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Hydraulic fluid power — Single rod, short-stroke cylinders with bores from 32 mm to 100 mm for use at 10 MPa (100 bar) — Mounting dimensions

*Transmissions hydrauliques — Vérins course courte à simple tige,
d'alésages 32 mm à 100 mm, pour utilisation à 10 MPa (100 bar) —
Dimensions d'interchangeabilité*

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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 16656 was prepared by Technical Committee ISO/TC 131, *Fluid power systems*, Subcommittee SC 3, *Cylinders*.

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.

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1 Scope

This International Standard establishes mounting dimensions for single rod short-stroke cylinders with bores from 32 mm to 100 mm for use at 10 MPa (100 bar¹⁾), as required for interchangeability of these commonly used hydraulic cylinders.

NOTE 1 This International Standard is intended to provide basic guidelines while allowing manufacturers of hydraulic equipment flexibility in the design of cylinders and not restricting technical development.

NOTE 2 The dimensions of these cylinders are most likely to require a minimum of space for mounting.

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 273, *Fasteners — Clearance holes for bolts and screws*

ISO 965-3, *ISO general purpose metric screw threads — Tolerances — Part 3: Deviations for constructional screw threads*

ISO 1179-1²⁾, *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 4393, *Fluid power systems and components — Cylinders — Basic series of piston strokes*

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

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 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*

1) 1 bar = 0,1 MPa = 10^5 Pa; 1 Pa = 1 N/m²

2) To be published.

3 Terms and definitions

For the purposes of this International Standard, the terms and definitions given in ISO 5598 and the following apply.

3.1

mounting

method by which a component, piping or system is fastened

NOTE Definition which will be included in the next revision of ISO 5598.

4 Bore sizes

This International Standard provides for the following bore sizes, in millimetres, in accordance with ISO 3320:

32 – 40 – 50 – 63 – 80 – 100

5 Nominal strokes

Nominal strokes in accordance with ISO 4393 shall be selected from those given in Table 1.

Table 1 — Nominal strokes and tolerance

Dimensions in millimetres

Nominal strokes	Tolerance
5, 10, 16, 20, 25, 32, 40, 50	+1 0

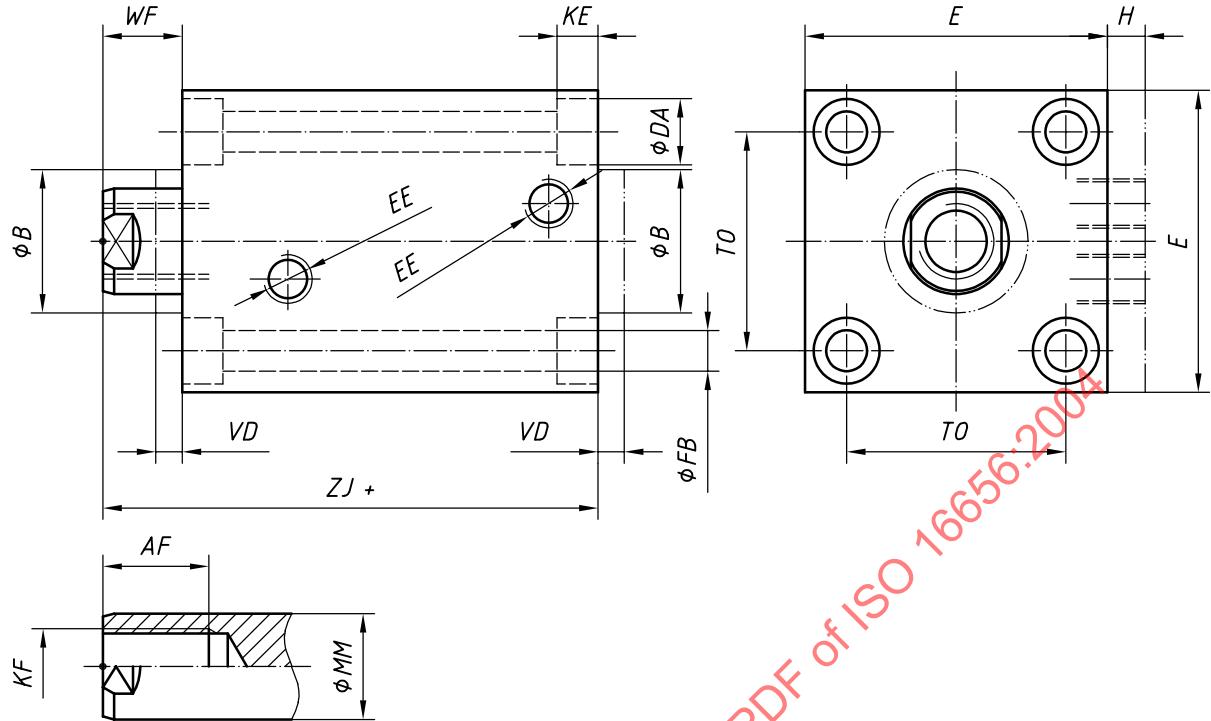
6 Piston rod characteristics

This International Standard covers piston rods that have a shouldered male thread end and female thread end (see Figures 1 and 2).

7 Dimensions

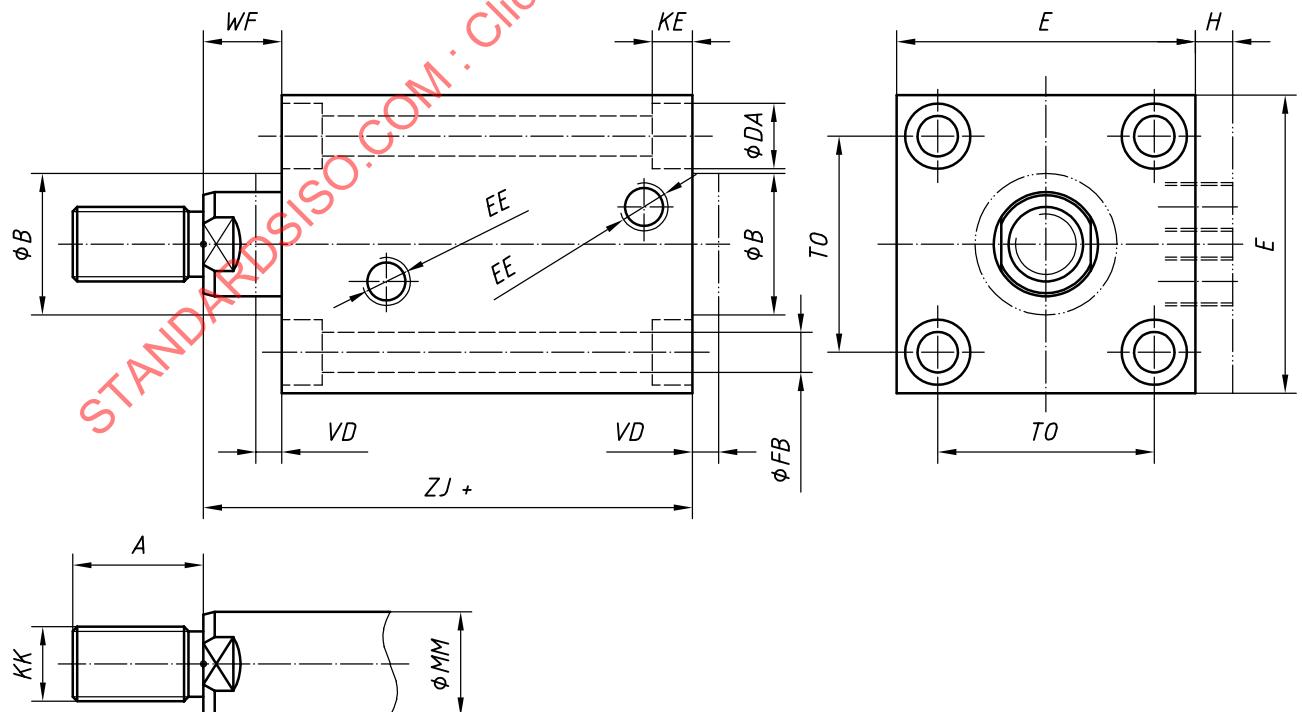
Mounting dimensions for cylinders manufactured in accordance with this International Standard shall be selected from Figures 1 and 2 and Table 2.

Identification codes for mounting dimensions and mounting types are in accordance with ISO 6099.



NOTE Pilot extension is optional. The dimensions B and VD should be used if pilot extensions are needed.

Figure 1 — Body, through bolt hole mounting (MB1) — Female threaded rod



NOTE Pilot extension is optional. The dimensions B and VD should be used if pilot extensions are needed.

Figure 2 — Body, through bolt hole mounting (MB1) — Male threaded rod

Table 2 — Dimensions of through bolt hole body mounting (MB1), male and female threaded rod

Dimensions en millimètres

Bore	MM ^a	KF ^b 6H	AF ^b	KK ^{b, c} 6g	A ^b	WF	DA	KE	H	ZJ
						± 0,5	min.	min.	max.	± 1
32	18	M12 × 1,25	16	M14 × 1,5	18	10	11	6,6	7	64
40	22	M16 × 1,5	22	M16 × 1,5	22	10	15	8,6	7	65
50	28	M20 × 1,5	28	M20 × 1,5	28	11	18	10,6	7	71
63	36	M27 × 2	36	M27 × 2	36	13	20	12,6	7	80
80	45	M30 × 2	40	M33 × 2	45	17	26	16,6	10	95
100	56	M36 × 2	50	M42 × 2	56	26	26	16,6	10	122

Bore	EE		E	FB ^d	TO		B ^e	VD ^e
	ISO 6149-1 port	ISO 1179-1 port	max.		nom.	tol.		max.
32	M14 × 1,5	G 1/8	63	6,6	47	± 0,3	36	3
40	M14 × 1,5	G 1/8	71	9	52	± 0,3	43	3
50	M14 × 1,5	G 1/4	81	11	58	± 0,3	53	3
63	M14 × 1,5	G 1/4	97	13,5	69	± 0,3	66	3
80	M18 × 1,5	G 1/4	117	17,5	86	+ 0,5	83	3
100	M18 × 1,5	G 3/8	142	17,5	106	± 0,5	103	3

^a See ISO 3320.^b See ISO 4395.^c See ISO 965-3.^d See ISO 273.^e Pilot extension is optional. These dimensions should be used if pilot extensions are needed.

8 Identification statement (reference to this International Standard)

Use the following statement in test reports, catalogues and sales literature when electing to comply with this International Standard:

“Mounting dimensions for single rod short-stroke cylinders selected in accordance with ISO 16656, *Hydraulic fluid power — Single rod, short-stroke cylinders with bores from 32 mm to 100 mm for use at 10 MPa (100 bar) — Mounting dimensions*.”