



INVITATION TO SUBMIT A BID

for the small size public procurement for supplies

„ Camera for Mie scattering_TP16_512”

(“Public Procurement”) that is to be concluded in the procedure according to the Rules for applicants and beneficiaries (“Rules”) under the Research, Development and Education Operational Programme.

Name of the contracting authority:	Institute of Physics of Academy of Sciences of the Czech Republic, public research institution
Registered office:	Na Slovance 2, Praha 8, PSČ: 182 21
Identification No.:	68378271
Tax Identification No.:	CZ68378271
Person authorized to act on behalf of the contracting authority:	RNDr. Michael Prouza, Ph.D., director
Contact person:	David Pokorny
Telephone:	00 420 601 555 056
E-mail:	david.pokorny@eli-beams.eu

(“Contracting Authority”)

1. GENERAL INFORMATION

The subject matter of the Public Contract shall be funded from Research, Development and Education Operational Programme, with reg. number: CZ.02.1.01/0.0/0.0/15_003/0000447” name “Strukturní dynamika biomolekulárních systémů (Structural dynamics of biomolecular systems)“

- 1.1 The Contracting Authority does not follow the rules for public procurements set out in the act no. 134/2016 Coll., on public contracts awarding (“Act”), because the Public procurement is considered a small size public procurement within the meaning of Section 27 of the Act.
- 1.2 However, the award procedure is subject to Rules due to the fact that the Public Procurement is financed from the Research, Development and Education Operational Programme.



1.3 If the Contracting Authority uses references to the Act, it means that the Contracting Authority shall proceed analogically in relation to the Act. However, these links to the Act do not imply that the Public Procurement is awarded in accordance with the Act.

1.4 Part of this invitation is also the tender documentation for the Public Procurement.

2. PUBLIC PROCUREMENT SPECIFICATION

2.1 The Camera for Mie scattering is a low noise high sensitivity high dynamic range back illuminated sCMOS device which will be dedicated for measuring scattered photons of laser light in visible and ultraviolet range from aerosolised nanoparticles. The device consists of a several components: the camera main module and any auxiliary parts such as cables, chillers, power supplies, software, controllers etc . The device needs to be capable of having high quantum yield at wide wavelength range ($>50\%$ @800 nm, $>92\%$ @532 nm, $>30\%$ @266 nm), read noise $\leq 1.7e$, dark current - $\leq 3.0e$ -/pixel/second, full well capacity $\geq 80,000e$ -, dynamic range $\geq 50,000:1$ and resolution ≥ 1 MPixel.

("Products")

2.2 The bidder shall include in its bid the description of the offered Products (e.g. product sheets, data sheets, etc.), so that the Contracting Authority may assess whether its requirements are fulfilled.

3. EXPECTED VALUE OF THE PUBLIC PROCUREMENT

3.1 The expected value of the Public Procurement is EUR 25.000, - without value added tax (VAT).

3.2 **The expected value of the Public Procurement is the maximum price for the Public Procurement that cannot be exceeded, i.e. the bidder that will offer higher bid price will be excluded from the award procedure.**

4. THE TIME AND PLACE OF DELIVERY

4.1 The supplier shall deliver the Products and carry out related activities within 8 weeks.

4.2 The place of delivery is at the address: ELI Beamlines, Průmyslová 836, post code 252 41, Dolní Břežany, Czech Republic or other address in Dolní Břežany specified by the Contracting Authority prior to the delivery of Products.

5. BUSINESS AND PAYMENT TERMS

5.1 Business and payments terms and conditions are contained in the binding draft of the contract that form integral Annex2 hereof. The bidders must fill in the contract where required (i.e. their identification data, and other data that are required by the Contracting Authority).



5.2 The bidders are not allowed to change or supplement the draft of the contract, i.e. the bidders must accept the draft of the contract as is attached to this invitation. Bidders particularly shall not refer in their bids to their business conditions and terms.

5.3 The draft of the contract must be signed by a person authorized to act on behalf of the bidder. If the draft of the contract is signed on the basis of the power of attorney or other authorization, then the power of attorney or other authorization must be included in the bid.

6. THE DATE AND PLACE OF THE SUBMISSION OF BIDS

6.1 Bids must be submitted to the address: **Fyzikální ústav AV ČR, v. v. i. - ELI, DEP. 95 – David Pokorný, Za Radnicí 835, Dolní Břežany, post code: 252 41, Czech Republic, on 5. 6. 2018 until 14:00** at the latest.

6.2 Bids may be supplied by post, courier, or personally to the above mentioned address in working days between 8-15 hours. On the last day of the period for the submission for bids the bids may be submitted until 14:00 o'clock.

7. EXPLANATIONS REGARDING THE TENDER CONDITIONS

7.1 The supplier is entitled to require in written form explanations regarding the tender conditions from the Contracting Authority. The written request must be received by the Contracting Authority no later than 4 working days before the deadline for submission of bids.

7.2 The Contracting Authority sends explanations regarding the tender condition and possibly related documents no later than 2 working days after receiving written request from the supplier. If the request from the supplier is not delivered in time and despite this fact the Contracting Authority decides to provide explanations regarding the tender conditions, then the time limit in the preceding sentence does not need to be observed by the Contracting Authority.

7.3 The explanations regarding the tender conditions (including the exact wording of the request of the supplier) shall be provided to all suppliers at the same time and sent in the same manner as this invitation.

7.4 The Contracting Authority is entitled to provide explanations regarding the tender conditions without prior request. In such cases the Contracting Authority proceeds analogically according to the preceding paragraphs.

7.5 The Contracting Authority may modify the tender conditions before the deadline for submission of bids elapses. The modification has to be notified to the suppliers in the same manner as the tender conditions that was the subject of modification. If the Contracting Authority through explanations of the tender conditions makes modification of the tender conditions and the nature of the such modification requires it, the Contracting Authority shall reasonably extend the deadline for the submission of bids. In the event such a modifications, which may extend the range of potential bidders, the



Contracting Authority will extend the deadline so that the potential bidders have the entire length of the original deadline for the submission of bid.

8. EVALUATION CRITERIA

- 8.1 Bids shall be evaluated on the basis of the lowest bid price criterion. The Contracting Authority shall (only for the purposes of evaluation and assessment) change bid prices into CZK. The exchange rate shall be the middle rate of Czech National Bank, which will be valid at the last day, on which bids could be submitted.
- 8.2 In the case that two or more bids contain the same lowest bid price, the time of the submission of the bid shall be a decisive element, i.e. the bid that was submitted earlier shall have priority over the bid that was submitted later.

9. BID PRICE

- 9.1 The Bidders must fill in the **COVER SHEET OF THE BID ANNEX. 1**. The bidder shall also fill in the currency, which must be EUR.
- 9.2 The bid price is the maximum price that cannot be exceeded and shall include all costs that the bidder shall incur during the performance of the Public Procurement.

10. FORMAL BID REQUIREMENTS

- 10.1 All bids must be submitted in writing in duly sealed envelope designated by the identification data of the bidder. The envelope must be designated by inscription "**DO NOT OPEN**" and by title of the Public Procurement „**Camera for Mie scattering_TP16_512**". On the envelope shall be address to which the Contracting Authority may send information regarding the Public Procurement.
- 10.2 The bid shall contain identification data of the bidder. This requirement is fulfilled by filling the cover sheet of the bid.
- 10.3 The bid must be submitted in Czech, Slovak or English language. This requirement is fulfilled if documents that by its nature cannot be in the required language are at least translated into one of the required languages.
- 10.4 The bid must contain the draft of the contract signed by the person authorized to act on behalf of the bidder.
- 10.5 All pages in the bid must be secured against unauthorized manipulation (e.g. bound by string and sealed), so that additional documents cannot be inserted nor any pages removed. The bid must be clearly readable, without any crossed words or other discrepancies.
- 10.6 The bidder must submit a bid in its original (paper) form.
- 10.7 The bidder must also include in the bid a CD-ROM, USB, or other generally used data carrier with an electronic copy of the bid (all paper documents in the bid).



10.8 If the bid is submitted jointly by several bidders (joint bid), a contact person authorized to represent all such bidders must be designated in the bid.

10.9 The bids must be structured in the following manner:

a) **Cover sheet**

Bidders shall fill in cover sheet

b) **The description of the offered Products related to RSD**

c) **Draft of the contract** signed by the person authorized to act on behalf of the bidder.

11. FINAL PROVISIONS

11.1 The Contracting Authority is entitled to cancel the award procedure anytime prior to the signature of the contract.

11.2 The Contracting Authority does not allow alternative bids.

11.3 The Contracting Authority is entitled to change or supplement the provisions of this invitation.

11.4 The bidders shall bear all their costs connected with their participation in the award procedure initiated by this invitation.

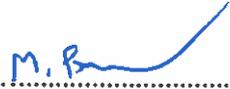
12. LIST OF ANNEXES

a) Annex 1 Cover sheet

b) Annex 2 Draft of the contract

c) Annex 3 Technical specification (RSD)

In Prague on 2018


.....
RNDr. Michael Prouza, Ph.D., director



ANNEX 1

COVER SHEET OF THE BID - Part No. 1

Public procurement title: Camera for Mie scattering_TP16_512

Contracting Authority: Fyzikální ústav AV ČR, v.v.i.
Registered office: Na Slovance 2, 182 21 Praha 8
Registration No.: 68378271
Person authorized to act on behalf of the bidder: RNDr. Michael Prouza, Ph.D., director

Contact person: David Pokorný

Telephone: 00 420 601 555 056

E-mail: david.pokorny@eli-beams.eu

Bidder:
Registered office:
Identification No.:
Tax Identification No.:
Person authorized to act on behalf of the bidder:
Bank account:
Contact person:
Contact address:
Telephone:
E-mail:

Bid price in EUR without VAT



EUROPEAN UNION
European Structural and Investing Funds
Operational Programme Research,
Development and Education



MINISTRY OF EDUCATION,
YOUTH AND SPORTS

ANNEX 2

DRAFT OF THE CONTRACT



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) **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. Michaelem Prouzou, Ph.D. – director
("Buyer"); and
- (2)
with its registered office at:
registration no.:
represented by:
("Supplier").

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

WHEREAS

- (A) The Supplier's bid for the public procurement entitled "Camera for Mie scattering", whose purpose was to procure the Object of Purchase ("Public Procurement"), was selected by the Buyer as the most suitable.

IT WAS AGREED AS FOLLOWS:

1. SUBJECT-MATTER OF THE CONTRACT

Under this Contract the Supplier shall at its own responsibility manufacture and deliver to the Buyer the equipment that is described in Annex 1 (*Technical Specification – Requirement Specification Document*) hereto, in the quality described therein ("Object of Purchase"), transfer to the Buyer ownership right to the Object of Purchase and provide other related performance as described herein and the Buyer shall take over the Object of Purchase and shall pay the Supplier the Purchase Price (as defined below), all under the terms and conditions stipulated in this Contract.

2. THE PLACE OF DELIVERY

The place of delivery is ELI Beamlines facility, Za Radnicí 836, 252 41 Dolní Břežany, district Prague-west, the Czech Republic.



3. THE TIME OF DELIVERY

The Supplier shall deliver the Object of Purchase to the place of delivery within 12 weeks from the signature of this Contract.

4. THE OWNERSHIP RIGHT

The ownership right to the Object of Purchase shall be transferred to the Buyer upon signature of the handover protocol by both Parties.

5. PRICE AND PAYMENT TERMS

5.1 The purchase price for the Object of Purchase is **FILL - IN EUR** ("Purchase Price") without value added tax ("VAT"). VAT will be paid in accordance with the applicable legal regulations.

5.2 The Purchase Price cannot be exceeded and includes all costs and expenses of the Supplier related to the performance of this Contract. The Purchase Price includes, among others, all expenses related to the manufacture and delivery of the Object of Purchase, insurance 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 in EUR on the basis of a tax document – invoice, to the account of the Supplier specified in the invoice. The Supplier is entitled to issue the invoice after signature of the handover protocol. Copy of the handover protocol must be attached to the invoice. The invoice must be delivered to the Buyer immediately after the signature of the handover protocol.

5.4 The Buyer shall realize the payment on the basis of duly issued invoice within 30 days from receipt thereof. 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 Supplier as a tax document must contain all information required by the applicable laws of the Czech Republic. Invoices issued by the Supplier 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) the date of the issue of the tax document,
- h) the date of the fulfilment of the Contract,
- i) Purchase Price,
- j) registration number of this Contract, which the Buyer shall communicate to the Seller based on Seller's request before the issuance of the invoice,



- k) declaration that the performance of the Contract is for the purposes of a project which the Buyer shall communicate to the Seller based on Seller's request before the issuance of the invoice

and must comply with the double tax avoidance agreements, if applicable.

- 5.6 In case that the invoice shall not contain the above mentioned information, the Buyer is entitled to return it to the Supplier during its 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. SUPPLIER'S DUTIES

During performance of this Contract the Supplier proceeds independently. If the Supplier receives instructions from the Buyer, the Supplier shall follow such instructions unless these are against the law or in contradiction to this Contract. If the Supplier 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 Supplier must notify the Buyer. The Supplier is not obliged to accept instructions if their implementation would increase costs of the Supplier in not only negligible extent or would prevent the Supplier from timely delivery of the Object of Purchase. In such cases an amendment hereto shall be concluded dealing with Purchase price increase or deadlines extension.

The Parties might modify Annex No 1 hereto (Technical specification) by mutual written agreement of their duly authorized representatives if such modification secures a more suitable technical solution and if such modification does not increase the Purchase Price nor prevents the Supplier from timely delivery. In case of Purchase Price increase/decrease or necessity of additional time an amendment hereto shall be concluded.

7. HANDOVER OF THE OBJECT OF PURCHASE

- 7.1 Handover and takeover of the Object of Purchase shall be realized on the basis of a handover protocol. The handover protocol shall contain documents which are specified in Annex 1 (*Technical Specification – Requirement Specification Document*)
- 7.2 If the Object of Purchase does not meet requirements stipulated by this Contract, the Buyer is entitled to refuse the takeover of the Object of Purchase. In such a case the Supplier shall remedy the deficiencies within ten (10) working days, unless Parties agree otherwise. If it is impossible to meet the said deadline for objective reasons proven by the Supplier the Parties will agree another sufficient deadline. The Buyer is entitled (but not obliged) take over the Object of Purchase despite the above mentioned deficiencies, in particular if such deficiencies do not prevent the Buyer from using the Object of Purchase for intended purpose. In such a case the Supplier and the Buyer shall list the deficiencies in the handover protocol, including the manner and the date of their removal (remedy). If the Parties do not reach agreement in the handover protocol regarding the date of the removal, the Supplier shall remove the deficiencies within ten (10) working days.



8. HIDDEN DEFECT REMOVAL

- 8.1 The Supplier shall remove hidden defects free of charge and in the terms stipulated herein. A hidden defect is deemed a defect present in the Object of Purchase on the time of handover execution which, however, might be discovered only during Object of Purchase use.
- 8.2 If the Buyer ascertains a defect of the Object of Purchase the Buyer shall notify the Supplier such defect without undue delay.
- 8.3 In the notification the Buyer shall describe the defect and the manner of removal of the defect. The Buyer has the right to:
- ask for the removal of the defect by the delivery of new Object of Purchase or its individual parts, or
 - ask for the removal of the defect by repair, or
 - ask for the reasonable reduction of the Purchase Price.

The choice among the above mentioned rights belongs to the Buyer. In case of a defect which is repairable and occurs for the first time the Buyer is not entitled to request delivery of a new Object of Purchase. The Buyer is also entitled to withdraw from this Contract, if by delivering the Object of Purchase with defects this Contract is substantially breached.

- 8.4 The Seller shall remove the defect within 10 working days from its notification. If it is impossible to meet the said deadline for objective reasons proven by the Supplier the Parties will agree another sufficient deadline.
- 8.5 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.

9. RIGHT OF WITHDRAWAL

- 9.1 The Buyer is entitled to withdraw from this Contract without any penalties, if any of the following circumstances occur:
- the Supplier is in delay with the fulfilment of this Contract and such delay lasts more than 3 weeks;
 - the Object of Purchase does not fulfil the requirements stipulated in this Contract, in particular in Annex 1 (Technical Specification), and thereby this Contract is deemed substantially breached; or
 - the insolvency proceeding is initiated against the Supplier.

10. SPECIAL PROVISIONS

By signing this Contract, the Supplier becomes a person that must 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 Research, Development and Education Operational Program or other control bodies access 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 preferably 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 in 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 part hereto is Annex 1 (*Technical Specification - Requirement Specification Document*). In case of any discrepancy between the provisions of this Contract and the provisions of Annex 1 (*Technical Specification - Requirement Specification Document*) the provisions of this Contract shall prevail.
- 11.7 This Contract is subject to publication according to Act. No. 340/2015 Coll, On the register of contracts (hereinafter the "Act"). This Contract shall be effective from the date of its publication pursuant to this Act.
- 11.8 This Contract shall be valid.



IN WITNESS WHEREOF attached Parties their handwritten signatures:

Buyer

Signature: _____

Name: RNDr. Michael Prouza, Ph.D.

Position: director

Date:

Supplier

Signature: _____

Name:

Position:

Date:



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European Structural and Investing Funds
Operational Programme Research,
Development and Education



ANNEX 1

TECHNICAL SPECIFICATION

Note: Requirement Specification Document



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Development and Education



ANNEX 3

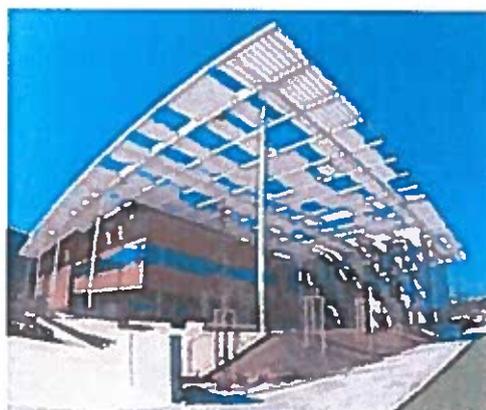
TECHNICAL SPECIFICATION

Confidentiality Level	<i>BL - Restricted for internal use</i>	TC ID / Revision	00167682/C
Document Status	<i>Document Released</i>	Document No.	N/A
WBS code	<i>5.3 - RP4 Applications in molecular, biomedical, and material sciences</i>		
PBS code	<i>EBIO.EQBL.DYN.1</i>		
Project branch	<i>Engineering & Scientific documents (E&S)</i>		
Document Type	<i>Specification (SP)</i>		

[RSD product category A]

Camera for Mie scattering

TP16_512



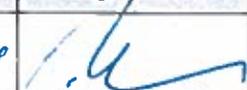
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Reviewed By			
<i>Name (Reviewer)</i>	<i>Position</i>	<i>Date</i>	<i>Signature</i>
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Approved by			
<i>Name (Approver)</i>	<i>Position</i>	<i>Date</i>	<i>Signature</i>
Georg Korn	Science and Technology Manager, Scientific coordinator of RP2-6	25.04.2018	

Revision History / Change Log				
<i>Change No.</i>	<i>Made by</i>	<i>Date</i>	<i>Change description, Pages, Chapters</i>	<i>TC rev.</i>
1	O. Kulyk	16.04.2018	RSD draft creation	A
2	O. Kulyk, A. Kuzmenko	18.04.2018	RSD update, version for internal review	B
3	A. Kuzmenko	25.04.2018	RSD update, final version for approval	C

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1. Introduction

1.1. Purpose

This Requirements Specification Document (RSD) lists the technical requirements and constraints for the selection of a camera for imaging scattered laser light for particle tracking at the AMO station (MAC chamber) or auxiliary test vacuum chambers.

1.2. Scope

This RSD contains all of the technical requirements: functional, performance and design, delivery, safety and quality requirements for the following product (tender number: TP16_512): **Camera for Mie scattering** (further "Camera").

The Camera is considered to be the standalone technology and will be placed in the E1 experimental hall, S1 laboratory space or the ELIBIO bio-lab at the ELI Beamlines facility. This Camera is registered in the PBS software under the following PBS code: *EBIO.EQBL.DYN.1 (1 pcs)*.

This Product is a **product Category A** according to the ELI Beamlines RSD categories. The category A is an Off-the-shelf Product without necessity of modifications and necessity to be subjected to a verification programme (review of design, inspection and testing) for ELI applications by the actual project specifications. All verification activities performing by a supplier shall be executed in accordance with the supplier's plan of outgoing inspection and tests. The verification of all specified parameters listed in this RSD shall be undertaken by the supplier before delivery to the ELI Beamlines facility and all items shall be furnished with a verification protocol and a declaration of conformity, to reflect their proper characteristics. Furthermore, all items may 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 abbreviations apply:

Abbreviation	Meaning
AC	Alternating current
AMO	Atomic, Molecular and Optical
ASCII	American Standard Code for Information Interchange
CA	Contracting Authority (ELI Beamlines)
e-	Electron
E1	Experimental hall 1
QE	Quantum Efficiency
CMOS	Complementary Metal Oxide Semiconductor

Abbreviation	Meaning
ELI	Extreme Light Infrastructure
ICD	Interface Control Document
NA	Not Applicable
FPS	Frames Per Second
RMS	Root Mean Square
RSD	Requirements Specification Document

1.4. Reference documents

Number of document	Title of Document/ File
RD-01	00163567-B_1.2_Q_M_Guide_for_Instructions_for_Use_Ver-9_EN_fully_signed.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 a 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. General Functional and Performance requirements

2.1. Camera operating conditions and general requirements

REQ-023114/A

The Camera shall have ≥ 2 threaded mounting holes at least on one side of the Camera enclosure to allow for stable mounting in an optical assembly, preferably with M2-6 thread type.

REQ-023115/A

The weight of the Camera, including all delivered accessories, shall be < 5 kg.

REQ-023116/A

The Camera operating conditions shall meet the requirements defined in Table 1 below.

Description of parameter	Value
Operational temperature range	18 – 28 °C
Storage temperature range	5 – 40 °C
Power requirements	100 - 240 V AC; 50 - 60 Hz universal input
Triggers (input, output)	5 V nominal into 50 Ohm
Synchronization	Internal or external
Cable length	10 m
Sockets standard	Europlug IEC 60906-1

Table 1: Operating conditions of the Camera.

REQ-023117/A

Dimension of the Camera shall not exceed 0.25 m x 0.25 m (length x width) footprint at 25 cm maximal height.

NOTE: Additional supporting equipment such as power sources or chillers may occupy extra space as long as they do not require optical table space for their operation.

2.2. Camera optical pulse output requirements

REQ-023118/A

The Camera shall have characteristics defined in Table 2.

Description of parameter	Value
Wavelength range (spectral sensitivity)	250-850 nm
Active Array Size	Anything between 10 mm x 10 mm up to 15 mm x 15 mm
Pixel size	Anything between 5 and 15 μ m
Sensor type	Back illuminated scientific CMOS
Sensor resolution	\geq 1200 x 1200 pixels
Sensor aspect ratio (shape)	1:1 (squared) is desired
QE% at 800 nm	> 50 %
QE% at 532 nm	> 92 %
QE% at 266 nm	> 30 %
Read Noise	\leq 1.7 e ⁻ (Median) \leq 1.9 e ⁻ (RMS)
Full-Well Capacity	\geq 80,000 e ⁻
Dynamic Range	\geq 50,000:1
Bit Depth	\geq 16-bit
Readout Mode	Rolling Shutter Effective Global Shutter
Binning	2x2

Description of parameter	Value
Cooling	Air Liquid
Dark Current	≤ 3.0 e-/pixel/second (air cooled) ≤ 0.8 e-/pixel/second (liquid cooled)
Lens (Optical) Interface	C-mount
Gain	≥ 100 (desirable)
Exposure	Varied in the range up to 1 s or more, with possibility to set minimal exposure time less than 0.5 ms
Frame rate	≥ 30 fps

Table 2: Characteristics of optical pulses of the Camera.

2.3. Control system, Data Acquisition and Storage

REQ-023119/A

Any control interfaces shall be equipped with an Ethernet or USB 3.0 port that allows communication with the ELI Beamlines control computer.

NOTE: The Supplier shall assist with the integration of the instrument into the ELI Beamlines network and software environment.

REQ-023120/A

The communication protocol used shall be compatible with Linux operating system. The protocol shall be open or libraries for 64 bit Linux shall be provided.

REQ-023121/A

The control software of the Camera shall be delivered by the Supplier and shall contain documented Application Programmers Interface (API) allowing its integration into ELI control system.

3. Delivery requirements

REQ-023123/A

The transportation to the final destination of the Camera shall be conducted by the Supplier.

REQ-023124/A

The Camera and its components shall be delivered in protective package preventing damage and contamination and in a minimum of two plies separate clean packaging. The Camera and its components shall be cleaned and packaged in compliance with the cleanliness of class 7 according to ČSN EN ISO 14644 (equivalent to EN ISO 14644) or cleaner.

NOTE: If the Supplier cannot fulfill class 7 cleanliness requirements, the Supplier and the CA shall agree on the cleaning method to be used to clean devices without decreasing the devices' performance and to avoid contamination of the clean space of the CA.

REQ-023126/A

The Supplier shall provide off-site support for installation, operation and maintenance following the delivery of the Camera to ELI Beamlines.

4. Safety Requirements

REQ-023127/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-023129/A

The Supplier shall provide Instructions for use (Product User Manual) as part of the delivered Product. The Instructions for use shall be approved by the CA and shall include the instructions and descriptions regarding the following:

- transport and handling;
- storage, installation and cleaning;
- safe operation and maintenance procedures.

*NOTE: The completeness of the Instructions for use will be reviewed by the CA for compliance with ELI "Instructions for use" methodology (see **RD-01**; chapter 1.4).*

REQ-023130/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-023131/A

The Supplier shall establish and maintain a nonconformity control system compatible with ČSN EN ISO 9001 (equivalent to EN ISO 9001).