
International Standard



6982

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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

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Descriptors : hydraulic fluid power, hydraulic cylinders, dimensions, interchangeability, pistons, piston-rods, designation.

Price based on 3 pages

Foreword

ISO (the International Organization for Standardization) is a worldwide federation of national standards institutes (ISO member bodies). The work of developing International Standards is carried out through ISO technical committees. Every member body interested in a subject for which a technical committee has been set up 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.

Draft International Standards adopted by the technical committees are circulated to the member bodies for approval before their acceptance as International Standards by the ISO Council.

International Standard ISO 6982 was developed by Technical Committee ISO/TC 131, *Fluid power systems*, and was circulated to the member bodies in November 1981.

It has been approved by the member bodies of the following countries :

Austria	Hungary	Romania
Belgium	India	Spain
Brazil	Ireland	Sweden
Czechoslovakia	Italy	Switzerland
Egypt, Arab Rep. of	Japan	United Kingdom
Finland	Netherlands	USA
France	Norway	USSR
Germany, F.R.	Poland	

No member body expressed disapproval of the document.

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

0 Introduction

In 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.

1 Scope and field of application

This International Standard establishes 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 References

ISO/R 286, *ISO System of limits and fits — Part 1: General, tolerances and deviations.*

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

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

ISO 5598, *Hydraulic and pneumatic fluid power — Vocabulary.*¹⁾

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

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

ISO 6099, *Fluid power systems and components — Cylinders — Identification code for mounting dimensions and mounting types.*

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

3 Definitions

For definitions of terms used, see ISO 5598.

1) At present at the stage of draft.

4 Mounting dimensions

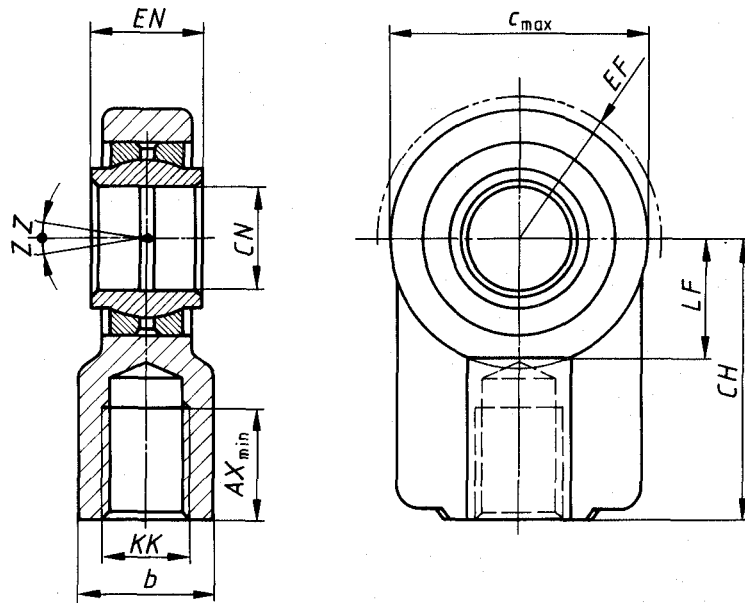


Figure — Rod end spherical eyes of hydraulic cylinder
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Table — Dimensions of rod end spherical eyes of hydraulic cylinders

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)}
12	8 000	12	12	M 12 × 1,25	17	38	14	32	16	16	4°
16	12 500	16	16	M 14 × 1,5	19	44	18	40	20	21	
20	20 000	20	20	M 16 × 1,5	23	52	22	50	25	25	
25	32 000	25	25	M 20 × 1,5	29	65	27	62	32	30	
32	50 000	32	32	M 27 × 2	37	80	32	76	40	38	
40	80 000	40	40	M 33 × 2	46	97	41	97	50	47	
50	125 000	50	50	M 42 × 2	57	120	50	118	63	58	
63	200 000	63	63	M 48 × 2	64	140	62	142	71	70	
80	320 000	80	80	M 64 × 3	86	180	78	180	90	90	
100	500 000	100	100	M 80 × 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 instead of CN the symbol *d*, instead of EN the symbol *B*, and instead of Z the symbol α are used.

2) See ISO/R 286.

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

5 General

5.1 Material

5.1.1 The rod ends are made of material having a minimum yield point $R_{p0,2}$ min. of 250 MPa¹⁾ and an elongation at rupture, A min., of at least 12 %.

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

5.2 Load capacity

Select all cross-sections so that under the maximum tensile load produced by the cylinder there is a minimum factor of safety of 2,5 on the yield strength of the material used for the rod end.

6 Mounting instructions

6.1 Shaft

Usually m6 will be used for the shaft fitting the spherical plain bearing bore (see ISO/R 286).

NOTE — However, in exceptional cases (for example, cylinder installation difficulties) a tolerance of f7 can be admitted. In this instance, a case-hardened shaft is recommended as movement will occur between

the shaft and the bearing bore. Lubrication must then be effected through the shaft.

6.2 Bearing

6.2.1 The specified tilting angle of $\pm 4^\circ$ 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 Screw these rod end spherical eyes firmly against the piston rod shoulder before locking them.

7 Example of ordering designation

Designate a rod end spherical eye with a bore of $CN = 25$ mm and steel on steel surfaces 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, *Hydraulic fluid power — Cylinders — Rod end spherical eyes — Mounting dimensions.*"

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1) 1 Pa = 1 N/m²; 1 MPa = 1 N/mm²