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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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ISO copyright office  
CP 401 • Ch. de Blandonnet 8  
CH-1214 Vernier, Geneva  
Phone: +41 22 749 01 11  
Email: [copyright@iso.org](mailto:copyright@iso.org)  
Website: [www.iso.org](http://www.iso.org)

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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](http://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](http://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](http://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](http://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<sup>1)</sup>.

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<sup>5</sup> Pa; 1 MPa = 1 N/mm<sup>2</sup>

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  $\pm 3^\circ$  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.