INTERNATIONAL STANDARD

**ISO 8138**

Second edition
1998-06-15

# Hydraulic fluid power — Single rod cylinders, 16 MPa (160 bar) compact series — Port dimensions

*Transmissions hydrauliques — Vérins 16 MPa (160 bar) série compacte à simple tige — Dimensions des orifices*

## 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 8138 was prepared by ISO/TC 131, *Fluid power systems*, Subcommittee SC 3, *Cylinders*.

This second edition cancels and replaces the first edition (ISO 8138:1986) which has been technically revised.





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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.

# Hydraulic fluid power — Single rod cylinders, 16 MPa (160 bar) compact series — Port dimensions

## 1 Scope

This International Standard establishes port dimensions[1)] for 16 MPa (160 bar[2)]) compact series cylinders as required for interchangeability of commonly used hydraulic cylinders.

NOTE — This International Standard allows manufacturers of hydraulic equipment, freedom in design of metric cylinders; it does not restrict technical development but provides basic guidelines.

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

This International Standard will be incorporated into the next edition of ISO 6020-2.



## 2 Normative references

The following standards contain provisions which, through reference in this text, constitute provisions of this International Standard. At the time of publication, the editions indicated were valid. All standards are subject to revision, and parties to agreements based on this International Standard 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:—[3)], *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 5598:1985, *Fluid power systems and components — Vocabulary.*

ISO 6020-2:1991, *Hydraulic fluid power — Mounting dimensions for single rod cylinders, 16 MPa (160 bar) series — Part 2: Compact series.*

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*.

ISO 6162:1994, *Hydraulic fluid power — Four-screw split-flange connections for use at pressures of 2,5 MPa to 40 MPa (25 bar to 400 bar) — Type I metric series and type II inch series*.

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1) This International Standard admits all ISO approved ports that are appropriate to fluid power applications.

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

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

## 3 Definitions

For the purposes of this International Standard, the definitions given in ISO 5598 apply. The following definitions are repeated from ISO 5598 for information:

**3.1 cylinder**
Device which converts fluid energy into linear mechanical force and motion.

[ISO 5598:1985]

**3.2 cylinder bore**
Internal diameter of the cylinder body.

[ISO 5598:1985]

**3.3 port**
Terminus of a fluid passage in a component to which can be connected pipelines for the transmission of fluid to or from the component.

[ISO 5598:1985]

## 4 Dimensions



Port sizes and dimensions for cylinders manufactured in accordance with ISO 6020-2 shall be selected from table 1 (see figure 1).



## 5 Bore sizes

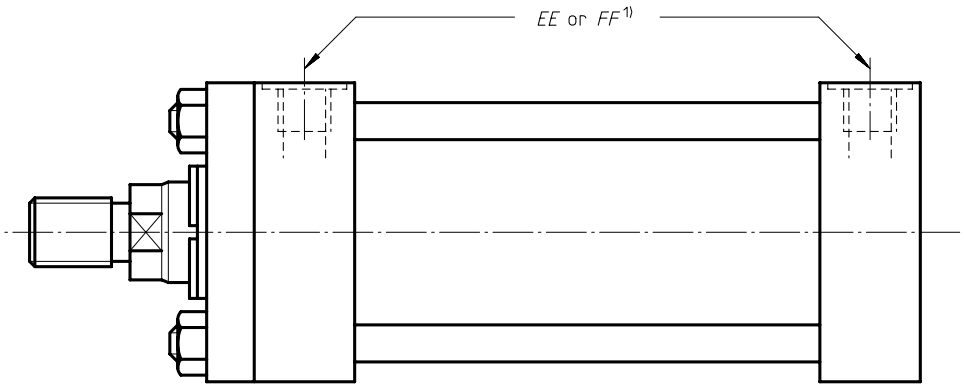
The following bore sizes, in millimetres, selected from ISO 3320, are included in this 16 MPa (160 bar) compact series:

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

## 6 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:

"Port dimensions selected in accordance with ISO 8138:1998, *Hydraulic fluid power – Single rod cylinders, 16 MPa (160 bar) compact series – Port dimensions*."




1) Dimension code in accordance with ISO 6099.

**Figure 1 — Port dimensions**

**Table 1 — Port sizes**

| **Bore** | *EE*<br>**ISO 6149-1**[1)]<br>**threaded port** | *EE*<br>**ISO 1179-1**[2)]<br>**threaded port** | *FF*<br>**ISO 6162**<br>**rectangular flange port**<br>2,5 MPa to 35 MPa<br>(25 bar to 350 bar) series |
|---|---|---|---|
| **25** | M14 × 1,5 | G 1/4 | —— |
| **32** | M14 × 1,5 | G 1/4 | —— |
| **40** | M18 × 1,5 | G 3/8 | —— |
| **50** | M22 × 1,5 | G 1/2 | —— |
| **63** | M22 × 1,5 | G 1/2 | —•– |
| **80** | M27 × 2 | G 3/4 | —— |
| **100** | M27 × 2 | G 3/4 | —— |
| **125** | M33 × 2 | G 1 | DN 25 |
| **160** | M33 × 2 | G 1 | DN 25 |
| **200** | M42 × 2 | G 1 1/4 | DN 32[3)] |

1) For threaded ports, ISO 6149-1 is preferred for new designs.

2) Port sizes as specified in ISO 6020-2.

3) **CAUTION — When selecting the largest diameter piston rod in a given bore size in connection with hydraulic systems where pull loads and/or pressure intensification effects may be generated, the pressure in the piston rod cavity of the cylinder can be two or more times the working pressure of the hydraulic system. In these cases, flange ports in accordance with ISO 6162, as shown in this table, may not have sufficient pressure ratings. When flange ports with a higher pressure rating are needed, they can be selected from the higher pressure series in ISO 6162.**

**ICS 23.100.20**

**Descriptors:** hydraulic fluid power, hydraulic transmission, hydraulic cylinders, single rod cylinders, ports (openings), form specifications, dimensions, interchangeability.

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