BRITISH STANDARD

BS EN
4645-002:2009

Aerospace series — Connectors, optical, circular, single and multipin, coupled by threaded ring, self-locking 1,25 mm diameter ferrule with removable alignment sleeve holder

Part 002: Specification of performance and contact arrangements

ICS 49.060

BSI
British Standards

National foreword

This British Standard is the UK implementation of EN 4645-002:2009.

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

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Série aérospatiale - Connecteurs optiques circulaires à accouplement par bague filetée, auto-freinante ferrule 1,25, équipés d'un porte sleeve démontable - Partie 002 : Spécification de performances et arrangements des contacts

Luft- und Raumfahrt - Optische Rundsteckverbinder mit Schraubkupplung, selbstsichernd, Einzel- und Multipin, Ferrulendurchmesser 1,25 mm, demontierbarer Zentrierhülsenhalter - Teil 002: Leistungsdaten und Kontaktanordnungen

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Foreword

This document (EN 4645-002:2009) 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of an identical text or by endorsement, at the latest by May 2010, and conflicting national standards shall be withdrawn at the latest by May 2010.

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1 Scope

This European Standard defines the performance and contact arrangements of circular optical connectors, coupled by triple start threaded ring.

2 Normative references

The following referenced documents are indispensable for the application of this document. For dated references, only the edition cited applied. For undated references, the latest edition of the referenced document (including any amendments) applies.

EN 4529-002, *Aerospace series — Elements of electrical and optical connection — Sealing plugs — Part 002: Index of product standards.*

EN 4641-100, *Aerospace series — Cables, optical 125 µm diameter cladding — Part 100: Product standard — 62,5/125 µm GI fibre 1,8 mm — Outside diameter — Tight structure construction.* [1)]

EN 4641-101, *Aerospace series — Cables, optical 125 µm diameter cladding — Part 101: 0,9 mm outside diameter — Product standard.* [1)]

EN 4641-102, *Aerospace series — Cables, optical 125 µm outside diameter cladding — Part 102: Semi-loose 62,5/125 µm GI fibre nominal 1,8 mm outside diameter — Product standard*.

EN 4645-001:2009, *Aerospace series — Connectors, optical, circular, single and multipin, coupled by threaded ring, self-locking 1,25 mm diameter ferrule with removable alignment sleeve holder — Part 001: Technical specification*. [2)]

EN 4645-003, *Aerospace series — Connectors, optical, circular, single and multipin, coupled by threaded ring, self-locking 1,25 mm diameter ferrule with removable alignment sleeve holder — Part 003: Square flange receptacle — Product standard*.

EN 4645-004, *Aerospace series — Connectors, optical, circular, single and multipin, coupled by threaded ring, self-locking 1,25 mm diameter ferrule with removable alignment sleeve holder — Part 004: Jam nut receptacle — Product standard.*

EN 4645-005, *Aerospace series — Connectors, optical, circular, single and multipin, coupled by threaded ring, self-locking 1,25 mm diameter ferrule with removable alignment sleeve holder — Part 005: Plug — Product standard.*

EN 4639-101, *Aerospace series — Connectors, optical, rectangular, modular, multicontact, 1,25 diameter ferrule, with removable alignment sleeve holder — Part 101: Optical contact for cable EN 4641-100 — Operating temperatures between - 65 °C and 152 °C — Product standard.*

EN 4639-102, *Aerospace series — Connectors, optical, rectangular, modular, multicontact, 1,25 diameter ferrule, with removable alignment sleeve holder — Part 102: Optical contact for cable EN 4641-102 — Operating temperatures between - 55 °C and 100 °C — Product standard.*

1) In preparation at the date of publication of this standard.
2) Published as ASD-STAN Prestandard at the date of publication of this standard.

TR 4647, *Aerospace series — Fibres and cables of optical contact EN 4531 — Aircraft use TR 4646 — Termination procedure for EN 4531, Optical contact.*[3)]

3 Terms and definitions

For the purposes of this document, the terms and definitions given in EN 4645-001:2009 apply.

4 Description and codification of models

See Table 1.

Table 1

Environmental class	Description
J	Composite receptacles and plugs, cadmium plated, olive drab – 2 000 h salt spray
M	Composite receptacles and plugs, nickel-plated – 2 000 h salt spray
C	Composite receptacles and plugs, without plating, high corrosion resistance
B	Nickel-Bronze receptacles and plugs, high corrosion resistance – 500 h salt spray
F	Aluminium receptacles and plugs, Nickel plated – 48 h salt spray
W	Aluminium receptacles and plugs, Cadmium plated – 500 h salt spray
O	Aluminium receptacles and plugs, Hard anodic non conductive – 500 h salt spray
K	Stainless steel receptacles and plugs, Passivated – 500 h salt spray
S	Stainless steel receptacles and plugs, Nickel plated – 48 h salt spray

5 Operating conditions

The termini optical performances are defined in EN 4639-101 and EN 4639-102 product standards in relationship with cables defined in Table 4.

6 Combinations of plug and receptacle shells

Table 2 shows the combinations:

1) which achieve the characteristics specified for each model;
2) for the characteristics of the pair of connectors of the component with the lowest performance;
3) for other combinations subject to the approval of the Design Authority.

3) Published as ASD Technical Report at the date of publication of this standard.

Table 2

Receptacle shell	Plug shell								
	J	M	C	B	F	W	O	K	S
J	1)	3)	2)	3)	3)	1)	2)	3)	3)
M	3)	1)	2)	3)	3)	3)	3)	3)	3)
C	2)	2)	1)	3)	3)	3)	3)	3)	3)
B	3)	3)	3)	1)	3)	3)	3)	3)	3)
F	3)	3)	3)	3)	1)	2)	2)	3)	3)
W	1)	3)	3)	3)	2)	1)	2)	3)	3)
O	2)	3)	3)	3)	2)	2)	1)	3)	3)
K	3)	3)	3)	3)	3)	2)	3)	1)	2)
S	3)	3)	3)	3)	3)	3)	3)	2)	1)

6.1 Permissible cables

The performance of these connectors is achieved with cables of outside jacket dimensions given in Table 3.

Table 3

Cable Designation	Fiber	Outer diameter cable	Designation cable
A	62,5 / 125	0,9 mm	EN 4641-101
B	62,5 / 125	1,8 mm (Tight structure)	EN 4641-100
C	62,5 / 125	1,8 mm (semi Loose structure)	EN 4641-102

6.2 Contact designation and coding

See Table 4.

Table 4

Contact designation	Contact type	Product standard	Cable structure type
Fibre optic contact for tight structure cable	MT	EN 4639-101	EN 4641-100
Fibre optic contact for loose structure cable	ML	EN 4639-102	EN 4641-102

6.3 Material of the sleeves

See Table 5.

Table 5

Sleeve material code	Recommendation	Material of the sleeves
01	Single mode silica fibre Multimode silica fibre 50/125 µm, 62,5/125 µm, 100/140 µm	Zirconia ceramic or similar

6.4 Climatic conditions

Temperature range: refer to product standard.

Fluid resistance: see EN 4645-001.

Corrosion resistance: see Table 1.

6.5 Mechanical conditions

Mechanical endurance: refer to product standard.

7 Type codes

See Table 6.

Table 6

Type	EN 4645- Product standard	Description
0	003	Square flange mounted receptacle
7	004	Jam Nut receptacle
6	005	Plug

8 Polarization

Polarization positions possible by shell size are defined in Table 7.

Table 7

Polarization position	Shell size							
	11	13	15	17	19	21	23	25
N	X	X	X	X	X	X	X	X
A	X	X	X	X	X	X	X	X
B	X	X	X	X	X	X	X	X
C	X	X	X	X	X	X	X	X
D	X	X	X	X	X	X	X	X
E	X	X	X	X	X	X	X	X

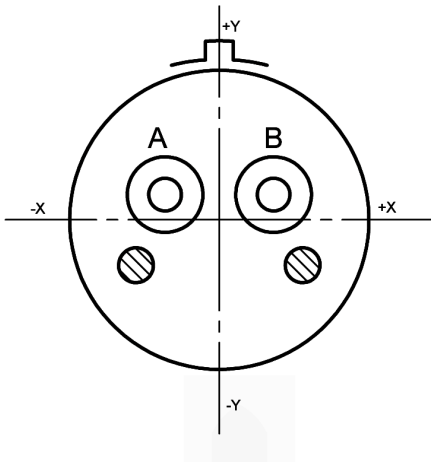
9 Housing sizes and contact arrangements

See Table 8 and Figures 1 to 8.

Table 8

Shell Size	Contact Layout	Number of ways
11	02	2
13	04	4
15	06	6
17	08	8
19	12	12
21	16	16
23	24	24
25	32	32

Front face view of the receptacle



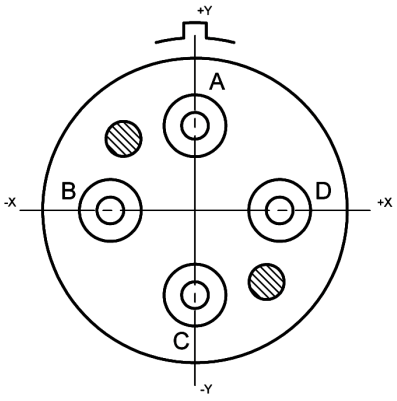
NOTES

Location of fibre optic terminus

Location of alignment pin

Figure 1 – Contact arrangement 11-02

Two optical ways

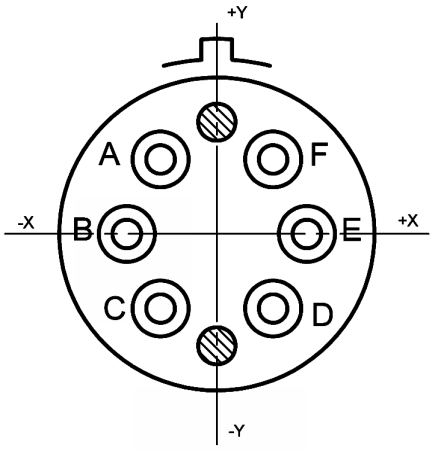


NOTES

Location of fibre optic terminus

Location of alignment pin

Figure 2 - Contact arrangement 13-04
Four optical ways

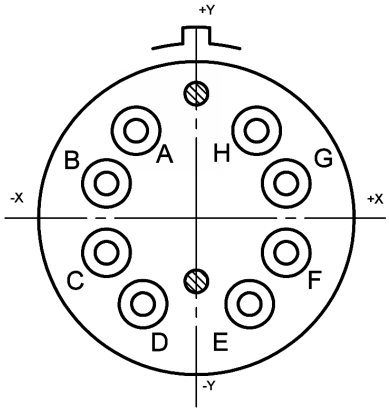


NOTES

Location of fibre optic terminus

Location of alignment pin

Figure 3 - Contact arrangement 15-06
Six optical ways

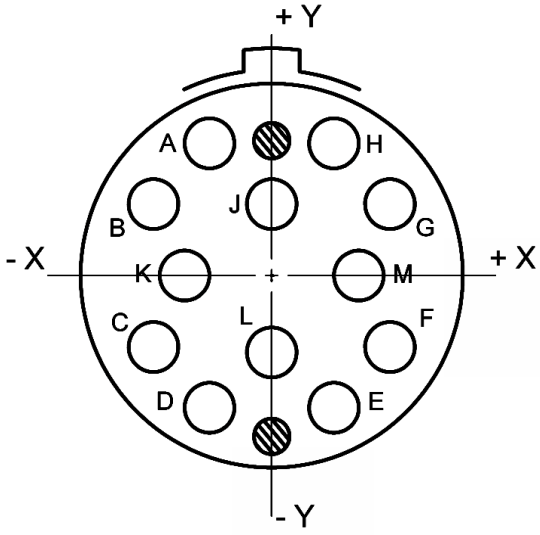


NOTES

Location of fibre optic terminus

Location of alignment pin

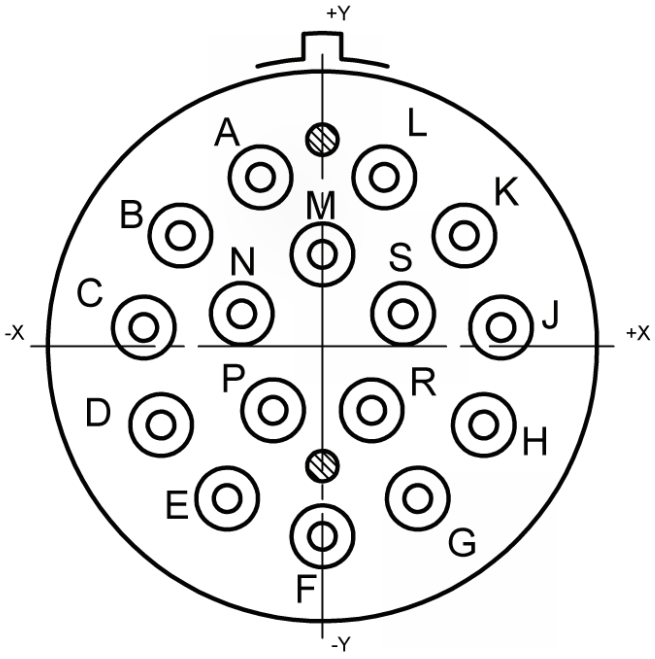
Figure 4 - Contact arrangement 17-08
Eight optical ways



NOTE

Location of alignment pin

Figure 5 - Contact arrangement 19-12
12 optical ways



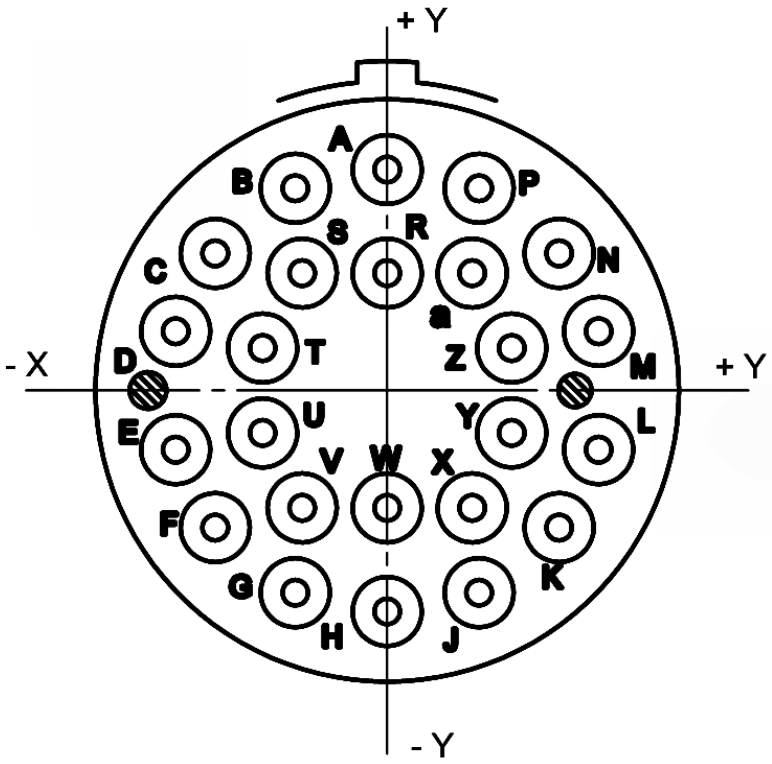
NOTES

Location of fibre optic terminus

Location of alignment pin

Figure 6 - Contact arrangement 21-16

16 optical ways



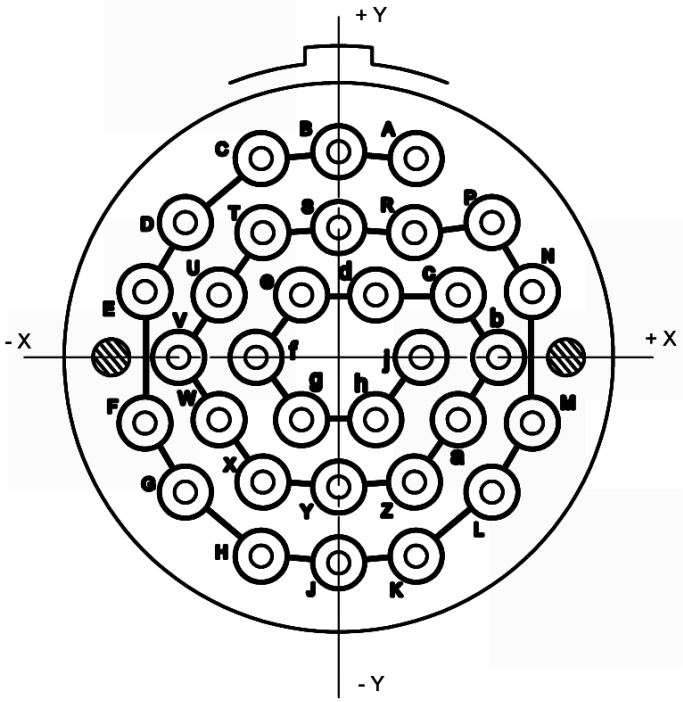
NOTES

Location of fibre optic terminus

Location of alignment pin

Figure 7 - Contact arrangement 23-24

24 optical ways



NOTES

Location of fibre optic terminus

Location of alignment pin

Figure 8 - Contact arrangement 25-32

32 optical ways

10 Filler plugs

Filler plugs defined in EN 4529-002 shall be used in the positions which correspond to unpopulated cavities.

11 Tooling

See product standard.

12 Assembly and termination instructions

TR 4647.

13 Cleaning instructions

TR 4647.

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