PURCHASE CONTRACT

This purchase contract ("**Contract**") was concluded pursuant to Section 2079 *et seq*. of the act no. 89/2012 Coll., Civil Code ("**Civil Code**"), on the day, month and year stated below by and between:

(1) **Fyzikální ústav AV ČR, v.v.i.,**

(Institute of Physics of the Academy of Sciences of the Czech Republic, a public research institution)

with its registered office at: Na Slovance 2, Praha 8, PSČ: 182 21

registration no.: 68378271

represented by: RNDr. Michael Prouza, PhD. – director

("**Buyer**"); and

(2) **ISP SYSTEM,**

with its registered office at: Zone Industrielle de la Herray, BP 10047, 65501 VIC-en-BIGORRE CEDEX, FRANCE

registration no.: 410 675 078 000 27

represented by: Paul SAUVAGEOT - CEO

enrolled in the commercial registered kept by Tribunal de commerce de Tarbes (France)

("**Seller**").

(The Buyer and the Seller are hereinafter jointly referred to as "**Parties**" and individually as "**Party**".)

WHEREAS

(A) The Seller's bid for the public procurement procedure entitled "**L3 Periscope Mirror Mounts – Type BIII**", whose purpose was to procure the Object of Purchase ("**Public Procurement**"), was selected by the Buyer as the most suitable.

(B) The Seller acknowledges that the Buyer considers the Seller's participation in the Public Procurement, provided that the Seller complies with all qualification requirements, as the confirmation of the fact that the Seller is capable, within the meaning of Sec 5(1) of the Civil Code, of providing performance under the Contract with such knowledge, diligence and care that is associated and expected of the Seller's profession, and that the Seller's potential performance lacking such professional care would give rise to corresponding liability on the Seller's part. The Seller is prohibited from misusing his

qualities as the expert or his economic position in order to create or exploit dependency of the weaker party or to establish an unjustified imbalance in the mutual rights and obligation of the parties.

(C) The Seller acknowledges that the Buyer is not, in connection to the subject of this Contract, an entrepreneur, and also that the subject of this Contract is not related to any business activities of the Buyer.

IT WAS AGREED AS FOLLOWS:

1. **BASIC PROVISIONS**

1.1 Under this Contract the Seller shall manufacture and deliver to the Buyer a set of 3 top and 3 bottom periscope mirror mounts as specified in Annex 1 hereto (Technical Specification), all in the quality stipulated therein (hereiafter the "**Object of Purchase**" or the "**Devices**" and each of Devices separately as the "**Device**") and shall transfer to the Buyer ownership right to the Object of Purchase, and the Buyer shall take over the Object of Purchase and shall pay the Seller the Purchase Price (as defined below), all under the terms and conditions stipulated in this Contract.

1.2 Under this Contract the Seller shall also carry out the following activities ("**Related Activities**"):

a) to clean, to assemble and to deliver the Devices to the place of delivery – all pursuant to the Technical specification;

b) to provide tests/verifications of the devices as stipulated by the Buyer in the Techical specification;

c) to supply to the Buyer all documents required by the Buyer in the Technical specification (ie. manuals, analyses, declaration of conformity, reports, etc. if required);

d) to supply to the Buyer the confirmation that the delivered Devices are in conformity herewith;

e) to cooperate with the Buyer during the performace of this Contract in the extent stipulated in this Contract.

2. **THE PLACE OF DELIVERY**

The place of delivery is at the address: Fyzikální ústav AV ČR v.v.i/ ELI-Beamlines, Průmyslová 836, 252 41 Dolní Břežany, Czech Republic or any other address in Dolní Břežany, Czech Republic, which the Buyer communicated to the Seller prior to the delivery of the Object of Purchase.

3. **THE TIME OF DELIVERY**

3.1 The Seller shall deliver the Object of Purchase and shall carry out Related Activities within **20 weeks** from the signature of the Contract.

4. **THE OWNERSHIP RIGHT**

The ownership right to the Object of Purchase shall pass to the Buyer upon the signature of the Acceptance protocol.

5. **PRICE AND PAYMENT TERMS**

5.1 The purchase price for the Devices is stipulated in Annex 2 hereto (Purchase Price). VAT will be settled in accordance with the applicable legal regulations.

5.2 The Purchase Price cannot be exceeded and includes all costs and expenses of the Seller related to the performance of this Contract. The Purchase Price includes, among others, all expenses related to the manufacture, cleaning, assembly and delivery of the Object of Purchase and execution of Related Activities, costs of copyright, insurance, customs, warranty service and any other costs and expenses connected with the performance of this Contract.

5.3 The Purchase Price for the Object of Purchase shall be paid on the basis of a tax document – invoice, to the account of the Seller designated in the invoice. The invoice must not be issued before the Acceptance protocol is confirmed by the Buyer. The invoice shall have only electronic form and shall be submitted to the email address: efaktury@fzu.cz.

5.4 The Buyer shall realize payments on the basis of duly issued invoice within 30 days from its receipt. If the Seller stipulates any shorter due period of the invoiced amount in the invoice such different due period shall not be deemed relevant and the due period stipulated herein applies. The invoice shall be considered to be paid for on the day when the invoiced amount is deducted from the Buyer's account on behalf of the Supplier's account.

5.5 The invoice issued by the Seller as a tax document must contain all information required by the applicable laws of the Czech Republic. Invoices issued by the Seller in accordance with this Contract shall contain in particular following information:

a) Name and registered office of the Buyer,

b) Tax identification number of the Buyer,

c) Name and registered office of the Seller,

d) Tax identification number of the Seller,

e) Registration number of the tax document,

f) Scope of the performance (including the reference to this Contract),

g) Date of the issue of the tax document,

h) Purchase Price,

i) Registration number of this Contract, which the Buyer shall communicate to the Seller based on Seller's request before the issuance of the invoice,

j) Declaration that the subject matter of this Contract has been supplied for the purposes of a project, which identity the Buyer shall communicate to the Seller based on Seller's request before the issuance of the invoice.

5.6 In case that the invoice shall not contain the above mentioned information, the Buyer is entitled to return it to the Seller during it maturity period and this shall not be considered as a default. The new maturity period shall begin from the receipt of the supplemented or corrected invoice to the Buyer.

6. SELLER'S RIGHTS AND DUTIES

6.1 The Seller shall ensure that the Object of Purchase and Related Activities are in compliance with this Contract including all its annexes and applicable legal (e.g. safety), technical and quality norms.

6.2 During the performance of this Contract the Seller proceeds independently. If the Seller receives instructions from the Buyer, the Seller shall follow such instructions unless these are against the law or in contradiction to this Contract. If the Seller finds out or should have found out if professional care was exercised that the instructions are for any reason inappropriate or illegal or in contradiction to this Contract, then the Seller must notify the Buyer.

6.3 All things necessary for the performance of this Contract shall procure the Seller, unless this Contract stipulates otherwise.

6.4 The Buyer shall not be obliged to verify correctness of any and all calculations and technical solution details during the course of the acceptance procedure.

6.5 The assessment of and subsequent acceptance of any fulfilment pursuant this Contract does not release the Seller from his liability for the correctness and completeness of the entire work.

6.6 Should it be necessary to modify any part of the already accepted part of work in order to meet the parameters expected of the completed work, the Seller undertakes to perform such modifications and accepts that the costs related thereto are included in the Purchase Price.

6.7 The "best efforts" duties of the Seller stipulated herein shall be interpreted as duties to apply all relevant professional care corresponding to its position of a top supplier in its field of business. Should the quality levels specified herein as best efforts results not be met, the Seller is obliged to prove what activities, measures and efforts have been applied in order the required quality levels are reached, in order for the Buyer to be able to assess whether the Contractor has breached its contractual obligation to use best efforts.

7. HANDOVER OF THE OBJECT OF PURCHASE

7.1 Handover and takeover of the Object of Purchase shall be realized on the basis of the Acceptance protocol signed by both Parties.

7.2 If the Seller fails to duly carry out all Related Activities or if the Object of Purchase does not meet requirements of this Contract (including requirements related to verification and required documentation), the Buyer is entitled to refuse the takeover of the Object of Purchase. In such a case the Seller shall remedy the deficiencies within twenty (20) working days, unless Parties agree otherwise. The Buyer is entitled (but not obliged) to take over the Object of Purchase despite the above mentioned deficiencies, in particular if such deficiencies do not prevent the Buyer from the proper operation of the Object of Purchase. In such a case the Seller and the Buyer shall list the deficiencies in the Acceptance protocol, including the manner and the date of their removal (remedy). If the Parties do not reach agreement in the Acceptance protocol regarding the date of the removal, the Seller shall remove the deficiencies within twenty (20) working days.

7.3 The Buyer is entitled based on the proposal of the Seller anytime before the acceptance process to agree in written on minor modificiation of technical requirements stipulated herein without the need of concluding an amendment hereto. Minor modification is only such modification which is not considered a substantiall modification of a contract pursuant to the Sec. 222 of the Czech Act. No 134/2016 Coll., on Public Contracts Awarding, as amended. A modification which modifies Purchase Price, delivery times or which substantially decreases quality, functional or user value of the Object of Purchase shall not be deemes minor.

7.4 The Buyer is entitled to accept minor defects of the Object of Purchase without requesting that such defects are removed or compensated (accepting the Object of Pucrahse as is). A minor defect is a defect that does not decrease quality, functional or user value of the Object of Purchase.

8. WARRANTY

8.1 The Seller hereby provides a warranty of quality of the Object of Purchase for the period of 24 months. If on the warranty list or other document is the warranty period of longer duration, then this longer warranty period shall have priority over the period stated in this Contract.

8.2 The warranty period shall begin on the day of the signature of the Acceptance protocol by both Parties.

8.3 The Seller shall remove defects that occur during the warranty period free of charge and in the terms stipulated in this Contract.

8.4 If the Buyer ascertains a defect of the Object of Purchase during the warranty period, the Buyer shall notify such defect without undue delay to the Seller. Defects may be notified on the last day of warranty period, at the latest.

8.5 The Buyer notifies defects in writing via e-mail. The Seller shall accept notifications of defects on the following e-mail address: contact@isp-system.fr.

8.6 In the notification the Buyer shall describe the defect and the manner of removal of the defect. The Parties shall agree on the manner of defects removal. If the Parties do not reach the agreement, the Buyer has the right to:

a) request removal of the defect by the delivery of new Object of Purchase or its individual parts, or

b) request removal of the defect by repair, or

c) request adequate discount from the Purchase Price.

The choice among the above mentioned rights belongs to the Buyer. However, in case of a removable defect that occurs for the first time the Buyer is not entitled to request removal of the defect by delivery of new Object of Purchase or its individual parts.

8.7 The Seller shall remove the defect within 40 working days. In cases where it is not possible for objective reasons proven to the Buyer by the Seller the Parties shall agree on another sufficient deadline.

8.8 Parties shall execute a protocol on the removal of the defect, which shall contain the description of the defect and the confirmation that the defect was removed. The warranty period shall be extended by a period of time that elapses between the notification of the defect until its removal in cases where the Buyer was prevented from using the Object of Purchase for its intended use.

8.9 In case that the Seller does not remove the defect within stipulated time or if the Seller refuses to remove the defect, then the Buyer is entitled to remove the defect at his own costs and the Seller shall reimburse these costs within 20 calendar days after the Buyer's request to do so.

8.10 The warranty does not cover defects caused by unprofessional manipulation or by the failure to follow Seller's instructions for the operation and maintanence of the Object of Purchase.

9. RIGHT OF WITHDRAWAL, CONTRACTUAL PENALTIES, VIS MAJOR

9.1 This Contract may be terminated by its fulfilment / completion, by agreement of the Parties or by withdrawal from the Contract for reasons specified in law or in this Contract.

9.2 The Buyer is entitled to withdraw from this Contract, if any of the following circumstances occur:

9.2.1 the Seller is in delay with the fulfilment of this Contract and such delay lasts more than 60 calendar days; or

9.2.2 the insolvency proceeding is initiated against the Seller, or

9.2.3 the Device during acceptance procedure does not fulfil requirements of the Buyer on the Device defined in this Contract, even after three repetitions.

9.3 In case of termination of the Contract due to reasons given in par. 9.2 of this Article, the Seller shall be eligible for payment for the actually executed part of the work delivered to the Buyer, if such had been executed in accordance with the terms and conditions hereof.

9.4 In the event of termination of this Contract by the Buyer for other reasons than for the reasons of a breach of obligations on the part of the Seller, the Seller shall have the right to payment of the part of the Purchase Price representing the costs which he accrued in connection with the fulfilment of his obligations hereunder prior to the Contract termination by the Buyer, and which could demonstrably not be cancelled in time and if such costs accrued by the Seller are not covered from other external sources.

9.5 Things, rights and any other values, whose price was paid for by the Buyer to the Seller according to par. 9.4 of this Article, shall pass, by payment, into the ownership of the Buyer and the Seller shall be obliged to allow the Buyer to dispose with such accordingly. The risk of damage shall pass to the Buyer upon handover.

9.6 In the event that the Seller is more then four weeks in delay with term of delivery as stipulated in Art. 3.1. hereof, the Seller shall pay to the Buyer the contractual penalty in the amount of 0.1% of the Purchase Price for each, even commenced day of delay.

9.7 In the event the Seller is in delay with removal of the deficienciencies of the Object of Purchase in the period stipulated in the Acceptance protocol, or if the Parties did not reach agreement in the Acceptance protocol regarding the date of the removal of the deficienciencies of the Object of Purchase, in the period stipulated by this Contract for the removal of such deficienciencies, the Seller shall pay to the Buyer the contractual penalty in the amount of 0.5% of the Purchase Price for each, even commenced day of delay.

9.8 The Parties have agreed that the maximal amount of contractual penalties shall be limited to 20% of the Purchase Price.

9.9 Circumstances precluding liability shall be deemed to have been constituted by such circumstances / obstacles which arose independently of the will of the obliged Party, and which prevent fulfilment of that Party's obligation, provided that it could not be reasonably expected that the obliged Party could overcome or avert this obstacle or its consequences, and furthermore that such Party could foresee such obstacle when it entered into the respective covenants (hereinafter "**Vis major**"). Liability cannot be precluded by obstacles that arose only after the obliged Party was in default with fulfilment of its obligations, or which arose in connection with its economic situation. The effects precluding liability shall be limited to the period during which the obstacles causing these effects persist.

9.10 Should a situation occur, which a Party could reasonably consider to constitute Vis major, and which could affect fulfilment of its obligations hereunder, such Party shall immediately notify the other party and attempt to continue in its performance hereunder in a reasonable degree. Simultaneously, such Party shall inform the other of any and all its proposals, including alternative modes of performance, however, without consent of the other Party, it shall not proceed to effect such alternative performance.

9.11 If a situation constituting Vis major occurs, the deadlines imposed hereunder shall be extended by the period of the duration of the said Vis major event.

9.12 The Parties exclude use of Sec. 2050 of the Civil Code. By the payment of contractual penalty in accordance with this Art 9 hereof, no claim of the Buyer to damage compensation shall be affected.

10. SPECIAL PROVISIONS

By signing this Contract, the Seller becomes a person obliged to cooperate during the finance control within the meaning of Section 2 letter e) of the act no. 320/2001 Coll., on finance control in the public administration, and shall provide to the Directing Body of the Operational Programme Research, Development and Education or other control bodies acces to all parts of the bid, Contract or other documents that are related to the legal relationship formed by this Contract. This duty also covers documents that are subject to the protection in accordance with other acts (business secrets, secret information, etc.) provided that control bodies fulfil requirements stipulated by these acts.

11. FINAL PROVISIONS

11.1 This Contract is governed by the laws of the Czech Republic, especially by the Civil Code.

11.2 All disputes arising out of this Contract or out of legal relations connected with this Contract shall be preferable settled by a mutual negotiation. In case that the dispute is not settled within sixty (60) days, such dispute shall be decided by courts of the Czech Republic in the procedure initiated by one of the Parties.

11.3 All modifications and supplements of this Contract must be in writing.

11.4 If any of provisions of this Contract are invalid or ineffective, the Parties are bound to change this Contract is such a way that the invalid or ineffective provision is replaced by a new provision that is valid and effective and to the maximum possible extent correspond to the original invalid or ineffective provision.

11.5 This Contract is executed in four (4) counterparts and every Party shall receive two (2) counterparts.

11.6 Integral parts of this Contract are Annex 1 (*Technical Specification - RSD*) and Annex 2 (Purchase Price). If Annex 1 (*Technical Specification*) uses the term "Contracting

Authority" or "contracting authority" or similar it means the Buyer. If Annex 1 (*Technical Specification*) uses the term "Supplier" or "supplier" or similar it means the Seller.

11.7 This Contract is subject to publication according to Act. No. 340/2015 Coll, on the register of contracts.

IN WITNESS WHEREOF attach Parties their handwritten signatures:

Buyer

Signature: _____

Name: RNDr. Michael Prouza, PhD.

Position: director

Date:

Seller

Signature: _____ PAUL SAUVAGEOT

Signé numériquement par PAUL SAUVAGEOT
ND : C=FR, O=ISP SYSTEM, OU=0002 410675078, CN=PAUL SAUVAGEOT, SERIALNUMBER=6a587c84c791171e78b5599bf40854a75a22cd2e
Raison : J'approuve ce document avec ma signature juridiquement valable
Emplacement : Paul SAUVAGEOT CEO ISP SYSTEM
Date : 29-10-2018 17:58:29
Foxit Reader Version: 9.3.0

Name: Paul SAUVAGEOT

Position: Chief Executive Officer

Date: October, 29th 2018

ANNEX 1

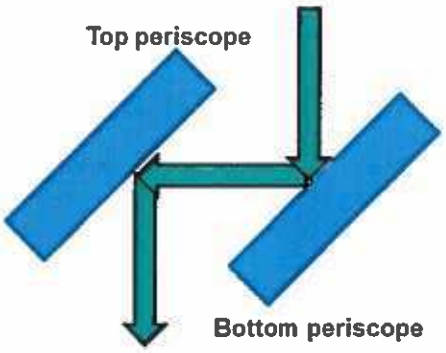
TECHNICAL SPECIFICATION - RSD

Confidentiality Level	*BL - Restricted for internal use*	**TC ID / Revision**	00175827/C
Document Status	*Document Released*	**Document No.**	*N/A*
WBS code	*4.3 – Beam transport*		
PBS code	*SE.BDS.BT.MNT.FM*		
Project branch	*Engineering & Scientific documents (E&S)*		
Document Type	*Specification (SP)*		

[RSD product category B, C]

Manufacturing of L3 top and bottom periscope mirror mounts type BIII according to ELI-Beamlines supplied manufacturing drawing package and 3D CAD file

(L3 periscope mirror mounts - Type BIII, TP18_050)



Keywords

Mirror mount, optomechanics, laser, ultra-stability and manufacturing

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Responsible person	Science and Technology Manager, Scientific coordinator of RP2-6	Dr. Georg Korn
Prepared by	Designer, BIS Senior Consultant BT, Senior Laser Scientist Team Leader BIS	Martin Sokol, PhD. Dr. Stefan Borneis Tomáš Laštovička, PhD.

RSS TC ID/revision	RSS - Date of Creation	RSS - Date of Last Modification	Systems Engineer
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Reviewed By

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Tadzio Levato	HELL Team Leader	NOTICE	
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Approved by

Name (Approver)	Position	Date	Signature
Georg Korn	Science and Technology Manager, Scientific coordinator of RP2-6	04.07.2018	

Revision History / Change Log

Change No.	Made by	Date	Change description, Pages, Chapters	TC rev.
1	S. Borneis	26.06.2018	RSD draft creation	A
2	S. Borneis, A. Kuzmenko	28.06.2018	RSD update, version for internal review	B
3	A. Kuzmenko	04.07.2018	RSD update, version for approval	C

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Table of Content

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Development and Education

MINISTRY OF EDUCATION

1. Introduction

1.1. Purpose

This *Requirements Specification Document (RSD)* lists the technical requirements of the L3 laser beam transport top and bottom periscope mirror mounts. The geometry is shown schematically in fig. 1. Bottom periscopes hold mirrors with their reflective surface facing upwards, while top periscopes hold mirrors with their reflective surface facing downwards. Top and bottom periscope mounts consist of close to 90% the same parts/sub-assemblies to lower manufacturing costs.

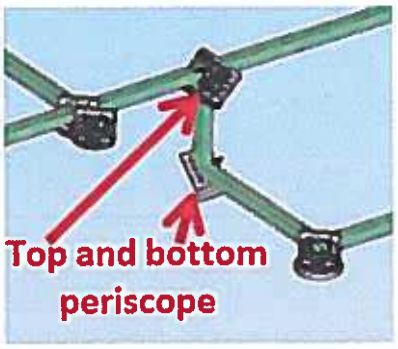

Figure 1: Schematics top and bottom periscope mirror mount.

The RSD acts as the parent document for the technical requirements that need to be addressed in lower level design-description documents.

The attached manufacturing drawings of the L3 periscope mirror mounts (*see reference drawing packages RD-01 and RD-02, chapter 1.4*) list all technical specifications of the 1 Petawatt, 30 J, 30 fs, 10 Hz, 820 nm beam transport mirror mounts for the L3 laser system. These mirror mounts will guide the short-pulse compressed L3 laser beam from the entrance of the beam distribution entirely in vacuum with up to 18 mounted high-power precision laser mirrors over a distance of up to 107 meters to the experimental areas (see Figure 2 below). The required RMS pointing stability per mounted turn mirror is 100 nrad RMS mechanical (200 nrad optical) on mirror towers that are up to 3.5 meters high.

The CA has built a similar design vertical prototype mirror mount and has measured with a high resolution accelerometer for vibration excitation frequencies > 5 Hz a mounted mirror dummy pointing stability of 5.4 nrad RMS when the mount was bolted onto our 10 mm thick aluminum breadboard and excited by our L4c hall floor with a floor displacement of less than 1 nm RMS as depicted in Figure 3 below.

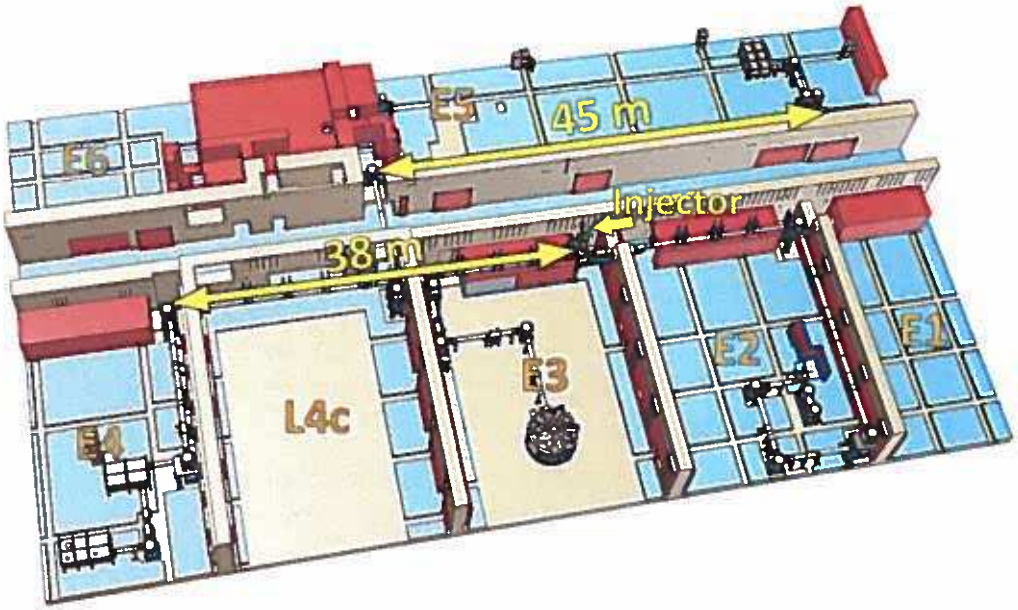

Figure 2: Overview of L3 Petawatt Laser beam transport system and its connections to the target chambers. The distance from the injector to the first turn mirror chamber in E4 is 38 m.

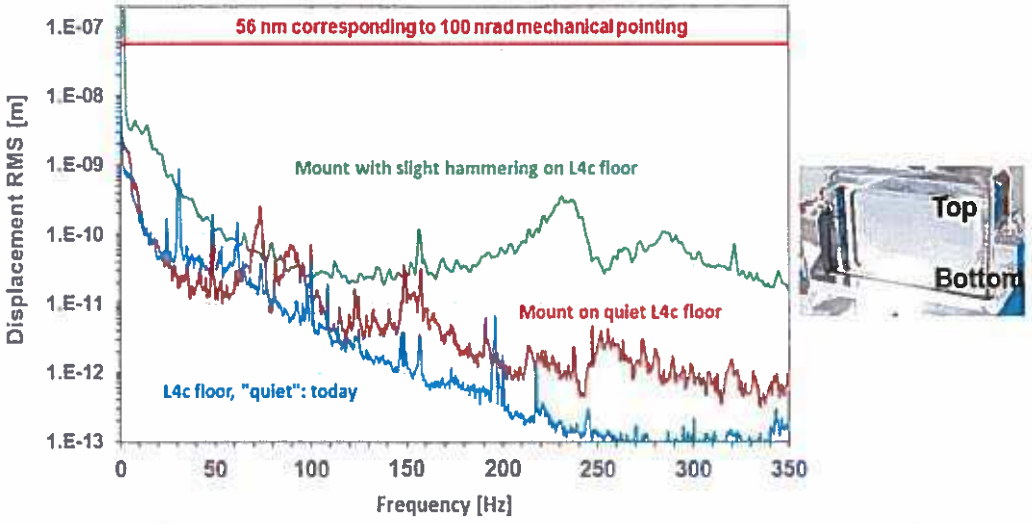

Figure 3: Measured input vibration excitation and vertical mirror mount prototype response when bolted onto 10 cm thick breadboard.

The **calculated** Eigenfrequency of the **periscope** mirror mount is between 136 and 149 Hz.

Based on the experience with the vertical mirror mount and our FEA model analysis of the periscope mirror mount, we expect that good craftsmen ship and engineering practices during the manufacturing and assembly of the periscope mount will result in an assembled mount with < 100 nrad mechanical pointing stability at vibration displacement inputs < 10 nm RMS.

The Supplier shall provide the documentation that all the manufactured parts of the mirror mounts comply with the manufacturing drawings (*see REQ-023572/A, REQ-023601/A and REQ-023603/A).* The Supplier shall assemble the mounts and validate its basic functionality. Any proposed technical changes of the original design for ease

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of manufacturing require the approval by the CA. Conditions for such approval are stipulated by the contract.

1.2. Scope

This RSD contains all of the functional, performance and design, handling, packaging and delivery, safety and quality requirements for the following product *(tender number TP18_050)*: ***L3 top and bottom periscope mirror mounts - Type BIII*** *(further "**Periscope Mount BIII**" or "**Product**")*.

In addition to the requirements specified in this RSD, the **Periscope Mounts BIII** shall comply completely with the requirements given in the Reference documents (*see RD-01 and RD-02, chapter 1.4*).

The **Mounts BIII** are integral parts of the standalone "L3 Petawatt Laser Vacuum Beam Transport" system and are registered in the PBS software under the following PBS codes: *SE.BDS.BT.MNT.FM*.

The verification of all specified parameters listed in this RSD shall be undertaken by the Supplier before delivery to the ELI Beamlines facility. All the **Periscope Mounts BIII** shall be furnished with a report outlining the results of any testing executed by the Supplier and a declaration of conformity, to reflect their proper characteristics. Furthermore, all the **Periscope Mounts BIII** will be subject to testing and verification upon delivery to the ELI Beamlines facility by qualified personnel. All non-conformances (if any) must be addressed by the Supplier in a timely manner.

1.3. Terms, Definitions and Abbreviations

For the purpose of this document, the following abbreviated terms are applied:

Abbreviation	Meaning
AMU	Atomic Mass Unit
CA	Contracting Authority (Institute of Physics AV CR, v. v. i.)
DI	Deionized (or Demineralized)
ELI	Extreme Light Infrastructure
FTIR	Fourier Transform Infra-Red
L3	Laser 3
LDT	Laser Damage Threshold
MOC	Molecular organic Contamination
NCR	Nonconformity Report
NVR	Non-Volatile Residue
PBS	Product breakdown structure (code of ELI-Beamlines)
RMS	Root Mean Square
RSD	Requirements Specification Document
UHV	Ultra-High Vacuum
ULO (bag)	Ultra-Low Outgassing (polyethylene bag)

1.4. Reference documents

Number of document	Title of Drawing Package/ File
RD-01	*00175825-A_Drawings_L3-BIII_Periscope_Top_TP18_050.rar*
RD-02	*00175826-A_Drawings_L3-BIII_Periscope_Bottom_TP18_050.rar*

Detailed list of files included within **RD-01 and RD-02** reference documents:

RD-01: Top periscope – FILE LIST

IT#	DRAWING NUMBER/REV.	DESCRIPTION	FILE NAME
1	ELI-1801-04-00.000/00	BIII Periscope Top 3D model	ELI-1801-04-00.000_BIII_Periscope_Top_00.stp
2	ELI-1801-04-00.000/00	BIII Periscope Top Main assembly drawing	ELI-1801-04-00.000_BIII_Periscope_Top_00.pdf
3	ELI-1801-04-00.000/00	BIII Periscope Top All drawings merged	ELI-1801-04-00.000_BIII_Periscope_Top_00_Merged.pdf
4	ELI-1801-04-00.000/00	BIII Periscope Top Partlist	ELI-1801-04-00.000_BIII_Periscope_Top_00_Partlist.pdf
5	ELI-1801-04-00.000/00	BIII Periscope Top Partlist - editable	ELI-1801-04-00.000_BIII_Periscope_Top_00_Partlist.xlsx
6	ELI-1801-04-00.001/01	BIII Periscope high base	ELI-1801-04-00.001_Base_01.pdf
7	ELI-1801-03-00.002/00	BIII Periscope outer gimbal	ELI-1801-03-00.002_Outer_Gimbal_00.pdf
8	ELI-1801-01-00.003/00	BIII Mount clamp	ELI-1801-01-00.003_Clamp_00.pdf
9	ELI-1801-03-00.004/00	BIII Mount locking bracket right	ELI-1801-03-00.004_Lock_Right_00.pdf
10	ELI-1801-03-00.005/00	BIII Mount locking bracket left	ELI-1801-03-00.005_Lock_Left_00.pdf
11	ELI-1801-01-01.000/01	BIII Mount pillow block assembly drawing	ELI-1801-01-01.000_Pillow_block_01.pdf
12	ELI-1801-01-01.001/01	BIII Mount pillow block 130	ELI-1801-01-01.001_Pillow_block_01.pdf
13	ELI-1801-01-01.002/01	BIII Mount outer shaft	ELI-1801-01-01.002_Shaft_outer_01.pdf
14	ELI-1801-01-01.003/00	33206 /Q tapered roller bearing	ELI-1801-01-01.003_Bearing_33206_Q.pdf
15	ELI-1801-01-02.000/00	BIII Mount lower bearing housing assembly dr.	ELI-1801-01-02.000_Bearing_housing_lower_00.pdf
16	ELI-1801-01-02.001/00	BIII Mount bearing housing fixed	ELI-1801-01-02.001_Bearing_housing_fixed_00.pdf
17	ELI-1801-01-02.002/00	BIII Mount inner shaft	ELI-1801-01-02.002_Shaft_inner_00.pdf
18	ELI-1801-01-02.003/00	30205 J2/Q tapered rol. bearing	ELI-1801-01-02.003_Bearing_30205_J2_Q.pdf
19	ELI-1801-01-03.000/00	BIII Mount upper bearing housing	ELI-1801-01-03.000_Bearing_housing_upper_00.pdf
20	ELI-1801-01-03.001/00	BIII M. bearing housing floating	ELI-1801-01-03.001_Bearing_housing_floating_00.pdf
21	ELI-1801-01-03.002/00	BIII Mount bearing housing clamp	ELI-1801-01-03.002_Bearing_housing_clamp_00.pdf
22	ELI-1801-01-03.003/00	BIII Mount shaft side pad screw	ELI-1801-01-03.003_Shaft_screw_00.pdf
23	ELI-1801-03-04.000/00	BIII Periscope inner gimbal assembly drawing	ELI-1801-03-04.000_Inner_Gimbal_00.pdf
24	ELI-1801-03-04.001/00	BIII Periscope inner gimbal	ELI-1801-03-04.001_Inner_Gimbal_00.pdf
25	ELI-1801-03-04.002/00	BIII Mount pad retainer	ELI-1801-03-04.002_Pad_retainer_00.pdf
26	ELI-1801-01-04.003/00	BIII Mount pad screw	ELI-1801-01-04.003_Pad_Screw_00.pdf
27	ELI-1801-03-04.004/01	BIII Periscope back crosshair	ELI-1801-03-04.004_Back_crosshair_01.pdf

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RD-01: Top periscope – FILE LIST

IT#	DRAWING NUMBER/REV.	DESCRIPTION	FILE NAME
28	ELI-1801-01-04.006/00	BIII Mount front pad	ELI-1801-01-04.006_Front_pad_00.pdf
29	ELI-1801-01-04.007/00	BIII Mirror side pad	ELI-1801-01-04.007_Mirror_side_pad_00.pdf
30	ELI-1801-03-04.008/00	BIII Back pad	ELI-1801-03-04.008_Back_Pad_00.pdf
31	ELI-1801-03-05.000/00	BIII Periscope elec. and brackets	ELI-1801-03-05.000_Electronics_00.pdf
32	ELI-1801-01-05-01.00/0	BIII Mount connector block	ELI-1801-01-05-01.00_Connector_0.pdf
33	ELI-1801-01-05-01.01/0	BIII Connector plate	ELI-1801-01-05-01.01_Connector_plate_0.pdf
34	ELI-1801-01-05-02.00/0	BIII UHV cable: FEMALE to MALE	ELI-1801-01-05-02.00_Cable_FtM_2m_0.pdf
35	ELI-1801-03-05.001/00	BIII Actuator bottom holder	ELI-1801-03-05.001_Holder_bottom_00.pdf
36	ELI-1801-02-05.002/00	BIII Actuator side holder	ELI-1801-02-05.002_Side_holder_00.pdf
37	ELI-1801-03-05.003/00	BIII Periscope button holder	ELI-1801-03-05.003_Button_holder_00.pdf
38	ELI-1801-01-05.004/00	BIII Side carbide holder	ELI-1801-01-05.004_Side_Button_holder_00.pdf
39	ELI-1801-02-05.005/00	BIII Limit switch holder	ELI-1801-02-05.005_Switch_holder_00.pdf
40	ELI-1801-03-05.006/00	BIII Periscope end stop 1	ELI-1801-03-05.006_End_stop_00.pdf
41	ELI-1801-01-05.007/00	BIII Actuator contact tip	ELI-1801-01-05.007_Tip_00.pdf
42	ELI-1801-01-05.008/00	BIII M3 adapter plate	ELI-1801-01-05.008_M3_plate_00.pdf
43	ELI-1801-01-05.009/00	BIII Stainless steel spring	ELI-1801-01-05.009_Spring_00_Lw=90.pdf
44	ELI-1801-01-05.010/00	BIII Carbide button	ELI-1801-01-05.010_Carbide_Button_00.pdf
45	ELI-1801-01-05.011/00	BIII stepper linear actuator	ELI-1801-01-05.011_Linear_actuator_00.pdf
46	ELI-1801-01-05.012/00	BIII Limit switch	ELI-1801-01-05.012_Limit_switch.pdf
47	ELI-1801-03-05.013/00	BIII Periscope end stop 2	ELI-1801-03-05.013_End_stop_00.pdf
48	ELI-1801-03-06.000/00	BIII Mount front transport cover	ELI-1801-03-06.000_Front_Cover_00.pdf
49	ELI-1801-03-06.001/00	BIII Front cover plate	ELI-1801-03-06.001_Front_cover_00.pdf

RD-02: Bottom periscope – FILE LIST

IT#	DRAWING NUMBER/REV.	DESCRIPTION	FILE NAME
1	ELI-1801-03-00.000/00	BIII Periscope Bottom 3D model	ELI-1801-03-00.000_BIII_Periscope_Bottom_00.stp
2	ELI-1801-03-00.000/00	BIII Periscope Bottom Main assembly drawing	ELI-1801-03-00.000_BIII_Periscope_Bottom_00.pdf
3	ELI-1801-03-00.000/00	BIII Periscope Bottom All drawings merged	ELI-1801-03-00.000_BIII_Periscope_Bottom_00_Merged.pdf
4	ELI-1801-03-00.000/00	BIII Periscope Bottom Partlist	ELI-1801-03-00.000_BIII_Periscope_Bottom_00_Partlist.pdf
5	ELI-1801-03-00.000/00	BIII Periscope Bottom Partlist - editable	ELI-1801-03-00.000_BIII_Periscope_Bottom_00_Partlist.xlsx
6	ELI-1801-03-00.001/02	BIII Periscope low base	ELI-1801-03-00.001_Base_02.pdf
7	ELI-1801-03-00.002/00	BIII Periscope outer gimbal	ELI-1801-03-00.002_Outer_Gimbal_00.pdf
8	ELI-1801-01-00.003/00	BIII Mount clamp	ELI-1801-01-00.003_Clamp_00.pdf
9	ELI-1801-03-00.004/00	BIII Mount locking bracket right	ELI-1801-03-00.004_Lock_Right_00.pdf
10	ELI-1801-03-00.005/00	BIII Mount locking bracket left	ELI-1801-03-00.005_Lock_Left_00.pdf

RD-02: Bottom periscope – FILE LIST

IT#	DRAWING NUMBER/REV.	DESCRIPTION	FILE NAME
11	ELI-1801-01-01.000/01	BIII Mount pillow block assembly drawing	ELI-1801-01-01.000_Pillow_block_01.pdf
12	ELI-1801-01-01.001/01	BIII Mount pillow block 130	ELI-1801-01-01.001_Pillow_block_01.pdf
13	ELI-1801-01-01.002/01	BIII Mount outer shaft	ELI-1801-01-01.002_Shaft_outer_01.pdf
14	ELI-1801-01-01.003/00	33206 /Q tapered roller bearing	ELI-1801-01-01.003_Bearing_33206_Q.pdf
15	ELI-1801-01-02.000/00	BIII Mount lower bearing housing assembly dr.	ELI-1801-01-02.000_Bearing_housing_lower_00.pdf
16	ELI-1801-01-02.001/00	BIII Mount bearing housing fixed	ELI-1801-01-02.001_Bearing_housing_fixed_00.pdf
17	ELI-1801-01-02.002/00	BIII Mount inner shaft	ELI-1801-01-02.002_Shaft_inner_00.pdf
18	ELI-1801-01-02.003/00	30205 J2/Q tapered rol. bearing	ELI-1801-01-02.003_Bearing_30205_J2_Q.pdf
19	ELI-1801-01-03.000/00	BIII Mount upper bearing housing	ELI-1801-01-03.000_Bearing_housing_upper_00.pdf
20	ELI-1801-01-03.001/00	BIII M. bearing housing floating	ELI-1801-01-03.001_Bearing_housing_floating_00.pdf
21	ELI-1801-01-03.002/00	BIII Mount bearing housing clamp	ELI-1801-01-03.002_Bearing_housing_clamp_00.pdf
22	ELI-1801-01-03.003/00	BIII Mount shaft side pad screw	ELI-1801-01-03.003_Shaft_screw_00.pdf
23	ELI-1801-03-04.000/00	BIII Periscope inner gimbal assembly drawing	ELI-1801-03-04.000_Inner_Gimbal_00.pdf
24	ELI-1801-03-04.001/00	BIII Periscope inner gimbal	ELI-1801-03-04.001_Inner_Gimbal_00.pdf
25	ELI-1801-03-04.002/00	BIII Mount pad retainer	ELI-1801-03-04.002_Pad_retainer_00.pdf
26	ELI-1801-01-04.003/00	BIII Mount pad screw	ELI-1801-01-04.003_Pad_Screw_00.pdf
27	ELI-1801-03-04.004/01	BIII Periscope back crosshair	ELI-1801-03-04.004_Back_crosshair_01.pdf
28	ELI-1801-01-04.006/00	BIII Mount front pad	ELI-1801-01-04.006_Front_pad_00.pdf
29	ELI-1801-01-04.007/00	BIII Mirror side pad	ELI-1801-01-04.007_Mirror_side_pad_00.pdf
30	ELI-1801-03-04.008/00	BIII Back pad	ELI-1801-03-04.008_Back_Pad_00.pdf
31	ELI-1801-03-05-000/00	BIII Periscope elec. and brackets	ELI-1801-03-05.000_Electronics_00.pdf
32	ELI-1801-01-05-01.00/0	BIII Mount connector block	ELI-1801-01-05-01.00_Connector_0.pdf
33	ELI-1801-01-05-01.01/0	BIII Connector plate	ELI-1801-01-05-01.01_Connector_plate_0.pdf
34	ELI-1801-01-05-02.00/0	BIII UHV cable: FEMALE to MALE	ELI-1801-01-05-02.00_Cable_FtM_2m_0.pdf
35	ELI-1801-03-05.001/00	BIII Actuator bottom holder	ELI-1801-03-05.001_Holder_bottom_00.pdf
36	ELI-1801-02-05.002/00	BIII Actuator side holder	ELI-1801-02-05.002_Side_holder_00.pdf
37	ELI-1801-03-05.003/00	BIII Periscope button holder	ELI-1801-03-05.003_Button_holder_00.pdf
38	ELI-1801-01-05.004/00	BIII Side carbide holder	ELI-1801-01-05.004_Side_Button_holder_00.pdf
39	ELI-1801-02-05.005/00	BIII Limit switch holder	ELI-1801-02-05.005_Switch_holder_00.pdf
40	ELI-1801-03-05.006/00	BIII Periscope end stop 1	ELI-1801-03-05.006_End_stop_00.pdf
41	ELI-1801-01-05.007/00	BIII Actuator contact tip	ELI-1801-01-05.007_Tip_00.pdf
42	ELI-1801-01-05.008/00	BIII M3 adapter plate	ELI-1801-01-05.008_M3_plate_00.pdf
43	ELI-1801-01-05.009/00	BIII Stainless steel spring	ELI-1801-01-05.009_Spring_00_Lw=90.pdf
44	ELI-1801-01-05.010/00	BIII Carbide button	ELI-1801-01-05.010_Carbide_Button_00.pdf
45	ELI-1801-01-05.011/00	BIII stepper linear actuator	ELI-1801-01-05.011_Linear_actuator_00.pdf
46	ELI-1801-01-05.012/00	BIII Limit switch	ELI-1801-01-05.012_Limit_switch.pdf

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RD-02: Bottom periscope – FILE LIST

IT#	DRAWING NUMBER/REV.	DESCRIPTION	FILE NAME
47	ELI-1801-03-05.013/00	BIII Periscope end stop 2	ELI-1801-03-05.013_End_stop_00.pdf
48	ELI-1801-03-06.000/00	BIII Mount front transport cover	ELI-1801-03-06.000_Front_Cover_00.pdf
49	ELI-1801-03-06.001/00	BIII Front cover plate	ELI-1801-03-06.001_Front_cover_00.pdf

1.5. References to standards

If this document includes references to standards or standardized/ standardizing technical documents the CA allows/permits also another equal solution to be offered. If the Supplier offers another equal solution the CA shall not reject its bid, once the Supplier by appropriate means in the bid proves that the offered supplies, services or works meet in an equivalent manner the requirements including references to standards or technical documents.

2. Functional, Performance and Design requirements

Functional, performance and design requirements for the **Periscope Mounts BIII** are summarized within reference drawing package RD-01 and RD-02 (*see chapter 1.4*). Wherever it eases the manufacturing, radii, edges and bending radii may be adjusted after approval by the CA.

2.1. General requirements

REQ-023572/A

The **Periscope Mounts BIII** shall be manufactured, assembled and verified according to the attached drawing package and the 3D CAD file (*see chapter 1.4; list of drawings within **RD-01** and **RD-02**).*

REQ-023573/A

All the vented screws with countersink shall be in accordance with Figure 4 below.

REQ-023574/A

The Supplier shall meet all tolerances of the drawings (*see chapter 1.4; list of drawings within **RD-01** and **RD-02***) and shall perform the assembly of the mount with best engineering practices such that a mirror mount mechanical pointing stability of < 100 nrad RMS shall be met.

NOTE: The best effort to achieve 40 nm RMS which is 4x the pointing stability of the vertical mount prototype.

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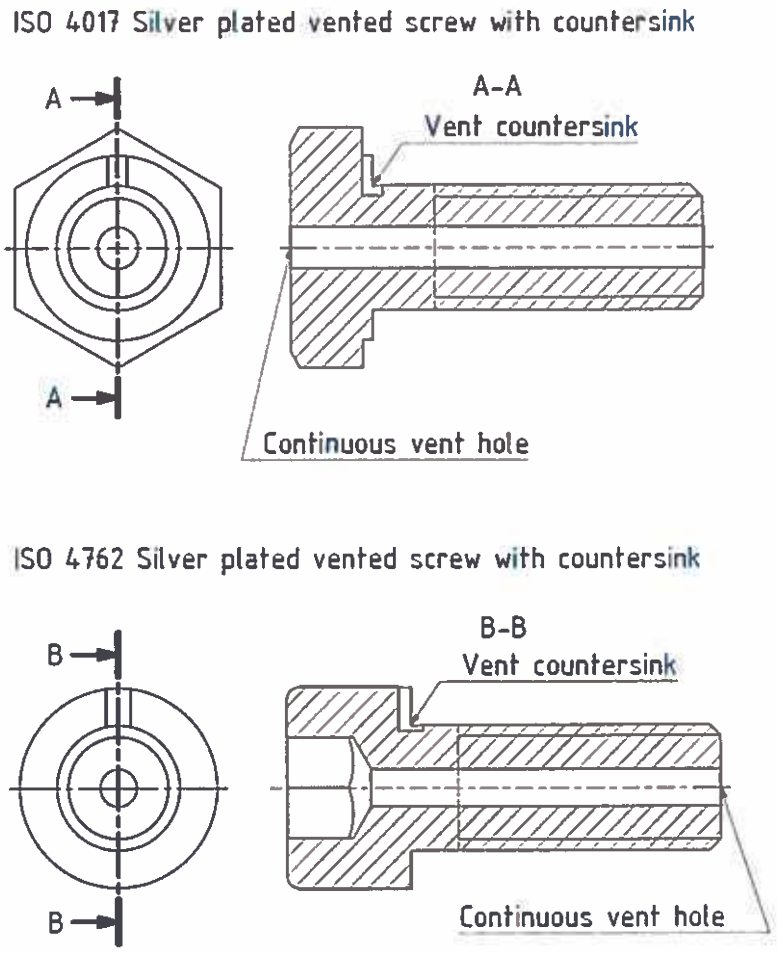

Figure 4: ISO 4017 and ISO 4762 Silver planted vented screws with countersink (or equivalent solutions).

NOTE: Regarding the referred to standard/s or standardized/ standardizing technical documents the CA allows/permits also another equal solution to be offered.

REQ-023575/A

All parts of the **Periscope Mounts BIII** shall be manufactured from materials indicated on the drawings (*see **RD-01 and RD-02**; chapter 1.4*). *The Supplier shall provide the information about all materials that were used in the production of the **Periscope Mounts BIII**.*

NOTE 1: For the aluminum alloy parts, EN AW-5083 (Al Mg4,5Mn0,7) may be used instead of EN AW-6082-T6 (Al Si1MgMn) prescribed on the drawings. Other equivalent standard solution may be applied.

NOTE 2: For the stainless steel parts, EN 1.4429 (AISI 316LN) may be used instead of EN 1.4435 (AISI 316L) prescribed on the drawings. Other equivalent standard solution may be applied.

NOTE 3: Regarding the referred to standard/s or standardized/ standardizing technical documents the CA allows/permits also another equal solution to be offered.

REQ-023576/A

All parts of the **Periscope Mounts BIII** shall be cleaned and validated for the lowest rate of outgassing specified in the REQ-023584/A (see a – d) to preserve the cleanliness level of cleaned L3 beam transport 1E-6 mbar vacuum system. This cleanliness level is particle level 100 best effort and level 130 guaranteed and an NVR level of A/10 per MIL-STD-1246C superseded by IEST-STD-CC1246D or equivalent standard *(see below Table I of REQ-023577/A and Table II of REQ-023578/A).*
NOTE: Regarding the referred to standard/s or standardized/ standardizing technical documents the CA allows/permits also another equal solution to be offered.

2.2. Cleaning and outgassing

REQ-023577/A

All parts shall be cleaned to meet a **particle cleanliness** level of **100** with **best effort** and a particle level 130 **guaranteed** per MIL–STD-1246C (or equivalent standard) superseded by IEST-STD-CC1246D for particles with size > 5 µm.
NOTE 1: The table below shows the particle cleanliness level.

TABLE I. Particle cleanliness levels. 1/

Level	Particle Size, µm	Count per 1 ft³	Count per 0.1 m³	Count per Liter
100	5	1785	1930	17850
100	15	265	286	2650
100	25	78	84.2	780
100	50	11	11.9	110
100	100	1.0	1.08	10

$$\frac{particles \geq diameter}{ft^3} = 10^{(0.926 \times (\log_{10}^2(cleanliness\ \ Level) - \log_{10}^2(diameter[\mu m])))}$$

NOTE 2: Regarding the referred to standard/s the CA allows/permits also another equal solution to be offered but the Supplier shall clean fully compliant to the above table and equation to meet particle level 100 best effort, 130 guaranteed.

REQ-023578/A

The total **non-volatile residue (NVR)** level of all parts shall be **A/10** per MIL-STD1246C (or equivalent standard) superseded by IEST-STD-CC1246D, i.e. < 0.1 µg/cm^2.
NOTE 1: The table below shows the non-volatile residue cleanliness levels of the MIL-STD1246C.

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TABLE II. Non-volatile residue cleanliness levels.

Level	Limit, NVR mg/0.1m² *1/ (or µg/cm²)	Limit, NVR mg/liter
A/100	0.01	0.1
A/50	0.02	0.2
A/20	0.05	0.5
A/10	0.1	1.0
A/5	0.2	2.0

NOTE 2: The **Periscope Mounts BIII** *will hold and allow the precision adjustment of the multi-million Euro high-power laser mirrors. Their laser damage threshold (LDT) and lifetime depends critically on cleanliness/outgassing rates, specifically hydro carbons which lower the LDT.*

NOTE 3: Regarding the referred to standard/s the CA allows/permits also other equal performance solutions but the Supplier shall clean fully compliant to the above table to meet the NVR level A/10, i.e. ≤ 0.1 µg/cm².

REQ-023579/A

Particle level acceptance testing shall be performed by the Supplier to validate particle level 100 (best effort) and particle level 130 (guaranteed) for all surfaces per Military standard 1246c (or equivalent standard) superseded by IEST-STD-CC1246D (see REQ-023577/A).

NOTE: Regarding the referred to standard/s or standardized/ standardizing technical documents the CA allows/permits also another equal solution to be offered.

Documented particle level cleanliness validation shall be conducted by the Supplier by rinsing the surfaces of the parts with ultra-clean DI water (particle level and NVR lower than 100 and A/10 respectively) or ultra-clean solvent rinse/wash with ≥ 5 bar pressure. Rinsing the parts with e.g. 10 litres of ultra-clean DI water or solvent and taking a 1 litre sample (see Figure 5) for particle counting as described in REQ-023580/A.

REQ-023580/A

Validation of the particle level best effort - 100, guaranteed - 130 shall include the rinsing of all surfaces with at least 5 - 10 liters of ultra-clean DI water preferably but not necessarily at ≥ 5 bar for particle validation and capturing of 0.5 - 1 liters of the rinse in a qualified low enough particle contamination glass bottle provided by the Supplier (see example in the Figure 5). This rinse shall be pored through a filter membrane with subsequent microscopic statistically significant particle ≥ 5 µm counting. It will be assumed that 1 liter captured out of 10 liters used for rinsing will correspond to 1/10 of the particles rinsed of the surface(s). Parts may be grouped for rinsing in a better than particle level 100 and NVR A/10 cleaned basket tray/sieve (see examples in the Figure 6).

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NOTE 1: In case that the Supplier can proof to the CA that the particle cleaning process is stable to achieve the required particle level, the CA may accept 30% of the components or random testing of components.
NOTE 2: The CA will use its PMT PartSens surface counter to validate during the incoming acceptance inspection the cleanliness level of the fully assembled mount. Also, better than level 100 compressed N2 will be used together with an airborne particle counter to cross-check the particle level cleanliness.

Figure 5: Example of acceptable 1 liter glass bottle for particle and NVR level rinse validation.

Figure 6: Examples of a stainless steel basket tray/sieve.

To reduce costs the CA may perform particle counting of all filter membranes with its own automated particle counting microscope at no cost. This reduces the effort/cost of the Supplier to the rinsing of all components and the sampling of 0.5 - 1 liter of rinse in an appropriately cleaned bottle and its shipping to ELI together with the information of the surface area rinsed and the respective part number(s). **Other particle counting methods like usage of a direct surface particle counter require the approval of the CA.**

REQ-023581/A

NVR level acceptance testing for all parts shall be performed by the Supplier at his cost to validate the A/10 (< 0.1 μg/cm² chemical contaminant) NVR cleanliness level per Military standard 1246c (or equivalent standard) superseded by IEST-STD-CC1246D (see REQ-023578/A).

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NOTE: Regarding the referred to standard/s or standardized/ standardizing technical documents the CA allows/permits also another equal solution to be offered.

Documented NVR level A/10 validation of all surfaces shall be conducted by the Supplier for each part or group of parts according to the following steps/requirements:

REQ-023582/A

The Supplier shall perform at his expense a molecular organic contamination (MOC)-analysis according to ČSN EN 16602-70-05 (equivalent to EN 16602-70-05) & ECSS-Q-ST-70-05C by a Cleanliness Validation Institution (other equivalent standard solution may be applied). The surface shall be rinsed with ultrapure (IR-grade) cyclohexane or equivalent solvent strength solvent followed by a 2-phase solvent extraction with subsequent analysis of the solvent for molecular organic contaminations using calibrated FTIR spectroscopy yielding the MOC mass/surface area.

NOTE 1: The details of the MOC test are summarized in Table 3 below.

NOTE 2: Calibration of used measuring instruments shall be performed with HC, Ester and Siloxanes or similar atomic weight of known substances (see REQ-023605/A).

NOTE 3: The outputs of the this requirement are the documented MOC test results with a table containing all errors/blank values and the MOC in ng/cm^2 in the HC, Ester and Siloxanes amu region as shown in Table 4.

NOTE 4: Regarding the referred to standard/s or standardized/ standardizing technical documents the CA allows/permits also another equal solution to be offered.

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Examination of packaging:	Fixation was only performed with one screw due to misalignment of screws and holes in the stainless steel plate		
Pre-treatment:	-		
Solvent:	Cyclohexane ultrapure (IR-grade)		
Method:	Rinse Test according ECSS-Q-ST-70-05C and DIN EN 16602-70-05		
Liquid handling:	Glass-Syringe with PTFE plunger 5 mL		
Total Volume Solvent:	2000 µL		
analyzed Volume Solvent:	500 µL		
Examined sample surface:	208 cm^2		
FTIR-Analysis			
Device / Model:			
Measurement principle:	Transmission		
Scan range:	4000 -1000 cm^{-1}		
Number of Scans:	4		
Resolution:	4 cm^{-1}		
Processing of solvent:	Solvent transfer onto ZnS-crystal (d = 25 mm, 75 °C during solvent transfer)		
Method:	Analysis according ECSS-Q-ST-70-05C and DIN EN 16602-70-05		
Purge gas:	none		
Calibration			
Method:	Linear regression (Lambert-Beer)		
Components:	**Range**	**Correlation (racc. Pearson)**	**Measurement uncertainty (Δ)**
Hydrocarbons (HC, Paraffin)	25 ng – 500 ng	0,97	< 20 % of end value
Ester (DINCH)	25 ng – 500 ng	0,99	< 20 % of end value
Siloxanes (PDMS, Polydimethylsiloxane)	50 ng – 1000 ng	0,99	< 20 % of end value
Date of last Calibration:	26.10.2016		
Check-Standard			
Date of last check standard:	-- (Age of calibration < 1 month)		
Target value:			
Measured value:			
Difference target/measurement < Δ:			

Table 3: Details of the MOC test procedure.

		HC	Ester	Siloxanes
MOC	(in ng/cm²)			
Δ MOC	(in ng/cm²)			
Maximum MOC	(in ng/cm²)			

Table 4: Sample of table summarizing MOC results (where ΔMOC - all errors of MOC determination, Maximum MOC - MOC value plus ΔMOC error).

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REQ-023583/A

The REQ-023582/A may be substituted by performing a NVR analysis of all parts using qualified ultra-clean wipes/swabs. The NVR analysis shall be performed according to ČSN EN 16602-70-05 (equivalent to EN 16602-70-05) with FTIR spectroscopy sensitive enough to detect ≤ 100 ng/cm^2 organic contamination.

NOTE 1: Regarding the referred to standard/s or standardized/ standardizing technical documents the CA allows/permits also another equal solution to be offered.

NOTE 2: The CA will determine the locations for swiping when the first components are cleaned.

NOTE 3: The solvent shall be cyclohexane or equivalent solvent strength for hydrocarbons.

NOTE 4: For each MOC analysis, a clean swab in a suitable solvent in a clean containment has to be used with a known well below level A/10 MOC value.

NOTE 5: After swabbing a representative area for large enough parts of 25 cm^2, the swab shall be reinserted into the solvent in the containment and be shipped for MOC analysis to the Cleanliness Validation Institution.

REQ-023584/A

An alternative for the above **NVR tests** described in **REQ-023582/A** and another accepted NVR validation described in **REQ-023583/A** can be the measurement of the outgassing rates of all components or the fully assembled mount in a low enough outgassing vacuum chamber at 1E-6 mbar with mass spectroscopy.
The mass spectrum of the full mount shall meet all following requirements:

a) The amplitude of the 43 AMU peak shall be ≤ 1/10 of the 44 AMU peak;
b) The amplitude of all peaks > 44 AMU shall be no higher than 1/100 of the 44 AMU peak;
c) The calibrated outgassing rate of the cracked hydrocarbon signature AMUs < 200 after ≤ 8 hours of pumping in an UHV-type cleaned chamber for the sum of all residual gas components with masses > 40 shall be measured to be ≤ 1E-11 mbar*l/s/cm^2;
   Note: Vacuum baking should allow achieving this value easily.
d) Check that there are no "significant" high AMU components above the background or instrument noise floor (even if < 1/100'th of AMU 44) up to AMU 200.

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REQ-023585/A

Bearings of the **Periscope Mounts BIII** shall be coated according to the drawings and cleaned for UHV compatibility to meet REQ-023584/A and also guarantee fulfillment of particle level 100 cleanliness and an NVR level A/10 per MIL-STD-1246C (superseded by IEST-STD-CC1246E) in the L3 beam transport 1E-6 mbar vacuum system.
NOTE: Regarding the referred to standard/s or standardized/ standardizing technical documents the CA allows/permits also another equal solution to be offered.

3. Handling, packaging and delivery requirements

3.1. Handling and packaging

3.1.1. Definitions

i. **ULO Polyethylene ("ULO")**: Ultra-Low Outgassing polyethylene bag or sheet ≥150 µm thick, with a certified NVR level of ≤ 0.14 µg/cm^2 (certified ULO polyethylene or equivalent).
ii. **Product Specific Label**: A cleanroom label identifying product information in accordance with contract documents.
iii. **Intimate Layer**: The innermost layer of ULO and which is in direct contact with the Periscope Mounts BIII.
iv. **Outer Layer**: The outermost layer of ULO used in packaging of the Periscope Mounts BIII.
v. **Layer Specific Label**: Cleanroom labels with the following:
   - Intimate Layer Identification Label with the text "Intimate Layer".
   - Outer Layer Identification Label with the text "Outer Layer".
vi. **Label of Cleaner**: Cleanroom label with the following information: Cleaner name and location, cleaning process(es) used and date of cleaning.

3.1.2. Packing

In the following requirements the word 'product' represents both singular and plural forms.

REQ-023586/A

The cleaned product shall be double packaged in ULO foil and sealed.
NOTE: The CA may provide a source for qualified ULO.

REQ-023587/A

All cleaned products shall be dry prior to packaging.

REQ-023588/A

Use of Cleanroom Tape shall be limited to situations where heat sealing of ULO packaging is impracticable. Cleanroom tape shall not come in contact with the product.

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REQ-023589/A

The cleaner shall ensure that part number and, if applicable, serial numbers on the Part Specific Label match with that of the product in that bag. Such label shall be at the inner and outer packaging ULO foil.

REQ-023590/A

Wrap product in the ULO shall ensure that the ULO covers the entire product and then seal.

REQ-023591/A

An Intimate Layer Identification Label, a Part Number Label, and a label with the responsible cleaner to the outside of the Intimate Layer shall be applied.
NOTE: The two labels specified for each packaging layer may be combined on one or two cleanroom labels.

3.1.3. Protection for handling and shipping

REQ-023592/A

Two Cleanroom Gloves shall be worn on each hand to form a double-layer cleanliness barrier. The inner gloves shall always be nitrile sterile and shall be certified and suitable for use in a class 5 cleanroom environment according to ČSN EN ISO 14644 (equivalent to EN ISO 14644). For general handling of dry parts, the outer gloves shall be nitrile sterile Cleanroom Gloves.
NOTE 1: Regarding the referred to standard the CA allows/permits also another equal solution to be offered.
NOTE 2: The CA may recommend a source for qualified clean room gloves upon request.

REQ-023593/A

For specific cleaning procedures that involve solvents, appropriate outer Cleanroom Gloves shall be selected.

REQ-023594/A

Cleanroom Gloves shall be replaced if they become soiled, punctured or torn. Used cleanroom gloves shall be discarded.

REQ-023595/A

As a minimum, both inside and outside gloves shall be replaced every four hours unless otherwise noted.

REQ-023596/A

The packaged product shall be crated and otherwise protected to prevent damage to the product and the clean packaging during handling and shipping.

REQ-023597/A

The crates shall be labelled with the contents of the crate, i.e. with all part numbers of the contained components.

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REQ-023598/A

Crates shall be equipped with shock and tip/tilt watch/sensors as well as with warning labels like "delicate instrument – handle with care".

3.2. Delivery requirements

REQ-023599/A

The shipping of the **Periscope Mounts BIII** to the CA shall be conducted by the Supplier.

4. Safety requirements

REQ-023600/A

The Supplier shall supply a Declaration of Conformity or any other equivalent document legally recognized and accepted in the Czech Republic for each product type if the appropriate legislation determines the Supplier's obligation to have a Declaration of Conformity (or the equivalent document) for the purposes of a Product sale in the Czech Republic to fulfil the requirements of 2001/95/EC directive or applicable Czech law.

5. Quality Requirements

5.1. General Quality Requirements

REQ-023601/A

The Supplier shall provide information on execution of outgoing check of the Product. At least this information shall comprise declaration about execution of outgoing check and declaration of conformity with technical requirements defined by the product RSD and completeness of the Product.

REQ-023602/A

The Supplier shall establish and maintain a nonconformity control system compatible with ČSN EN ISO 9001 (equivalent to EN ISO 9001).
NOTE: Regarding the referred to standard the CA allows/permits also another equal solution to be offered.

5.2. Specific Quality requirements

REQ-023603/A

The Supplier shall provide a report outlining the results of any testing executed on all individual **Periscope Mounts BIII** to confirm specification conformity (i.e. dimensional and outgassing

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reports, measured particle and non-volatile residue cleanliness levels, basic functionality, motion of actuators, etc.).
*NOTE: The Supplier and the CA shall agree on structure and content of the test reports before starting the manufacturing of the **Periscope Mounts BIII**.*

REQ-023604/A

In case of a warranty repair of the **Periscope Mounts BIII** by the Supplier, the Supplier shall redo necessary parts of the verification procedure. The results of this process shall be provided to the CA.

REQ-023605/A

All tests shall be performed by the measuring instruments with valid metrological confirmation.
NOTE: The CA can request the Supplier to provide the valid Calibration Certificates.

5.3. Acceptance

Acceptance will be carried out by the CA upon delivery of the final delivered complete **Periscope Mounts BIII**.

The Acceptance phase (as defined in the Contract) shall demonstrate the following:

- The final delivered **Periscope Mounts BIII** have been successfully verified and this process has been documented in an appropriate way (see REQ-023603/A and REQ-023601/A);
- All detected nonconformities have been solved in accordance with REQ-023602/A;
- The final **Periscope Mounts BIII** are free of fabrication errors and are ready for the intended operational use and have < 100 nrad RMS pointing stability similar to the described in the Figure 3 above, which was measured for the vertical mount BIII prototype.

In case of successful acceptance phase the CA will provide to the Supplier a signed acceptance protocol. In case of unsuccessful acceptance the CA will provide to the Supplier a Nonconformity Report (NCR) and ELI nonconformity control process will be applied (see REQ-023602/A).

REQ-023606/A

Acceptance shall be complete when the final **Periscope Mounts BIII** comply with all specifications verified by the Supplier's outgoing check (see REQ-023601/A and REQ-023603/A) and by passing additional acceptance verification carried out by the CA after delivery at its own premises.
NOTE 1: The Periscope Mounts BIII will pass the acceptance when all specifications/requirements of the drawings/RSD are met.
NOTE 2: The cleanliness is an important acceptance requirement.
NOTE 3: Supplier's outgoing check shall be carried out prior to delivery.

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ANNEX 2

PURCHASE PRICE

Annex 2 – Purchase price

BID PRICE

Items	Pieces	Price per 1 pc in EUR without VAT	Price per all pieces in EUR without VAT
Top mount RD-01	3	47 426 €	142 278 €
Bottom mount RD-02	3	47 426 €	142 278 €
Total price			**284 556 €**

In VIC-en-BIGORRE, On September 6th, 2018

Signature

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