

SLOVENSKI STANDARD

SIST EN 4644-001:2018

01-februar-2018

Nadomešča:

SIST EN 4644-001:2012

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

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

iTeh STANDARD PREVIEW

(standards.iteh.ai)

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

<https://standards.iteh.ai/catalog/standards/sist/b0b02317-e9e3-4930-bef0-04872d8cb3f4/sist-en-4644-001-2018>

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 4644-001:2017

ICS:

31.220.10	Vtiči in vtičnice, konektorji	Plug-and-socket devices. Connectors
49.060	Letalska in vesoljska električna oprema in sistemi	Aerospace electric equipment and systems

SIST EN 4644-001:2018

en,fr,de

iTeh STANDARD PREVIEW
(standards.iteh.ai)

SIST EN 4644-001:2018

<https://standards.iteh.ai/catalog/standards/sist/b0b02317-e9e3-4930-bef0-04872d8cb3f4/sist-en-4644-001-2018>

EUROPEAN STANDARD

EN 4644-001

NORME EUROPÉENNE

EUROPÄISCHE NORM

October 2017

ICS 49.060; 49.090

Supersedes EN 4644-001:2012

English Version

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

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

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

This European Standard was approved by CEN on 12 June 2017.

CEN members are bound to comply with the CEN/CENELEC Internal Regulations which stipulate the conditions for giving this European Standard the status of a national standard without any alteration. Up-to-date lists and bibliographical references concerning such national standards may be obtained on application to the CEN-CENELEC Management Centre or to any CEN member.

This European Standard exists in three official versions (English, French, German). A version in any other language made by translation under the responsibility of a CEN member into its own language and notified to the CEN-CENELEC Management Centre has the same status as the official versions.

CEN members are the national standards bodies of Austria, Belgium, Bulgaria, Croatia, Cyprus, Czech Republic, Denmark, Estonia, Finland, Former Yugoslav Republic of Macedonia, France, Germany, Greece, Hungary, Iceland, Ireland, Italy, Latvia, Lithuania, Luxembourg, Malta, Netherlands, Norway, Poland, Portugal, Romania, Serbia, Slovakia, Slovenia, Spain, Sweden, Switzerland, Turkey and United Kingdom.



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

CEN-CENELEC Management Centre: Avenue Marnix 17, B-1000 Brussels

Contents

	Page
European foreword	3
Introduction	4
1 Scope.....	4
2 Normative references.....	4
3 Terms and definitions.....	5
4 Description.....	6
5 Design.....	18
6 Dimensions and masses.....	20
7 Tests.....	80
8 Quality assurance.....	93
9 Designation and marking.....	98
10 Delivery conditions.....	99
11 Packaging.....	99
12 Storage	99

[SIST EN 4644-001:2018](https://standards.iteh.ai/catalog/standards/sist/b0b02317-e9e3-4930-bef0-04872d8cb3f4/sist-en-4644-001-2018)
<https://standards.iteh.ai/catalog/standards/sist/b0b02317-e9e3-4930-bef0-04872d8cb3f4/sist-en-4644-001-2018>

European foreword

This document (EN 4644-001:2017) has been prepared by the Aerospace and Defence Industries Association of Europe - Standardization (ASD-STAN).

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 April 2018, and conflicting national standards shall be withdrawn at the latest by April 2018.

Attention is drawn to the possibility that some of the elements of this document may be the subject of patent rights. CEN shall not be held responsible for identifying any or all such patent rights.

This document supersedes EN 4644-001:2012.

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, Former Yugoslav Republic of Macedonia, France, Germany, Greece, Hungary, Iceland, Ireland, Italy, Latvia, Lithuania, Luxembourg, Malta, Netherlands, Norway, Poland, Portugal, Romania, Serbia, Slovakia, Slovenia, Spain, Sweden, Switzerland, Turkey and the United Kingdom.

ITEH STANDARD PREVIEW
(standards.iteh.ai)

[SIST EN 4644-001:2018](https://standards.iteh.ai/catalog/standards/sist/b0b02317-e9e3-4930-bef0-04872d8cb3f4/sist-en-4644-001-2018)

<https://standards.iteh.ai/catalog/standards/sist/b0b02317-e9e3-4930-bef0-04872d8cb3f4/sist-en-4644-001-2018>

EN 4644-001:2017 (E)**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 2267-003, *Aerospace series — Cables, electrical, for general purpose — Operating temperatures between – 55 °C and 260 °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 3155-002, *Aerospace series — Electrical contacts used in elements of connection — Part 002: List and utilization of contacts*

EN 3909, *Aerospace series — Test fluids and test methods for electrical and optical components and sub-assemblies*

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 mm 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 Products*

MIL-HDBK-454A, *General guidelines for electronic equipment* ¹⁾

SAE AS39029/1, *Contacts electrical connector, pin, crimp removable (for AS81714 terminal junction system)* ²⁾

SAE AS31971, *Gage pin for socket contact engagement test* ²⁾

3 Terms and definitions

For the purposes of this document, the terms and 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/>

EN 4644-001:2017 (E)**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 2 disconnect panel housing sizes and 3 rack and panel housing sizes. 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 2 quarter turn fasteners.

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

Housings having the quarter turn fasteners are polarized by using 2 polarizing posts and keys offering a total of 16 polarizing positions.

A size 1 housing has 1 insert cavity with 1 keyway, quarter turn fasteners and 2 polarizing posts or keys.

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

There are three rack and panel (blind mate) connector housing sizes; it is a size 2, size 3 and size 4 housing which have respectively 2, 3 and 4 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 4 male connector can be mated with 2 size 2 female connector in a disconnect application by using 2 centre coupling mechanism.

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**

For disconnect application, the following housings are described:

- size 1 housing has quarter turn fasteners and 2 polarization keys that can take 4 positions to polarize the housing.
Size 1 female housing is panel mount connector.
- size 2 housing has a central coupling mechanism which can take 12 positions to polarize the housing.
Size 2 female housing are either panel mount connector or cable connector.

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

For rack and panel application, the following sizes are described:

- size 2 housing has 3 polarization keys, each of them can take 4 positions to prevent mismating between male and female housing.
- size 3 housing has 3 polarization keys, each of them can take 4 positions to prevent mismating between male and female housing.
- size 4 housing has 3 polarization keys, each of them can take 4 positions to prevent mismating between male and female housing.

Rack and panel female housing shall be installed on the aircraft side and are cable connectors.

No grounding block option is available for rack and panel housings.

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 2 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.

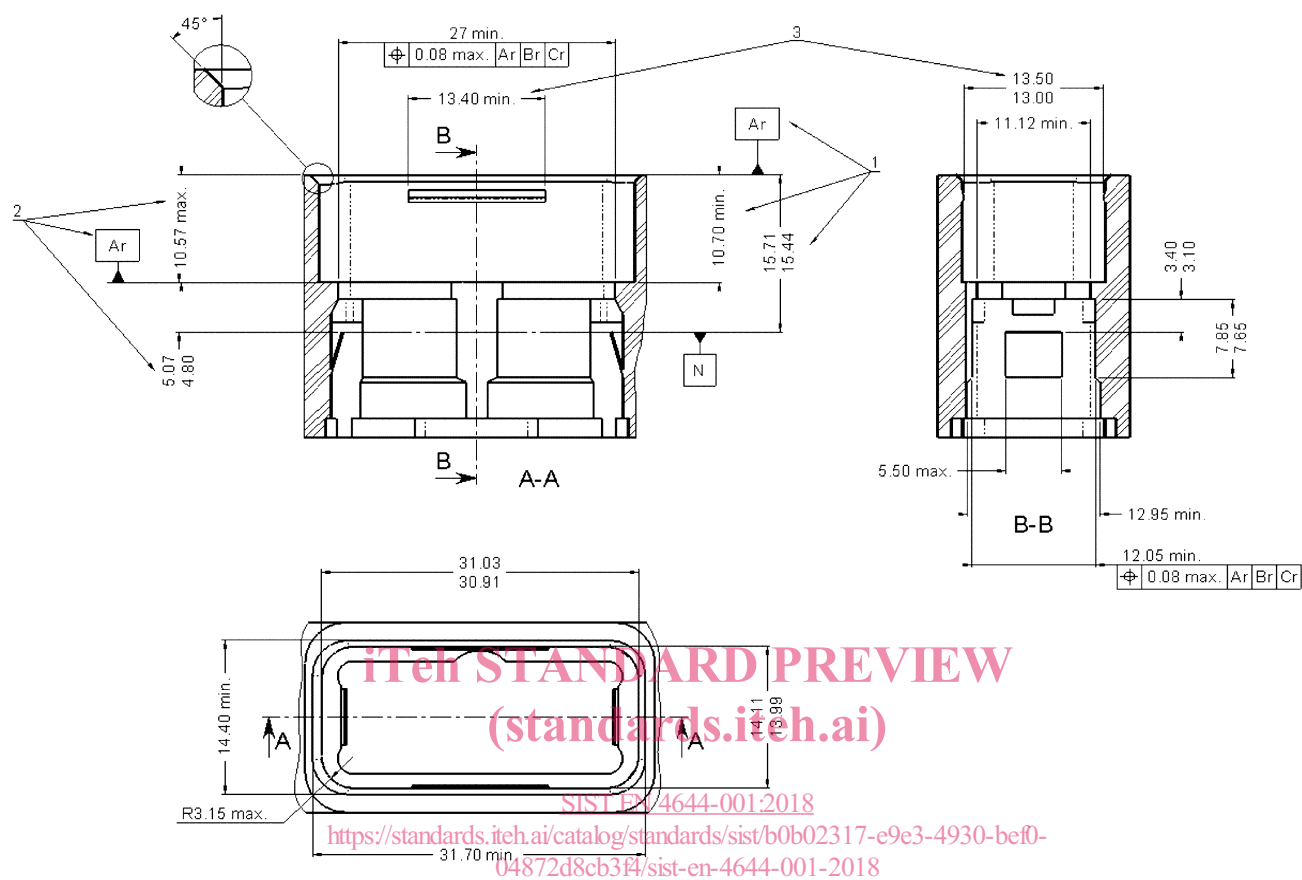
For each female housing, some cavities are aligning cavities and other cavities are non-aligning.

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.

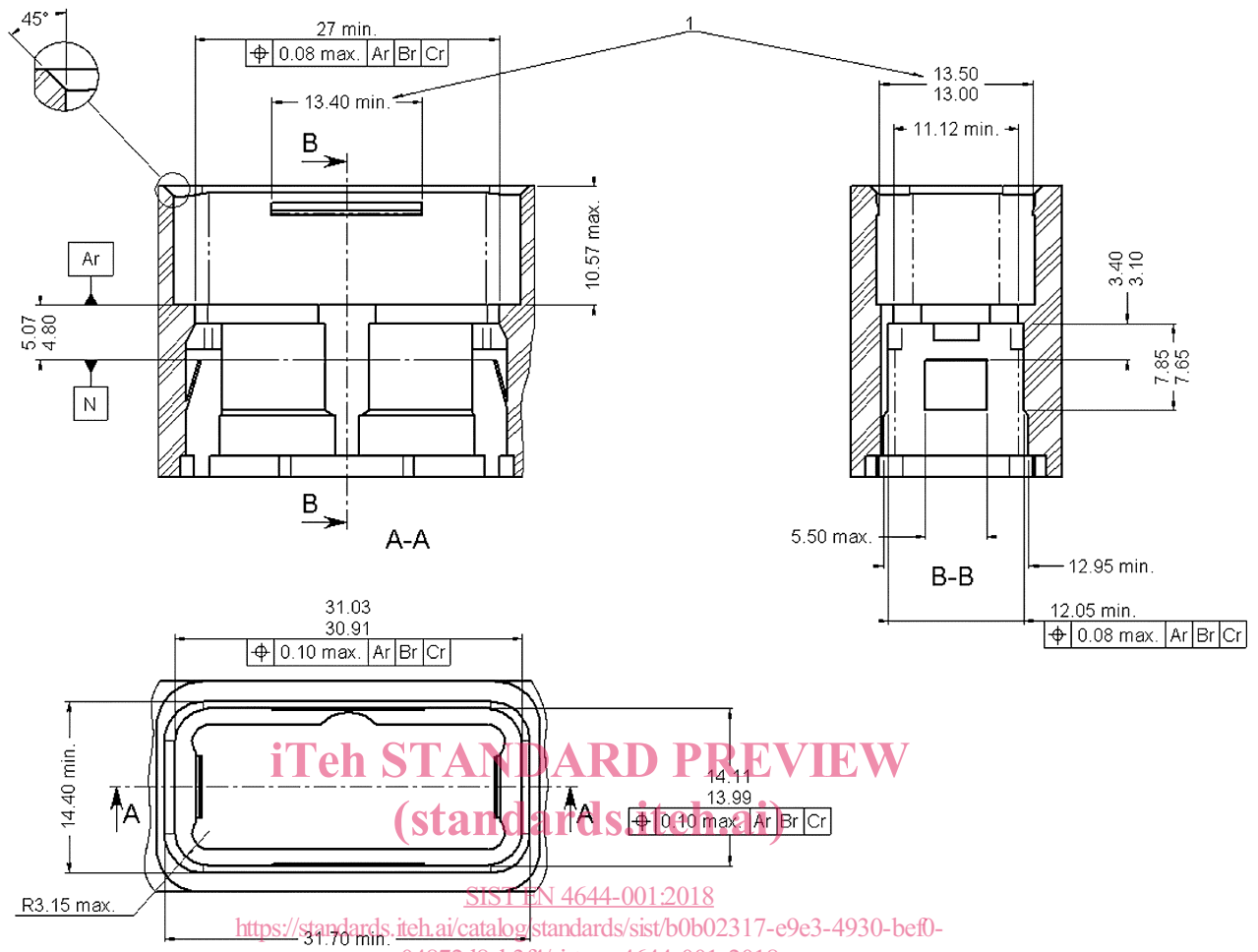
In order to define how alignment of the female and male housing is achieved, a dimension line between the 2 housing aligning cavities is defined.

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)



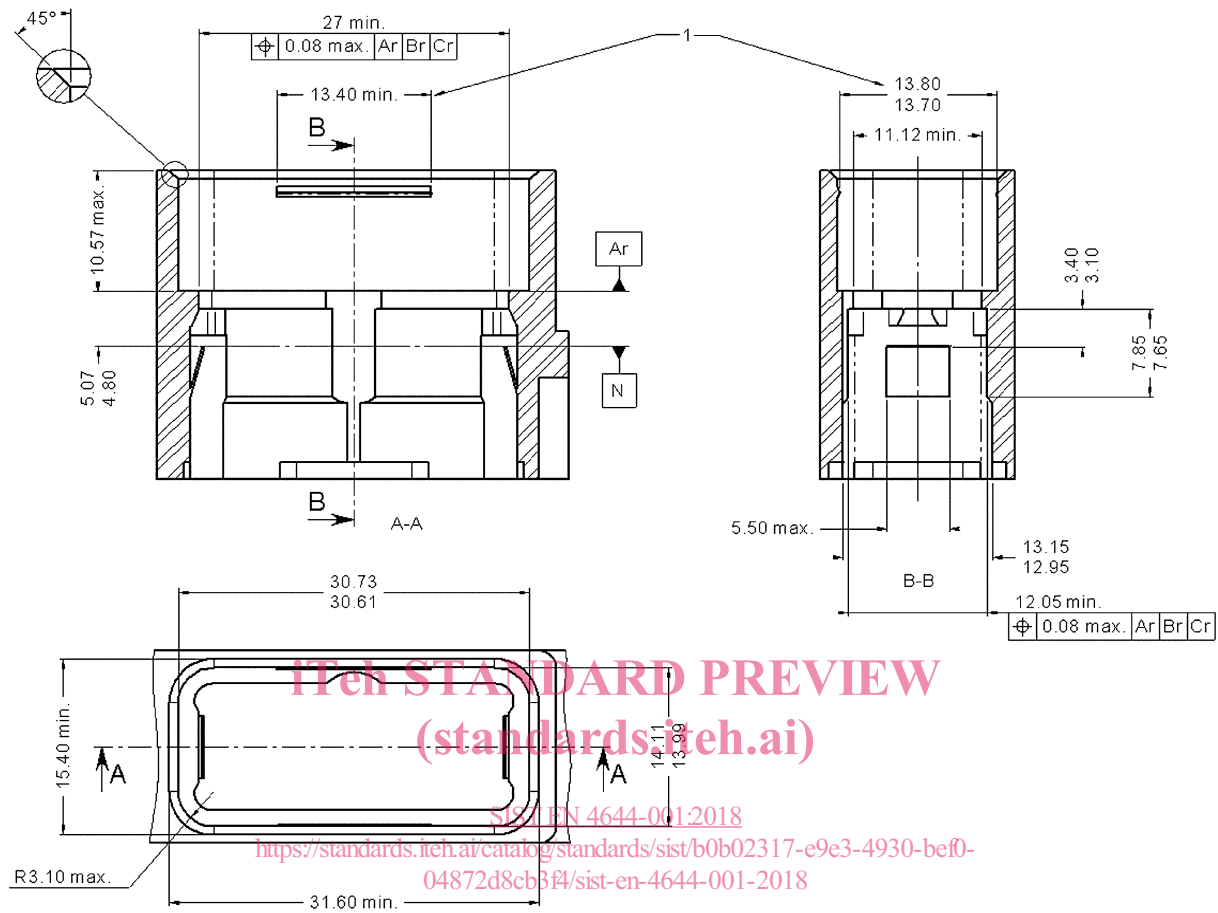
Key

- 1 Dimension of grounding device (optional)

Figure 2 — Disconnect panel female non-aligning cavity (DNC)

EN 4644-001:2017 (E)

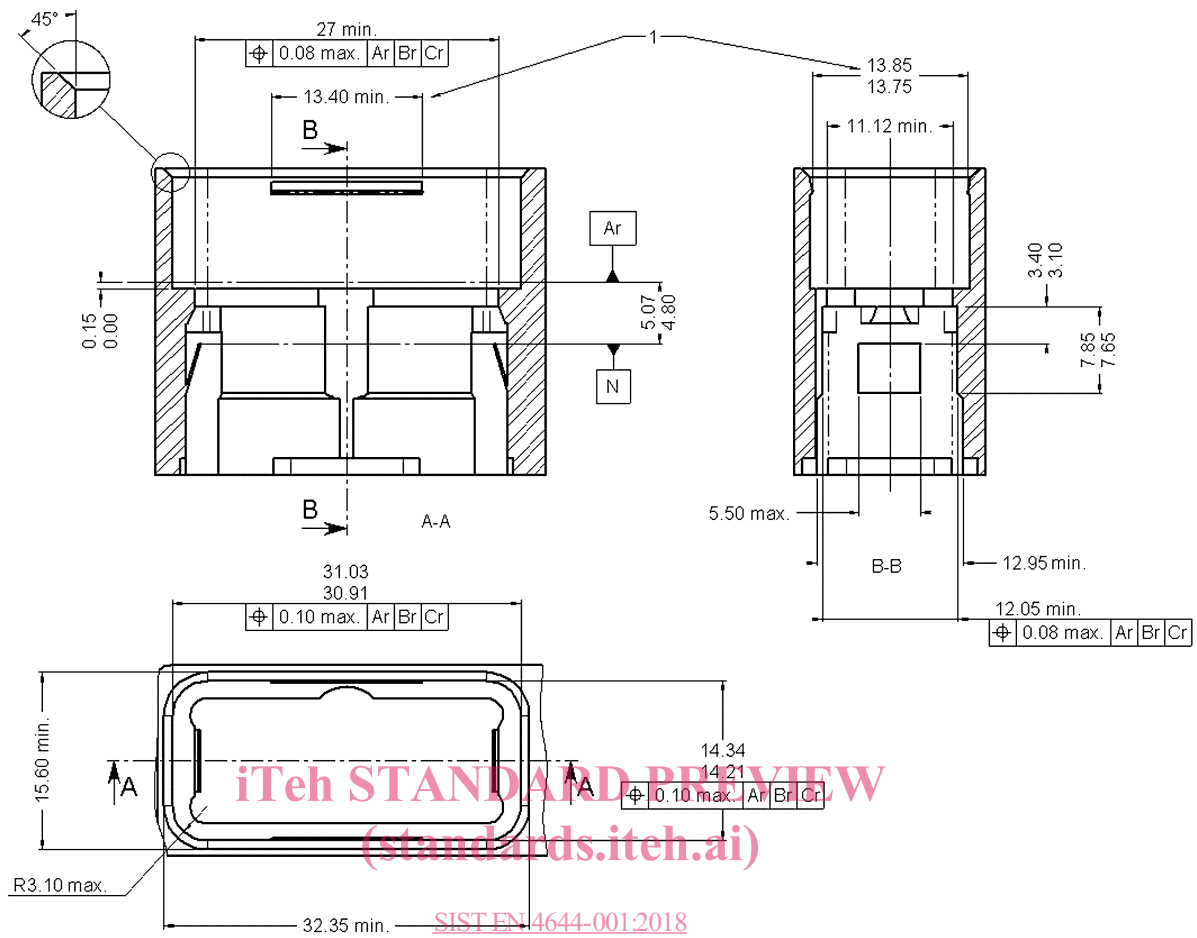
4.2.3 Rack and panel female housing



Key

- 1 Dimension for grounding device

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



<https://standards.itech.ai/catalog/standards/sist/b0b02317-e9e3-4930-bef0-04872d8cb3f4/sist-en-4644-001-2018>

Key

- 1 Dimension for grounding device (optional)

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

EN 4644-001:2017 (E)**4.3 Male housing****4.3.1 General**

For disconnect application, the following housings are described:

- size 1 male housing has quarter turn fasteners and 2 polarization post that can take 4 positions to polarize the housing.
Size 1 male housing is cable connector.
- size 2 male housing has a central coupling mechanism which can take 12 positions to polarize the housing.
Size 2 male housing is panel mount connector or cable connector.

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

For rack and panel application, the following housings are described:

- size 2 male housing has three polarization posts, each of them can take 4 positions to prevent mismatching between male and female housing.
- size 3 male housing has three polarization posts, each of them can take 4 positions to prevent mismatching between male and female housing.
- size 4 male housing has three polarization post, each of them can take 4 positions to prevent mismatching between male and female housing.

Male housing shall be installed on equipment side and can be connected to PCB or cable harness.

No grounding block option is available for rack and panel housings.

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 2 insert retaining devices allowing rear insertion and rear release of the insert.

All male housing have a minimum of 1 (for single cavity connectors) and a maximum of 2 aligning housing cavities (see Figure 5 and Figure 7); the remaining housing cavities are non-aligning cavities (see Figure 6 and Figure 8).

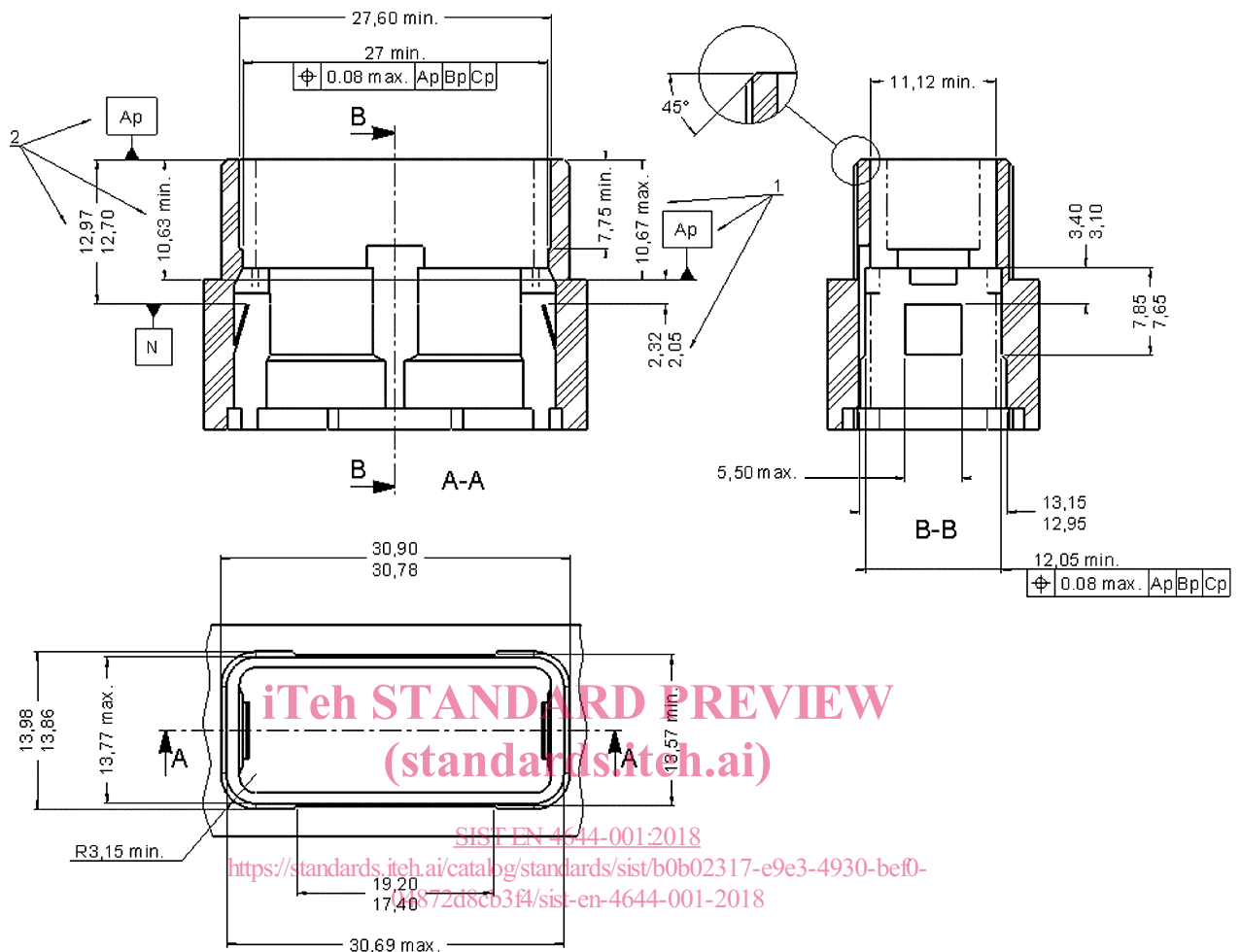
This principle is not valid for size 4 male housing because it can be mated with 2 size 2 female housings.

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 2 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)