BS ISO 6162-1:2012

BSI Standards Publication

Hydraulic fluid power — Flange connections with split or one-piece flange clamps and metric or inch screws

Part 1: Flange connectors, ports and mounting surfaces for use at pressures of 3,5 MPa (35 bar) to 35 MPa (350 bar), DN 13 to DN 127

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National foreword

This British Standard is the UK implementation of ISO 6162-1:2012. It supersedes BS ISO 6162-1:2002 which is withdrawn.

The UK participation in its preparation was entrusted to Technical Committee MCE/18/-/4, Connectors and associated components.

A list of organizations represented on this committee can be obtained on request to its secretary.

This publication does not purport to include all the necessary provisions of a contract. Users are responsible for its correct application.

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INTERNATIONAL STANDARD

ISO 6162-1

Second edition
2012-12-15

Hydraulic fluid power — Flange connections with split or one-piece flange clamps and metric or inch screws —

Part 1: Flange connectors, ports and mounting surfaces 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-brides fendue ou bride monobloc et vis métriques ou en inches —

Partie 1: Brides, orifices et surfaces de montage 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 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 6162-1 was prepared by Technical Committee ISO/TC 131, *Fluid power systems*, Subcommittee SC 4, *Connectors and similar products and components*.

This second edition cancels and replaces the first edition (ISO 6162-1:2002), which has been technically revised. It also incorporates the Technical Corrigendum ISO 6162-1:2002/Cor.1:2004. In this second edition, property class 8.8 screws in accordance with ISO 898-1 have been deleted to avoid the potential problem of a user using these screws in an application that requires screws conforming to the requirements of property class 10.9.

ISO 6162 consists of the following parts, under the general title *Hydraulic fluid power -– Flange connections with split or one-piece flange clamps and metric or inch screws*:

— *Part 1: Flange connectors, ports and mounting surfaces for use at pressures of 3,5 MPa (35 bar) to 35 MPa (350 bar), DN 13 to DN 127*

— *Part 2: Flange connectors, ports and mounting surfaces for use at a pressure of 42 MPa (420 bar), DN 13 to DN 76*

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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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INTERNATIONAL STANDARD ISO 6162-1:2012(E)

Hydraulic fluid power — Flange connections with split or one-piece flange clamps and metric or inch screws —

Part 1:
Flange connectors, ports and mounting surfaces 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 should ensure that suitable material is chosen for the port to maintain the required working pressure, if carbon steel is not used. In addition, flanged head material and wall thickness depend on the selected working pressure and the d_8 diameter.

1 Scope

This part of ISO 6162 gives general and dimensional specifications for flanged heads, split flange clamps (FCS and FCSM), one-piece flange clamps (FC and FCM), ports and mounting surfaces applicable to four-screw, split and one-piece flange clamp type tube connectors and hose fittings for use at pressures of 3,5 MPa (35 bar[1)]) to 35 MPa (350 bar). It also specifies the dimensions of the seals to be used, as well as the grooves that house the seals.

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

These connections 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 can reduce the ability of the flange connections to retain the hydraulic fluid. This needs to be taken into account in the design of the hydraulic system.

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

ISO 725, *ISO inch screw threads –– Basic dimensions*

ISO 898-1, *Mechanical properties of fasteners made of carbon steel and alloy steel — Part 1: Bolts, screws and studs with specified property classes — Coarse thread and fine pitch thread*

ISO 1302, *Geometrical Product Specification — Indications of surface texture in technical product documentation*

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

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

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

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

ISO 4017, *Hexagon head screws — Product grades A and B*

ISO 4762, *Hexagon socket head cap screws*

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

ISO 7089, *Plain washers — Normal series — Product grade A*

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

ISO 19879, *Metallic tube connections for fluid power and general use — Test methods for hydraulic fluid power connections*

ANSI/ASME B18.3, *Socket Cap, Shoulder, and Set Screws, Hex and Spline Keys (Inch Series)*

ASTM A574, *Standard Specification for Alloy Steel Socket-Head Cap Screws*

SAE J429, *Mechanical and Material Requirements for Externally Threaded Fasteners*

3 Terms and definitions

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

4 Material

4.1 Split flange clamps (see Figure 3) and one-piece flange clamps (see Figure 4) shall be ferrous material with the following properties in the finished condition:

For nominal flange size DN 13:

— minimum yield strength: 220 MPa

— minimum elongation at fracture: 3 %

and for all other nominal flange sizes:

— minimum yield strength: 415 MPa

— minimum elongation at fracture: 3 %.

4.2 Flanged heads shall be ferrous material with the following properties in the finished condition:

— minimum yield strength: 215 MPa

— minimum elongation at fracture: 10 %.

4.3 Unless otherwise specified, one of the following screw options shall be used:

a) hexagon head screws conforming to ISO 4017 of property class 10.9 (minimum) in accordance with ISO 898-1, or

b) socket head screws conforming to ISO 4762 of property class 10.9 (minimum) in accordance with ISO 898-1, or

c) inch hexagon head screws conforming to SAE J429 of grade 8 (minimum), or

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