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Hydraulic fluid power — Mounting dimensions for accessories for single rod cylinders, 16 MPa (160 bar) compact series

Transmissions hydrauliques — Dimensions d'interchangeabilité des accessoires pour vérins, 16 MPa (160 bar) à simple tige, série compacte

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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.

The procedures used to develop this document and those intended for its further maintenance are described in the ISO/IEC Directives, Part 1. In particular, the different approval criteria needed for the different types of ISO documents should be noted. This document was drafted in accordance with the editorial rules of the ISO/IEC Directives, Part 2 (see www.iso.org/directives).

Attention is drawn to the possibility that some of the elements of this document may be the subject of patent rights. ISO shall not be held responsible for identifying any or all such patent rights. Details of any patent rights identified during the development of the document will be in the Introduction and/or on the ISO list of patent declarations received (see www.iso.org/patents).

Any trade name used in this document is information given for the convenience of users and does not constitute an endorsement.

For an explanation of the voluntary nature of standards, the meaning of ISO specific terms and expressions related to conformity assessment, as well as information about ISO's adherence to the World Trade Organization (WTO) principles in the Technical Barriers to Trade (TBT), see www.iso.org/iso/foreword.html.

This document was prepared by Technical Committee ISO/TC 131, *Fluid power systems*, Subcommittee SC 3, *Cylinders*.

This fourth edition cancels and replaces the third edition (ISO 8133:2014), which has been technically revised.

The main are as follows:

— The reference to ISO 3322 (withdrawn) has been replaced by ISO 2944 (Scope);

— Figure 1 has been replaced: bearings type E are used, not type W.

Any feedback or questions on this document should be directed to the user's national standards body. A complete listing of these bodies can be found at www.iso.org/members.html.

Introduction

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

One component of such systems is the fluid power cylinder. This is a device that 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.

Hydraulic fluid power — Mounting dimensions for accessories for single rod cylinders, 16 MPa (160 bar) compact series

1 Scope

This document specifies the mounting dimensions required for interchangeability of accessories for 16 MPa (160 bar) compact cylinders conforming to ISO 6020-2. The accessories have been designed specifically for use with cylinders manufactured in accordance with ISO 6020-2, but this does not limit their application[1)].

This document covers the following accessories, identified in accordance with ISO 6099:

— AP6 — rod eye spherical, female thread (see Figure 1 and Table 1);

— AB5 — clevis bracket, spherical eye, in angle (see Figure 2 and Table 2);

— AA6-L — pivot pin, spherical bearing, locking plate (see Figure 3 and Table 3);

— AL6 — locking plate for pivot pin (see Figure 4 and Table 4);

— AP2 — rod clevis, female thread (see Figure 5 and Table 5);

— AP4 — rod eye plain, female thread (see Figure 6 and Table 6);

— AB2 — eye bracket (see Figure 7 and Table 7);

— AB4 — clevis bracket, straight (see Figure 8 and Table 8);

— AA4-S — pivot pin, plain (split pins) (see Figure 9 and Table 9);

— AA4-R — pivot pin, plain (rings) (see Figure 10 and Table 10);

— AT4 — trunnion bracket (see Figure 11 and Table 11).

These accessories are used on hydraulic cylinders for mechanically transmitting the cylinder force. The design of these accessories is based on the maximum forces resulting from the specified internal diameters of the cylinders and pressures according to ISO 3320 and ISO 2944.

This document only applies to the dimensional criteria of products manufactured in conformity with this document; it does not apply to their functional characteristics.

2 Normative references

The following documents are referred to in the text in such a way that some or all of their content constitutes requirements of this document. For dated references, only the edition cited applies. For undated references, the latest edition of the referenced document (including any amendments) applies.

ISO 286-2, *Geometrical product specifications (GPS) — ISO code system for tolerances on linear sizes — Part 2: Tables of standard tolerance classes and limit deviations for holes and shafts*

ISO 2768-1, *General tolerances — Part 1: Tolerances for linear and angular dimensions without individual tolerance indications*

1) 1 bar = 0,1 MPa = 10^5 Pa; 1 MPa = 1 N/mm^2

ISO 5598, *Fluid power systems and components — Vocabulary*

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

3 Terms and definitions

For the purposes of this document, the terms and definitions given in ISO 5598 apply.

ISO and IEC maintain terminological databases for use in standardization at the following addresses:

— ISO Online browsing platform: available at https://www.iso.org/obp

— IEC Electropedia: available at https://www.electropedia.org/

4 Mounting dimensions

The mounting dimensions for accessories are shown in Figures 1 to 11 and are given in Tables 1 to 11.

5 Tolerances

5.1 Tolerances values are given in Figures 1 to 11.

5.2 Tolerances for other linear and angular dimensions shall be in accordance with the designation as described in ISO 2768-1.

6 Application instructions

6.1 Installation

6.1.1 A tolerance of f8 shall be used for plain bearing shafts in accordance with ISO 286-2. A tolerance of h6 should be used for the shaft fitting the spherical plain bearing bore. In exceptional cases (for example where there are difficulties in cylinder installation), a tolerance of f7 can be used. In this instance, a case-hardened shaft is recommended because movement occurs between the shaft and the bearing bore and lubrication is needed. Lubrication can be carried out through the shaft.

6.1.2 The specified tilting angle of ±3° for the spherical bearing can still be obtained even after the clevis is in place next to the side faces of the spherical plain bearing's inner ring.

6.1.3 The rod clevis and the rod eye shall be screwed firmly against the piston rod shoulder before locking.

6.2 Life spherical bearing

6.2.1 The life of the spherical plain bearing is influenced by many factors, such as the specific load, angle of oscillation, type of lubricant and frequency of lubrication.

6.2.2 The spherical plain bearings are designed to give an acceptable bearing life under normal operating conditions.

6.2.3 Where a constant unidirectional load is applied or other unusual operating conditions exist, consultation with the supplier is recommended.

6.3 Lubrication

6.3.1 Sufficient lubrication for the satisfactory performance of these accessories shall be provided.

6.3.2 The method and frequency of such lubrication depends on the particular operating conditions.

6.3.3 For maintenance-free mating parts, no additional lubrication is required.

7 Designation

Accessories conforming to this document shall be designated by the mounting type identification in accordance with ISO 6099, followed by "ISO 8133", followed by a dash, followed by the type (size) from the relevant table.

EXAMPLE 1 A rod eye spherical, female thread of type 20 (*CN* = 20) conforming to ISO 8133 is designated:

AP6 ISO 8133 - 20

EXAMPLE 2 A clevis bracket, spherical eye, in angle of type 20 (*CF* = 20) conforming to ISO 8133 is designated:

AB5 ISO 8133 - 20

EXAMPLE 3 A pivot pin, spherical bearing, locking plate of type 20 (*DK* = 20) conforming to ISO 8133 is designated:

AA6-L ISO 8133 - 20

EXAMPLE 4 A locking plate for pivot pin of type 20 (*DK* = 20) conforming to ISO 8133 is designated:

AL6 ISO 8133 - 20

EXAMPLE 5 A rod clevis, female thread of type 20 (*CK* = 20) conforming to ISO 8133 is designated:

AP2 ISO 8133 - 20

EXAMPLE 6 A rod eye plain, female thread of type 20 (*CK* = 20) conforming to ISO 8133 is designated:

AP4 ISO 8133 - 20

EXAMPLE 7 An eye bracket of type 20 (*CK* = 20) conforming to ISO 8133 is designated:

AB2 ISO 8133 - 20

EXAMPLE 8 A clevis bracket, straight of type 20 (*CK* = 20) conforming to ISO 8133 is designated:

AB4 ISO 8133 - 20

EXAMPLE 9 A pivot pin plain (plain split pins) of type 20 (*EK* = 20) conforming to ISO 8133 is designated:

AA4-S ISO 8133 - 20

EXAMPLE 10 A trunnion bracket of type 20 (*CR* = 20) conforming to ISO 8133 is designated:

AT4 ISO 8133 - 20

8 Identification statement (reference to this document)

It is strongly recommended to fabricators who elect to conform to this document to use the following statement in test reports, catalogues, and sales literature when electing to comply with this document:

"Cylinder accessory mounting dimensions conform to ISO 8133, *Hydraulic fluid power — Mounting dimensions for accessories for single rod cylinders, 16 MPa (160 bar) compact series.*"

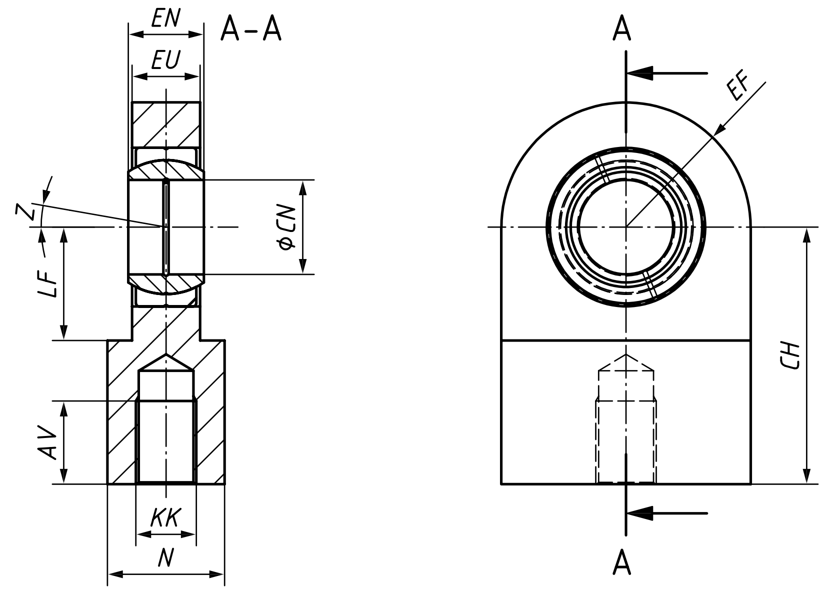
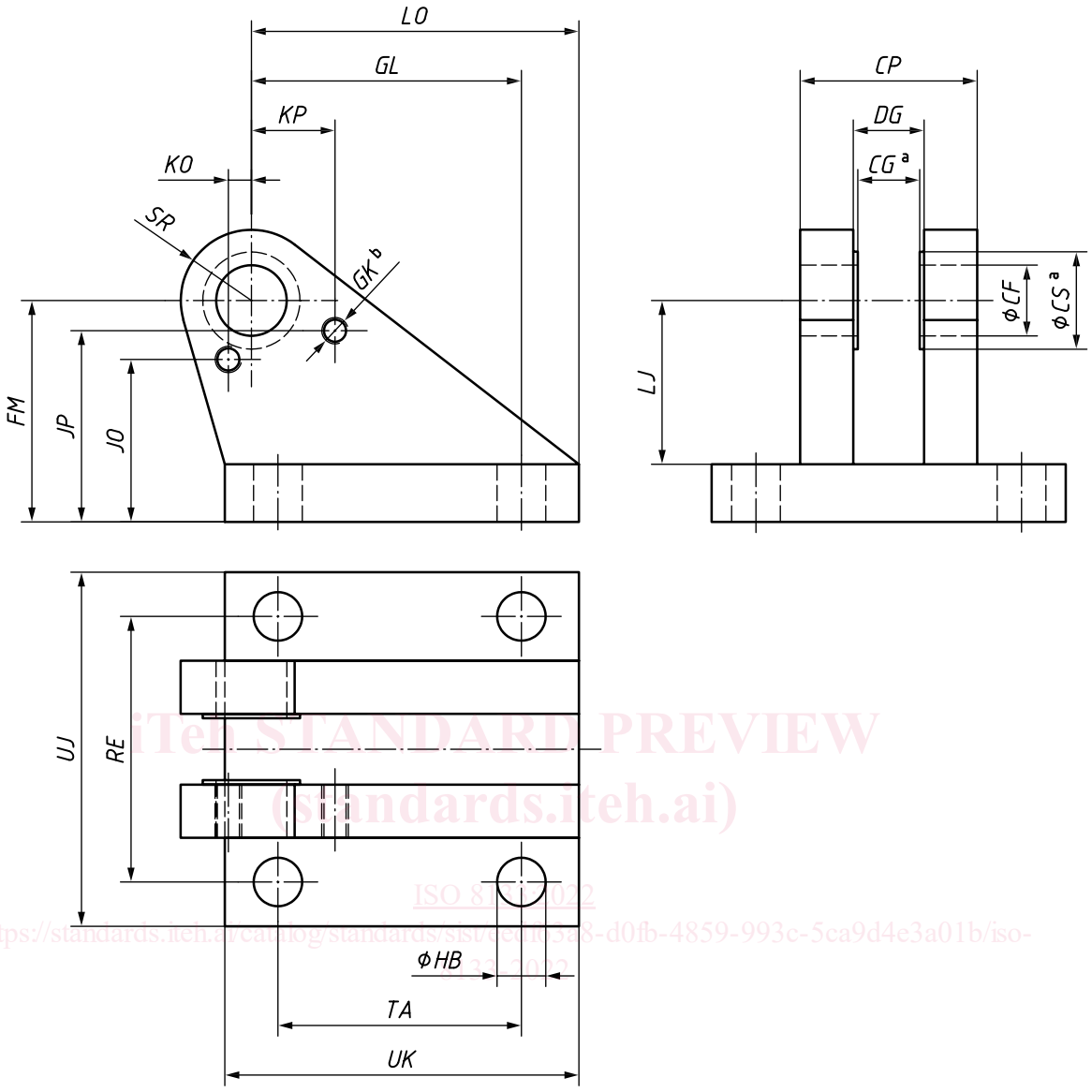


Figure 1 — AP6 — Rod eye spherical, female thread

Table 1 — Dimensions of AP6 — Rod eye spherical, female thread

Dimensions in millimetres

Type	Nominal force N	*N* max.	*KK* 6H	*CN* nom.	*CN* tol. µm	*EN* nom.	*EN* tol. µm	*EF* max.	*CH* js13	*AV* min.	*LF* min.	*EU* max.	Tilting angle *Z* min.
12	8 000	19	M10 × 1,25	12	0 −8	10	0 −120	18	42	15	16	8,5	3°
16	12 500	22	M12 × 1,25	16		14		23	48	17	20	11,5	
20	20 000	28	M14 × 1,5	20	0 −10	16		28	58	19	25	13,5	
25	32 000	31	M16 × 1,5	25		20		33	68	23	30	18	
30	50 000	37	M20 × 1,5	30		22		41	85	29	35	20	
40	80 000	47	M27 × 2	40	0 −12	28		51	105	37	45	24	
50	125 000	57	M33 × 2	50		35		61	130	46	58	31	
60	200 000	69	M42 × 2	60	0 −15	44	0 −150	80	150	57	68	39	
80	320 000	91	M48 × 2	80		55		102,5	185	64	92	48	
100	500 000	110	M64 × 3	100	0 −20	70	0 −200	120	240	86	116	57	
NOTE For spherical bearings see ISO 12240-1, type E.													



a Separate spacers are permitted to maintain *CG* and *CS* dimensions.

b Tapped holes are required only when using a pivot pin with a locking plate.

Figure 2 — AB5 — Clevis bracket, spherical eye, in angle