SLOVENSKI STANDARD

SIST EN 4644-001:2012

01-september-2012

Aeronavtika - Konektor, električni in optični, pravokotni, modularni, pravokotni vložki, stalna delovna temperatura 175 °C (ali 125 °C) - 001. del: Tehnične specifikacije

Aerospace series - Connector, electrical and optical, rectangular, modular, rectangular inserts, operating temperature 175 °C (or 125 °C) continuous - Part 001: Technical specification

Luft- und Raumfahrt - Elektrische und optische Rechtecksteckverbinder, modular, rechteckige Kontakteinsätze, Dauerbetriebstemperatur 175 °C (oder 125 °C) konstant - Teil 001: Technische Lieferbedingungen

Série aérospatiale - Connecteur, électrique et optique, rectangulaire, modulaire, à inserts rectangulaires, température de fonctionnement 175 °C (ou 125 °C) continu - Partie 001: Spécification technique

Ta slovenski standard je istoveten z: EN 4644-001:2012

ICS:

49.060	Letalska in vesoljska električna oprema in sistemi	Aerospace electric equipment and systems

SIST EN 4644-001:2012 **en**

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EUROPEAN COMMITTEE FOR STANDARDIZATION
COMITÉ EUROPÉEN DE NORMALISATION
EUROPÄISCHES KOMITEE FÜR NORMUNG

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Foreword

This document (EN 4644-001:2012) has been prepared by the Aerospace and Defence Industries Association of Europe - Standardization (ASD-STAN).

This standard was reviewed by the Domain Technical Coordinator of ASD-STAN's Electrical Domain.

After enquiries and votes carried out in accordance with the rules of this Association, this Standard has received the approval of the National Associations and the Official Services of the member countries of ASD, prior to its presentation to CEN.

This European Standard shall be given the status of a national standard, either by publication of an identical text or by endorsement, at the latest by November 2012, and conflicting national standards shall be withdrawn at the latest by November 2012.

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According to the CEN/CENELEC Internal Regulations, the national standards organizations of the following countries are bound to implement this European Standard: Austria, Belgium, Bulgaria, Croatia, Cyprus, Czech Republic, Denmark, Estonia, Finland, France, Germany, Greece, Hungary, Iceland, Ireland, Italy, Latvia, Lithuania, Luxembourg, Malta, Netherlands, Norway, Poland, Portugal, Romania, Slovakia, Slovenia, Spain, Sweden, Switzerland, Turkey and the United Kingdom.

Introduction

The connectors defined by this standard are suitable for use on board of commercial and military aircraft for both disconnect panel and rack and panel applications in severe environmental conditions.

1 Scope

This European Standard specifies the required characteristics, the condition for qualification, acceptance and quality assurance for electrical and optical rectangular connectors with single or multiple removable rectangular inserts for use in a temperature range from – 65 °C to 175 °C continuous for electrical contact.

This family of connectors is particularly suitable for aeronautic use in zones of severe environmental conditions on board aircraft, applying EN 2282.

Inserts for fiber optic contacts or mixing fiber optic contacts and electrical contacts are described in EN 4639-002.

2 Normative references

The following documents, in whole or in part, are normatively referenced in this document and are indispensable for its application. For dated references, only the edition cited applies. For undated references, the latest edition of the referenced document (including any amendments) applies.

EN 2266-003, *Aerospace series — Cables, electrical, for general purpose — Operating temperatures between – 55 °C and 200 °C — Part 003: Ink jet printable — Product standard*

EN 2282, *Aerospace series — Characteristics of aircraft electrical supplies*

EN 2591 (all parts), *Aerospace series — Elements of electrical and optical connection — Test methods*

EN 3155-001, *Aerospace series — Electrical contacts used in elements of connection — Part 001: Technical specification*

EN 3155-002, *Aerospace series — Electrical contacts used in elements of connection — Part 002: List and utilization of contacts*

EN 4530-002, *Aerospace series — Sealing sleeves used in elements of connection — Part 002: List and utilization of sealing sleeves*

EN 4639-002, *Aerospace series — Connectors, optical, rectangular, modular, multicontact, 1,25 diameter ferrule, with removable alignment sleeve holder — Part 002: List of product standards*

EN 4644-002, *Aerospace series — Connector, electrical and optical, rectangular, modular, rectangular inserts, operating temperature 175 °C (or 125 °C) continuous — Part 002: Specification of performance and contact arrangements*

EN 9100, *Quality Management Systems — Requirements for Aviation, Space and Defence Organizations*

EN 9133, *Aerospace series — Quality management systems — Qualification procedure for aerospace standard parts*

MIL-HDBK-454B, *General guidelines for electronic equipment* [1)]

SAE AS31971, *Connectors, high reliability, space use, general specification for* [2)]

SAE AS39029/1, *Installing and removal tools, connector electrical contact, general specification for* [2)]

3 Terms and definitions

For the purposes of this document, the definitions given in EN 2591-100 apply.

The reference planes and axis used in this product standard are listed below:

Ap : shell bottoming reference plane on male housing.

Ar : shell bottoming reference plane on female housing.

Bp : vertical axis of male housing

Br : vertical axis of female housing

Cp : horizontal axis of male housing

Cr : horizontal axis of female housing

DAC: disconnect aligning housing cavity

DNC: disconnect non aligning housing cavity

N : extremity of insert retention clip reference plane

P : front face of hard insert

R : vertical axis of housing backshell interface

RAC: rack & panel aligning housing cavity

RNC: rack & panel non Aligning housing cavity

S : horizontal axis of housing backshell interface

T : backshell bottoming reference plane on housing

X : horizontal axis of insert

Y : vertical axis of insert

1) Published by: DoD National (US) Mil. Department of Defense http://www.defenselink.mil/

2) Published by: SAE National (US) Society of Automotive Engineers http://www.sae.org/

4 Description

4.1 General

This family of connectors is divided into two types of connectors which are the following:

— disconnect panel connectors;

— rack and panel connectors.

The current revision of this standard is describing two disconnect panel housing sizes and one rack and panel housing size. However, it is also providing a design rule to extend the current range described. The design rule is based on the description of housing aligning cavities, housing non aligning cavities and a clinging dimension line; see 4.2 and 4.3 for details.

These connectors have rectangular housings, removable rectangular inserts and contacts and can be fitted with rear accessories. Male and female inserts can be fitted either in the male or female housing.

Depending on the housing size, the disconnect panel connectors are mated and unmated either by using a centre coupling screw or two quarter turn fasteners.

The centre coupling screw and coupling nut can be installed either on the male or female housing.

The centre coupling mechanism shall provide a total of 12 polarization positions.

Housings having the quarter turn fasteners are polarized by using two polarizing posts and keys offering a total of 16 polarizing positions.

A size 1 housing has one insert cavity with one keyway, a quarter turn fastener and two polarizing posts or keys.

A size 2 housing has two insert cavities with one cavity having one keyway and the other having two keyways; a central coupling mechanism provides housing polarization.

There is two rack and panel (blind mate) connector housing sizes; it is a size three housing and a size four housing which have respectively three and four insert cavities all with one keyway, three polarizing posts or keys offering 64 polarizing positions and no locking mechanism.

In addition to this rack and panel use, the size four male connector can be mated with two size 2 female connectors in a disconnect application by using two centre coupling mechanisms.

These connectors use different types of contacts (signal, power, coaxial, triaxial, quadrax, etc.) see EN 3155-002 and optical contacts see EN 4639-002.

4.2 Female housing

4.2.1 General

Size 1 and 3 female housing shall be attached by rectangular flange with two mounting holes, size 3 housing has floating eyelet mounting holes or through holes. The size 3 housing has four pins, each of which can take two positions, to polarize the shell with the panel on which it is mounted.

Size 4 female housing shall be attached by rectangular flange with two or three mounting holes, Size 4 housing has four pins, each of which can take two positions, to polarize the shell with the panel on which it is mounted.

Size 2 female housing are either panel mount connector or cable connector. Panel mount receptacle connector shall be attached by rectangular flange with two mounting holes.

The insert cavities are identified on the female housing by letters A, B, C, D for size 4, letters A, B, C for size 3 letters, A, B for size 2 and no letter for size 1.

The insert cavities are polarized by either one (A polarizing position) or two keyways (B polarizing position) location. Housing size 1, 3 and 4 insert cavities have one keyway. Housing size 2 insert cavity identified with letter A has one keyway and insert cavity identified with letter B has two keyways.

Each insert cavity has two insert retaining devices allowing rear insertion and rear release of the insert.

Each female housing has a grounding device ensuring electrical continuity between housings before contact mating.

In addition, size 1 and 2 female housings are available with a grounding block (classes B and F) or without a grounding block (classes A, C and E) allowing grounding of a cable braid with a pigtail.

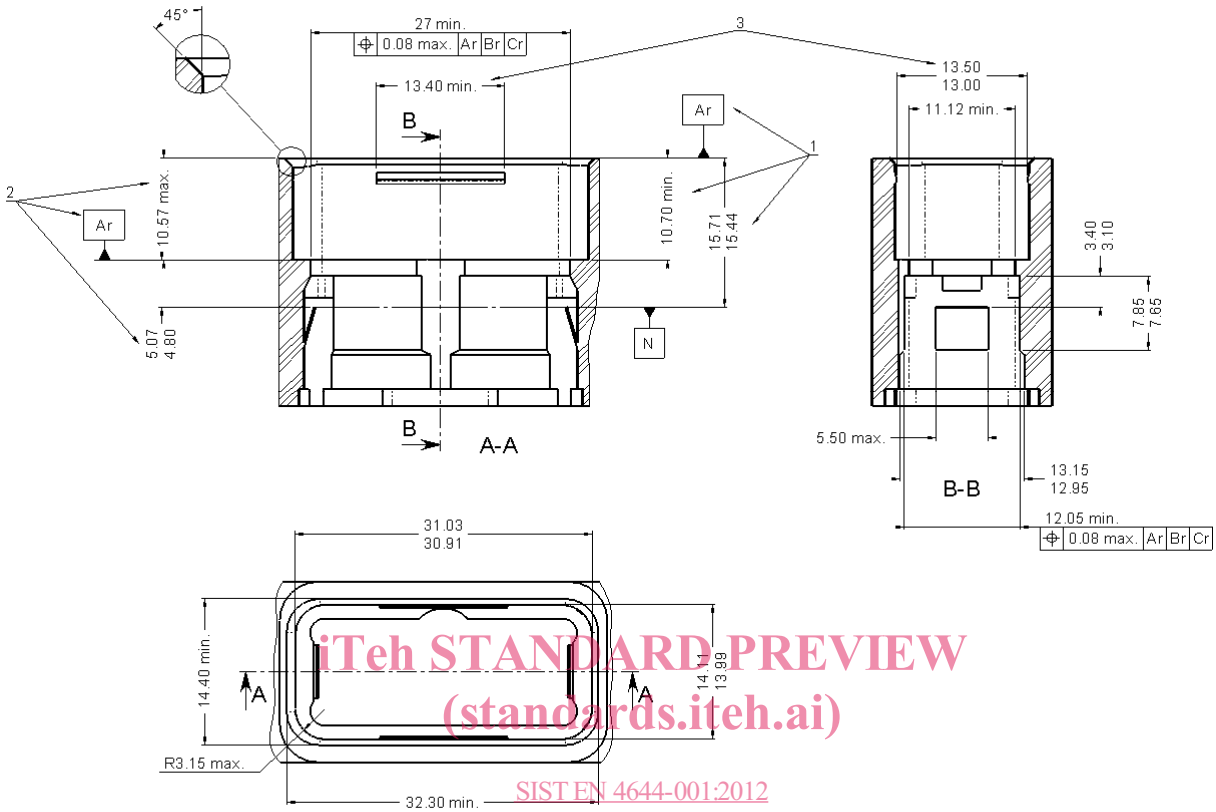
For each female housing, some cavities are aligning cavities and other cavities are non aligning.

Aligning cavities guaranty not only the alignment between male and female housing but also guarantee the shell to shell bottoming.

Non aligning female housing cavities have a circular location tolerance.

In order to define how alignment of the female and male housing is achieved a dimension line between the two housing aligning cavities is defined.

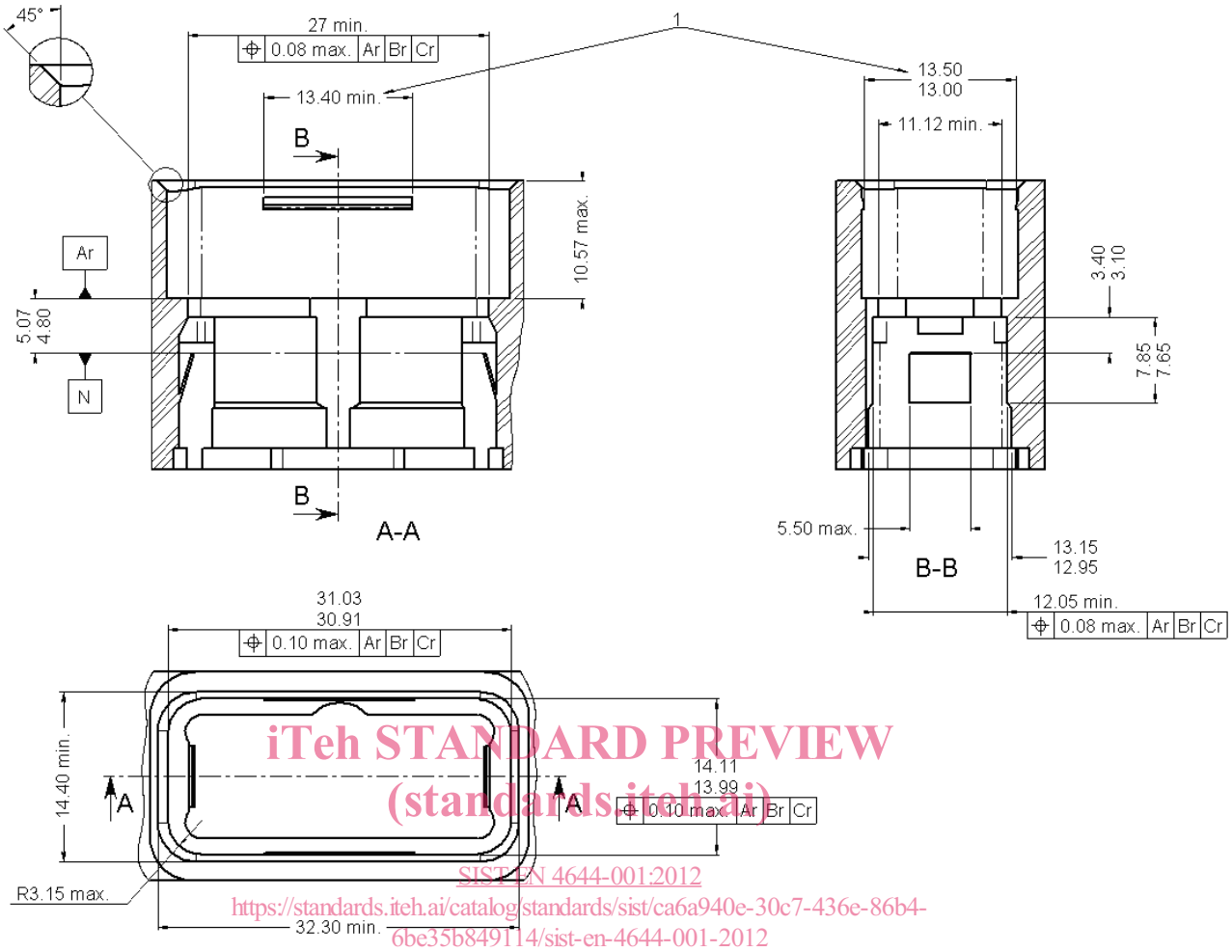
4.2.2 Disconnect panel female housing alignment



Key

1 Dimensions for housing size 1
2 Dimension for housing size n (n > 1)
3 Dimension of grounding device (optional)

Figure 1 – Disconnect panel female aligning cavity (DAC)

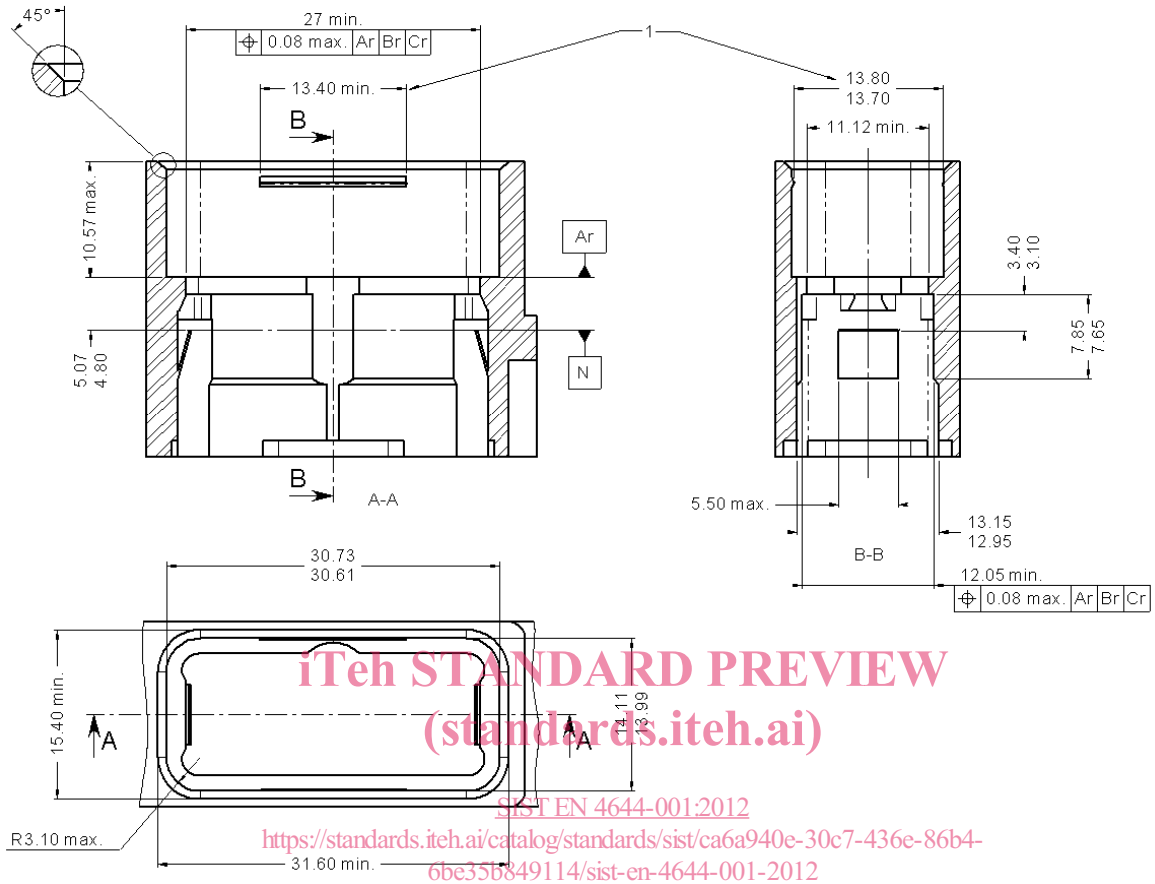


Key

1 Dimension of grounding device (optional)

Figure 2 — Disconnect panel female aligning cavity (DNC)

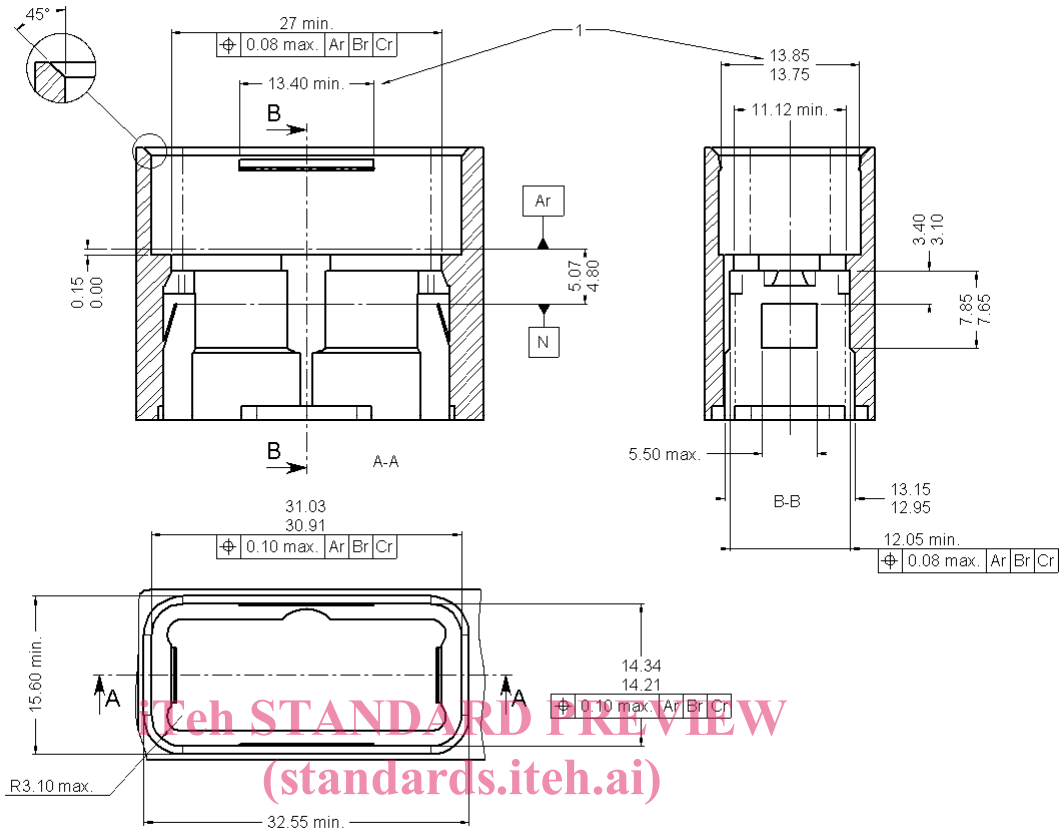
4.2.3 Rack and panel female housing



Key

1 Dimension for grounding device

Figure 3 — Rack and panel female aligning cavity (RAC)



Key

1 Dimension for grounding device (optional)

Figure 4 — Rack and panel female non aligning cavity (RNC)

4.3 Male housing

4.3.1 General

Size 1, 3 and 4 male housing shall be attached by rectangular flange with two mounting holes;

Size 2 male housing are either panel mount connector or cable connector. Panel mount connector shall be attached by rectangular flange with two mounting holes.

The insert cavities are identified on the male housing by letters A, B, C, D for size 4, letters A, B, C for size 3, letters A, B for size 2 and no letter for size 1.

The insert cavities are polarized by either one or two keyways location. Housing size 1, 3 and 4 insert cavities have one keyway. Housing size 2 insert cavity identified with letter A has one keyway and insert cavity identified with letter B has two keyways.

Each insert cavity has two insert retaining devices allowing rear insertion and rear release of the insert.

Size 1 and 2 male housings are available with (classes B and F) or without a grounding block (classes A, C and E) allowing grounding of a cable braid with a pigtail.

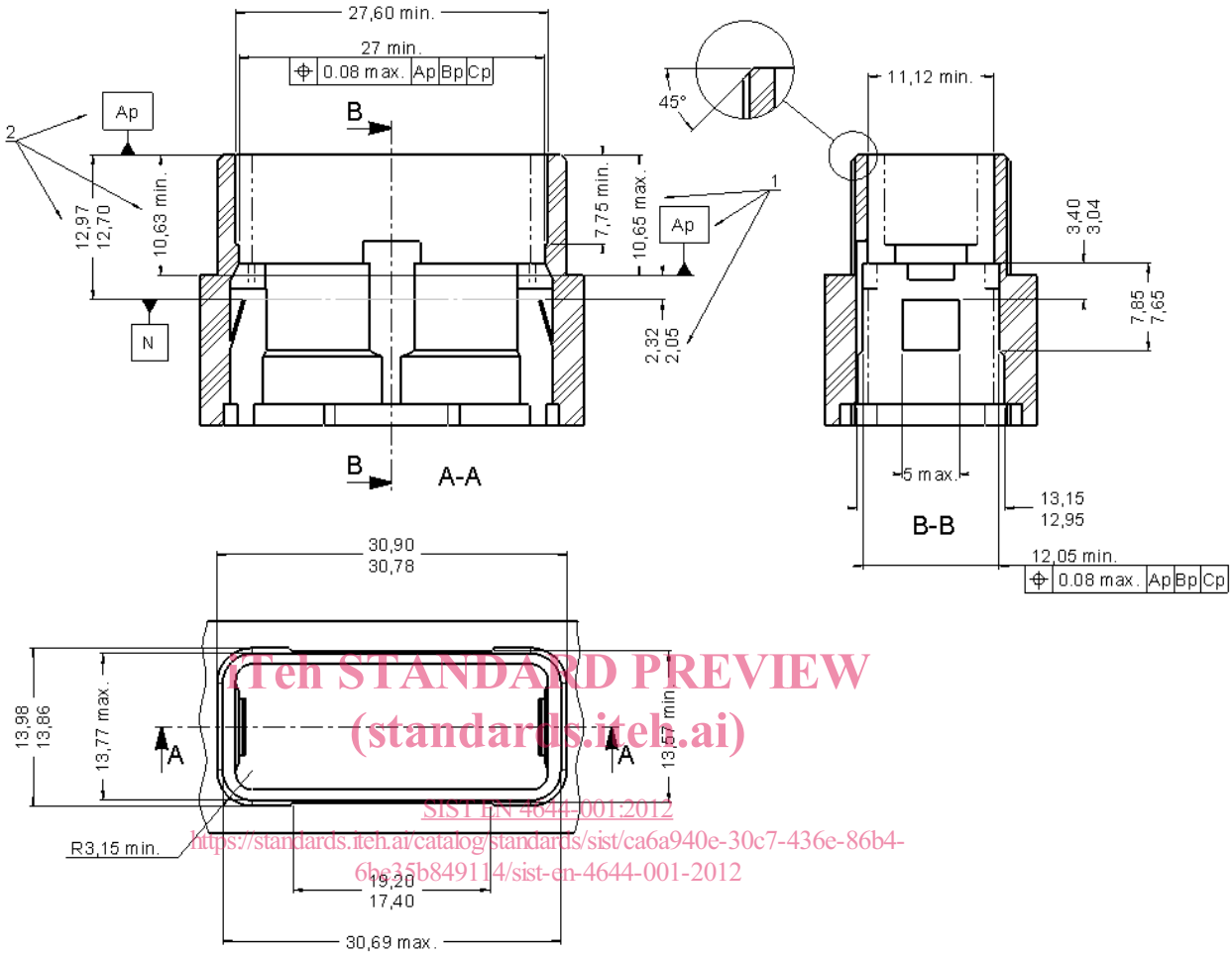
All male housing have a minimum of one (for single cavity connectors) and a maximum of two aligning housing cavities (see Figure 5 and Figure 7); the remaining housing cavities are non aligning cavities (see Figure 6 and Figure 8).

Aligning cavities guaranty not only the alignment between male and female housing but also guarantee the shell to shell bottoming.

Non aligning housing cavities have a circular location.

In order to define how alignment of the female and male housing is achieved a clinging dimension line between the two housing aligning cavities is defined.

4.3.2 Disconnect panel male housing



Key

1 Dimension for housing size 1

2 Dimension for housing size n (n > 1)

Figure 5 — Disconnect panel male aligning cavity (DAC)