INTERNATIONAL STANDARD

ISO 6020-2

Third edition
2006-02-15

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

Part 2: Compact series

Transmissions hydrauliques — Dimensions d'interchangeabilité des vérins 16 MPa (160 bar) à simple tige —

Partie 2: Série compacte

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.

International Standards are drafted in accordance with the rules given in the ISO/IEC Directives, Part 2.

The main task of technical committees is to prepare International Standards. 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.

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.

ISO 6020-2 was prepared by Technical Committee ISO/TC 131, *Fluid power systems*, Subcommittee SC 3, *Cylinders*.

This third edition of ISO 6020-2 cancels and replaces the second edition of ISO 6020-2 (ISO 6020-2:1991) and ISO 8138 (ISO 8138:1998), both of which have been technically revised.

ISO 6020 consists of the following parts, under the general title *Hydraulic fluid power — Mounting dimensions for single rod cylinders, 16 MPa (160 bar) series*:

— *Part 1: Medium series*

— *Part 2: Compact series*

— *Part 3: Compact series with bores from 250 mm to 500 mm*

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 cylinder. This is a device that converts power into linear mechanical force and motion. It consists of a moveable element, i.e. a piston and piston rod, operating within a cylindrical bore.

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

Part 2: Compact series

1 Scope

This part of ISO 6020 establishes metric mounting dimensions for compact series cylinders, 16 MPa [160 bar [1)]], as required for interchangeability of commonly-used hydraulic cylinders.

NOTE 1 This part of ISO 6020 allows manufacturers of hydraulic equipment flexibility in the design of metric cylinders and does not restrict technical development; however, it does provide basic guidelines.

NOTE 2 The compact series dimensions are most applicable to square head cylinders.

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 1179-1 [2)], *Connections for general use and fluid power — Ports and stud ends with ISO 228-1 threads with elastomeric or metal-to-metal sealing — Part 1: Threaded ports*

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

ISO 4395, *Fluid power systems and components — Cylinders — Piston rod thread dimensions and types*

ISO 5598 [3)], *Fluid power systems and components — Vocabulary*

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

ISO 6149-1, *Connections for fluid power and general use — Ports and stud ends with ISO 261 threads and O-ring sealing — Part 1: Ports with O-ring seal in truncated housing*

ISO 6162-1, *Hydraulic fluid power — Flange connectors with split or one-piece flange clamps and metric or inch screws — Part 1: Flange connectors for use at pressures of 3,5 MPa (35 bar) to 35 MPa (350 bar), DN 13 to DN 127*

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

2) To be published. (Revision of ISO 1179:1981)

3) Under revision. (Revision of ISO 5598:1985)

ISO 6162-2, *Hydraulic fluid power — Flange connectors with split or one-piece flange clamps and metric or inch screws — Part 2: Flange connectors for use at pressures of 35 MPa (350 bar) to 40 MPa (400 bar), DN 13 to DN 51*

ISO 8133, *Hydraulic fluid power — Single rod cylinders, 16 MPa (160 bar) compact series — Mounting dimensions for accessories*

3 Terms and definitions

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

4 Dimensions

4.1 Mounting dimensions for cylinders manufactured in accordance with this part of ISO 6020 shall be selected from Figures 1 through 13 and Tables 1 through 13.

4.2 Port and flange sizes and dimensions shall be selected from Table 14 and in the respective International Standards cited therein.

4.3 All the dimensions and methods of mounting in this part of ISO 6020 are identified by codes in conformance with ISO 6099.

5 Bore sizes

This part of ISO 6020 includes the following bore sizes, in millimetres, in accordance with ISO 3320:

25 — 32 — 40 — 50 — 63 — 80 — 100 — 125 — 160 — 200

NOTE Mounting dimensions for compact hydraulic single rod cylinders with bores from 250 mm to 500 mm are specified in ISO 6020-3.

6 Stroke tolerances

6.1 The tolerance on strokes $\leqslant$ 1 250 mm shall be $^{+2}_{0}$ mm.

6.2 Tolerances on strokes $>$ 1 250 mm shall be in accordance with the manufacturer's specification or an agreement between the manufacturer and user.

7 Mounting types

This part of ISO 6020 includes the following mounting types, in accordance with ISO 6099:

— ME 5: Head, rectangular (see Figure 2 and Table 2)

— ME 6: Cap, rectangular (see Figure 3 and Table 3)

— MP 1: Cap, fixed clevis (see Figure 4 and Table 4)

— MP 3: Cap, fixed plain eye (see Figure 5 and Table 5)

— MP 5: Cap, fixed eye with spherical bearing (see Figure 6 and Table 6)

— MS 2: Side lugs (see Figure 7 and Table 7)

— MT 1: Head, integral trunnion (male) (see Figure 8 and Table 8)

— MT 2: Cap, integral trunnion (male) (see Figure 9 and Table 9)

— MT 4: Intermediate fixed or movable trunnion (male) (see Figure 10 and Table 10)

— MX 1: Both ends studs or tie rods extended (see Figure 11 and Table 11)

— MX 2: Cap studs or tie rods extended (see Figure 12 and Table 12)

— MX 3: Head studs or tie rods extended (see Figure 13 and Table 13)

8 Piston rod characteristics

8.1 This part of ISO 6020 covers piston rods that have shouldered male thread ends; see Figure 1 and Table 1 for basic dimensions.

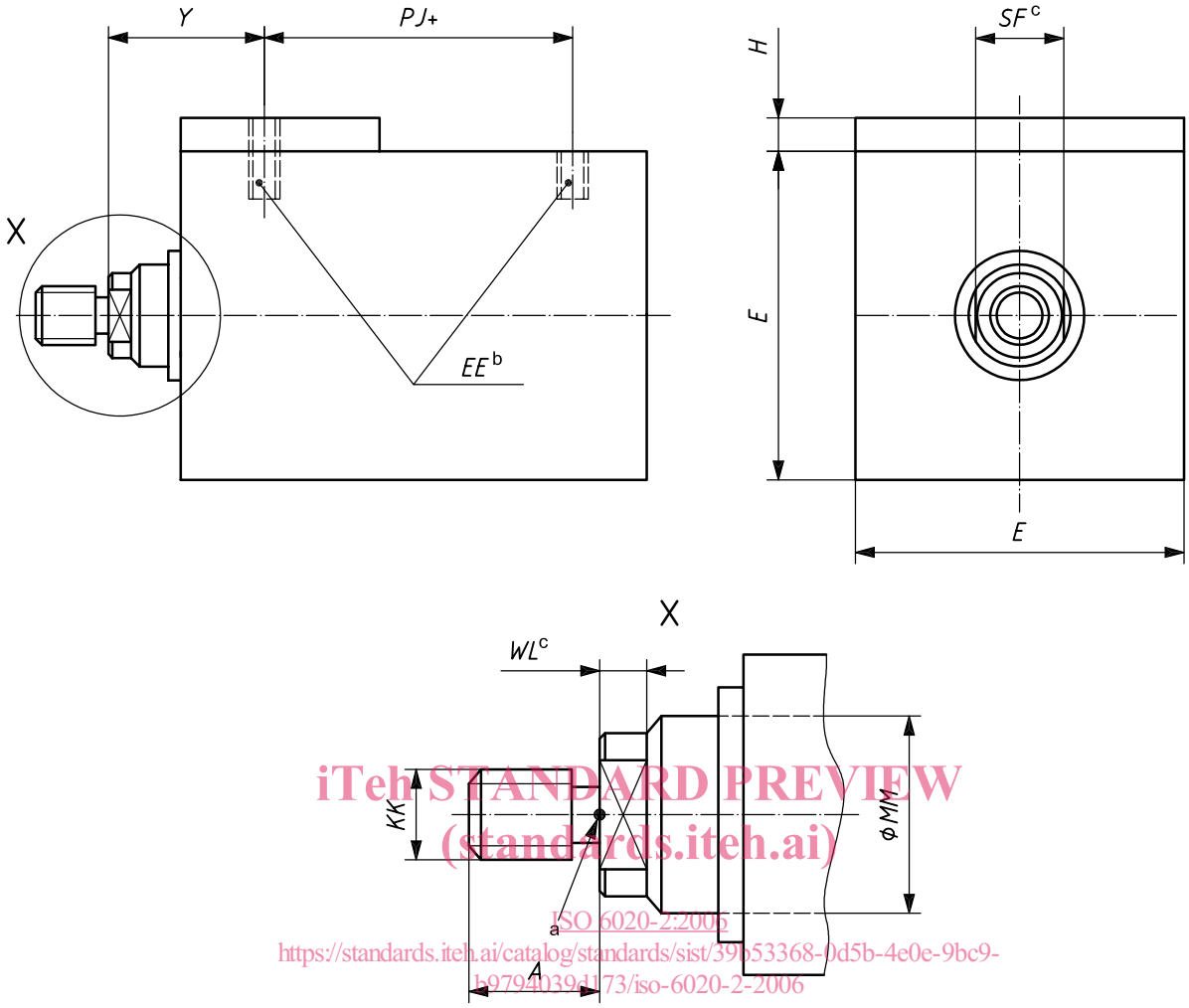
8.2 For rod end types, see ISO 4395.

8.3 For accessories, see ISO 8133.

9 Identification statement (reference to this part of ISO 6020)

It is strongly recommended to fabricators who elect to conform to this part of ISO 6020 to use the following statement in test reports, catalogues and sales literature:

"Interchangeable mounting dimensions selected in accordance with ISO 6020-2:2006, *Hydraulic fluid power — Mounting dimensions for single rod cylinders, 16 MPa (160 bar) series — Part 2: Compact series.*"



a Reference point.

b See Table 14 for port options.

c Dimensions *SF* and *WL* are controlled by ISO 4395.

Figure 1 — General dimensions

Table 1 — General dimensions

Dimensions in millimetres

Bore	Rod MM [a]	KK [a] 6g	A max.	H max.	E	Y [b] ± 2	PJ [c] ± 1,5
25	12	M10 × 1,25	14	5	40 ± 1,5	50	53
	18	M10 × 1,25 M14 × 1,5	14 18				
32	14	M12 × 1,25	16	5	45 ± 1,5	60	56
	22	M12 × 1,25 M16 × 1,5	16 22				
40	18	M14 × 1,5	18	—	63 ± 1,5	62	73
	28	M14 × 1,5 M20 × 1,5	18 28				
50	22	M16 × 1,5	22	—	75 ± 1,5	67	74
	36	M16 × 1,5 M27 × 2	22 36				
63	28	M20 × 1,5	28	—	90 ± 1,5	71	80
	45	M20 × 1,5 M33 × 2	28 45				
80	36	M27 × 2	36	—	115 ± 1,5	77	93
	56	M27 × 2 M42 × 2	36 56				
100	45	M33 × 2	45	—	130 ± 2	82	101
	70	M33 × 2 M48 × 2	45 63				
125	56	M42 × 2	56	—	165 ± 2	86	117
	90	M42 × 2 M64 × 3	56 85				
160	70	M48 × 2	63	—	205 ± 2	86	130
	110	M48 × 2 M80 × 3	63 95				
200	90	M64 × 3	85	—	245 ± 2	98	165
	140	M64 × 3 M100 × 3	85 112				

[a] If other piston rod diameters or other piston rod threads are required, use those identified in ISO 3320 and ISO 4395.

[b] The tolerance on dimension Y applies to strokes $\leqslant$ 1 250 mm. Tolerances on strokes $>$ 1 250 mm can be in accordance with the manufacturer's specification or an agreement between the manufacturer and user (see 6.2).

[c] The tolerance on dimension PJ shall be added to the tolerance on the stroke.