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

**Part 1:
Medium series**

iTeh STANDARD PREVIEW

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

Partie 1: Série moyenne

[ISO 6020-1:1998](#)

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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.

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.

International Standard ISO 6020-1 was prepared by ISO Technical Committee 131, *Fluid power systems*, Subcommittee SC 3, *Cylinders*.

This second edition cancels and replaces the first edition (ISO 6020-1:1981) which has 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*

Annex A of this part of ISO 6020 is given for information only.

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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 which 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.

Two mounting standards have been provided to meet the needs required in the application of interchangeable cylinders. This part of ISO 6020 is one of three parts relating to mounting dimensions for 16 MPa (160 bar) hydraulic cylinders. Of the other parts of ISO 6020, ISO 6020-2, relates to the compact series and ISO 6020-3 relates to compact series cylinders with larger bores.

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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 16 MPa [160 bar¹⁾] medium series cylinders 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 or square head cylinders with bores larger than 200 mm, thus allowing a wider range of applications. They admit larger ports with longer cushions that are particularly suitable for applications requiring higher velocity and rapid decelerations.

NOTE — This part of ISO 6020 allows manufacturers of hydraulic equipment, freedom in the design of metric cylinders and does not restrict technical development but does provide basic guidelines.

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2 Normative references

The following standards contain provisions which, through reference in this text, constitute provisions of this part of ISO 6020. At the time of publication, the editions indicated were valid. All standards are subject to revision, and parties to agreements based on this part of ISO 6020 are encouraged to investigate the possibility of applying the most recent editions of the standards indicated below. Members of IEC and ISO maintain registers of currently valid International Standards.

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

ISO 4395:1978, *Fluid power systems and components — Cylinders — Piston rod thread dimensions and types.*

ISO 5598:1985, *Fluid power systems and components — Vocabulary.*

ISO 6099:1985, *Fluid power systems and components — Cylinders — Identification code for mounting dimensions and mounting types.*

ISO 6149-1:1993, *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 = 10⁵ Pa; 1 MPa = 1 N/mm²

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

ISO 6162-1:—³⁾, *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 6164:1994, *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 8135:—⁴⁾, *Hydraulic fluid power — Single rod cylinders, 16 MPa (160 bar) medium and 25 MPa (250 bar) series — Tolerances.*

3 Definitions

For the purposes of this part of ISO 6020, the definitions of ISO 5598 and the following apply:

3.1 piston rod: Element that transmits mechanical force and motion from the piston.

4 Dimensions

Select dimensions for cylinders manufactured in accordance with this part of ISO 6020 from tables 1 to 6, inclusive. Select dimensions for ports and flanges from table 7 and the relevant International Standards cited therein.

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

All cylinder tolerances shall be in accordance with ISO 8135.

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5 Bore sizes

This part of ISO 6020 includes the following bore sizes, in millimetres, for this medium series:

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

6 Mounting styles

This part of ISO 6020 includes the following mounting styles:

- MF1: Head rectangular flange mounting (see figure 2 and table 2)
- MF2: Cap rectangular flange mounting (see figure 2 and table 2)
- MF3: Head circular flange mounting (see figure 3 and table 3)
- MF4: Cap circular flange mounting (see figure 3 and table 3)
- MP3: Cap fixed eye mounting (see figure 4 and table 4)
- MP4: Cap detachable eye mounting (see figure 4 and table 4)
- MP5: Cap fixed eye with spherical plain bearing mounting (see figure 4 and table 4)
- MP6: Cap detachable eye with spherical plain bearing mounting (see figure 4 and table 4)
- MS2: Side lugs mounting (see figure 5 and table 5)
- MT4: Intermediate fixed or movable trunnion (male) mounting (see figure 6 and table 6)

3) To be published. (Partial revision of ISO 6162:1994)

4) To be published. (Revision of ISO 8135:1986)

7 Piston rod characteristics

7.1 This part of ISO 6020 covers piston rods having a shouldered male thread end; see figure 1 and table 1 for basic dimensions.

7.2 Internally threaded rod ends shall be in conformance with ISO 4395.

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

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

"Interchangeable cylinder mounting dimensions selected in accordance with ISO 6020-1, *Hydraulic fluid power — Mounting dimensions for single rod cylinders, 16 MPa (160 bar) series — Part 1: Medium series.*"

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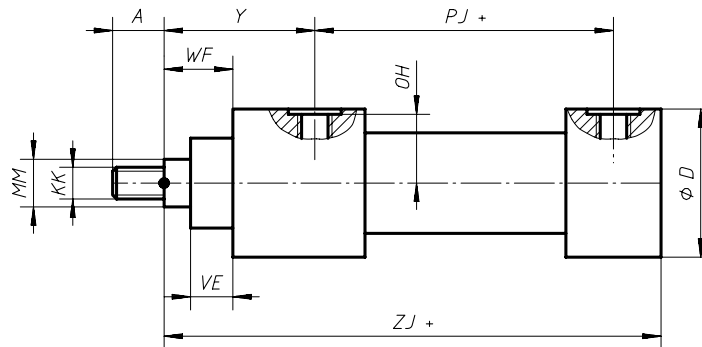


Figure 1 — General dimensions

Table 1 — General dimensions

Dimensions in millimetres

| Bore | VE | WF | ZJ | KK | MM | A | Y | PJ | D | OH ¹⁾ |
|------|----|----|-----|------------|----|----|-----|-----|-----|------------------|
| 25 | 15 | 28 | 150 | M12 × 1,25 | 16 | 16 | 58 | 77 | 56 | 25,5 |
| | | | | M12 × 1,25 | 18 | 16 | | | | |
| | | | | M14 × 1,5 | 18 | 18 | | | | |
| 32 | 19 | 32 | 170 | M14 × 1,5 | 18 | 18 | 64 | 89 | 67 | 30 |
| | | | | M14 × 1,5 | 22 | 18 | | | | |
| | | | | M16 × 1,5 | 22 | 22 | | | | |
| 40 | 19 | 32 | 190 | M16 × 1,5 | 22 | 22 | 71 | 97 | 78 | 35 |
| | | | | M16 × 1,5 | 28 | 22 | | | | |
| | | | | M20 × 1,5 | 28 | 28 | | | | |
| 50 | 24 | 38 | 205 | M20 × 1,5 | 28 | 28 | 72 | 111 | 95 | 44 |
| | | | | M20 × 1,5 | 36 | 28 | | | | |
| | | | | M27 × 2 | 36 | 36 | | | | |
| 63 | 29 | 45 | 224 | M27 × 2 | 36 | 36 | 82 | 117 | 116 | 54 |
| | | | | M27 × 2 | 45 | 36 | | | | |
| | | | | M33 × 2 | 45 | 45 | | | | |
| 80 | 36 | 54 | 250 | M33 × 2 | 45 | 45 | 91 | 134 | 130 | 62 |
| | | | | M33 × 2 | 56 | 45 | | | | |
| | | | | M42 × 2 | 56 | 56 | | | | |
| 100 | 37 | 57 | 300 | M42 × 2 | 56 | 56 | 108 | 162 | 158 | 75 |
| | | | | M42 × 2 | 70 | 56 | | | | |
| | | | | M48 × 2 | 63 | 63 | | | | |
| 125 | 37 | 60 | 325 | M48 × 2 | 70 | 63 | 121 | 174 | 192 | 92 |
| | | | | M48 × 2 | 90 | 63 | | | | |
| | | | | M64 × 3 | 85 | 85 | | | | |

Table 1 (concluded)

Dimensions in millimetres

| Bore | VE | WF | ZJ | KK | MM | A | Y | PJ | D | OH ¹⁾ |
|------|-----|-----|-----|----------|-----|-----|-----|-----|-----|------------------|
| 160 | 41 | 66 | 370 | M64 × 3 | 90 | 85 | 143 | 191 | 238 | 115 |
| | | | | M64 × 3 | 110 | 85 | | | | |
| | | | | M80 × 3 | | 95 | | | | |
| 200 | 45 | 75 | 450 | M80 × 3 | 110 | 95 | 190 | 224 | 285 | 138 |
| | | | | M80 × 3 | 140 | 95 | | | | |
| | | | | M100 × 3 | | 112 | | | | |
| 250 | 64 | 96 | 550 | M100 × 3 | 140 | 112 | — | — | 365 | — |
| | | | | M100 × 3 | 180 | 112 | | | | |
| | | | | M125 × 4 | | 125 | | | | |
| 320 | 71 | 108 | 660 | M125 × 4 | 180 | 125 | — | — | 455 | — |
| | | | | M125 × 4 | 220 | 125 | | | | |
| | | | | M160 × 4 | | 160 | | | | |
| 400 | 90 | 130 | 740 | M160 × 4 | 220 | 160 | — | — | 565 | — |
| | | | | M160 × 4 | 280 | 160 | | | | |
| | | | | M200 × 4 | | 200 | | | | |
| 500 | 110 | 163 | 890 | M200 × 4 | 280 | 200 | — | — | 645 | — |
| | | | | M200 × 4 | 360 | 200 | | | | |
| | | | | M250 × 6 | | 250 | | | | |

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

1) Dimension OH is optional and only pertains to threaded ports.