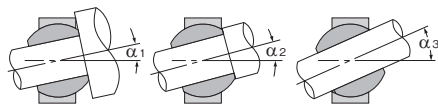
Unit: mm

| | |
|------------------|---------------|
| Radial clearance | 0.035 or less |
| Axial clearance | 0.1 or less |

[Fitting with the Shaft]

For the fitting between the shaft and the housing, the following values are recommended.

| Condition | | Shaft | Housing |
|----------------------------|--------------------|-------|---------|
| Inner ring rotational load | Normal load | m6 | H7 |
| | Indeterminate load | n6 | |
| Outer ring rotational load | Normal load | h7 | M7 |
| | Indeterminate load | k6 | |



Permissible Tilt Angles

[Lubrication]

Apply lubricant before using the product.
The holder has a greasing hole and an oil groove; they allow grease to be replenished through the grease nipple as necessary.

A23-14 THK

To download a desired data, search for the corresponding model number in the Technical site.

<https://tech.thk.com>

Permissible Tilt Angles

The permissible tilting angles of Link Ball models are indicated in the corresponding specification tables.

Note) If the permissible tilt angle is exceeded, it may cause serious damage to the holder. Be sure to use the Link Ball within its permissible tilt angle.

Installation

Please note that the Rod End is not capable of receiving a thrust load indicated in Fig.1.

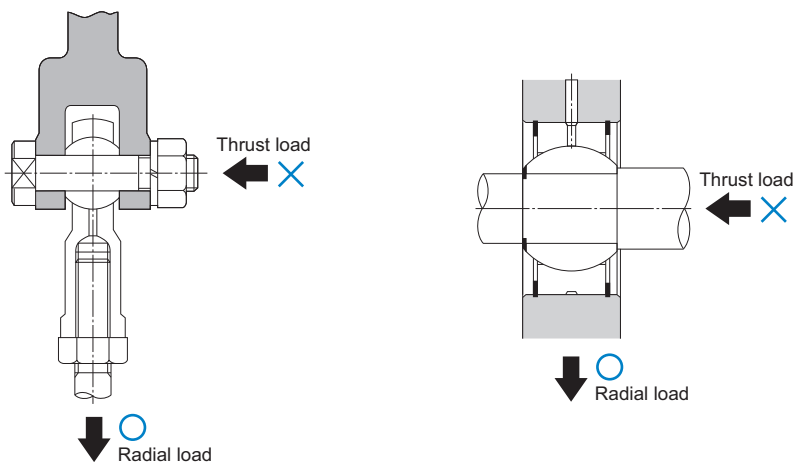


Fig.1 Examples of Installing the Rod End

Model Number Coding

Model number configurations differ depending on the model features. Refer to the corresponding sample model number configuration.

[Rod End]

- Models PHS, NHS-T, POS and NOS-T

PHS10 L

Model No.

Machine screw thread direction
No symbol: Right hand (standard)
L: Left hand

[Rod end (insert model)]

- Model PB

PB20

Model No.

Precautions on Use

Rod End

[Handling]

- (1) Do not disassemble the parts. This will result in loss of functionality.
- (2) Take care not to drop or strike the Rod End. Doing so may cause injury or damage. Giving an impact to it could also cause damage to its function even if the product looks intact.
- (3) When handling the product, wear protective gloves, safety shoes, etc., as necessary to ensure safety.

[Precautions on Use]

- (1) Do not use the product in the manner that the permissible tilting angle is exceeded since doing so may damage the product.
- (2) Prevent foreign material, such as cutting chips or coolant, from entering the product. Failure to do so may cause damage.
- (3) The Rod End is designed for use under a radial load. Do not use the product under a thrust load.
- (4) Do not use the product at temperature of 80°C or higher.
- (5) Insufficient rigidity or accuracy of mounting members causes the bearing load to concentrate on one point and the bearing performance will drop significantly. Accordingly, give sufficient consideration to the rigidity/accuracy of the housing and base and strength of the fixing bolts.

[Lubrication]

- (1) All Rod End models except lubrication-free models must be lubricated before use (THK recommends lithium grease no. 2). When lubricating the Rod End, do not combine different lubricants. Mixing lubricants can cause adverse interaction between disparate additives or other ingredients. While the unit is in use, replenish the lubricant whenever necessary.
- (2) When using the product in locations exposed to constant vibrations or in special environments such as clean rooms, vacuum and low/high temperature, use the grease appropriate for the specification/environment.

[Storage]

When storing the Rod End, enclose it in a package designated by THK and store it in a room while avoiding high temperature, low temperature and high humidity.

[Disposal]

Dispose of the product properly as industrial waste.

THK **A23-17**

A23-18 THK



**HENNLICH -
ŽIJEME TECHNIKOU**

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www.hennlich.cz/lin-tech



Rod End

THK General Catalog

B Support Book

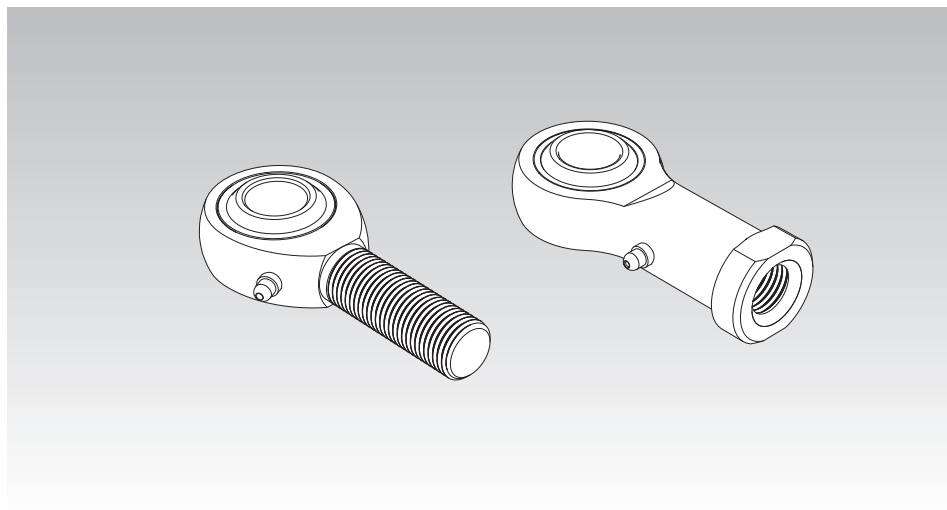
| | |
|---------------------------------|-------|
| Features and Types | B23-2 |
| Features of the Rod End | B23-2 |
| • Features | B23-2 |
| Types of the Rod End | B23-3 |
| • Types and Features | B23-3 |
| Point of Selection | B23-5 |
| Selecting a Rod End | B23-5 |
| Installation | B23-6 |
| Installation | B23-6 |
| Model No. | B23-7 |
| • Model Number Coding | B23-7 |
| Precautions on Use | B23-8 |

A Product Descriptions (Separate)

| | |
|---|--------|
| Features and Types | A23-2 |
| Features of the Rod End | A23-2 |
| • Features | A23-2 |
| Types of the Rod End | A23-3 |
| • Types and Features | A23-3 |
| Point of Selection | A23-5 |
| Selecting a Rod End | A23-5 |
| Dimensional Drawing, Dimensional Table | |
| Model PHS (Female Threading Type) .. | A23-6 |
| Model NHS-T (No Lubrication Type) .. | A23-8 |
| Model POS (Male Thread Type) | A23-10 |
| Model NOS-T (No Lubrication, Male Thread Type) .. | A23-12 |
| Model PB (Standard Type) | A23-14 |
| Point of Design | A23-15 |
| Permissible Tilt Angles | A23-15 |
| Installation | A23-15 |
| Model No. | A23-16 |
| • Model Number Coding | A23-16 |
| Precautions on Use | A23-17 |

THK B23-1

Features of the Rod End



Features

The Rod End is a self-aligning plain bearing that uses a spherical inner ring which has the same level of accuracy and hardness as bearing steel balls. With the combination of a spherical inner ring whose sliding surface is mirror-finished and a rationally designed holder, the Rod End ensures play-free, extremely smooth rotation and oscillation.

B23-2 **THK**

Types of the Rod End

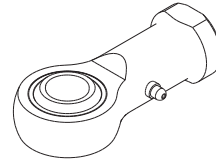
Types and Features

Type Provided with a Female Threading - Model PHS

Specification Table → **A 23-6**

With model PHS, a copper alloy with high conformability is inserted between the chromate treated steel holder and the spherical inner ring, in which only the circumference of the spherical area is hard chrome plated. This structure ensures high rigidity, high wear resistance and high corrosion resistance.

The grease nipple on the holder allows grease to be applied to the sliding surface as necessary.



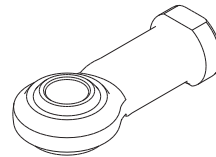
Model PHS

No Lubrication Type - Model NHS-T

Specification Table → **A 23-8**

This no lubrication rod end uses self-lubricating synthetic resin formed between the steel holder and the spherical inner ring.

Since the clearance on the sliding surface is minimized, an accurate link motion is achieved.

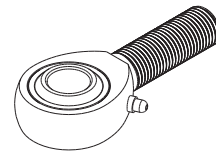


Model NHS-T

Male thread Type - Model POS

Specification Table → **A 23-10**

This model is a highly rigid rod end that is basically the same as the female threading type model PHS, but has a male thread on the holder end.

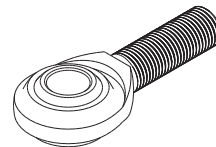


Model POS

No Lubrication, Male thread Type - Model NOS-T

Specification Table → **A 23-12**

This model is a no lubrication rod end that is basically the same as the female threading type model NHS-T, but has a male thread on the holder end.



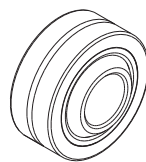
Model NOS-T

Standard Type - Model PB

With model PB, a copper alloy with high conformability is inserted between the steel outer ring and the spherical inner ring, in which only the spherical area is hard chrome plated. This structure makes this model a highly rigid Spherical Plain Bearing with high corrosion resistance and high wear resistance.

The oil groove and the greasing hole on the outer ring allow grease to be applied to the sliding surface as necessary.

Specification Table⇒ **A23-14**



Model PB

B23-4 **THK**

Selecting a Rod End

[Permissible Load P]

The static load capacity (C_s) indicated in the specification tables, is presented as a guide for the mechanical strength of the Rod End. Select a bearing while taking into account the safety factor (f_s) indicated in Table1 according to the type of the load.

Table1 Safety Factor (f_s)

| Type of load | Lower limit of f_s |
|--|----------------------|
| Constant load in a constant direction | 2 to 3 |
| Fluctuating load in a constant direction | 3 to 5 |
| Load in varying directions | 5 to 8 |

According to the type of load, select a bearing that satisfies the following equation from a mechanical strength's viewpoint.

$$P \leq \frac{C_s}{f_s} \quad \dots\dots(1)$$

- P** : Permissible Load (N)
C_s : Static load capacity (N)
f_s : Safety factor (see Table1)

[Dynamic Load Capacity C_d]

The dynamic load capacity refers to the upper limit of load that the spherical area can receive without showing seizure while the Rod End is rotating or oscillating. The dynamic load capacity is obtained from the following approximation formula using the static load capacity (C_s)^(note 1) indicated in the specification table.

$$C_d = \frac{C_s}{\sqrt[3]{n}} \quad \dots\dots(2)$$

- C_d** : Dynamic load capacity (N)
C_s : Static load capacity (N)
n : Revolutions per minute (min^{-1})

The selected bearing must meet both the permissible load obtained from equation (1) and the dynamic load capacity obtained from equation (2).

Note1) Static load capacity (C_s) refers to the value obtained by multiplying the projected area on the spherical section by the permissible surface pressure, and is used to obtain the dynamic load capacity.

Installation

Please note that the Rod End is not capable of receiving a thrust load indicated in Fig.1.

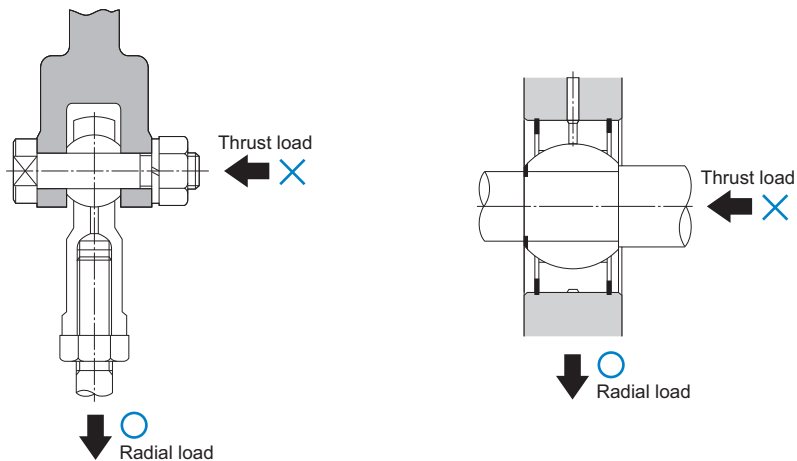


Fig.1 Examples of Installing the Rod End

Model Number Coding

Model number configurations differ depending on the model features. Refer to the corresponding sample model number configuration.

[Rod End]

- Models PHS, NHS-T, POS and NOS-T
-

PHS10 L

Model No.

Machine screw thread direction
 No symbol: Right hand (standard)
 L: Left hand

[Rod end (insert model)]

- Model PB
-

PB20

Model No.

Precautions on Use

Rod End

[Handling]

- (1) Do not disassemble the parts. This will result in loss of functionality.
- (2) Take care not to drop or strike the Rod End. Doing so may cause injury or damage. Giving an impact to it could also cause damage to its function even if the product looks intact.
- (3) When handling the product, wear protective gloves, safety shoes, etc., as necessary to ensure safety.

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[Lubrication]

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- (2) When using the product in locations exposed to constant vibrations or in special environments such as clean rooms, vacuum and low/high temperature, use the grease appropriate for the specification/environment.

[Storage]

When storing the Rod End, enclose it in a package designated by THK and store it in a room while avoiding high temperature, low temperature and high humidity.

[Disposal]

Dispose of the product properly as industrial waste.

B23-8

THK