
**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**

*Transmissions hydrauliques — Raccordements à bride avec demi-bridés ou
bride monobloc et vis métriques ou en inches —*

*Partie 1: Raccordements à bride pour utilisation à des pressions de 3,5 MPa
(35 bar) à 35 MPa (350 bar), DN 13 à DN 127*



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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 3.

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 part of ISO 6162 may be the subject of patent rights. ISO shall not be held responsible for identifying any or all such patent rights.

International Standard ISO 6162-1 was prepared by Technical Committee ISO/TC 131, *Fluid power systems*, Subcommittee SC 4, *Connectors and similar products and components*.

This first edition of ISO 6162-1 together with the first edition of ISO 6162-2 cancel and replace the first edition of ISO 6162:1994, which has been technically revised.

ISO 6162 consists of the following parts, under the general title *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*
- Part 2: *Flange connectors for use at pressures of 35 MPa (350 bar) to 40 MPa (400 bar), DN 13 to DN 51*

Annexes A and B of this part of ISO 6162 are for information only.

Introduction

In hydraulic fluid power systems, power is transmitted and controlled through a liquid under pressure within an enclosed circuit. Components are interconnected through their ports and associated fluid conductor connector ends.

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Part 1:

Flange connectors for use at pressures of 3,5 MPa (35 bar) to 35 MPa (350 bar), DN 13 to DN 127

WARNING — Users of this part of ISO 6162 shall ensure that suitable material is chosen for the port to maintain the required working pressure, if carbon steel is not used. Also, the tube material and wall thickness depend on the selected working pressure and tube diameter. Tube dimensions shall be calculated in accordance with ISO 10763.

1 Scope

This part of ISO 6162 specifies complete general and dimensional characteristics for flange heads, split flange clamps (FCS), one-piece flange clamps (FC) and ports applicable to four-screw, split and one-piece flange clamp type tube and hose connectors for use at pressures of 3,5 MPa (35 bar¹⁾) to 35 MPa (350 bar). It also specifies the dimensions of the seals to be used, as well as the grooves to house the seal.

This part of ISO 6162 also recognizes the need to accommodate metric (type 1) screw fasteners, as well as to provide a means to use existing inch (type 2) screw fasteners.

These connectors are intended for application in hydraulic systems on industrial and commercial products, where it is desired to avoid the use of threaded connectors.

Surges of pressure higher than the nominal ratings will reduce the ability of the flange connectors to retain the hydraulic fluid. This shall be taken into account in the design of the hydraulic system.

2 Normative references

The following normative documents contain provisions which, through reference in this text, constitute provisions of this part of ISO 6162. For dated references, subsequent amendments to, or revisions of, any of these publications do not apply. However, parties to agreements based on this part of ISO 6162 are encouraged to investigate the possibility of applying the most recent editions of the normative documents indicated below. For undated references, the latest edition of the normative document referred to applies. Members of ISO and IEC maintain registers of currently valid International Standards.

ISO 48, *Rubber, vulcanized or thermoplastic — Determination of hardness (hardness between 10 IRHD and 100 IRHD)*

ISO 261, *ISO general-purpose metric screw threads — General plan*

ISO 263, *ISO inch screw threads — General plan and selection for screws, bolts and nuts — Diameter range 0.06 to 6 in*

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

1) 1 bar = 0,1 MPa = 10⁵ Pa; 1 Pa = 1 N/m².

ISO 724, *ISO general-purpose metric screw threads — Basic dimensions*

ISO 898-1, *Mechanical properties of fasteners made of carbon steel and alloy steel — Part 1: Bolts, screws and studs*

ISO 2768-1, *General tolerances — Part 1: Tolerances for linear and angular dimensions without individual tolerance indications*

ISO 3601-1, *Fluid power systems — O-rings — Part 1: Inside diameters, cross-sections, tolerances and size identification code*

ISO 3601-3, *Fluid power systems — O-rings — Part 3: Quality acceptance criteria*

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

ISO 8434-5, *Metallic tube connections for fluid power and general use — Part 5: Test methods for threaded hydraulic fluid power connections*

ISO 9227, *Corrosion tests in artificial atmospheres — Salt spray tests*

ISO 10763, *Hydraulic fluid power — Flat-end, seamless and welded precision steel tubes — Dimensions and nominal working pressures*

ASME/B1.1, *Unified Inch Screw Threads (UN and UNR Thread Form)*

3 Terms and definitions

For the purposes of this part of ISO 6162, the terms and definitions given in ISO 5598 apply.

4 Material

4.1 Split flange clamp halves (see Figure 3) and one-piece flange clamps (see Figure 4) shall be made from ferrous material with the following properties:

For nominal flange size 13:

- minimum yield strength: 221 N/mm²;
- minimum elongation at fracture: 3 %;

and for all other nominal flange sizes:

- minimum yield strength: 414 N/mm²;
- minimum elongation at fracture: 3 %.

4.2 Use flange heads made from ferrous material with:

- minimum yield strength: 215 N/mm²;
- minimum elongation at fracture: 10 %.

4.3 Use hex head metric screws of property class 8.8 or 10.9, as specified in ISO 898-1, or equivalent inch screws (see annex B).

4.4 Unless otherwise specified, the O-rings shall be made of NBR (nitrile) with a hardness of (90 ± 5) IRHD, measured in accordance with ISO 48, for use at the pressure and temperature requirements given in clause 9 and Table 1 or Table 2, and for testing. The O-rings shall conform to the dimensions given in Table 4 and shall meet or exceed the O-ring quality acceptance criteria for grade N of ISO 3601-3.

NOTE For higher temperatures, use sealing materials that meet the higher requirements.