INTERNATIONAL STANDARD

ISO 6020-1

Third edition
2007-08-15

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

Part 1: Medium series

Transmissions hydrauliques — Dimensions d'interchangeabilité des vérins 16 MPa (160 bar) à simple tige —
Partie 1: Série moyenne

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 6020-1 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 6020-1:1998) and ISO 8135:1999, 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 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 single rod cylinders, 16 MPa (160 bar) series —

Part 1: Medium series

1 Scope

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

The medium series dimensions are applicable to round head cylinders with bores from 25 mm to 200 mm and to both round and square head cylinders with bores larger than 200 mm, thus allowing a wider range of applications.

NOTE This part of ISO 6020 allows manufacturers of hydraulic equipment flexibility in the design of 16 MPa (160 bar) cylinders and does not restrict technical development; however, it does provide basic guidelines.

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, *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 3320:1987, *Fluid power systems and components — Cylinder bores and pistons rod diameters — Metric series*

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

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

ISO 6099:2001, *Fluid power systems and components — Cylinders — Identification code for mounting dimensions and mounting types*

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

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*

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*

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

ISO 6164, *Hydraulic fluid power — Four-screw, one-piece square-flange connections for use at pressures of 25 MPa and 40 MPa (250 bar and 400 bar)*

ISO 8132, *Hydraulic fluid power — Single rod cylinders, 16 MPa (160 bar) medium and 25 MPa (250 bar) 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 The mounting dimensions for cylinders manufactured in accordance with this part of ISO 6020 shall be selected from Figures 1 to 6 and Tables 1 to 6 inclusive.

4.2 The dimensions for ports and flanges shall be selected from Table 7 and the relevant International Standards cited therein.

4.3 All dimensions and mounting types in this part of ISO 6020 are labelled with codes in accordance with ISO 6099.

5 Bore sizes

This part of ISO 6020 covers the following bore sizes, expressed in millimetres, in accordance with ISO 3320:1987, Table 1:

25 — 32 — 40 — 50 — 63 — 80 — 100 — 125 — 160 — 200 — 250 — 320 — 400 — 500

6 Stroke tolerances

Tolerances on stroke shall be in accordance with Table 9.

7 Mounting types

This part of ISO 6020 includes the following mounting types, identified in accordance with ISO 6099:2001, Table 2:

a) MF 1 — Head, rectangular flange;

b) MF 2 — Cap, rectangular flange;

c) MF 3 — Head, circular flange;

d) MF 4 — Cap, circular flange;

e) MP 3 — Cap, fixed plain eye;

f) MP 4 — Cap, detachable plain eye;

g) MP 5 — Cap, fixed eye with spherical bearing;

h) MP 6 — Cap, detachable eye with spherical bearing;

i) MS 2 — Side lugs;

j) MT 4 — Intermediate fixed or movable trunnion (male).

8 Piston rod characteristics

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

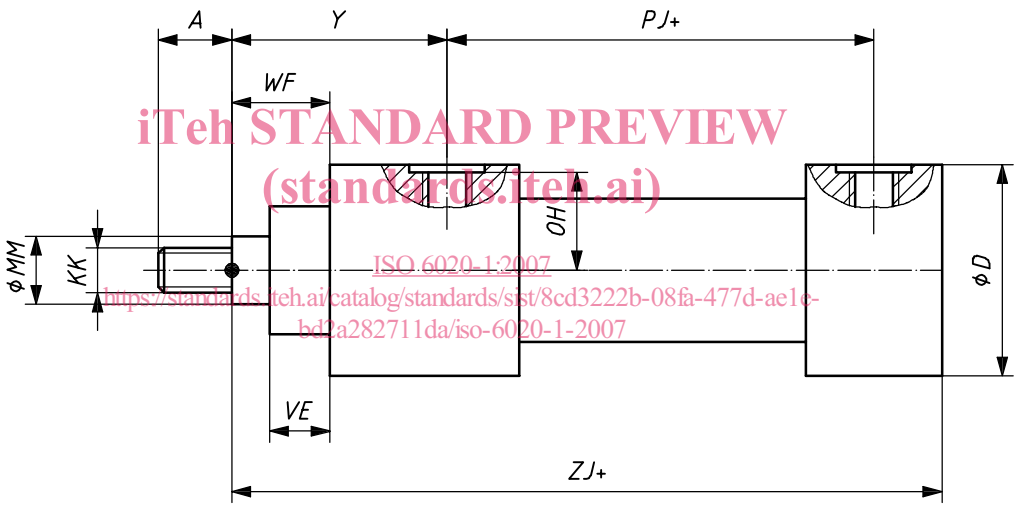
8.2 For rod end types, see ISO 4395.

8.3 Accessory mounting dimensions shall be selected in accordance with ISO 8132.

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

It is strongly recommended to manufacturers who have chosen to conform to this part of ISO 6020 that the following statement be used in test reports, catalogues and sales literature:

"Medium series hydraulic single rod cylinders for use at 16 MPa (160 bar) have been selected in accordance with ISO 6020-1:2007, *Hydraulic fluid power — Mounting dimensions for single rod cylinders, 16 MPa (160 bar) series — Part 1: Medium series.*"



NOTE Rod end types are controlled by ISO 4395.

Figure 1 — General dimensions

Table 1 — General dimensions

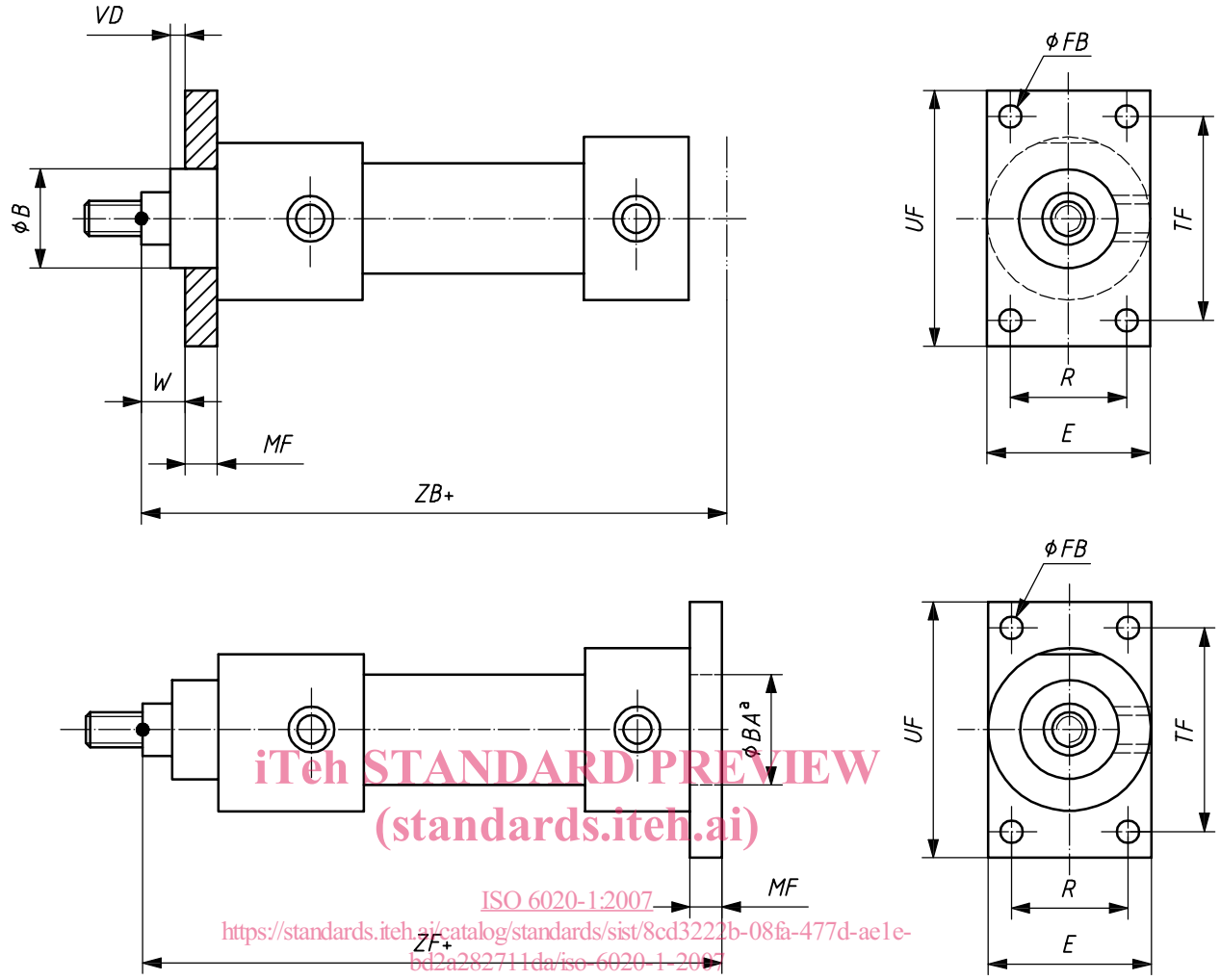
Dimensions in millimetres

Bore	Rod *MM*	*ZJ* [a]	*KK* 6g	*A* max.	*Y* [a]	*PJ* [a]	*D* max.	*OH* [b]	*VE* max.	*WF* [a]
25	14	150	M12 × 1,25	16	58	77	56	25,5	15	28
	18		M12 × 1,25	16						
			M14 × 1,5	18						
32	18	170	M14 × 1,5	18	64	89	67	30	19	32
	22		M14 × 1,5	18						
			M16 × 1,5	22						
40	22	190	M16 × 1,5	22	71	97	78	35	19	32
	28		M16 × 1,5	22						
			M20 × 1,5	28						
50	28	205	M20 × 1,5	28	72	111	95	44	24	38
	36		M20 × 1,5	28						
			M27 × 2	36						
63	36	224	M27 × 2	36	82	117	116	54	29	45
	45		M27 × 2	36						
			M33 × 2	45						
80	45	250	M33 × 2	45	91	134	130	62	36	54
	56		M33 × 2	45						
			M42 × 2	56						
100	56	300	M42 × 2	56	108	162	158	75	37	57
	70		M42 × 2	56						
			M48 × 2	63						
125	70	325	M48 × 2	63	121	174	192	92	37	60
	90		M48 × 2	63						
			M64 × 3	85						
160	90	370	M64 × 3	85	143	191	238	115	41	66
	110		M64 × 3	85						
			M80 × 3	95						
200	110	450	M80 × 3	95	190	224	285	138	45	75
	140		M80 × 3	95						
			M100 × 3	112						
250	140	550	M100 × 3	112	—	—	365	—	64	96
	180		M100 × 3	112						
			M125 × 4	125						
320	180	660	M125 × 4	125	—	—	455	—	71	108
	220		M125 × 4	125						
			M160 × 4	160						
400	220	740	M160 × 4	160	—	—	565	—	90	130
	280		M160 × 4	160						
			M200 × 4	200						
500	280	890	M200 × 4	200	—	—	645	—	110	163
	360		M200 × 4	200						
			M250 × 6	250						

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

[a] Tolerances for dimensions *ZJ*, *WF*, *Y* and *PJ* are dependent on stroke; see Table 8.

[b] Dimension *OH* is optional and only pertains to threaded ports.



[a] Optional.

Figure 2 — MF 1 — Head, rectangular flange and MF 2 — Cap, rectangular flange

Table 2 — Dimensions of rectangular flange mounting types MF 1 and MF 2

Dimensions in millimetres

Bore	*FB* H13	*TF* js13	*R* js13	*VD* min.	*W* [a]	*ZF* [a]	*ZB* max.	*BA*, *B* H8/f8	*UF* max.	*E* max.	*MF* js13
25	6,6	69,2	28,7	3	16	162	158	32	85	60	12
32	9	85	35,2	3	16	186	178	40	105	70	16
40	9	98	40,6	3	16	206	198	50	115	80	16
50	11	116,4	48,2	4	18	225	213	60	140	100	20
63	13,5	134	55,5	4	20	249	234	70	160	120	25
80	17,5	152,5	63,1	4	22	282	260	85	185	135	32
100	22	184,8	76,5	5	25	332	310	106	225	160	32
125	22	217,1	90,2	5	28	357	335	132	255	195	32

[a] Tolerances for dimensions *W* and *ZF* are dependent on stroke; see Table 8.