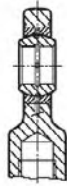


Metric Rod Ends

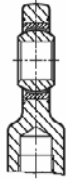


Internal Threads DIN ISO 12240-4

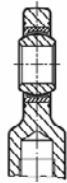
EI..(-2RS) Type
Steel on Steel
Regreasable
Zinc Plated
6-80mm Bores
Compact
Hi Multi-directional Loads



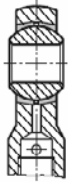
EI..D Type
Maintenance Free
Zinc Plated
6-80mm Bores
Compact
Hi Unidirectional Loads



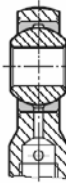
EI..D SS Type
Stainless Steel (Niro)
Maintenance Free
6-80mm Bores
Compact
Hi Unidirectional Loads



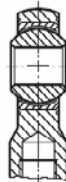
GI Type
Standard
Regreasable
Zinc Plated
5-25mm Bores
Suited For Axial Loads



GIS...GIXS...GIRS... Type
Heavy Duty
Regreasable
Zinc Plated
2-50mm Bores
High Speed



**GISW... GIXSW...
GIRSW...Type**
Heavy Duty
Maintenance Free
5-50mm Bores
OK for Dynamic Loads



External Threads DIN ISO 12240-4

EA..(-2RS) Type
Steel on Steel
Regreasable
Zinc Plated
6-80mm Bores
Compact
Hi Multi-directional Loads



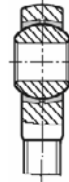
EA..D Type
Maintenance Free
Zinc Plated
6-80mm Bores
Compact
Hi Unidirectional Loads



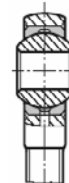
EA..D SS Type
Stainless Steel (Niro)
Maintenance Free
6-80mm Bores
Compact
Hi Unidirectional Loads



GA Type
Standard
Regreasable
Zinc Plated
5-25mm Bores
Suited For Axial Loads



GAS...GAXS...GARS...Type
Heavy Duty
Regreasable
Zinc Plated
2-50mm Bores
High Speed



**GASW... GAXSW...
GARSW...Type**
Heavy Duty
Maintenance Free
5-50mm Bores
OK for Dynamic Loads



Spherical Plain Bearings DIN ISO 12240-1 with / without outer ring

GE..EC Type
Maintenance Free
Steel on PTFE Liner
6-300mm Bores
Hi Unidirectional Loads



Hydraulic Rod End DIN 812-8.8

FPR..U Type
Regreasable
Steel on Steel, GE..E
20-120mm Bores
For Short Relay Distances
and Maximum Stroke.



Corrosion Protection Accessories

RERS & RELS Type
Neoprene Protector Caps
Protects against Dust &
Chemicals



Shaded units = indicates most sizes are stock. All others available from European warehouse.

Rod Ends



Technical / Selection Information

Shaft and Housing Fit

Type	Bore Tolerance	Shaft Tolerance	Bearing OD Tolerance	Housing Fit Tolerance
G..Type	H7	g6	h6	J7
E..Type	H7	g7	h5	J57

Threads: Standard Metric ISO, DIN 13, Tolerance h6.

Misalignment Capability: See individual Products.

Internal Clearance

Type	Size	Radial Internal Clearance in mm (min/max)
El..D / EA..D	06 - 12	0.000 - 0.030
El..D - NIRO	15 - 20	0.000 - 0.040
EA..D - NIRO	25 - 35	0.000 - 0.050
	40 - 60	0.000 - 0.055
	70 - 80	0.000 - 0.060
GISW / GASW	05 - 10	0.005 - 0.030
GIXSW / GAXSW	12 - 18	0.005 - 0.035
GIRSW / GARSW	20 - 25	0.005 - 0.045
	30 - 40	0.005 - 0.055
GE..EC	06 - 12	0.032 - 0.068
	15 - 20	0.040 - 0.082
	25 - 35	0.050 - 0.100
	40 - 60	0.060 - 0.120
	70 - 80	0.072 - 0.142
GL	02 - 10	0.005 - 0.040
	12 - 18	0.010 - 0.050
	20 - 25	0.015 - 0.060
	30 - 40	0.015 - 1.075
GI / GA	02 - 10	0.005 - 0.035
GIS / GAS	12 - 20	0.010 - 0.040
GIRS / GARS	22 - 44	0.010 - 0.050

Lubrication

Maintenance Free Rod Ends and Spherical Plain Bearings do not require lubrication. The Ball is supported by a PTFE Liner in the housing. Rod Ends are available with regreasable options on request. For GE Type Bearings that can be lubricated we recommend Re-Greasing with a Lithium Grease with a Moly Disulfide Additive.

Temperature Range

SERIES	SURFACES	T (°C)	T (°F)
G..Type GISW / GASW GIRSW / GARSW	Steel on PTFE	-50° TO 200°	-58° TO 392°
E..Type EA..D / El..D EA..D-NIRO / El..D-NIRO	Steel on PTFE	-50° TO 200°	-58° TO 392°
G..Type GE..EC	Steel on PTFE	-50° TO 200°	-58° TO 392°

Static Load Ratings C₀

C₀ is the max permissible Static Load that a Rod End can withstand without causing permanent distortion or damage. The Static Load is also used to establish the maximum axial (thrust) load during misalignment where: F_r = Radial Load, F_a = Axial or Thrust Load.

$$F_a (\text{max}) = a \cdot C_0 \quad \text{where:} \quad \begin{array}{l} a = 0.5 \text{ for GI or GA Types} \\ a = 0.3 \text{ for All Others} \end{array}$$

Dynamic Load Ratings C_n

Dynamic Load Ratings are used to establish the working life of spherical plain bearings or rod ends under Dynamic Load conditions. Use equivalent load features below.

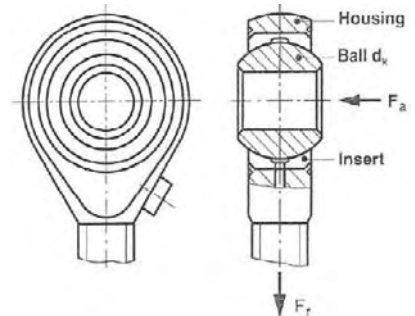
y factor

$\frac{F_a}{F_r}$.1	.2	.3	.4	.5
y	.8	1	1.5	2.5	3

$$F_{eq} = F_r + y \cdot F_a$$

F_r = Radial Load

F_a = Axial Load



For Variable Loads, PTI recommends using the max load for sizing / selection purposes.

Thermal & Load Type Service Factors

Rod Ends or Spherical Bearings that must operate in elevated temperatures or in load conditions that could be harsh, a service factor must be applied to insure proper sizing or selection. Use the factors and formula below to determine the max loads suggested.

Temperature Factor (f_T)

Temperature	80C (175°F)	100C(212°F)	150C (300°F)	200C (392°F)	250C (480°F)
Maintenance Free	1	1	1	0.8	0.5
Re-Lube Type	1	1	0.8	0.5	0.3

Load Type Service Factor (f_B)

Load Type	f _B
Steady / Uniform	1.0
Light Shock / Variable	0.5

Use the following formula to determine the max allowable load.

$$F_r (\text{max}) = C_0 \cdot f_T \cdot f_B$$

$$\text{also } F_a (\text{max}) = a \cdot F_r (\text{max})$$

If no bearing load is known in the application, the required Static Load Rating can be determined using the same formula re-written for the Static Load:

$$C_0 (\text{req}) \geq \frac{F_r}{f_B \cdot f_T}$$

For an expected Life Calculation, many factors contribute and an approximation is the general result, experience is also a good reference. For more details contact PTI.