INTERNATIONAL STANDARD

ISO 6982

Second edition
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Hydraulic fluid power — Cylinders — Rod end spherical eyes — Mounting dimensions

Transmissions hydrauliques — Vérins — Tenons à rotule d'extrémité de tige de piston — Dimensions d'interchangeabilité

INTERNATIONAL ISO

Reference number
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Foreword

ISO (the International Organization for Standardization) is a worldwide federation of national standards bodies (ISO member bodies). The work of preparing International Standards is normally carried out through ISO technical committees. Each member body interested in a subject for which a technical committee has been established has the right to be represented on that committee. International organizations, governmental and non-governmental, in liaison with ISO, also take part in the work. ISO collaborates closely with the International Electrotechnical Commission (IEC) on all matters of electrotechnical standardization.

Draft International Standards adopted by the technical committees are circulated to the member bodies for voting. Publication as an International Standard requires approval by at least 75 % of the member bodies casting a vote.

International Standard ISO 6982 was prepared by Technical Committee ISO/TC 131, *Fluid power systems*, Sub-Committee SC 3, *Cylinders*.

This second edition cancels and replaces the first edition (ISO 6982:1982), figure 1 and table 1 of which have been technically revised.

Annex A of this International Standard is for information only.

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Introduction

In hydraulic fluid power systems, power is transmitted and controlled through a fluid (liquid or gas) under pressure within an enclosed circuit.

One component of such systems is the fluid power cylinder. This is a device which converts power into linear mechanical force and motion. It consists of a movable element, i.e. a piston and piston rod, operating within a cylindrical bore.

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Hydraulic fluid power — Cylinders — Rod end spherical eyes — Mounting dimensions

1 Scope

This International Standard specifies the mounting dimensions required for interchangeability of rod end spherical eyes of hydraulic cylinders. These rod end spherical eyes have been designed specifically for use with cylinders manufactured in accordance with ISO 6020-1 and ISO 6022, but this does not limit their application.

The spherical bearing end eyes are used on piston rods of hydraulic cylinders for mechanically transmitting the cylinder force under oscillatory rotational and tilting movements. The design of the rod end spherical eyes is based on the maximum forces resulting from the specified internal diameter of the cylinders and pressures according to ISO 3320 and ISO 3322.

2 Normative references

The following standards contain provisions which, through reference in this text, constitute provisions of this International Standard. At the time of publication, the editions indicated were valid. All standards are subject to revision, and parties to agreements based on this International Standard are encouraged to investigate the possibility of applying the most recent editions of the standards indicated below. Members of IEC and ISO maintain registers of currently valid International Standards.

ISO 286-2:1988, *ISO system of limits and fits — Part 2: Tables of standard tolerance grades and limit deviations for holes and shafts.*

ISO 3320:1987, *Fluid power systems and components — Cylinder bores and piston rod diameters — Metric series.*

ISO 3322:1985, *Fluid power systems and components — Cylinders — Nominal pressures.*

ISO 5598:1985, *Fluid power systems and components — Vocabulary.*

ISO 6020-1:1981, *Hydraulic fluid power — Single rod cylinders — Mounting dimensions — 160 bar (16 000 kPa) series — Part 1: Medium series.*

ISO 6022:1981, *Hydraulic fluid power — Single rod cylinders — Mounting dimensions — 250 bar (25 000 kPa) series.*

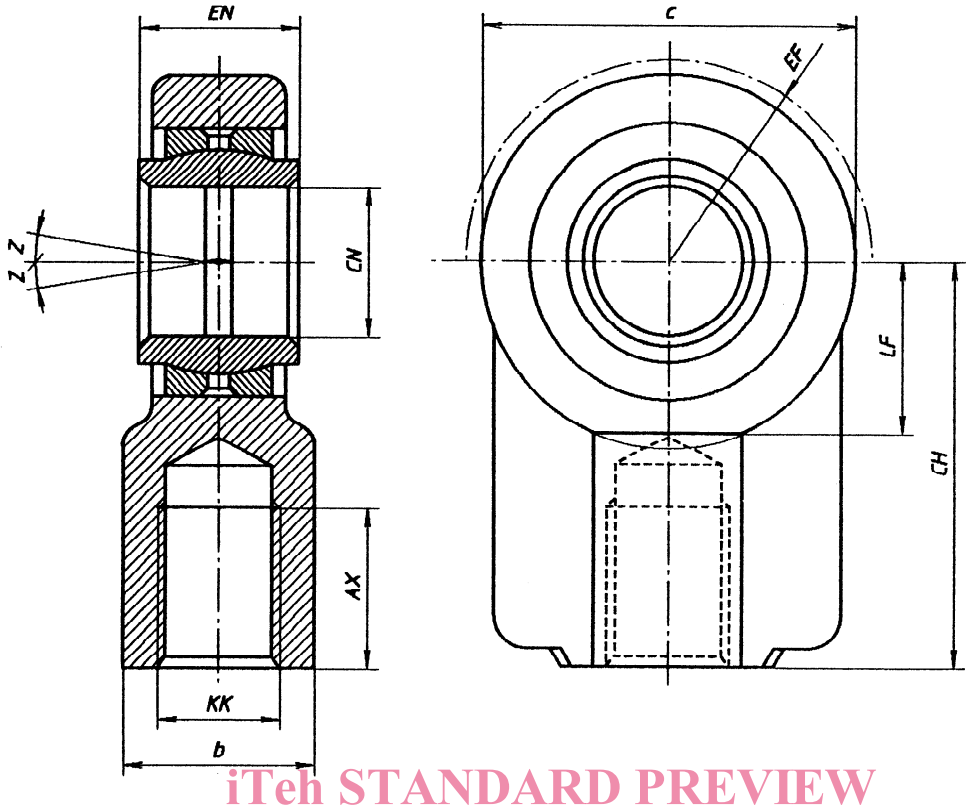
ISO 6124-2:1982, *Spherical plain radial bearings, joint type — Boundary dimensions — Part 2: Dimension series EW, bearings with extended inner ring.*

3 Definitions

For the purposes of this International Standard, the definitions given in ISO 5598 apply.

4 Mounting dimensions

See figure 1 and table 1.



NOTE — A suitable locking device shall be used.

Figure 1 — Rod end spherical eyes

Table 1 — Dimensions of rod end spherical eyes

Dimensions in millimetres

Type	Nominal force N	*CN* [1] H7[2]	*EN* [1] h12[2]	*KK*	*AX* min.	*CH*	*LF*	*c* max.	*EF*	*b*	Tilting angle *Z* [1] [3]
10	5 000	10	10	M10 × 1,25	14	37	14	32	16	15	
12	8 000	12	12	M12 × 1,25	17	38	14	32	16	16	
16	12 500	16	16	M14 × 1,5	19	44	18	40	20	21	
20	20 000	20	20	M16 × 1,5	23	52	22	50	25	25	
25	32 000	25	25	M20 × 1,5	29	65	27	62	32	30	
32	50 000	32	32	M27 × 2	37	80	32	76	40	38	
40	80 000	40	40	M33 × 2	46	97	41	97	50	47	
50	125 000	50	50	M42 × 2	57	120	50	118	63	58	
63	200 000	63	63	M48 × 2	64	140	62	142	71	70	4°
80	320 000	80	80	M64 × 3	86	180	78	180	90	90	
100	500 000	100	100	M80 × 3	96	210	98	224	112	110	
125	800 000	125	125	M100 × 3	113	260	120	290	160	135	
160	1 250 000	160	160	M125 × 4	126	310	150	346	200	165	
200	2 000 000	200	200	M160 × 4	161	390	195	460	250	215	
250	3 200 000	250	250	M200 × 4	205	530	265	640	320	300	
320	5 000 000	320	320	M250 × 6	260	640	325	750	375	360	

1) In ISO 6124-2, the symbol d is used instead of CN, the symbol B instead of EN, and the symbol α instead of Z.

2) See ISO 286-2.

3) Dimensions of the bearing and tilting angle Z are in accordance with ISO 6124-2.

5 General requirements

5.1 Material

5.1.1 Rod end spherical eyes shall be made of material having a minimum yield point $R_{p0,2}$ of 250 N/mm^2 and an elongation at rupture, A min., of at least 12 %.

5.1.2 The radial spherical plain bearings mounted in the rod ends shall be made of steel with a minimum surface hardness of 50 HRC.

5.2 Load capacity

All cross-sections shall be selected so that, under the maximum tensile load produced by the cylinder, the yield strength of the material used for the rod end is at least 2,5 times the maximum tensile load.

6 Mounting instructions

6.1 Shaft

Usually a tolerance of m6 shall be used for the shaft fitting the spherical plain bearing bore (see ISO 286-2). However, in exceptional cases (for example where there are difficulties in cylinder installation), a tolerance of f7 may be admitted. In this instance, a case-hardened shaft is recommended since movement will occur between the shaft and the bearing bore and lubrication should be carried out through the shaft.

6.2 Fitting

6.2.1 The specified tilting angle of $\pm$ 4° can still be obtained when the clevis inner faces abut the side faces of the inner ring of the spherical plain bearing.

6.2.2 The rod end spherical eye shall be screwed firmly against the piston rod shoulder before locking.

7 Example of ordering designation

A rod end spherical eye with a bore of $CN = 25$ mm and steel on steel surfaces shall be designated as:

Rod end ISO 6982 - 25

8 Identification statement (Reference to this International Standard)

Use the following statement in test reports, catalogues and sales literature when electing to comply with this International Standard:

"Cylinder rod end spherical eye mounting dimensions selected in accordance with ISO 6982:1992, *Hydraulic fluid power — Cylinders — Rod end spherical eyes — Mounting dimensions.*"

Annex A
(informative)

Bibliography

[1] ISO 6099:1985, *Fluid power systems and components — Cylinders — Identification code for mounting dimensions and mounting types.*

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