BRITISH STANDARD

BS ISO 8139:2009

Pneumatic fluid power — Cylinders, 1 000 kPa (10 bar) series — Mounting dimensions of rod-end spherical eyes

ICS 23.100.20

BSI British Standards

National foreword

This British Standard is the UK implementation of ISO 8139:2009. It supersedes BS ISO 8139:1991 which is withdrawn.

The UK participation in its preparation was entrusted to Technical Committee MCE/18/-/3, Cylinders.

A list of organizations represented on this committee can be obtained on request to its secretary.

This publication does not purport to include all the necessary provisions of a contract. Users are responsible for its correct application.

Compliance with a British Standard cannot confer immunity from legal obligations.

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ISO 8139 was prepared by Technical Committee ISO/TC 131, *Fluid power systems*, Subcommittee SC 3, *Cylinders*.

This third edition cancels and replaces the second edition (ISO 8139:1991), which has been technically revised.

Introduction

In pneumatic fluid power systems, power is transmitted and controlled through a gas under pressure within a circuit.

One component of such systems is the pneumatic 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.

INTERNATIONAL STANDARD **ISO 8139:2009(E)**

Pneumatic fluid power — Cylinders, 1 000 kPa (10 bar) series — Mounting dimensions of rod-end spherical eyes

1 Scope

This International Standard specifies the mounting dimensions required for interchangeability of rod-end spherical eyes of pneumatic cylinders. The rod-end spherical eyes have been designed specifically for use with 1 000 kPa [10 bar [1)]] series cylinders manufactured in accordance with ISO 6430, ISO 6432 and ISO 15552, but this does not limit their application.

The spherical bearing end eyes are used on piston rods of pneumatic 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 pressure according to ISO 6430, ISO 6432 and ISO 15552.

2 Normative references

The following referenced documents are indispensable for the application 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 5598, *Fluid power systems and components — Vocabulary*

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

ISO 6430, *Pneumatic fluid power — Single rod cylinders, 1 000 kPa (10 bar) series, with integral mountings, bores from 32 mm to 250 mm — Mounting dimensions*

ISO 6432, *Pneumatic fluid power — Single rod cylinders — 10 bar (1 000 kPa) series — Bores from 8 to 25 mm — Mounting dimensions*

ISO 15552, *Pneumatic fluid power — Cylinders with detachable mountings, 1 000 kPa (10 bar) series, bores from 32 mm to 320 mm — Basic, mounting and accessories dimensions*

3 Terms and definitions

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

The identification code for mounting dimensions and mounting types is in accordance with ISO 6099.

1) 1 bar = 100 kPa = 10^5 Pa; 1 Pa = 1 N/m^2.

4 Mounting dimensions

See Figure 1 and Table 1.

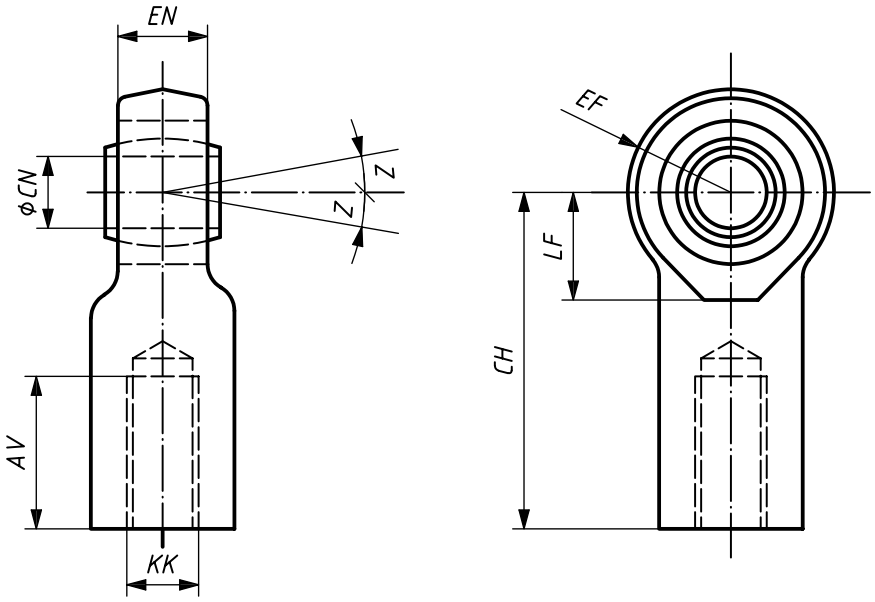

Figure 1 — AP6 — Rod-end spherical eyes

Table 1 — Dimensions of AP6 — Rod-end spherical eyes

Dimensions in millimetres

KK	*CN* H9	*EN* h12	*CH*	*LF* min.	*EF* max.	*AV* min.	**Tilting angle** *Z* min. degree
M4 × 0,7	5	8	27	10	9	10	4
M6 × 1	6	9	30	11	10	12	
M8 × 1,25	8	12	36	13	12	16	
M10 × 1,25	10	14	43	15	14	20	
M12 × 1,25	12	16	50	17	16	22	
M16 × 1,5	16	21	64	22	21	28	
M20 × 1,5	20	25	77	26	25	33	
M27 × 2	30	37	110	36	35	51	
M36 × 2	35	43	125	41	40	56	
M42 × 2	40	49	142	46	45	60	
M48 × 2	50	60	160	59	58	65	

5 Application instructions

5.1 Installation

5.1.1 Usually a tolerance of m6 (see ISO 286-2) is used for the shaft fitting the spherical plain bearing bore.

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 occurs between the shaft and the bearing bore. Lubrication shall then be effected through the shaft.

5.1.2 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.

5.1.3 The rod-end spherical eyes shall be locked with a locking nut.

5.2 Bearing life

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

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

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

5.3 Lubrication

5.3.1 Sufficient lubrication shall be provided for the satisfactory performance of the rod-end spherical eyes.

5.3.2 The method and frequency of such lubrication depend on the particular operating conditions.

6 Example of ordering designation

A rod-end spherical eye with a bore of CN = 20 mm and steel-on-steel surface shall be designated as follows:

Rod eye spherical ISO 8139 – 20

7 **Identification statement** (reference to this International Standard)

It is strongly recommended to manufacturers who have chosen to conform to this International Standard that the following statement be used in test reports, catalogues and sales literature:

"Pneumatic cylinder rod-end spherical eye mounting dimensions in accordance with ISO 8139:2009, *Pneumatic fluid power — Cylinders, 1 000 kPa (10 bar) series — Mounting dimensions of rod-end spherical eyes*."

Bibliography

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

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