International Standard 4400

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Fluid power systems and components — Three-pin electrical plug connector — Characteristics and requirements

Transmissions hydrauliques et pneumatiques — Connecteurs électriques à trois broches — Caractéristiques et exigences

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Descriptors: hydraulic fluid power, pneumatic fluid power, hydraulic equipment, pneumatic equipment, control devices, electrical control units, connector plugs, specifications, dimensions.

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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.

Draft International Standards adopted by the technical committees are circulated to the member bodies for approval before their acceptance as International Standards by the ISO Council. They are approved in accordance with ISO procedures requiring at least 75 % approval by the member bodies voting.

International Standard ISO 4400 was prepared by Technical Committee ISO/TC 131, *Fluid power systems*.

This second edition cancels and replaces the first edition (ISO 4400-1980), of which the reference to IEC Publication 309 has been updated.

Users should note that all International Standards undergo revision from time to time and that any reference made herein to any other International Standard implies its latest edition, unless otherwise stated.

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Fluid power systems and components — Three-pin electrical plug connector — Characteristics and requirements

0 Introduction

In fluid power systems, power is transmitted and controlled through a fluid under pressure within an enclosed circuit. Typical components found in such systems are hydraulic and pneumatic controls. These devices are used to regulate the function of a component or system.

Some control components found in fluid power systems are electrically actuated. The electrical plug connector described in this International Standard is used with control and regulation assemblies for use in hydraulic and pneumatic fluid power systems.

1 Scope and field of application

This International Standard specifies the following characteristics and requirements for a general purpose three-pin electrical plug connector with earth contact for use with a single solenoid :

— the electrical characteristics of the connector;

— the dimensions of the pins and earth contact;

— the means for fixing the socket to the plug;

— the sealing procedure between the plug and the socket.

The electrical plug connector specified in this International Standard is intended to be used under working conditions where the connector cannot be damaged by external action (for example shock or excessive loading).

2 References

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

IEC Publication 144, *Degrees of protection of enclosures for low-voltage switchgear and controlgear.*

IEC Publication 309, *Plugs, socket-outlets and couplers for industrial purposes*

Part 1: General requirements.

Part 2: Dimensional interchangeability requirements for pin and contact-tube accessories.

IEC Publication 529, *Classification of degrees of protection provided by enclosures.*

3 Definitions

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

electrical connector: Two-piece assembly (plug and socket) which, when joined, provides electrical continuity.

4 Connector components

The components of the connector are illustrated and identified in figure 1.

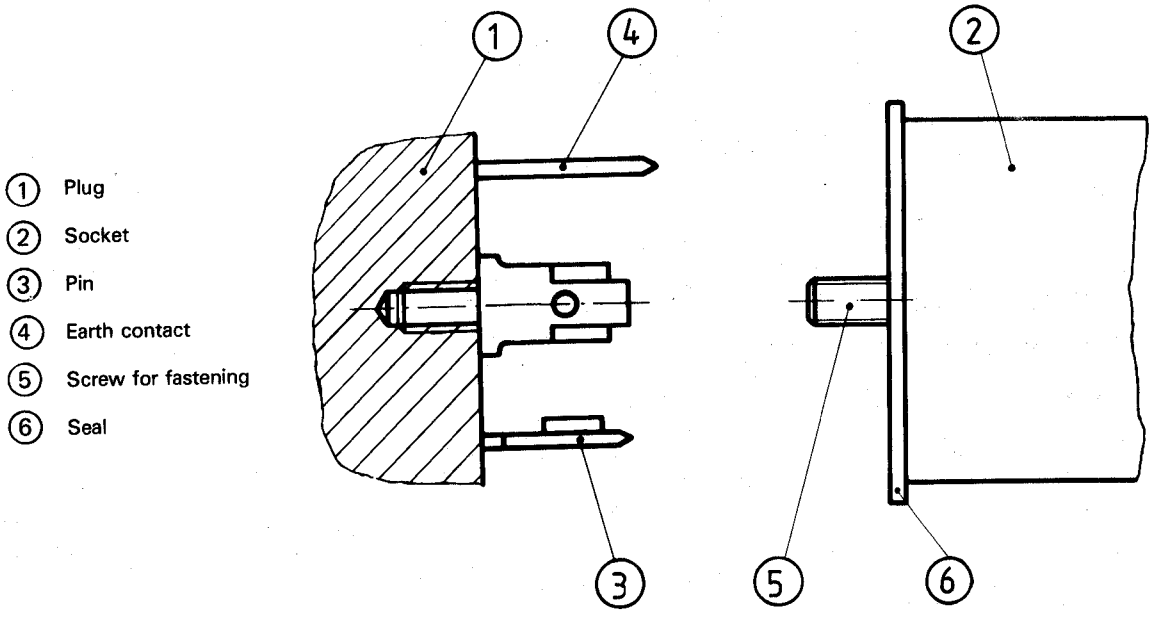


Figure 1 — Connector components

5 Connector characteristics

The connector shall be designed to meet the following requirements:

a) voltage: 250 V;

b) current: 10 A;

c) temperature of use: −20 to +115 °C; at elevated temperatures, the variation of current with temperature is given in figure 2;

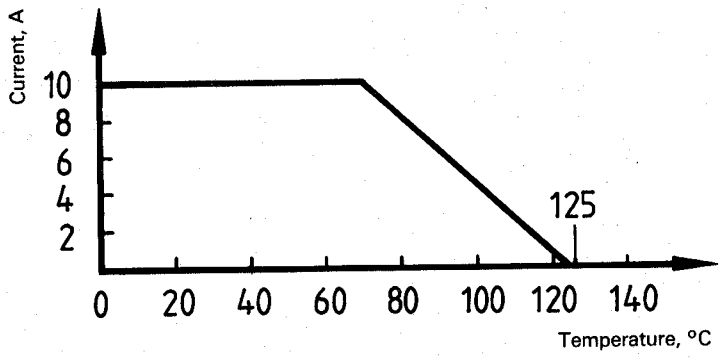


Figure 2 — Variation of current with temperature

d) degree of protection after fixing the socket onto the plug: IP 65, in accordance with IEC Publication 144;

e) insulation and dielectric strength: the connector shall meet the requirements stated in clauses 19 of IEC Publications 309-1 and 309-2.

NOTE — If it is necessary to specify the mechanical degree of protection, reference should be made to IEC Publication 529.

6 Position of pins and earth contact

6.1 The pins and earth contact shall be fitted on the plug.

6.2 The earth contact pin shall be fixed in such a way that earth connection is ensured before current enters the pins.

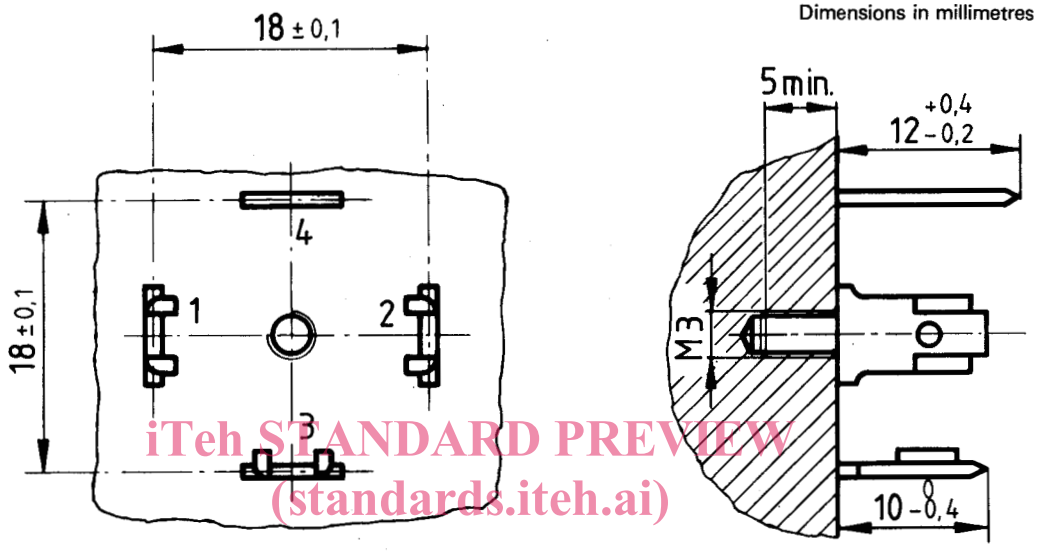
6.3 The position, dimensions and marking information of pins and the earth contact shall comply with figure 3.

6.4 Pins 1 and 2 are the main pins.

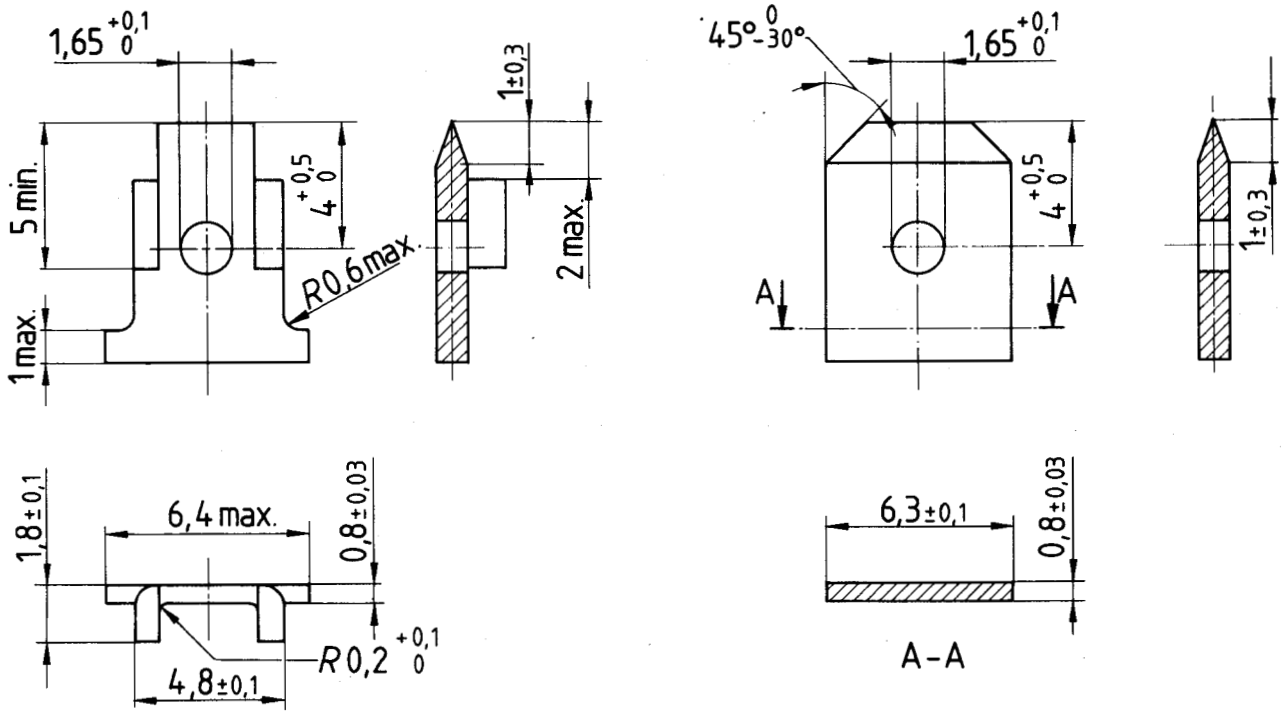
6.5 Pin 3 is an additional pin for auxiliary purposes, such as indicator lamps, stroke limiter, etc.

6.6 Pin 4 (2 mm longer than pins 1, 2 and 3) is the earth contact.

Dimensions in millimetres



a) Position and marking of pins and earth contact



b) Pin dimensions

c) Earth contact dimensions

Figure 3 — Connector details

7 Fixing the socket onto the plug

An M3 screw shall be used to fix the socket onto the plug in accordance with figure 3a).

8 Socket/plug tightness

8.1 A flat seal shall be provided on the plug to ensure tightness in the socket/plug assembly.

8.2 The seal shall be fitted on the socket to suit the overall dimension requirements indicated in figure 4.

Dimensions in millimetres

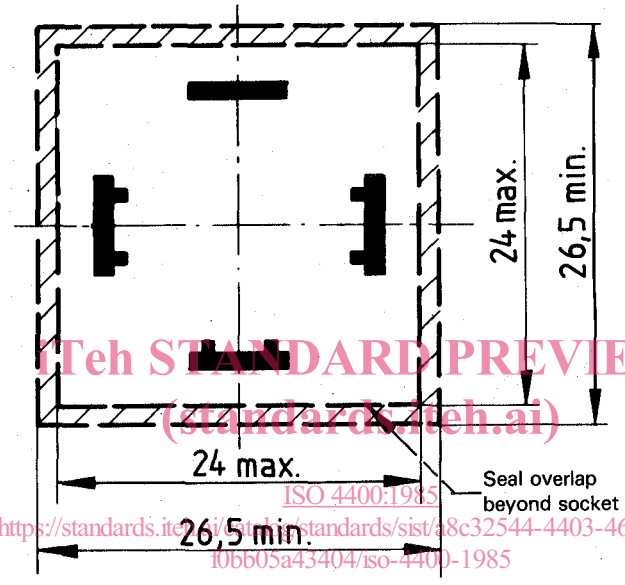


Figure 4 — Overall dimensions

9 Mechanical protection

A cover plate shall be provided to protect the electrical plug connector specified in this International Standard when the socket connector has been removed. The cover plate may be made of plastics or similar material.

10 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:

"Electrical plug connector conforms to ISO 4400, *Fluid power systems and components — Three-pin electrical plug connector — Characteristics and requirements.*"