

वैज्ञानिक तथा औद्योगिक अनुसंधान परिषद्  
Council of Scientific & Industrial Research  
राष्ट्रीय वांतरिक्ष प्रयोगशालाएं  
National Aerospace Laboratories



CSIR - NAL Estd. 1959  
ISO 9001 : 2015  
Certified Organization

INVITATION FOR BIDS/NIT

Tender No. NAL/PUR/ACD/066/20-Y

Dated: 27-July-2020

CSIR- National Aerospace Laboratories (NAL), Bengaluru, India is one of the premier laboratories under Council of Scientific and Industrial Research (CSIR), an autonomous body under Department of Scientific and Industrial Research, Government of India, New Delhi. CSIR-NAL is a Science and Knowledge based Research, Development and Consulting Organization. It is internationally known for its excellence in Scientific Research in Aerospace Engineering.

The Director, CSIR-NAL invites online quotation for procurement of the following item(s) for day to day research work.

Sl.No.	Description of Items	Unit	Quantity
1	Rugged Fiber Optics Connectors, Cable assemblies, tools and accessories. Please refer Annexure for detailed specification.	Set	01
Single / Double Bid		Single	
Bid Security (EMD) (in INR)		40000/-	
Performance Security		10% of the purchase order value	

01. Tender Documents may be downloaded from Central Public Procurement Portal <https://www.etenders.gov.in>. Aspiring Bidders who have not enrolled/ registered in e- procurement should enroll/ register before participating through the website <https://www.etenders.gov.in>. The portal enrolment is free of cost. Bidders are advised to go through instructions provided at 'Instructions for online Bid Submission'.
02. Tenderers can access tender documents on the website (For searching in the NIC site <https://www.etenders.gov.in>, kindly go to Tender Search option, select tender type and select ' Council of Scientific and Industrial Research' in organization tab and select NAL-Bengaluru-CSIR in department type Thereafter, Click on "Search" button to view all CSIR-NAL, Bengaluru tenders). Select the appropriate tender and fill them with all relevant information and submit the completed tender document online on the website <https://www.etenders.gov.in> as per the schedule given in the next page.
03. Either the Indian Agent on behalf of the Foreign principal or the Foreign principal can bid directly in a tender but not both. However, the offer of the Indian Agent should also accompany the authorization letter from their principal. To maintain sanctity of tendering system, one Indian Agent cannot represent two different Foreign principals in one tender.
04. Unsolicited / conditional / unsigned tenders (Quotations) **shall not** be considered. Quotations received after the due date and time **shall be summarily rejected**.
05. The Bidder shall comply the terms and conditions of the tender, failing which, the offer shall be liable for rejection.
06. The Director, CSIR- National Aerospace Laboratories., Bengaluru reserves the right to accept any or all the tenders either in part or in full or to split the order without assigning any reasons there for.

  
Raman Kumar  
(Section Officer S&P)

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P B No 1779, HAL Airport Road, Kodihalli, Bengaluru - 560 017, INDIA  
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[purchasek@nal.res.in](mailto:purchasek@nal.res.in)





**SCHEDULE CUM CRITICAL DATE SHEET**

1	Name of Organization	CSIR-National Aerospace Laboratories, Bengaluru	
2	Tender Reference No	NAL/PUR/ACD/066/20-Y dated: 27-July-2020	
3	Tender Type (Open/Limited/EOI/Auction/Single)	Limited Tender	
4	Type/Form of Contract (Work / Supply / Auction / Service / Buy / Empanelment / Sell)	Supply	
5	No of Covers (One/Two/Three/Four)	One	
6	Tender Category (Services/Good/Works)	Goods	
7	Allow Resubmission (Only in online mode within scheduled period)	Yes	
8	Allow Withdrawal (Only in online mode within scheduled period)	Yes	
9	Allow Offline Submission	No	
10	Work Item Title	Rugged Fiber Optics Connectors, Cable assemblies, tools and accessories.	
11	Work Description	Rugged Fiber Optics Connectors, Cable assemblies, tools and accessories.	
12	Delivery Schedule	90 days from the date of purchase order	
13	Product Category (Civil Works / Electrical Works / Fleet Management / Computer Systems)	R & D Equipment	
14	Is Multi Currency Allowed	Yes	
15	a) Tender Publishing Date -	27-July-2020	1800 Hrs
	b) Document Download Start Date-	27-July-2020	1800 Hrs
	c) Bid Submission Start Date-	27-July-2020	1800Hrs
	d) Bid Submission End Date-	13-Aug-2020	1000 Hrs
	e) Bid Opening Date-	14-Aug-2020	1100 Hrs
16	Bid Validity Days	90 days	
17	Address for communication	Stores and Purchase Officer CSIR-National Aerospace Laboratories, HAL Airport Road, Kodihalli, Bengaluru - 560017	
18	Inviting Officer	Director, CSIR-NAL	
19	Contact No	25086040, 25086041	
20	E-mail Address	<a href="mailto:purchasek@nal.res.in">purchasek@nal.res.in</a>	
21	Detailed specification of item	Refer Invitation for bids / NIT	
22	Tender Terms & Conditions & Instruction for online bid submission	The prospective bidders are requested to refer to the Standard Tender Document available on NAL Internet ( <a href="http://www.nal.res.in">www.nal.res.in</a> ) under the icon Tender-Purchase before formulating and submitting their bids	

**Note:**

- Participation in this tender is by invitation only and is limited to the selected bidders. Unsolicited offers are liable to be ignored. However, bidders who desire to participate in such tenders in future may bring it to the notice of Procuring Entity and apply for registration.**
- To get registered as an approved bidder with the procuring entity please refer our website [www.nal.res.in](http://www.nal.res.in) and submit.**

**ANNEXURE-1**

SI No.	Description	Qty	Unit	Remarks
<b>Fiber Optic Plugs &amp; Receptacles</b>				
1	Fiber Optic LxCR Jam nut receptacle with dust caps	5	Nos.	<u>Refer Table -1 For characteristic specifications &amp; test Compliance.</u>
2	Fiber Optic EZLux Jam nut receptacle with dust caps	5	Nos.	<u>Refer Table -2 For characteristic specifications &amp; test Compliance</u>
3	R8 Series 6 cavity Jam nut receptacle with dust caps	1	No.	<u>Refer Table -3 For characteristic specifications &amp; test Compliance</u>
4	FCAPC Jam nut adaptor with dust caps	2	Nos.	
<b>Fiber optic Cable Assembly</b>				
5	Cable assembly with SMF and tensolite loose cable. one end with LxCR plug, boot & dust cap other end with LuxCis termini with boot, ferrule & dust cap	3	Nos.	<u>Refer Detailed specification in Dwg. No -5</u>
6	Cable assembly with SMF and tensolite loose cable. Both end's with LxCR plug, boot & dust cap.	3	Nos.	<u>Refer Detailed specification in Dwg. No -6</u>
7	Cable assembly with SMF and tensolite loose cable. one end with EZLux plug with boot & dust cap. other end with LuxCis termini, boot, ferrule & dust cap	3	Nos.	<u>Refer Detailed specification in Dwg. No -7</u>
8	Cable assembly with SMF and tensolite loose cable. Both ends with EZLux plug, boot & dust cap.	3	Nos.	<u>Refer Detailed specification in Dwg. No -8</u>
9	Cable assembly with SMF and tensolite loose jacket cable. One end with R8 series plug 6 cavity rugged assembly. Other end with 3 LxCR plugs and 3 EzLux Plug with boot and cap.	1	No.	<u>Refer Detailed specification in Dwg. No -9</u>
10	Cable assembly with SMF and tensolite loose jacket cable. One end FCAPC Connector & dust cap. Other end with LuxCis termini with boot, ferrule & dust cap.	5	Nos.	<u>Refer Detailed specification in Dwg. No -10</u>
11	Cable assembly with SMF and tensolite loose jacket cable. One end with 4 individual LuxCis termini with boot & dust cap. Other end with fan in R8 series plug 4 cavity.	1	No.	<u>Refer Detailed specification in Dwg. No -11</u>
12	Cable assembly with SMF and tensolite loose cable. Both ends with LuxCis SingleMode APC 8° (RL>65dB) 1.8-2 mm SM 9/125 µm loose Simplex aerospace grade connector with boot & dust cap	4	Nos.	<u>Refer Detailed specification in Dwg. No -12</u>
13	Cable assembly with SMF and tensolite loose jacket cable. Both end FCAPC Connector & dust cap.	4	Nos.	<u>Refer Detailed Specification in Dwg. No - 13</u>

Fiber Optic Tools & Accessories				
Sl. No.	Description	Qty	Unit	Remarks
14	LuxCis to LuxCis simplex bulkhead feedthrough adapter	2	Nos	
15	LuxCis to LuxCis simplex straight adapter	2	Nos	
16	LuxCis to LuxCis duplex adapter for PCB	1	Nos	
17	LuxCis to LuxCis quick release adapter	1	Nos	
18	Plastic insertion/extraction tool, size 16	5	Nos	
19	Dust caps for LuxCis ARINC 801 (Pack of 100)	1	Nos	
20	Sealing plugs for LuxCis ARINC 801 cavities (Pack of 100)	1	Nos	
21	Extraction tool for removal of Ez-Lux plug and receptacle	1	Nos	
22	Plastic Dust cap for Ez-Lux Plug/LxCR Plug/LxCR receptacle (Packet of 100 pieces)	1	Packet	
23	Protective boot for fiber cable for plugs and receptacles (Packet of 100 pieces)	1	Packet	
24	Fiber Optic Cleaning Supplies Kit (for inspection & replenishment) Comprising of 1. Fiber wash cleaning pen. 2. Fiber optic cleaning platform with wipes and pad. 3. cleaning sticks. 4. optical face cleaning swabs. 5. Mechanical stick cleaner	1	Set	
25	Tip for APC terminus for digital probe	1	No.	
26	Fiber microscope 200x/400x digital probe (with USB plug and necessary software)	1	No.	
29	Primary stripper (for 900µm buffer)	1	No.	

**Table – 1: Fiber Optic LxCR Jam nut receptacle’s Mechanical And Environmental Characteristics**

Test	Standard	Compliance Value
Thermal cycling	SAE AS 13441; method 1003.1	-65°C/+125°C (cable dependent)
Temperature endurance	TIA/EIA 455-4	1000 h @ 125°C (cable dependent)
Vibration	TIA/EIA 455-11	50 Grms
Shocks	TIA/EIA 455-14	3000 G, 3 ms
Durability	TIA/EIA 364-09	500 cycles
Maintenance aging	SAE AS 13441; method 2002.1	10 cycles
Cable retention 1.88 mm diameter	SAE AS 13441; method 2009.1	68 N
Cable retention 0.9 mm diameter	SAE AS 13441; method 2009.1	7 N
Humidity	TIA/EIA 455-5	10 cycles/24 h; 90% RH; -25°C/+65°C
Salt Spray	SAE AS 13441; method 1001.1	96 h

**Table – 2: Fiber Optic EzLux Jam nut receptacle’s Mechanical And Environmental Characteristics**

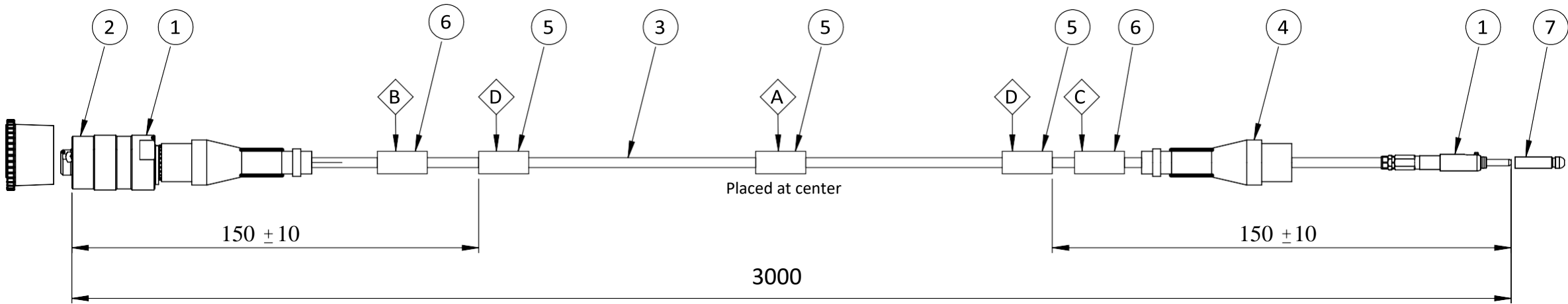
Test	Standard	Compliance Value
Thermal cycling	TIA 455-3B - Test Condition C-4	-55 to +125 °C
Temperature endurance	TIA/EIA-455-4C	1000 hours / 125°C
Vibration	TIA/EIA-455-11C	44.8 Grms
Shocks	TIA-455-14-A Test Condition D	300 G
Durability	TIA/EIA-455-21	100 Cycles
Connector coupling forces	EIA-364-13E	<80N
Humidity	TIA/EIA-455-5C	96h – 95% humidity – 40°C ±2°C
Salt Spray	TIA/EIA 455-16	96 h

**Table – 3: Fiber Optic R8 Series 6 cavity Jam nut receptacle’s Mechanical And Environmental Characteristics**

Test	Standard	Compliance Value
Thermal cycling	SAE AS 13441 method 1003.1	-55°C/+125°C (cable dependent)
Temperature endurance	TIA/EIA 455-4	1000 h @ 125°C (cable dependent)
Vibration	TIA/EIA 455-11	43 Grms; 60 G sinus
Shocks	TIA/EIA 455-14	300 G, 3 ms
Durability	TIA/EIA	500 cycles
Maintenance aging	SAE AS 13441; method 2002.1	10 cycles
Cable retention 1.88 mm diameter	SAE AS 13441; method 2009.1	68 N
Cable retention 0.9 mm diameter	SAE AS 13441; method 2009.1	7 N
Humidity	TIA/EIA 455-5	10 cycles/24 h; 90% RH; -25°C/+65°C
Salt Spray	SAE AS 13441; method 1001.1	96 h

**Note: To be followed for all the applicable parts, accessories and cable Assemblies being supplied.**

- 1. Certificate of compliance to be provided for all the connectors and individual cable assemblies.**
- 2. All the receptacles, plugs etc. MUST maintain N-polarization.**
- 3. For cable assemblies (Sl. No. 5 to 12): Necessary optical loss test report for each cable assembly should be provided.**
- 4. All the cable assembly will have Single mode fiber cable.**
- 5. Necessary dust caps must be provided for all the cable assemblies and receptacles.**



Marking:

Sl. No.	Text @. Loc B	Text @. Loc C
1	P1A	P2A
2	P1B	P2B
3	P1C	P2C

Table 1

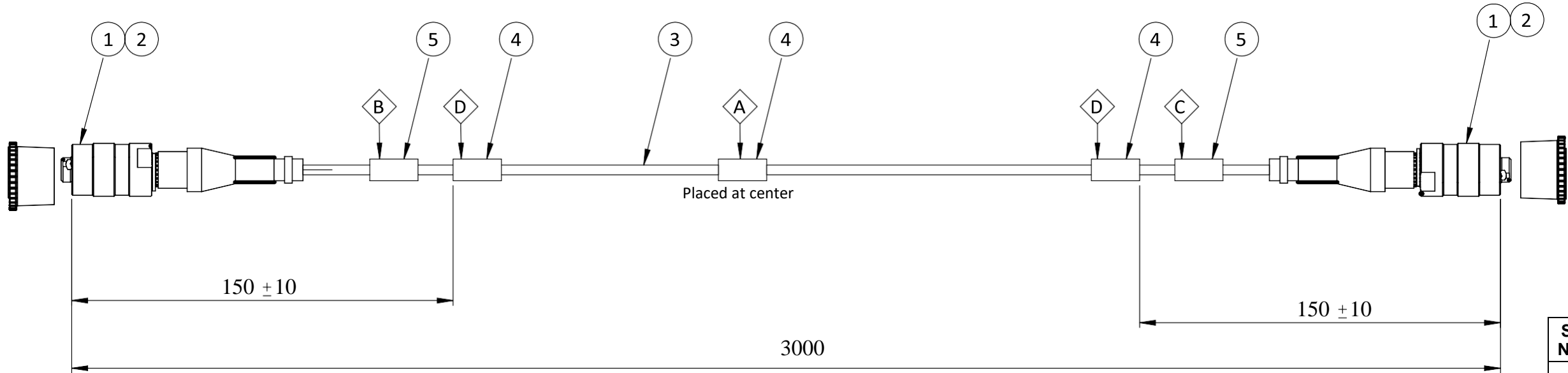
Marking:

Loc	Text
A	Part number defined by vendor
B	Refer Table 1
C	Refer Table 1
D	SM LxCR 03 LuxCis

xx PART LIST:

No.	Qty.	Description
1	2	LuxCis-APC, Single Mode $\phi$ 1.25mm zirconia ceramic ferrule for 1.8mm cable.
2	1	LxC-R Plug with boot and Plastic cap (LXCRP1C1BL1N)
3	-	$\phi$ 1.8mm SM, Aeronautical Tensolite loose cable
4	1	LxC-R Plug boot
5	-	White heat shrink sleeve for marking
6	2	Self-laminating label
7	1	LuxCis ferrule black dust cap

		LXC-R Plug	LuxCis-APC
Optical :	Attenuation: Socket mated with reference plug, at 1550nm (IEC 61300-3-4)	0.3 dB Typical (Max. 0.5 dB)	0.3 dB Typical (Max. 0.5 dB)
	Return Loss	>65 dB	>65 dB
Mechanical :	Endurance	500 matings	500 matings
	Individual cable retention	68N	68N
Environmental :	Temperature range	-55°C / +125°C	-55°C / +125°C



Marking:

Sl. No.	Text @. Loc B	Text @. Loc C
1	P2A	P3A
2	P2B	P3B
3	P2C	P3C

Table 1

Marking:

Loc	Text
A	Part number defined by vendor
B	Refer Table 1
C	Refer Table 1
D	S LxCR 03 LxCR

xx PART LIST:

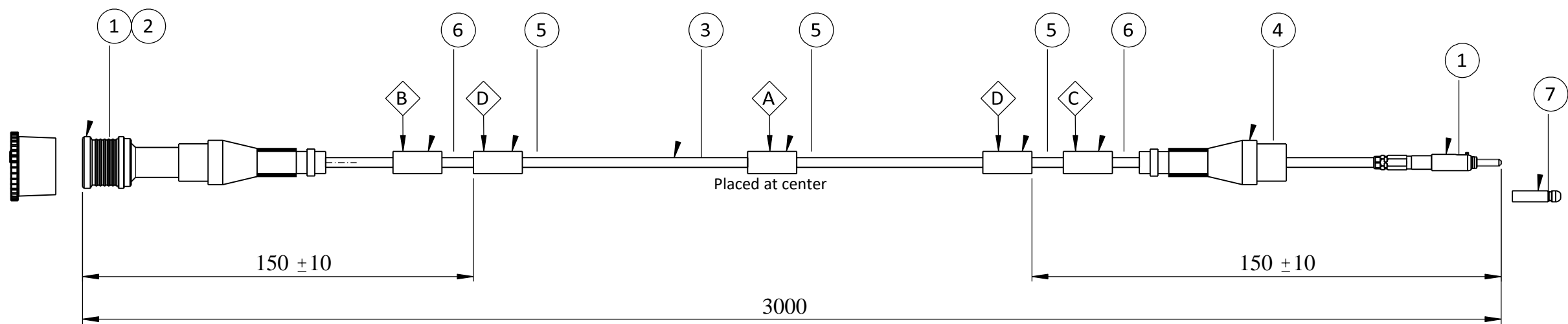
No.	Qty.	Description
1	2	LuxCis-APC Single Mode $\phi$ 1.25mm zirconia ceramic ferrule for 1.8mm cable
2	2	LxC-R Plug with boot & plastic cap (LXCRP1C1BL1N)
3	-	$\phi$ 1.8mm SM, Aeronautical Tensolite loose cable
4	-	White heat shrink sleeve for marking
5	2	Self-laminating label

		LXC-R Plug
Optical :	Attenuation: Socket mated with reference plug, at 1550nm (IEC 61300-3-4)	0.3 dB Typical (Max. 0.5 dB)
	Return Loss	>65 dB
Mechanical :	Endurance	500 matings
	Individual cable retention	68N
Environmental :	Temperature range	-55°C / +125°C

Note: All the Dimensions in mm unless otherwise mentioned specifically

Drawing. No. – 06





Marking:

Sl. No.	Text @. Loc B	Text @. Loc C
1	P1A	P2A
2	P1B	P2B
3	P1C	P2C

Table 1

Marking:

Loc	Text
A	Part number defined by Vendor
B	Refer Table 1
C	Refer Table 1
D	SM EzLux 03 LuxCis

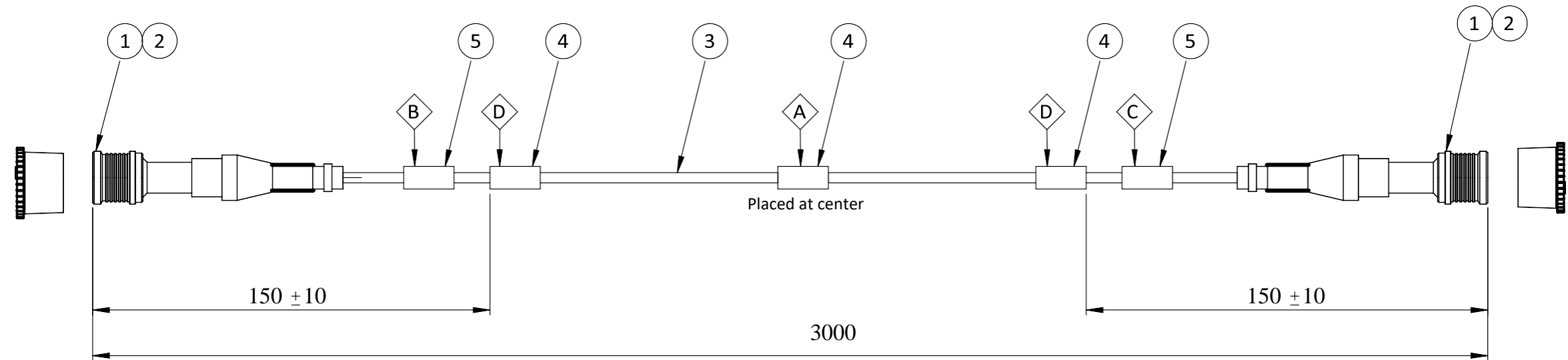
xx PART LIST:

No.	Qty.	Description
1	2	LuxCis-APC, Single Mode $\phi$ 1.25mm zirconia ceramic ferrule for 1.8mm cable.
2	1	EZLux Plug with Boot and plastic cap (F725E00100)
3	-	$\phi$ 1.8mm SM, Aeronautical Tensolite loose cable
4	1	EZLux Plug boot
5	-	White heat shrink sleeve for marking
6	2	Self-laminating label
7	1	LuxCis ferrule dust cap

		EZLux	LuxCis-APC
Optical :	Attenuation: Socket mated with reference plug, at 1550nm (IEC 61300-3-4)	0.3 dB Typical (Max. 0.5 dB)	0.3 dB Typical (Max. 0.5 dB)
	Return Loss	>65 dB	>65 dB
Mechanical :	Endurance	100 matings	500 matings
	Individual cable retention	68N	68N
Environmental :	Temperature range	-55°C / +125°C	-55°C / +125°C

Note: All the Dimensions in mm unless otherwise mentioned specifically

Drawing. No. – 7



Marking:

Sl. No.	Text @. Loc B	Text @. Loc C
1	P2A	P3A
2	P2B	P3B
3	P2C	P3C

Table 1

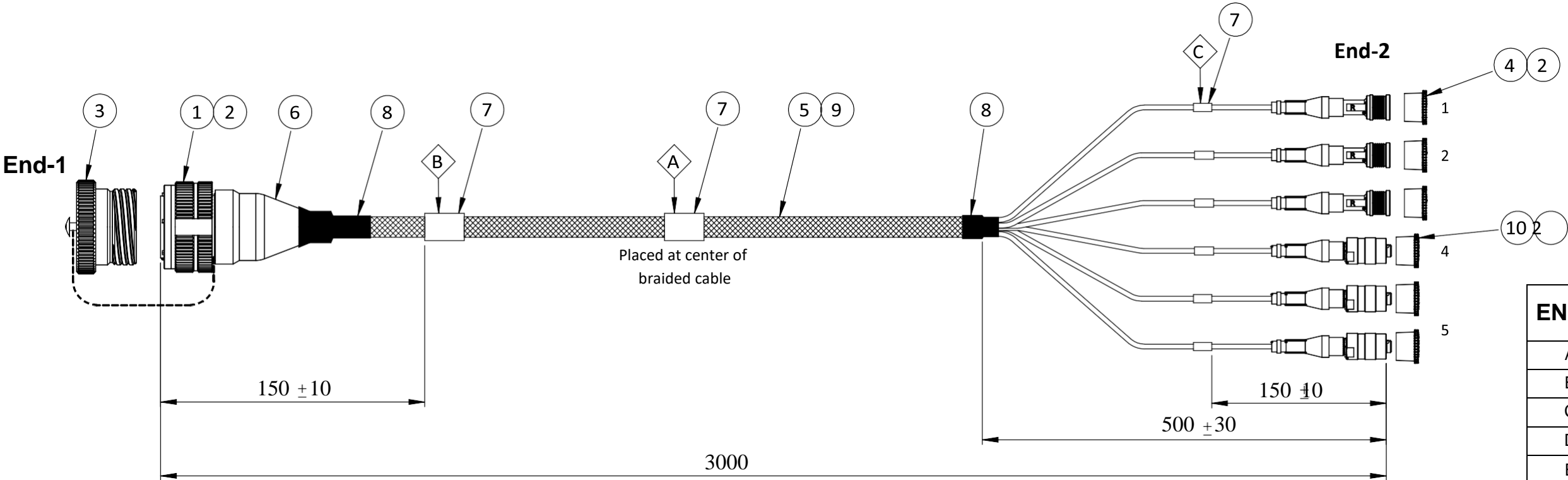
Marking:

Loc	Text
A	(Part number defined by vendor)
B	Refer Table 1
C	Refer Table 1
D	S EzLux 03 EzLux

xx PART LIST:

No.	Qty.	Description
1	2	LuxCis-APC Single Mode $\phi$ 1.25mm zirconia ceramic ferrule for 1.8mm cable
2	2	EZLux Plug with boot & plastic cap (F725E00100)
3	-	$\phi$ 1.8mm SM, Aeronautical Tensolite loose cable
4	-	White heat shrink sleeve for marking
5	2	Self-laminating label

		EZLux Plug
Optical :	Attenuation: Socket mated with reference plug, at 1550nm (IEC 61300-3-4)	0.3 dB Typical (Max. 0.5 dB)
	Return Loss	>65 dB
Mechanical :	Endurance	100 matings
	Individual cable retention	68N
Environmental :	Temperature range	-55°C / +125°C



Marking		
END-1	END-2	Text @ Loc. C
A	1	P3A
B	2	P3B
C	3	P3C
D	4	P3D
E	5	P3E
F	6	P3F

Table 1

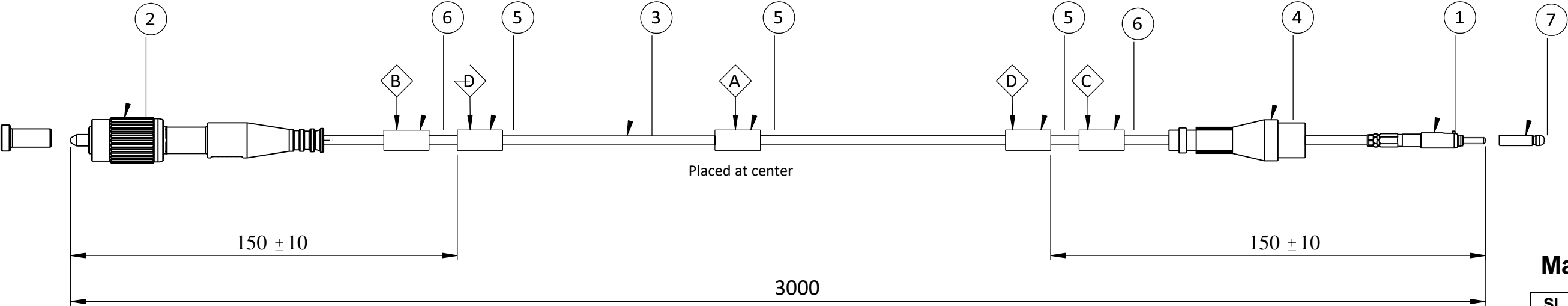
Marking:

Loc	Text
A	(Part number defined by vendor)
B	MP_CA2_R8
C	Refer Table 1
D	M R8C4 03 LxCR03 EzLux03

xx PART LIST:

No.	Qty.	Description
1	1	38999 #15 Plug Cadmium Olive Drab plated,(R8W15O6FOSAN)
2	12	LuxCis-APC Single Mode $\phi$ 1.25mm zirconia ceramic ferrule for 1.8mm cable
3	1	38999 #15 Metallic Dust cap with link
4	3	EZLux Plug with boot & plastic cap (F725E00100)
5	-	$\phi$ 1.8mm SM, Aeronautical Tensolite loose cable
6	1	Back shell for #15
7	-	White heat shrink sleeve for marking
8	-	Heat shrink sleeve
9	-	Braided Sleeve
10	3	LxC-R Plug with plastic cap and boot (LXCRP1C1BL1N)

		38999-P	EZLux Plug	LXC-R Plug
Optical :	Attenuation : Socket mated with reference plug, at 1550nm (IEC 61300-3-4)	0.3 dB Typical (Max. 0.5 dB)	0.3 dB Typical (Max. 0.5 dB)	0.3 dB Typical (Max. 0.5 dB)
	Return Loss	>65 dB	>65 dB	>65 dB
Mechanical :	Endurance	500 matings	100 matings	500 matings
	Individual cable retention	68N	68N	68N
Environmental :	Temperature range	-55°C / +125°C		



Marking:

Sl. No.	Text @. Loc B	Text @. Loc C
1	P1A	P2A
2	P1B	P2B
3	P1C	P2C
4	P1D	P2D
5	P1E	P2E

Table 1

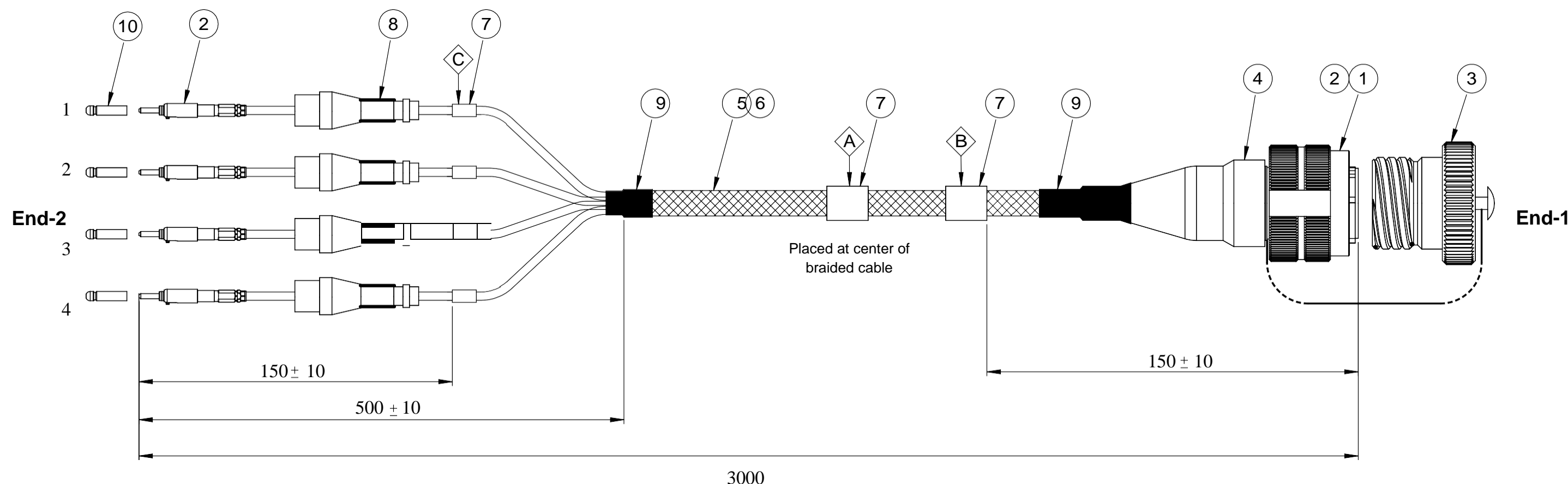
xx PART LIST:

No.	Qty.	Description
1	1	LuxCis-APC Single Mode $\phi$ 1.25mm zirconia ceramic ferrule for 1.8mm cable
2	1	FCAPC connector with boot and dustcap
3	-	$\phi$ 1.8mm SM, Aeronautical Tensolite loose cable
4	1	LxC-R Plug boot
5	-	White heat shrink sleeve for marking
6	2	Self-laminating label
7	1	LuxCis ferrule dust cap

Marking:

Loc	Text
A	Part number defined by vendor
B	Refer Table 1
C	Refer Table 1
D	S FCAPC 03 LuxCis

		FCAPC	LuxCis-APC
Optical :	Attenuation: Socket mated with reference plug, at 1550nm (IEC 61300-3-4)	0.3 dB Typical (Max. 0.5 dB)	0.3 dB Typical (Max. 0.5 dB)
	Return Loss	>65 dB	>65 dB
Mechanical :	Endurance	200 matings	500 matings
	Individual cable retention	68N	68N
Environmental :	Temperature range	-55°C / +125°C	



xx PART LIST:

No.	Qty.	Description
1	1	38999 #13 Plug, Nickel plated Aluminium,(R8W13N4FOSAN)
2	8	LuxCis-APC Single Mode 1.25mm zirconia ceramic ferrule for 1.8mm cable
3	1	Metallic Dust cap with link, Nickel plated
4	1	Back shell for #13
5	-	Ø 1.8mm SM, Aeronautical Tensolite loose cable
6	-	Braided Sleeve
7	-	White heat shrink sleeve for marking
8	4	EZLux Plug boot
9	-	Heat shrink sleeve
10	4	LuxCis ferrule dust cap

Marking:

Loc	Text
A	Part number defined by vendor
B	SSAMOIC_LuxCis
C	Refer Table 1
D	SSAMOIC LuxCis 03 R8C4

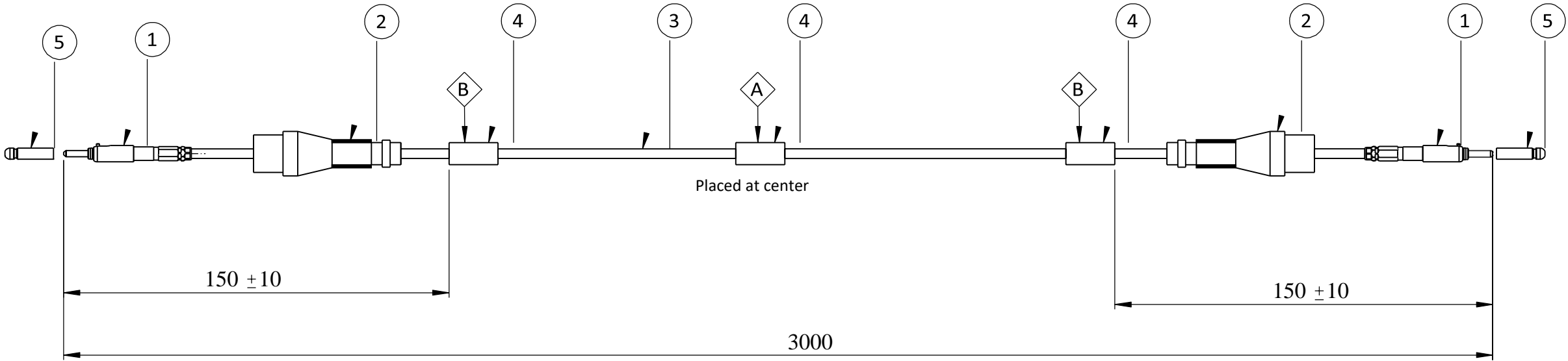
Pin Map & Marking

END-1	END-2	Text @ Loc C
A	1	P3CH1A
B	2	P3CH2B
C	3	P3CH3C
D	4	P3CH4D

Table 1

		LuxCis-APC	38999-P
Optical :	Attenuation: Socket mated with reference plug, at 1550nm (IEC 61300-3-4)	0.3 dB Typical (Max. 0.5 dB)	0.3 dB Typical (Max. 0.5 dB)
	Return Loss	>65 dB	>65 dB
Mechanical :	Endurance	500 matings	500 matings
	Individual cable retention	68N	68N
Environmental :	Temperature range	-55°C / +125°C	-55°C / +125°C





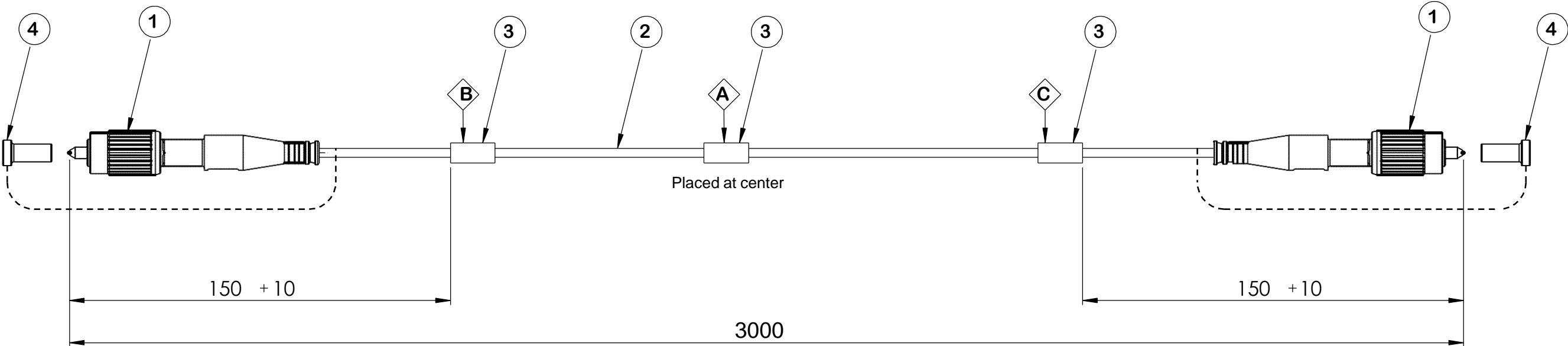
Marking:

Loc	Text
A	Part Number defined by vendor
B	LuxCis Cable Assembly
D	S LuxCis 03 LuxCis

xx PART LIST:

No.	Qty.	Description
1	2	LuxCis-APC, Single Mode $\phi$ 1.25mm zirconia ceramic ferrule for 1.8mm cable
2	2	EZLux Plug boot
3	-	$\phi$ 1.8mm SM, Aeronautical Tensolite loose cable
4	-	White heat shrink sleeve for marking
5	2	LuxCis ferrule dust cap

		LuxCis-APC
Optical :	Attenuation: Socket mated with reference plug, at 1550nm (IEC 61300-3-4)	0.3 dB Typical (Max. 0.5 dB)
	Return Loss	>65 dB
Mechanical :	Endurance	500 matings
	Individual cable retention	68N
Environmental :	Temperature range	-55°C / +125°C



Marking:

Loc	Text
A	Part Number defined by vendor
B	FCAPC Cable Assembly
D	S FCAPC 03 FCAPC

xx PART LIST:

No.	Qty.	Description
1	2	FCAPC connector with boot and dustcap
2	-	Ø1.8mm SM, Aeronatical violet colour Tensolite loose cable
3	-	White heat shrink sleeve for marking
4	2	Secured FC ferrule caps

		FCAPC	FCAPC
Optical :	Attenuation : Socket mated with reference plug, at 1550nm (IEC 61300-3-4)	0.3 dB Typical (Max. 0.5 dB)	0.3 dB Typical (Max. 0.5 dB)
	Return Loss	>65 dB	>65 dB
Mechanical :	Endurance	200 matings	200 matings
	Individual cable retention	68N	68N
Environmental :	Temperature range	-55°C / +125°C	