



EVROPSKÁ UNIE
EVROPSKÝ FOND PRO REGIONÁLNÍ ROZVOJ
INVESTICE DO VAŠÍ BUDOUCNOSTI

MSMT
MINISTERSTVO ŠKOLSTVÍ,
MLÁDEŽE A TĚLOVÝCHOVY



OP Výzkum a vývoj
pro inovace

S15/ 092 E

Dated

2015

Fyzikální ústav AV ČR, v. v. i.

and

Walnut Technology Consulting GmbH

CONTRACT FOR WORK

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Contract for Work concluded in compliance with the provisions of Section 2586 et seq. of the Act No. 89/2012 Coll., the Czech Civil Code (hereinafter the "**Contract**")

1 PARTIES

1.1 The Client:

Fyzikální ústav AV ČR, v.v.i., having its registered office at: Na Slovance 2, Prague 8, ZIP Code 182 21 represented by: prof. Jan Řídký, DrSc. in his capacity of Director registered in the Register of the Public Research Institutions of the Ministry of Education, Youth and Sports of the Czech Republic,

Banking details:

UniCredit Bank Czech Republic and Slovakia, a.s.

Account No.: 2106551053/2700

Identification Number: 68378271

VAT Number: CZ68378271

(hereinafter the "**Client**")

and

1.2 the Contractor:

Walnut Technology Consulting GmbH

having the registered office in: Postallee 29, D-21279 Wenzendorf, Germany

Identification Number: HRB 200 525

registered in Registergericht Tostedt

represented by Prof. Rübhausen, in his capacity of Geschäftsführer

Banking details:

Commerzbank Hamburg Germany

Account "Prag Projekt"

IBAN: DE95 2004 0000 0181 2221 01

BIC: COBADEFFXXX

VAT Identification Number: DE211095003


(hereinafter the "**Contractor**");

(the Client and the Contractor may be referred to herein jointly as the "**Parties**", or each of them separately as the "**Party**").

2 INTRODUCTORY PROVISIONS

2.1 The Client declares that:

- (a) The Client is the recipient of funding provided by the Ministry of Education, Youth and Sports of the Czech Republic (hereinafter the "**Sponsor**") for the Project "ELI: Extreme Light Infrastructure", Reg. No. CZ.1.05/1.1.00/02.0061, granted within the framework of the Operational Program Research and Development for Innovation (hereinafter the "**RDIOP**"), Priority Axis I European Centres of Excellence, Area of Intervention 1.1. European Centres of Excellence (hereinafter the "**ELI-Beamlines Project**").
- (b) The aim of the ELI-Beamlines Project is to construct and operate an international research laboratory (research facility) using the latest generation of laser technologies and to subsequently implement a number of future projects in basic and applied research. The objectives, extent and aims of the ELI-Beamlines Project are given in more detail in the European Commission Decision dated 20.4.2011, Ref. No. C(2011) 2753 on major project "ELI: Extreme Light Infrastructure" and in the decision of the Sponsor dated 2.8.2011, Ref. No. 26310/2009-45 and in the documents related to these decisions.
- (c) The ELI-Beamlines Project is one of the pillars within the so-called ESFRI Roadmap created by the European Strategy Forum on Research Infrastructures which was formed at the behest of the European Commission to establish a network of pan-European research centres at the most advanced scientific levels whose aim is to facilitate, within the framework of specific scientific focus of each such research centre, a fully open access into these facilities to academic workers exclusively on the basis of their scientific excellence (i.e. without regard to the legal or commercial status of institutions or corporations they may come from).

- (d) In order to successfully implement the ELI-Beamlines Project it will be necessary to execute certain work according to this Contract. The executed work shall form an integral part of the infrastructure for research, development and innovations of ELI-Beamlines (hereinafter the "ELI Beamlines Infrastructure") and shall be further used to implement research projects in the area of applications of the interaction of highly intensive laser radiation with materials.
 - (e) The Client does not intend to use the System for commercial activities with the purpose of gaining of regular profit.
- 2.2 The Contractor was selected as the winner of a negotiated procedure without publication announced by the Client in accordance with Act No. 137/2006 Coll., on Public Procurement, as amended and supplemented (the "Public Procurement Act"), for the procedure called "ELIps: Time resolved VUV Ellipsometer" (hereinafter the "Negotiated Procedure").
- 2.3 The Contract contains valid and effective obligations to which Parties are unconditionally bound hereunder according to its terms and conditions.
- 2.4 Herein below is a list of Annexes which, among the others referred to hereunder in the Contract, constitute an integral part of this Contract:
- (a) Annex 1 ("**Scope of Work**") contains the detailed technical description and specifications of the System. All technical specifications are divided into two groups: the first including technical specifications to be met and demonstrated by 31/10/2015 (i.e. the deadline for Deliverable D2 consisting in final technical drawings and CAD models and the second including technical specifications to be met and demonstrated by 1/10/2016 (i.e. the deadline for final mandatory Deliverable D6 consisting in System's verification at the Client's Place of Business);
 - (b) Annex 2 ("**Deliverables and Payments Schedule**") contains the schedule of delivery and payment instalments (the "**Payment Instalments**") as well as the deliverables of which the System is comprised (plus the optional Deliverable D7) to be realized throughout the Deadlines set out therein (the "**Deliverables**");
 - (c) Annex 3 ("**Additional Assistance**") contains the economical guidelines under which the Client, if and when the Client will be endowed with sufficient financial resources to finance it, may optionally request Additional Assistance;
 - (d) Annex A-1 ("**The Contractor's Bid Package**") contains the technical specifications submitted within the Negotiated Procedure.
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- 2.5 In the event of inconsistency or difference among the Contractor's Bid Package and any other technical specification in this Contract, the conditions and specifications contained in the Contractor's Bid Package shall prevail in the case they are more favourable to the Client, i.e. the Contractor offers higher (more technically advanced or demanding) technical specification values.
- 2.6 The Contractor declares it is capable to fulfil this Contract in the meaning of Section 5 (1) of Act No. 89/2012 Coll., the Czech Civil Code (hereinafter as "Czech Civil Code"), thereupon it will act with knowledge and carefulness which is related to his profession or status within the terms contemplated in this Contract.
- 2.7 The Contractor is aware that the Client does not act as an entrepreneur in relation to the subject-matter of this Contract.
- 2.8 The Client acknowledges the unique and innovative nature of the VUV-Ellipsometer instrument and accordingly that there is inherent design and performance risk associated with this Contract and the performance of the Contractor's obligations hereunder.

3 WORK SUBJECT-MATTER; WORK SCOPE

- 3.1 The Contract concerns the design, assembling and delivering to the Client at the Client's Place of Business of a novel and unique Ellipsometer with a theoretical capability of VUV operation for magneto-optical reflection, absorption and ellipsometry experiments in the photon energy range from 1 to 40 eV for reflection and absorption experiments and 1 to 40 eV for ellipsometry in accordance with this Contract (hereinafter the "System"). The System comprises of Deliverable D1, Deliverable D2, Deliverable D3, Deliverable D4, Deliverable D5 and Deliverable D6. (The Deliverable D7 is optional and beyond the Scope of Work). Furthermore, the scope of this Contract mainly encompasses (i) various training services to be provided to the Client's personnel in compliance with Article 12 of this Contract (ii) a royalty free licence, if any according to Article 13, to use the System for the purposes of the use of the ELI-Beamlines Project after completion (the System and the other parts of the works/services are hereinafter referred to as the "Works").
- 3.2 This Contract, specifically Annex 1, lists the technical requirements and constraints for the construction of the System for the ELI Beamlines facility (ELIps). This System as an instrument shall have the ability to perform spectroscopic magneto optic ellipsometry on solid state targets in the IR to VUV range (1 to 40 eV) with sub ps temporal resolution. The System is to be tested, verified for operation in the IR to UV range using the included light source. The parts necessary for the VUV operation (VUV polarisers, optics and detector) shall

be tested separately as parts and it shall be shown that they can be mechanically integrated in the System. (Hereinafter referred to as the "Purpose of Work").

3.3 The Contractor may designate all the subcontractors it deems fit to perform the Works. In that event, the Contractor shall be liable for its obligations imposed by this Contract to the same extent as if the performance was provided by the Contractor instead of any such subcontractors.

3.4 Should the Client wish that the Contractor performs:

- (a) Integration of the controls systems into the central ELI systems;
- (b) Commissioning of the VUV range with the Client's HHG source;

the Client may request such additional assistance, consisting of an additional Deliverable D7, which is beyond the Scope of Work and not included in the Price, (hereinafter the "Additional Assistance") up to the maximal extent of 30 man-days, to be provided by the Contractor not later than by 31/12/2017 and for the consideration stipulated in accordance with Annex 3. The Contractor shall be bound to provide Additional Assistance under this par. 3.4 to the Client without undue delay upon receipt of the Client's request, but not later than within 60 (sixty) days after receipt of such request, unless Parties agree otherwise.

All Additional Assistance are beyond the Scope of Work and not included in the Price under Article 7 hereunder, thus the Additional Assistance shall be paid separately. For the sake of clarity, any other obligation of the Contractor to perform other activity expressly stated in this Contract is not deemed to be an Additional Assistance under this par. and as such is ruled by the provisions of this Contract other than this par. 3.4. and therefore included in the Price under Article 7 hereunder provided that changes in the technical specifications or the Scope of Work are not included in the Price.

3.5 The Contractor shall, simultaneously with the delivery of the Contractor's Documents (see par. 4.3 below), at the latest during handover of the System, provide the Client with a list of components that have only disposable use and therefore will be considered as "consumables" as well a list of subsystems. The list of consumables and subsystems shall include the following items: name, list of potential manufacturers and expected lifetime (assuming a typical operational regime of 12 hours per day).

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4 OBLIGATIONS OF THE CONTRACTOR

- 4.1 Subject to Article 11 the Contractor shall design (to the extent specified in the Scope of Work), execute and complete the System in accordance with this Contract
- 4.2 The Contractor shall be liable for due execution of the Works in accordance with this Contract and with respect to and focus on the Purpose of Work, and therefore shall not be obliged to conform to wrong or unsuitable orders received from the Client, even in case of par. 4.4 and 4.7 hereof. Any Contractor's compliance with such orders shall mitigate or release the Contractor from its responsibility.
- 4.3 The Contractor shall provide the documents (hereinafter the "Contractor's Documents") as described in the Client's technical specification. The Contractor's Documents shall be in English.
- 4.4 Technical Reports as set out in the Deliverable and Payment Schedule shall be provided for each Deliverable in such level of detail so that a professional in the given area is able to assess the correctness of the Contractor's approach (or the solution agreed with or required by the Client, if applicable) in solutions used for each Deliverable.
- 4.5 The Client's Personnel shall, on condition that any examination would not hinder or delay the execution of the Works, have access to the Contractor's Place of Business expressly dedicated to the realization of the System and/or to any other third party's place directed by the Contractor (as the case may be, depending on the concerned Deliverable) in order to examine the Contract performance.
- 4.6 The design, the Contractor's Documents, the execution and the completed System shall comply with the technical requirements as stated in Annex 1 and Annex A-1 attached hereto. In the event the necessity arises or it can be deemed as suitable from the professional point of view of the Contractor, the Contractor is entitled to modify a particular design, arrangement or Contractor's Document which has previously been submitted to the Client if it deems, at its professional discretion, that any such modification would serve better to attain the Purpose of Work, provided that any such change has been previously approved in writing by the Client. The Client shall provide a response to the Contractor within 10 (ten) days after delivery of the Contractor's proposal under this par. 4.6, unless the Client within such 10 days term communicates to the Contractor (i) reasonably objective reasons why 10 days are not sufficient to assess the requested change and provide an answer accordingly (ii) an alternative deferred term for providing an answer that, in any event, shall not exceed 20 (twenty) days from delivery of the proposal by the Contractor. If

the Client fails to respond within the above terms, the approval shall be deemed to have been issued by the Client on the last day of the aforesaid terms and all relevant deadlines shall be extended accordingly.

- 4.7 The Parties mutually agreed on provision 4.6 above with recognition of the highly sophisticated technological experimental scope of this Contract which may require the Contractor to shift to practicable alternative solutions in the event that the one set out in the Contract or in the Contractor's Bid Package is not viable as a result of a feasibility study or for other grounded reasons. The Contractor shall inform the Client accordingly. Any such modification has to be previously approved in writing by the Client and shall be at the Contractor's cost unless such modifications are required because the original or any subsequently modified technical requirements specified or agreed to by the Client are incompatible with any other technical requirements of the Client whenever such incompatibility is discovered in which case such modifications shall be at the cost of the Client.
- 4.8 If changed or new applicable standards come into force in the Czech Republic (or in any other country whose legislation affects or has its bearings on the Works or System) after the Contract signature so that the Client's technical requirement in the Scope of Work are no longer – or at any time are not found - applicable, attainable, legal or not implementable for whatever reason, the most diligent Party shall inform the other accordingly and the Parties shall convene to agree on necessary modifications, alterations to the Deliverables and Payments Schedule, which shall be at the Clients expense. In the event that any modification cannot be realized at all, Article 16 shall apply.
- 4.9 The Contractor shall comply with all applicable and reasonable safety regulation on the Client's Place of Business which shall have been communicated in due time to the Contractor by the Client.
- 4.10 If the Contractor is prevented from delivering the Deliverable D6 (System verification) by the agreed Deadline set out in the Deliverables and Payments Schedule or the System by the Final Delivery Date because of reasons out of the Contractor's control or influence, the Contractor may request the postponement of the Deadline or Final Delivery Date after the original Deadline or Final Delivery Date provided that the postponed date is within 100 days after the initial (i.e. not postponed) Deadline or Final Delivery Date. The Client may not refuse this request justified by such reasons, if they are duly reported, reasonably grounded and evidenced by the Contractor to the Client. If the Contractor fails to deliver the System by the Final Delivery Date or if the Contractor does not fulfil the Deliverable D6 (System



verification) by the relevant Deadline in accordance with the Deliverables and Payments Schedule but in each case as such deadline shall be extended pursuant to this par. 4.10, the Client shall be entitled to receive a contractual penalty as a daily accruing penalty of 200 EUR for each day of delay. The total aggregate amount of the contractual penalty for delay is limited by max 5% of the Price. If the delay is directly or indirectly caused by, or it is howsoever related to, the Client, no delay and no penalty shall be imposed on the Contractor. Such penalties shall be paid by the Contractor within 20 days from the delivery of notification issued by the Client but may in the absence of any justification by the Contractor for such delay be settled in favour of the Client by offsetting any such penalties with any Payment Instalment still due to the Contractor as provided in the Deliverable and Payment Schedule or with any amount still owing to the Contractor under the Contract at the time delay contractual penalty are validly payable under this Contract.

- 4.11 The Contractor shall be obliged to assure transparent information exchange on the progress of the System's execution in accordance with the Scope of Work. The Contractor shall provide the Client with any information, explanation or documents reasonably requested by the Client provided that such requests - considering their extent and times - are not inappropriate or demanding for the Contractor.
- 4.12 The Contractor undertakes, under the terms and conditions hereof, in accordance with instructions issued by the Client, to:
- (a) Archive, without prejudice to Articles 13 and 21 all written material prepared in connection with the execution of the Works hereunder so that its compliance with the archiving principles required within the framework of the RDIOP are ensured and to provide access to the Client to these archived documents until 2025. The Client, without prejudice to Articles 13 and 21 shall be entitled to take possession of these documents from the Contractor free of charge after ten years from the completion of the System hereunder;
 - (b) Cooperate, without prejudice to Article 21 during financial inspections carried out in accordance with Act No. 320/2001 Coll., on Financial Inspections, as amended, namely to allow the Sponsor to access also those portions of the bid submitted within the Negotiated Procedure, the Contract and related documents which may be protected by special legal regulation, given that all requirements set forth by legal regulation with respect to the manner of executing such inspections will have been observed; the Contractor shall seek to bind any of its subcontractors to comply with this obligation and accordingly the Contractor shall be obliged to ask any of its

subcontractors to undertake to comply with this obligation, but shall be released from this duty if the concerned subcontractor expressly refuses to undertake to comply with this obligation (in which case the Contractor, if requested by the Client, shall provide the Client with evidence of such refusal);

- (c) Keep separate records regarding any activities undertaken pursuant hereto. Until final delivery, the Contractor shall keep any and all payments received from the Client pursuant hereto on its special bank account (bank account opened just for this Contract).
 - (d) Observe, without prejudice to Articles 13 and 21, any publicity obligations stemming from RDIOP;
 - (e) Provide yearly reports on subcontractors to enable the Client to fulfil its obligations pursuant to Section 147a of the Act. No. 137/2006 Coll., on Public Procurement, as amended and these reports may be implemented, if suitable, in the quarterly reports under par. 4.13;
 - (f) The Contractor is entitled to use the funds received from the Client only for the purposes of the activities undertaken hereunder, i.e. to cover direct and indirect costs of the work undertaken hereunder and the fee/margin appropriate to the duly delivered Deliverables;
 - (g) In case of early termination of this Contract the Contractor may use any funds received from the Client by way of pre-payment to offset any monies owed to the Contractor pursuant to Article 17;
 - (h) The Contractor is obliged to inform the Client about any potential insolvency proceedings or application for extraordinary governmental administration initiated as against the Contractor.
- 4.13 The Contractor shall be obliged to assure transparent information exchange and shall execute quarterly reports on the progress of the System's execution in accordance with the Scope of Work. The quarterly report shall be drafted in accordance with the scheme set out in Annex 5 and shall contain a brief description of the activity carried out by the Contractor during the quarter preceding the relevant Deadline and evaluating the overall and significant risk related to the planned performance of the Contract during the next quarter including suitable suggestion how to minimize the risks. The Client will assess all quarterly reports and will provide the Contractor with its statement on the respective quarterly report and may



request the Contractor to supplement, specify or clarify the quarterly report. The Contractor shall provide the Client with any information, explanation or documents requested by the Client in its statement to any quarterly report, unless the Contractor provides the Client with qualified reason not do to so.

5 Organization of the Client's Place of Business and assistance of the Client.

5.1 The Client shall have obtained (or shall obtain) all necessary permissions for the delivery and assembly of the System to the Client's Place of Business in accordance with the Contract.

5.2 The Client shall give the Contractor right of access to, and possession of, the Client's Place of Business within such times as may be required to enable the Contractor to proceed in accordance with the program. If the Contractor suffers delay and/or increased costs as a result of a failure of the Client to enable the Contractor due performance of the Contract, the Contractor shall be entitled to an extension of time for completion for any such delay and/or to be reimbursed for their wasted costs.

5.3 For any part of Works undertaken by the Contractor pursuant hereto at the Client's Place of Business the following principles shall apply:

(a) the Client's Personnel: (i) shall be managed and directed at the risk and cost of the Client, at the same time ensuring that the Contractor is in a position to discharge its task; (ii) shall co-operate with the Contractor's Personnel;

(b) the Client shall during activities carried out under this Contract at the Client's Place of Business take all reasonable precautions to maintain the health and safety of the Contractor's and Client's Personnel. The Client shall ensure that suitable arrangements are made for all necessary welfare, work safety and hygiene requirements and for the prevention of injury or disease (e.g. sick bay and medical staff first aid). The Client shall appoint an accident prevention manager at the Client's Place of Business, responsible for maintaining safety and protection against accidents according to the applicable law. This person shall be qualified for this responsibility and shall have the authority to issue instructions and take protective measures to prevent accidents.

(c) The Client shall have made available to the Contractor for his information, prior to the Commencement Date, all existing relevant data in the Client's possession on Client's Place of Business conditions, including environmental aspects.

- (d) The Client shall bear all costs and charges for special and/or temporary rights-of-way which the Contractor may require, including those for access to the Client's Place of Business.
- (e) As the various components and materials of the System are being transported to the Client's Place of Business by the Contractor throughout the execution of the Contract, the Client shall be responsible for receiving them at the Client's Place of Business, unloading (without prejudice to par. 17.1) storing and protecting the goods and other things required for the Works. Unpacking operation and installing shall be carried out by the Contractor and any of such operations shall be jointly recorded in minutes by the Parties.
- (f) The Client shall take precautions to protect the environment, in particular on the Client's Place of Business, in order to limit potential damage and nuisance to the site and to the Contractor's and Client's Personnel or third parties as well as to their properties as a result of the operations under this Contract.
- (g) The Client shall make the Client's equipment and means available for the use of the Contractor in the execution of the System in accordance with the details and arrangements stated in Annex 4 ("Client's Equipment").
- (h) The Client shall be responsible for keeping unauthorized persons off the Client's Place of Business where the System is being assembled or built and where the Contractor and the Contractor's Personnel is working. Authorized persons shall be limited only to the Contractor's Personnel and the Client's Personnel.
- (i) During the execution of the System, the Client shall keep the Client's Place of Business free from all unnecessary obstruction, and shall make available to the Contractor storage rooms for Contractor's Equipment. The Client shall clear away and remove from the Client's Place of Business any wreckage, rubbish and temporary works which are no longer required during the intermediate or final phase of the execution of the System.
- (j) The Client shall be the only responsible, after the taking – over of the System, (i) to clear away and remove all surplus material, wreckage, rubbish and temporary works (ii) to leave the Client's Place of Business related to the System in a clean and safe condition. The Contractor may retain on the Client's Place of Business, during the period necessary to make good defects, such goods and equipment as are required for the Contractor to fulfil obligations under the Contract.

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6 PERIOD OF EXECUTION

- 6.1 The Parties have agreed that the System shall be executed by the Contractor according to timing set out in the Deliverables and Payment Schedule. The Contractor shall be responsible for duly and timely delivery of each Deliverable as well as of the complete delivery of the whole System which shall be delivered on the Final Delivery Date, i.e. the Deadline of Deliverable D6 subject in all cases under this par 6.1 to any extension of time permitted pursuant to this Contract.
- 6.2 For any reason whatsoever shall late delivery of the Deliverable in respect of each Deadline be reported and duly justified by the Contractor to the Client, while the Contractor has to suggest what steps at what time schedule shall be taken in order to catch up such delay.
- 6.3 The Contractor shall be responsible for unpacking and visual checking of transported components of the System.
- 6.4 The Contractor with the previous consent of the Client shall be allowed to re-schedule the Deadlines of the Deliverables – except for Deliverables D3 and D6 – by changing the order of execution of the Deliverables (by postponing or advancing execution of one or more Deliverable) and any such consent shall not unreasonably withheld if the Contractor, by submitting objectively grounded reasons, proves that such re-scheduling is useful to expedite the accomplishment of the System, because of technical reasons or if it is necessary with respect to the internal organization of the Contractor's resources.
- 6.5 The Contractor shall promptly give notice to the Client of specific probable future events or circumstances which may adversely affect the System, potentially increase the Price in accordance with the Public Procurement Act or delay the execution of the System and indicate what measures intends to adopt in order to mitigate such delay.
- 6.6 Without prejudice to any postponement, of the Final Delivery Date pursuant to this Contract and the applicable law, any other deferment of the Final Delivery Date shall be mutually agreed by the Parties exclusively by written agreement.

7 PRICE OF WORKS; INVOICING; PAYMENT

- 7.1 The price of Works shall not exceed the aggregate maximum amount of EUR 356 440, excluding VAT, in words: Three hundred fifty six thousand four hundred forty Euros (the "Price"). The Price shall be a lump sum but may be subject to adjustment under the terms and conditions of this Contract and the applicable law.

- 7.2 Save as otherwise stated herein, the Price shall cover any and all performance to be provided by the Contractor in order to properly execute and deliver the Works hereunder, and includes all costs accrued by the Contractor during the execution of the Works and its handover at Client's Place of Business including all fees, customs (except those related to the territory of the Czech Republic), transportation costs and duties as well as all costs of the Contractor arising in connection with creating any intellectual property and acquiring and maintaining its protection, if existing.
- 7.3 The Parties agreed that the Price shall be payable in different Payment Instalments as stipulated in the Deliverables and Payments Schedule on condition of acceptance of relevant Deliverable by the Client which shall, exempt of the Deliverable D1, follow pursuant to Art. 8 hereof; the first payment is being paid by the Client for accepted Deliverable D1 and upon Contract signature in accordance with the Deliverable and Payment Schedule. It is understood by the Parties that for one or more Payment Instalments maybe paid to the Contractor in a pre-payment fashion in that it embodies also a portion representing the value of one or more Deliverable still to be realized by the Contractor as better detailed in the Deliverables and Payment Schedule.
- 7.4 Early Delivery Option. Should the Contractor be in position to deliver any Deliverable in advance in respect of the envisaged Deadline, it shall inform the Client accordingly with at least thirty (30) days' notice. The Client, upon delivery of the early Deliverables shall be bound to issue, respectively, the Acceptance Certificate or the Final Acceptance Certificate (as the case may be) pursuant to the Contract and shall make its best effort to effect early payment in advance in respect of the original Deadline of the concerned Deliverable. Provided that, in any event, the Contractor shall be entitled (i) to issue the invoice under par. 7.9 below from the expiry of the 20th (twentieth) day following issuance of the respective Acceptance Certificate or Final Acceptance Certificate, as the case may be, and (ii) be paid as stated in par. 7.9.
- 7.5 Partly Payment Release Option. In the event that not all of the criteria of a specific Deliverable are met at the given Deadlines (and the Acceptance Certificate or the Final Acceptance Certificate is delayed for reasons imputable to the Contractor), the Contractor shall be nonetheless entitled to submit, at each respective Deadline, a payment statement for a (partial) payment of the value of the concerned Deliverable. The amount shall or may be limited by the discretion of the Client considering the following criteria: (i) the value of the portions of the Deliverable effectively realised/delivered which meet the agreed requirements (ii) value of the work performed toward completion of the corresponding



and/or preceding Deliverables, (iii) plan submitted by the Contractor addressing anticipated completion of the corresponding and/or preceding Deliverables and (iv) risks connected with delay of payment with regards to fulfilling future Deliverables on time. Notwithstanding the foregoing, the Client may at its own discretion provide the Contractor with prepayment at any time during performance of this Contract.

- 7.6 **Delayed Payments.** If the Contractor does not receive payments in accordance with the Deliverables and Payments Schedule or with this Article 7 or by reason of any other sum to which is entitled under this Contract, the Contractor shall be entitled (i) to receive interests on late payment compounded daily on the due amount(s), being any such financial charges calculated at the daily rate of 0,01% accrued on the due sum and (ii) after not less than thirty (30) days' notice to the Client, to suspend work unless and until the Contractor has received reasonable evidence of the payment. The Contractor's action shall not prejudice its entitlements to financing charges under this par. 7.6 and its right to termination under Article 15 below. Payment of interest shall, at the discretion of the Contractor, be paid to the Contractor either (i) by setoff with any sum due by Contractor to the Client under this Contract or (ii) in immediate available funds each month of accrued interest.
- 7.7 **Payment Schedule Modifications Option.** In the event that modifications to the time schedule of the Payment Instalment within the Price are required (in terms of different time and payment allotments) in order to execute the Works, as determined by the Contractor in planning and updating the process and due to internal Contractor's accounting procedures, then Contractor shall promptly notify the Client. Contractor shall endeavour to provide as much advance notice as possible, and will in all cases be no shorter than 30 (thirty) days. At Client's sole discretion, changes to the Payment Instalment (without any variation of the expected Deliverable) as required by the Contractor under this par. 7.7 may be implemented, but the total funds shall not exceed the maximum Price as determined under Article 7, unless otherwise stated in this Contract. For changes required by the Contractor with a notice period from 30 (thirty) to 40 (forty) days in advance, changes will be limited to an additional sum in favour of the Contractor equal to max. +10% in excess of the upcoming Payment Instalment.
- 7.8 **The Client is liable to pay the VAT to the respective applicable VAT authority (Tax Office).** The Client expressly represents and warrants to the Contractor that the payment of the Price in relation to the Works is not subject to any other indirect tax, levy or charge under the laws of the Czech Republic.

7.9 The due date of payment of all invoices issued hereunder shall be 30 (thirty) days from the date of its delivery to the Client. A payment of the amounts invoiced shall be acknowledged to be effective on the day such payment is effectively remitted to the bank account of the Contractor. The tax documents – invoices issued by the Contractor hereunder shall be in compliance with all applicable legal regulations of the Czech Republic which include the following:

- (a) Commercial name and registered office of the Contractor;
- (b) Tax identification number of the Contractor;
- (c) Commercial name and registered office of the Client;
- (d) Tax identification number of the Client;
- (e) Number of the tax document;
- (f) Quantity (extent) and nature of performance supplied or services rendered;
- (g) The date of issue of the tax document;
- (h) The day of the supply of goods or services or the date of the payment on account, whichever comes earlier, insofar as they differ from the date of issue of the tax document – invoice;
- (i) Unit price excl. VAT, eventually discount, should it not be included in the unit price; and
- (j) Statement that the performance is provided in connection with the "ELI: EXTREME LIGHT INFRASTRUCTURE" project, Reg. No. CZ.1.05/1.1.00/02.0061.

All the tax documents – invoices shall also be in compliance with agreements on avoidance of double taxation, if applicable in particular cases.

Each payment due to the Contractor under this Contract shall be credited in Euros to the bank account identified herein in the headings.

7.10 The last invoice of each calendar year must be delivered by the Contractor to the Client's mail room no later than on December 15th (fifteenth) of that calendar year. Should a tax document – invoice not be issued in compliance with payment terms defined herein or should it not meet the statutory requirements, or if it is not delivered to the Client by deadlines set hereunder, the Client is entitled to return the tax document – invoice back to



the Contractor as incomplete, or incorrectly issued, for its correction and re-issue, within 15 (fifteen) days from the date of its delivery to the Client. In such a case, the Client shall not be in default with the remittance of the related payment, and the Contractor shall issue a corrected invoice with a new due date which shall commence to run on the day of delivery of the corrected or re-issued tax document – invoice to the Client.

7.11 The Client's invoicing details are given in Article 1 above.

8 PRELIMINARY ASSESSMENT OF EXECUTION, ACCEPTANCE PROCEDURE AND HANDOVER

8.1 Technical Reports - Acceptance Procedure of Deliverables

(a) **Assessment of Deliverables.** The execution of Deliverable D2, Deliverable D3, Deliverable D4, Deliverable D5 and Deliverable D6 shall be recorded and assessed in a Technical Report which shall be prepared by the Contractor in the course of performing the Deliverable and the Contractor shall exert its best effort to deliver it to the Client for its review under par. 8.1(b)

(b) **Acceptance Certificate.** The Client shall issue to the Contractor, without undue delay and in any event not later than 15 (fifteen) days after the Contractor has delivered to the Client the Technical Report under par. 8.1(a) hereof:

(i) a confirmation attesting the due execution and the unconditional acceptance of a specific Deliverable, should the final Technical Report comply with the Scope of Work (hereinafter the "Acceptance Certificate"), or

(ii) a rejection report containing objectively reasonable grounds not to accept and the specific issues to be remedied in order for the Acceptance Certificate to be issued.

(c) **Ungrounded failure to issue the Acceptance Certificate under par. 8.1(b) letter (i), or to issue the rejection report under par. 8.1(b) letter (ii) is tantamount as having issued by the Client an Acceptance Certificate without reserve. In the event of issue of a rejection report, without prejudice to the Contractor's claim under Article 24, the procedure under this par. 8.1 shall be repeated.**

(d) **Fulfilment of the obligation.** Without prejudice to par. 8.3(a), the Contractor's obligation arising on the basis of Technical Report in relation to a specific Deliverable shall be deemed to have been fulfilled by the issue of the Acceptance Certificate by

the Client confirming the completeness, correctness and compliance of the Technical Reports with this Contract and the unconditional acceptance of the related Deliverable.

8.2 Handover

- (a) The System shall be taken over by the Client:
- (i) At the Client's Place of Business according to the provisions of this par. 8.2, unless specified otherwise in this Contract, or unless the Parties agree otherwise;
 - (ii) When the Works on the System have been completed in accordance with the Contract, also beyond the Final Delivery Date and the Contractor has provided the Client with "as built" records and drawings of the execution of the System and the operation and maintenance manuals as they are contemplated by the Contractor's Document; and
 - (iii) Through the issue of the Final Acceptance Certificate attesting completion of the Deliverable D6 (and of the whole System).
- (b) In case that there is any minor outstanding work, back logs and defects which will not substantially affect or hinder the use of the System for the intended Purpose of Work, the Client is entitled to issue the Final Acceptance Certificate and the System shall be deemed to be duly executed and completed in accordance with the Contract. If the Client does not accept the Deliverable D6 or its part or within assessment of the Deliverable D6 any other part of the System for a minor defect or backlog, the defects and backlogs have to be specified in writing by the Client and the Contractor is obliged to repair/remove the defects and backlogs within a period of 30 (thirty) days, unless it is not possible for objective grounded reasons, in which case the Parties shall agree on another reasonable period. Should these defects and backlogs not be repaired/removed within the above term (or the other term agreed by the Parties), the Client will be entitled to repair/remove them at the Contractor's costs. In the event that proper and timely repair/removal of the minor outstanding works, defects and backlogs is eventually carried by the Contractor under this par. 8.2(b), the time spent by the Contractor for any such remedy and repair shall not be considered a delay for which the Contractor is accountable for any purpose under this Contract. For the sake of clarity, if timely remedying of minor outstanding works, defects and backlogs is completed by the Contractor after the Final Delivery

Date and the Final Acceptance Certificate is issued, the delivery of Deliverable D6 is meant to be delivered on time by the Final Delivery Date.

- (c) The Client shall provide all apparatus, assistance, documents and other information, electricity, equipment, consumables, instruments, labour, materials and suitably qualified and experienced staff, as are required by the Contractor to carry out the specified assembly operation of Deliverable D6 in an efficient and flawless manner.
- (d) The Client shall be notified by the Contractor under par. 8.1(a), shall proceed to assess the final Deliverable D6 without undue delay and shall, instead of issuing the Acceptance Certificate under par. 8.1(c), issue the taking-over certificate to the Contractor within the term under par. 8.1(c), stating that the System has been completed in accordance with the Contract the first day of delivery of the Deliverable D6 (the "Final Acceptance Certificate"), unless it has grounded reasons to object or to express acceptance with reserve. If the Client fails to issue within the above indicated terms (i) the Final Acceptance Certificate or (ii) a report evidencing the objective sound reasons why the System is not substantially in accordance with the Contract and specifying the work required to be done for the Final Acceptance Certificate to be issued, the Final Acceptance Certificate shall be deemed to have been issued without reserve on the first day of delivery of the Deliverable D6.
- (e) Fulfilment of the obligation. Without prejudice to par. 8.3(a), the Contractor's obligations arising on the basis of the Scope of Work shall be deemed to have been duly and appropriately fulfilled by the issue of the Final Acceptance Certificate confirming completeness, correctness and compliance of the last Deliverable D6 with this Contract and the unconditional acceptance of the System as a whole by the Client.

8.3 Common provisions for the acceptance procedure

- (a) The assessment of and subsequent acceptance of the individual Deliverable preceding the issue of the Final Acceptance Certificate does not release the Contractor from his liability to correctly and completely deliver and assemble the various components of the System.
- (b) The Client shall not be obliged to verify correctness of all calculations and technical solution details during the course of the acceptance procedure.

- (c) Should it be necessary to modify any part of the already accepted Deliverable in order to meet the parameters expected of the completed System, the Contractor undertakes to perform such modifications and accepts that the costs related thereto are included in the Price.
- (d) The Parties may upon mutual agreement replace meetings in person by other forms of communication, as long as they agree on such in writing.
- (e) Save as otherwise stated in this Contract, each Party shall bear its expenditures related to their participation in meetings at the other Party's seat; costs which would however arise due to error, faulty performance or breach by the Parties shall be borne by the Party which caused such breach.

9 TRANSFER OF OWNERSHIP

- 9.1 The ownership rights to the System shall pass to the Client upon handover of the System, i.e. on the date stated in the Final Acceptance Certificate.
- 9.2 The risk of loss or damage on the System shall transfer from the Contractor to the Client upon commencement of unloading of the System by the Client at the Client's Place of Business.

10 VARIATION

- 10.1 Variations to the Scope of Work shall be performed only upon agreement of the Parties in compliance with the applicable law.

11 DEFECTS LIABILITY AND WARRANTY

- 11.1 Subject to par. 11.2 the Contractor shall be liable for its defective performance of this Contract and therefore the Contractor is obliged to remedy all defects of the System claimed in writing by the Client within the warranty period, if and to the extent that the System or its part is not complying with the Contract. The Contractor warrants that:
 - (a) the System achieves the performances pursuant to the technical specification;
 - (b) the used materials are of such quality which is required for such purpose, performances and functioning; and
 - (c) the work has been performed by the Contractor hereunder using its good craftsmanship and skills on the basis of its state-of-the-art knowledge and best



effort in order to design and assembly the System to such purpose, performances and functioning.

- 11.2 The warranty period for the System shall be 1 (one) year and shall commence on the date of execution of the Final Acceptance Certificate on handover and takeover of the System by the Client.
- 11.3 Any part of the Works which carries its own warranty, shall have the warranty period for the period specified therein but at least for the period defined in par. 11.2 here above.
- 11.4 The warranty shall not apply to defects caused by fair wear and tear in the usual course of operation, incorrect handling, incorrect or unsuitable maintenance, non-compliance with the manufacturers' rules of operation and maintenance of the System accepted by the Client from the Contractor upon handover of the System, or those of which the Contractor advised the Client in writing. The warranty shall also not apply to defects caused by negligence or intentional conduct of the Client.
- 11.5 The Client shall raise a claim for removal of a defect, regardless whether from defective performance or from warranty, (hereinafter the "Claim") against the Contractor without undue delay after discovering the defect, but in any case) not later than on the last day of the warranty period, unless stipulated herein expressly otherwise. The Claim shall be raised by means of a written notice sent to the Contractor's authorised representative for technical matters set out herein. Any such Claim sent by the Client on the last day of the warranty period shall be considered to have been made in timely manner.
- 11.6 In the Claim, the Client shall describe the defect and the manner in which the defect is to be removed. The Client is entitled to:
- (a) request the removal of defects by delivery of a substitute for defective Works, or
 - (b) request that the defects be removed by repair if the defects can be repaired, or
 - (c) request an appropriate discount from the Price provided that the Contractor may replace or remove a part before a request for an appropriate discount from the Price can be made.

Furthermore, the Client is entitled to withdraw from the Contract if the Contract was materially breached by defective performance of the Contractor or by defects under warranty. Material breach shall be constituted mainly by situation in which the Works or any of its parts ceases to achieve, in case of warranty within the warranty period, the minimum

parameters required by the Client and defined in the Contractor's Bid and/or in the technical specification hereof and cannot be re-established by repair or the exchange of defective parts.

- 11.7 The Contractor where liable to do so undertakes to remove the defects for which it is liable free of charge.
- 11.8 The Contractor where liable to do so agrees to commence acts aimed at removing the defect without undue delay upon receiving the Claim, i.e. not later than 72 hours upon receiving the Claim, and undertakes to verify the Claim, diagnose the defect, notify the Client whether the Contractor acknowledges the Claim, and notify the Client in writing whether a special spare part will be necessary to remove the defect. Saturdays, Sundays and holidays shall not be counted.
- 11.9 In case no special spare parts are necessary to remove the defect, the Contractor shall be obliged to remove the defect within the shortest reasonable time from receiving the Claim, but not later than within 7 business days, except there are reasonably objective reasons why the deadlines cannot be achieved (in which case the Parties shall agree on an accordingly prolonged term). Saturdays, Sundays and holidays shall not be counted. Should the removal require that specialized spare parts are acquired, then the Contractor shall be obliged to remove the defect within 4 weeks from the Claim receipt, unless the Parties agree otherwise. Specialized spare parts shall be those parts which need to be manufactured specially, or parts that cannot be readily obtained within the world market within 5 business days from the claim receipt.
- 11.10 Within the warranty period the Contractor may remove defects within the periods set out above in instances in which the Contractor is of the opinion that it is not liable for such defects and where not liable for such defects shall be paid by the Client the costs accrued in connection with the removal of such defects.
- 11.11 The Parties shall execute a record on removal of claimed defects, in which they shall confirm that the defect has been removed. Where the defect is one that the Contractor was liable for then the warranty period shall be extended by the time that expires from the date of exercising the warranty Claim until the defect is removed, unless the System can be fully operated in line with the Purpose of Work despite the defect, in which case it shall extend only in relation to the portion of the System affected by the defect.



12 TRAINING OF THE CLIENT'S EMPLOYEES – ASSISTANCE BY CONTRACTOR

12.1 Training after completion of the System

The Contractor undertakes to train at the Client's Place of Business 2 (two) of the Client's Personnel (with the following background/specialization: engineer and physicist) for the development, operation and maintenance of the System.

12.2 The Contractor shall ensure the training during execution of Deliverable D6.

12.3 Any training activity shall not exceed an aggregate number of 10 (ten) days per trainee (max. 8 hours per day).

12.4 Any such provision of services under this Article 12 is included in the Price.

13 INTELLECTUAL PROPERTY RIGHTS

13.1 In the event that in connection with the execution of this Contract the System as a whole or any part thereof (including the Contractor's Documents) shall constitute a copyrighted work within the meaning of the Act No. 121/2000 Coll., on Copyrights, Rights Related to Copyright and on amendment of certain other Acts, as amended (hereinafter referred to as the "Copyright Act"), such will be considered as the System under commission as defined in Section 61 of the Copyright Act. In such case, the Contractor grants the Client a royalty-free non exclusive licence to use copyright work (or its part) for the limited purposes of this Contract (hereinafter the "Licence 1"), including the use of the System for the purposes of research, education and experimental activities under par. 13.4, for the economic rights' duration of the copyright works on the territory of the EU (with no implicit or explicit renewal after expiry of the first term of duration).

13.2 In the event that (i) the execution of this Contract will result in the System or any part thereof being eligible to be registered through any form of industrial or intellectual property rights (e.g. trademark, patent or invention, utility or industrial design, etc.) protected according to valid legal regulation in the Czech Republic or any other country, or international, supra-national or regional body, and (ii) the Contractor, at its full discretion, decides to register the System accordingly, the Contractor undertakes to grant the Client for the protection period of the relevant form of industrial rights a royalty-free non exclusive licence to use the System for the limited purposes of the ELI-Beamlines Project and other research, education and experimental activities under par. 13.4 on the territory of the EU (hereinafter the "Licence 2" which together with Licence 1 are the "Licences").

13.3 The Client, irrespective of the fact that it will be the licensee under this Article 13, hereby undertakes not to disclose the results of the Works and/or the Contractors' Documents, the System and any related and ancillary data or information, the information disclosed in the Licences and those disclosed by virtue of the training activity under Article 12 to any third parties without the prior written consent of the Contractor, other than for purposes permitted by this Article 13.

13.4 Unless agreed otherwise, the right to use Licences stipulated above in this Article 13 includes on a not for profit basis:

- (a) permission to operate the System at the Client's Place of Business and to use its output for providing beam time to the Client, its employees and external users in order to carry out experiments with the System in fundamental and applied research fields;
- (b) permission to operate the System at the Client's Place of Business and to use its output for providing beam time to third parties mainly for experimental purposes;
- (c) permission to provide limited technical information about the System to users who have been awarded beam time through favourable evaluation of their proposals by the ELI Beamlines proposal review committee or similar body established by the Client. This exchange of information shall be for the sole purpose of experiment preparation and planning and be in the form of the relevant parts of the "full resolution CAD model with IPR related elements masked" material provided as part of the Works. For cases outside of these limitations the Client require the Contractor's written permission prior to any disclosure. The Client acknowledges that the CAD models that are provided to users are not guaranteed to be accurate since they are supposed to be used for reference and rough experimental planning only and the Contractor shall have no liability for such use;
- (d) permission to use limited resolution 3D CAD models of the System (agreed in advance between the Contractor and the Client) and its parts for the development of the future ELI Beamlines virtual beam line. To avoid the risks of violation of intellectual property rights, the Contractor has the right to specify critical details of the technical design of the System which are not to be disclosed to any third party by means of the virtual beam line or restrict disclosing of such information by lower level resolution. The Parties agree that the virtual beam line is not guaranteed to be accurate since it is supposed to be used at the user's own choice and risk;

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- (e) permission to fully employ the adjustability and modularity of the System to satisfy the demands of future users and permission to make, upon expiry of the warranty period, changes to the System, namely but not exclusively to exchange parts ("modules") of the System such as polarisers, detectors, mirrors, sample environment, cryostat, timing system, DAQ, motors, controls.
- (f) For the purposes of this Contract "not for profit" shall be determined on the basis of whether on a general basis the charges made for use of the System and the associated parts of the Beamlines Project are intended (on an objectively judged basis) to cover the costs of providing those facilities and ancillary services rather than for commercial gain.

13.5 Any intellectual property created due to any modification of the System or any part thereof

- (a) by the Contractor shall be deemed to form part of the Licences, however, it shall belong to the Contractor;
- (b) by the Client or any third party shall not form part of the Licences and shall belong to the Client or the third party as they may agree BUT the Contractor shall be automatically granted an irrevocable non exclusive royalty free licence to use such intellectual property.

13.6 Except for par. 13.8 the Licences shall not be capable and shall not be assigned or sub-licensed to any other party, and shall cease forthwith in the event that:

- (a) the Client (or any permitted assignee) is in breach of any of its obligations under this par. 13, or
- (b) the Client (or any permitted assignee) (i) becomes insolvent and is declared bankrupt by a Czech court (rozhodnutí o úpadku) (or in the case of a non Czech entity then the local equivalent determination of bankruptcy) or (ii) formally applies for a moratorium to delay the initiation of insolvency proceedings or (iii) enters into any court sanctioned reorganisation ; or
- (c) the System is decommissioned or can reasonably be said to be no longer intended to be used by the Client (or by any permitted assignee).

13.7 Save only to the extent necessary to provide the Client with sufficiently detailed information of the System's software and hardware to enable the Client to incorporate the local systems for instrument control, DAQ, timing and time-stamping efficiently into its counterparts in the ELI-Beamlines Infrastructure the Contractor shall not provide and shall not in and/or the

future be obliged to provide access to any software source code or similar programming materials relating to the System or any part thereof nor shall any such information be included in either of the Licences.

13.8 The Licences may be assigned once together and not separately in full to the legal successor of the Client and/or the future operator of the ELI-Beamlines Infrastructure (namely to future ELI ERIC - European Research Infrastructure Consortium - or any other such ELI-Beamlines operator) for the remaining protection period of the relevant form of industrial rights and/or the economic rights' duration of the copyright works on the territory of the EU (if any), provided that any legal successor accepts to be bound by the same provisions of this Contract and in particular Article 13.

13.9 The Parties declare that they have agreed that the Contractor's is not entitled to receive any additional remuneration for the provision of any licence or sub-licence pursuant to this Article 13.

14 TERMINATION OF THE CONTRACT BY THE CLIENT

14.1 The Client is entitled to withdraw from the Contract only if any of the below specified events occur:

(a) Any expenditure or any part thereof, which may arise on basis of this Contract, are declared by the Sponsor or other controlling body to be ineligible or the Client's financial support (aid) provided toward implementation of any part or phase of the ELI-Beamlines Project or its further phases is withdrawn or not awarded.

(b) The Contractor is in delay with a single delivery for a period longer than 45 (forty-five) days with respect to the due date under this Contract and having considered all the relevant circumstances it becomes clear (and it is assessed as such by the Client acting reasonably) that the System cannot be delivered on time, i.e. that the System cannot be delivered within the required technical specifications within the Final Delivery Date postponed for 2 (two) months in accordance with this Contract.

(c) If the System after handover is definitively unsuitable for the intended use and cannot be definitively remedied, corrected or restored by the Contractor;

(d) If there are material defects (i.e. defects that make the System unsuitable for the intended use);



- (e) Should any insolvency proceedings or governmental administration procedure be held or formally initiated against the Contractor;
 - (f) It is revealed that in the Bid the Contractor stated information or submitted documents which do not correspond to reality and which have had a material impact on the results of the Negotiated Procedure that led to entering this Contract [Section 82 (8) of Public Procurement Act];
- 14.2 In any of the above events or circumstances occur, the Client may, upon giving 30 days' notification to the Contractor, withdraw from the Contract. However, in the case of par. 14.1(f), the Client may withdraw from the Contract immediately.
- 14.3 In case of termination of the Contract by the Client under par. 14.1(a) to 14.1(f) the Contractor shall be entitled to be paid in accordance with Article 17.
- 14.4 Withdrawal from the Contract by the Client shall not prejudice any right to which the Client is entitled under the Contract or otherwise.

15 SUSPENSION AND TERMINATION BY THE CONTRACTOR

15.1 Suspension by the Contractor

- (a) If the Client fails to issue the Acceptance Certificate or the Final Acceptance Certificate, or fails to comply with any payment to which the Contractor is entitled pursuant to this Contract or for any other reason set out in the Contract, the Contractor may, after giving not less than 30 (thirty) days' notice to the Client, suspend works on System and the training activity (or reduce the rate of work) unless and until the Contractor has received the above certificates, reasonable evidence of payment or compliance with the Client's financial undertakings or has ceased any action or omission in relation to which this Contract provides for the Contractor's right to suspend the Works, as the case may be and as described in the notice.
- (b) If the Contractor subsequently receives evidence of payment or of compliance with previous unfulfilled obligations (as described in the relevant par. and in the above notice) before giving a notice of termination, the Contractor shall resume normal working as soon as is reasonably practicable.
- (c) If the Contractor suffers delay and/or incurs cost as a result of suspending work (or reducing the rate of work) in accordance with this par. 15.1., the Contractor shall

give notice to the Client and shall be entitled to (a) an extension of time for any such delay, and (b) payment of any such cost.


15.2 Termination by the Contractor

- (a) The Contractor is entitled to withdraw from the Contract under the applicable law and if the following cases occur:
 - (i) the Client is in delay with the payment in respect of the instalments set out in the Deliverables and Payment Schedule for a period longer than 50 (fifty) days running from delivery of the relevant invoice; or
 - (ii) the Client becomes bankrupt or insolvent, goes into liquidation, or if any act is done or event occurs which (under applicable laws) has a similar effect to any of these acts or events.
- (b) In any of the above events or circumstances, the Contractor may, upon giving 15 days' notification to the Client, withdraw from the Contract.
- (c) In case of termination of the Contract by the Contractor under this Article 15 the Contractor shall be entitled to be paid in accordance with Article 17.
- (d) Withdrawal from the Contract by the Contractor shall not prejudice any other right to which the Contractor is entitled under the Contract or otherwise.

16 FORCE MAJEURE

16.1 In this Article, "Force Majeure" means an exceptional event or circumstance which arose independently of the will of the obliged Party, and which extends for a period of at least 180 days or constantly prevents fulfilment of that Party's obligation, provided that it could not be foreseen and overcome or avert this obstacle or its consequences.

16.2 Force Majeure may include, but is not limited to, exceptional events or circumstances of the kind listed below, so long as condition in par. 16.1 above is satisfied:

- (a) War, hostilities (whether war be declared or not), invasion, act of foreign enemies,
 - (b) Rebellion, terrorism, revolution, insurrection, military or usurped power, or civil war,
 - (c) Riot, commotion, disorder, strike or lockout by persons,
 - (d) Natural catastrophes such as earthquake, hurricane, typhoon or volcanic activity.
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- 16.3 Should a situation occur, which a Party could reasonably consider to constitute Force Majeure, and which could affect fulfilment of its obligations hereunder, such Party shall immediately notify the other Party and it shall reasonably attempt to continue in its performance hereunder in order to minimize delay. Simultaneously, such Party shall inform the other of any and all its proposals, including alternative manners of performance, however, without consent of the other Party, it shall not proceed to effect such alternative performance. The notification shall be made within 15 days after the Party became aware, or should have become aware, of the relevant event or circumstance constituting Force Majeure.
- 16.4 The Party shall, having given notice, be excused performance of such obligations for so long as such Force Majeure prevents it from performing them. Party shall notify to the other Party when it ceases to be affected by the Force Majeure. Each Party shall bear additional costs related to Force Majeure events which affect the respective Party's "environment" or which are howsoever related to it.
- 16.5 If the Contractor is prevented from performing any of his obligations under the Contract by Force Majeure of which notice has been given under par. 16.3, and suffers delay and/or incurs cost by reason of such Force Majeure, the Contractor shall be entitled to an extension of time for any such delay.
- 16.6 If the execution of substantially all the Works in progress is prevented for a continuous period of 180 days by reason of Force Majeure of which notice has been given under par. 16.3, or for multiple periods which total more than 180 days due to the same notified Force Majeure, then either Party may withdraw from the Contract. In this event, the termination shall take immediate effect and the Contractor:
- (a) Shall cease all further work;
 - (b) Hand over the Contractor's documents, plants and materials for which has been paid; and
 - (c) Remove its equipment and goods and leave the site.
- 16.7 Upon such termination, the Contractor is entitled to be paid in accordance with Article 17.
- 16.8 Upon such termination, the Client is entitled to retain the Works which were carried out by the Contractor and do not have the temporary characteristics.

17 SEVERANCE PAYMENT ON TERMINATION

17.1 Subject to Article 17.5 on termination of this Contract the Contractor shall, to the extent not already paid by the Client without reservation, be paid up to the date of such termination an amount equal to

(a) all direct and indirect costs incurred or committed to by the Contractor including but not limited to those relating to

(i) materials;

(ii) labour costs;

(iii) sub contractors – including each sub contractors own direct and indirect costs for which the Contractor is responsible;

(iv) utilities and premises costs;

(v) insurance; and

(b) (save in the case of a Fundamental Breach by the Contractor) the Profit Margin.

17.2 For the purposes of this Article 17 a Fundamental Breach of this Contract by the Contractor shall mean a failure on the part of the Contractor to carry out any or any material work on the Project in the absence of (i) any material breaches of the Contract by the Client of which 10 days prior written notice has been given to the Client by the Contractor and which the Client has failed to remedy or (ii) material technical issues that could not reasonably have been foreseen at the outset of this Contract by either party and which failure could reasonably be expected in the absence of any other reasons to cause an agreed Deliverable to be delivered to the Client more than 60 days later than as anticipated in the agreed Timetable in Deliverables and Payments Schedule.

17.3 For the purposes of this Article 17 Profit Margin shall be agreed to be 15% of the Price up to delivery of Deliverable D2 and thereafter 25% of the Price as stated in Article 7.1 in each as the Price might be amended for additional or amended works or services to be performed by the Contractor.

17.4 For the sake of clarification, the Parties agree that the Payment Schedule contains elements of pre-payment and the actual value of Deliverables is not defined by the Payment Schedule. The entitlement to payment in accordance with this par. is subject to handover of any systems and their components and any and all documentation executed so far as part of the

Works. The Parties are obliged to provide reasonable cooperation to each other for this purpose, i.e. agree on possible cancelation of Client's orders etc.

17.5 Notwithstanding the foregoing provisions of this Article 17 the Contractor shall not be entitled to be paid more than it would have been paid if the Contract had been permitted to run to its natural conclusion.

18 INSURANCE BY CONTRACTOR

18.1 The Contractor undertakes to insure the goods to be delivered to the Client:

- (a) against damage to the System during its development at the Contractor's Place of Business or on third parties' sites, including testing activities (up to the full value of the System);
- (b) by a cargo insurance (transport of goods, Contractor's equipment, and material to and from the Client's Place of Business including unloading of the goods).

18.2 The above insurance coverage shall: (i) not cover risks which are upon the Client's under this Contract or by operation of the applicable law; (ii) not include part of the System or the entire System if it is accepted by the Client.

18.3 In case of any breach of this obligation by the Contractor, the Contractor shall be deemed liable for the damage incurred. The Contractor shall be obliged, upon the Client's request, to document the requested insurance cover.

19 INSURANCE BY CLIENT

19.1 Without derogating from the Client's liability pursuant to this Contract and the applicable law, the Client shall secure and maintain, at its own cost and expenses, the insurance coverage specified herein. For the avoidance of any doubt, it is hereby clarified that all of the following provisions shall apply in respect of all the insurance policies which the Client is required to procure and maintain under this Contract:

- (a) Third Party Liability Insurance.
- (b) Employer's liability Insurance (covering the Client's Personnel at the site).
- (c) Contractor's Equipment damages at the Client's Place of Business limited to amount of CZK 5 000 000.

19.2 From the Execution Date and throughout the entire term of construction until issue of Final Acceptance Certificate, the Client shall take out and maintain the insurance policies set out in par. 19.1.

20 COMMON PROVISIONS TO INSURANCE

20.1 The relevant insuring Party shall submit to the other Party: (i) evidence that the insurances have been effected and that they have used reasonable endeavours to ensure the other Party's interests are noted on the policy (ii) copies of the relevant policies and evidence of payment of the relevant premium.

20.2 The insuring Party shall keep the insurers informed of any relevant changes to the execution of the Works and ensure that insurances are maintained in accordance with this Contract.

20.3 If the insuring Party fails to effect and keep in force any of the insurances it is required to effect and maintain under the Contract, or fails to provide satisfactory evidence and copies of policies in accordance with this Article, the other Party may (at its option and without prejudice to any other right or remedy) effect insurance for the relevant coverage and pay the premiums due. The insuring Party shall pay the amount of these premiums to the other Party.

20.4 Nothing in Article 18, 19 and 20 limits or derogates from the obligations, liabilities and responsibilities of the Client or the Contractor, under the terms of the Contract or otherwise under the applicable law. Any amounts not insured or not recovered from the insurers (e.g. deductible or excess) shall be borne by the Client or by the Contractor in accordance with these obligations, liabilities or responsibilities. However, if the insuring Party fails to effect and keep in force an insurance which is available and which is required to effect and maintain under the Contract, and the other Party neither approves the omission nor effects insurance for the coverage relevant to its default, any moneys which should have been recoverable under this insurance shall be paid by the insuring Party.

21 CONFIDENTIALITY

21.1 For the purposes of this Contract, Confidential Information means any data or information that is proprietary to or possessed by a Disclosing Party and not generally known to the public or that has not yet been revealed, whether in tangible or intangible form, whenever and however disclosed, including, but not limited to, the following:

- (a) any scientific or technical information, invention, design, process, procedure, formula, improvement, technology or method;



- (b) any concepts, samples, reports, data, know-how, works-in-progress, designs, drawings, photographs, development tools, specifications, software programs, source code, object code, flow charts, and databases;
- (c) any marketing strategies, plans, financial information, or projections, operations, sales estimates, business plans and performance results relating to the Contracting Party's past, present or future business activities, or those of its affiliates, subsidiaries and affiliated companies;
- (d) trade secrets; plans for products or services, and customer or supplier lists;
- (e) any other information that should reasonably be recognized as Confidential Information by the Contracting Parties.

21.2 The Contracting Parties agree that Confidential Information need not be novel, unique, patentable, copyrightable or constitute a trade secret in order to be designated Confidential Information and therefore protected.

21.3 Confidential Information shall not need to be specifically identified.

21.4 Notwithstanding the aforementioned, Confidential Information shall exclude information that:

- (a) is already in the public domain at the time of disclosure by the Disclosing Party to the Receiving Party or thereafter enters the public domain without any breach of the terms of this Contract;
- (b) was already known by the Receiving Party before the moment of disclosure (under evidence of reasonable proof or written record of such knowledge);
- (c) is subsequently communicated to the Receiving Party without any obligation of confidence from a third party who is in lawful possession thereof and under no obligation of confidence to the Disclosing Party;
- (d) becomes publicly available by means other than a breach of the confidentiality obligations by the Receiving Party (not through fault or failure to act by the Receiving Party);
- (e) is or has been developed independently by employees, consultants or agents of the Receiving Party (proved by reasonable means) without violation of the terms of this

Contract or reference or access to any Confidential Information pertaining to the Contracting Parties.

21.5 Save as may be required by law the Receiving Party shall hold and maintain the Confidential Information in strict confidence, and in particular shall not disclose it to anyone except as authorized herein, nor use such Confidential Information save for purposes of this Contract. For the purposes of this Article 21.5 "as required by law" shall be satisfied if the Receiving Party provides to the other a legal opinion that the request is legitimate beyond any reasonable dispute AND is derived from a public obligation which without limiting the foregoing shall exclude any obligation derived from a contract (including terms implied by CCC).

21.6 The Receiving Party shall take sufficient precautions which are reasonably necessary to prevent any unauthorized disclosure or use of Confidential Information. The Receiving Party shall be responsible for the breach of any of the terms hereof by any person to whom Receiving Party discloses any Confidential Information.

22 PUBLICATION ACTIVITIES

22.1 The Contractor shall refer all publications arising as a direct result of this Contract to the Client, at least 20 (twenty) calendar days before the publication is submitted to scientific journals, proceedings or other periodicals. Where both Client and Contractor agree, comments or amendments suggested by the Client will be added to the text of publication.

22.2 The Contractor shall acknowledge in the publications the present Contract and the ELI-Beamlines Project as the source of funding supporting the work reported, in the Acknowledgments section of the publication.

22.3 Reciprocal provisions apply to publications submitted to scientific journal, proceedings or other periodicals by the Client.

22.4 Notwithstanding any of the foregoing provisions, the Contractor may refer to the System and the provision of the System to the Client for the purposes of its commercial marketing activities and materials provided that the Contractor acknowledges the present Contract and the ELI-Beamlines Project as the source of funding supporting the work reported.

23 REPRESENTATIVES, NOTICES

23.1 The Contractor has appointed the following representative responsible for the management and performance of the Works hereunder and communication with the Client:

4

In technical and contractual matters:

Prof. Rübhausen

E-mail: ruebhausen@4-dos.com

- 23.2 The Client has appointed the following representative responsible for communication with the Contractor for the purposes of realization of the Work:

In technical matters:

Jakob Andreasson

E-mail: Jakob.Andreasson@eli-beams.eu

In contractual matters:

prof. Jan Řídký, DrSc., the Director

Tel: +420 266 052 121,

E-mail: ridky@fzu.cz

- 23.3 Any and all notices transmitted between the Parties hereunder must be made in writing and delivered to the other Party by an internationally recognized courier service (Federal Express, DHL, etc.), delivered in person (with a written confirmation of receipt), by a registered letter or in the form of electronic communication carrying electronic signature.
- 23.4 With respect to technical matters (e.g. matters related to preliminary assessment of the Deliverables, etc.) communication via e-mail without the formalities set out in par. 23.3 above will be acceptable between the appointed representatives for technical matters.

24 CHOICE OF LAW, DISPUTE RESOLUTION

- 24.1 This Contract shall be governed by the laws and regulations of the Czech Republic and the Czech Civil Code shall apply to this Contract except where the relevant subject matter or legal concept is addressed by the provisions of this Contract in which the terms of this Contract shall prevail and the relevant parts of the Czech Civil Code shall be excluded.
- 24.2 Parties shall seek to solve amicably any dispute or difference arising in connection with the execution or interpretation of the Contract (both in technical and juridical matters).

- 24.3 If no amicable settlement is reached by the Parties within forty-five (45) days following any of the Parties' first invitation to the other one to solve any matter under par. 24.2 above, the Parties agree to submit the matter to settlement proceedings under the ICC Mediation Rules (as they are in force as of January 1, 2014). The costs shall be borne by the Parties as the mediator shall direct. The place of mediation shall be London or Geneva and the proceedings shall be conducted in English.
- 24.4 If the dispute has not been settled pursuant to the ICC Mediation Rules under par.24.3 above within forty-five (45) days following the filing of a Request for Mediation (or within such other period as the Parties may agree in writing), such dispute shall be finally settled by binding arbitration under the Rules of Arbitration of the International Chamber of Commerce by three arbitrators appointed in accordance with the said Rules of Arbitration. The place of mediation shall be London or Geneva and the proceedings shall be conducted in English. The Arbitral Tribunal shall consist of three judges. Each Party shall select one judge, and the third judge will be selected by agreement between the two selected judges or should the judges fail to agree thereon, it shall be designated in accordance with the ICC Rules of Arbitration.
- 24.5 Each Party shall bear all legal and administrative costs, fees and expenses of arbitration pursuant to par. 24.4 (advance payments, deposit, filing fees etc.) as the arbitrators shall determine and no success based reimbursement shall be allowed.

25 MISCELLANEA

- 25.1 This Contract represents a complete agreement between the Client and the Contractor.
- 25.2 Any reciprocal payable monetary claims of the Parties may be subject to set-off of claims according to the respective provisions of the Czech Civil Code.
- 25.3 Subject to and without prejudice to the terms of Article 17 no Party may claim for any damages save for those arising directly out of the relevant breach of this Contract (including personal injury) and, in particular, no Party may claim for indirect or consequential loss including loss of profit
- 25.4 Notwithstanding any other term of this Contract or any provisions of the Czech Civil Code then except for claims relating to death or personal injury the maximum aggregate liability of the Contractor for any breach or breaches of this Contract however or whenever arising shall be limited to the lower amount of Euros 50,000 and twenty percent of the amount paid to the Contractor up to the date the Contract is completed or terminated by the Client and



the Client may not recover monies from the Contractor to the extent they have already been compensated for their loss under any other provisions of the Contract. For the purposes of this par 25.4 only "paid" shall exclude any element of any advanced payments to the Contractor which the Contractor is not absolutely entitled to keep.

- 25.5 If a Party breaches its duty arising from this Contract or it may and should know about such a breach, it will, without any undue delay and without thereby admitting or being deemed to admit any liability on its part, inform the other Party which may incur damage thereof and it will warn it of potential consequences; in such a case, the damaged Party has no right to be compensated for the damage which it could reasonably avoid after being informed hereunder.
- 25.6 If any of the provisions hereof shall appear or shall be determined invalid, ineffective, or unenforceable at a later date, then such invalidity, ineffectiveness or unenforceability shall not cause the invalidity, ineffectiveness, or unenforceability hereof as a whole. In such a case, the Parties undertake, without any undue delay, to replace, by mutual agreement, any such invalid, ineffective or unenforceable provision hereof with a new provision that most closely reflects the intentions of the Parties at the time of conclusion hereof, to an extent permitted by the laws and regulations of the Czech Republic.
- 25.7 The Contract becomes valid and comes into force on the date of its signature by the authorized representatives of both Parties.
- 25.8 The Contract may be amended or modified exclusively in the form of written and numbered amendments specifying the time and place thereof, and signed by the authorized representatives of the Parties.
- 25.9 Art. 21, 22, 23 and 24 shall survive any invalidity, void, termination or withdrawal related to or affecting this Contract.
- 25.10 The Contract was made out in the English language in four (4) counterparts, each having the force of original. Each Party shall receive two (2) counterparts.
- 25.11 By affixing their signature hereto the Parties express their consent with the content hereof in its entirety.
- 25.12 The Annexes listed below form an integral part of this Contract:

Annex 1 ("Scope of Work");

Annex 2("Deliverables and Payments Schedule");

Annex 3 ("Additional Assistance");

Annex 4 ("Client's Equipment");

Annex 5 ("Quarterly Reports");

Annex A-1 ("The Contractor's Bid Package")

✓

Signed in Prague on 12/15/2015

Signed in Wunnenberg on 20/11/2015

On behalf of:

On behalf of:

Fyzikální ústav AV ČR, v. v. i.

Walnut Technology Consulting GmbH

Signature: 

Signature: 

Name: prof. Jan Řídký, DrSc.

Name: prof. Michael Rübhausen

Title: Director

Title: Geschäftsführer

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- 1 -

1 - Scope of Work

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TP14_130



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1. Introduction

1.1. Purpose

This Requirements Specification Document (RSD) lists the technical requirements and constraints for the construction of a user-oriented magneto-optical VUV Ellipsometer with sub-ps temporal resolution for the ELI Beamlines facility (ELIps). This instrument design shall be compatible with the performance of time resolved magneto optic ellipsometry on solid state targets in the IR to VUV range (1 to 40 eV) with sub ps temporal resolution and at a light-source repetition rate of 1 kHz. The system is to be tested and verified for operation in the IR to UV range (1 to 6.5 eV) using an included light source and at a 1 kHz rep. rate using the ELI Beamlines Ti:Sapphire alignment laser. The parts necessary for the VUV operation (VUV polarizers, optics and detector) shall be tested separately as parts and it shall be shown that they can be mechanically integrated into the system.

The ELIps is outlined by the following main parts:

- Target area for solid-state target for absorption, transmission, reflection and ellipsometry measurements.
- Exchangeable IR-vis-UV and VUV polarizers on the incoming and outgoing beams.
- Light source and spectrometer for IR (1 eV) to UV (6.5 eV) operation.
- UHV vacuum chambers on a support system.
- Local control and DAQ system.

1.2. Scope

This RSD contains all of the top level functional, performance, safety, operational, design and quality requirements for the ELIps system in experimental hall number 1 (E1). In addition to the requirements specified in this RSD, this system shall comply with the requirements given in the "FZU Specifikace" document and in the ELI-Beamlines Summary of User Requirements Specification.

1.3. Terms, Definitions and Abbreviations

For the purposes of this document, the terms and definitions from ECSS-S-ST-00-01 apply (AD -001) as well as the following abbreviations:

Abbreviation	Meaning
ELI	Extreme Light Infrastructure
HHG	High-order Harmonic Generation
RA4 (and 2)	Research activity 4 (and 2)
E1, 5	Experimental area 1, 5
ELIps	Magneto-optical VUV Ellipsometer with sub-ps temporal resolution for the ELI Beamlines Facility
VUV	Vacuum ultraviolet
L1	Laser 1 (1 kHz, 100 mJ)
RSD	Requirement Specification Document
NA	Not Applicable

<i>R</i>	Review of design
<i>FD</i>	Functional demonstration
<i>T</i>	Test
<i>A</i>	Analysis
<i>I</i>	Inspection
L x W x H	Length x width x height
SI	International System of Units
CCS	Central Control System
CVS	Central vacuum system
CDAQS	Central data acquisition system
FZU	Institute of Physics, Academy of Sciences of the Czech Republic
FAT	Factory Acceptance tests

1.4. List of applicable and reference documents

a. Applicable documents

Number of document	Title of document
AD-01	ECSS-S-ST-00-01 Glossary of Terms
AD-02	ECSS-E-ST-10-06C Technical Requirements Specification

b. Reference documents

Number of document	Title of document
RD-01	ELI Beamlines FZU Specification "FZU Specifikace" Issue 3
RD-02	ELI-BEAMLINES SUMMARY OF USER REQUIREMENTS SPECIFICATION, Version 1
RD-03	ELI Beamlines Requirements for suppliers quality planning

1.5. System Verification and Validation Requirements

The requirements are presented with the following structure: First the requirement is given. Each requirement is associated with a verification method. Verification methods are as follows: inspection (I), review of design (R), analysis (A), test (T), functional demonstration (FD). Finally a code D2 or D6 is given. This tells if the requirement is to be fulfilled at the latest as part of the D2 or D6 deliverable according to the appended deliverables and payment table.

1.5.1. Inspection

Verification via inspection shall be the check of the item's physical presence according to requirement statement and physical check of the activity supposed to be done according to requirement. Then the list of accomplished requirements and their physical location and presence, and the list of unaccomplished and incomplete requirements shall be made. The results of inspection shall be documented in approved record.

1.5.2. Review of design

Verification via review shall be the comparison of the relevant documentation, which was required with the delivered documentation (e.g. technical, design, safety documentation, operational, maintenance manuals, etc.). Then the list of accomplished requirements and the list of unaccomplished and incomplete requirements shall be made. The results of review shall be documented in approved record.

1.5.3. Analysis

Verification via analysis shall be to do a calculation process (calculation, simulation, numerical models, etc.) where the calculation results shall be documented together with further qualified recommendation of the following steps. The list of accomplished requirements with the calculation results and output parameters and the list of unaccomplished and incomplete requirement with the note of the missing input and reason of calculation failure shall be made. The results of calculation shall be documented in approved record.

1.5.4. Test

Verification via test shall be to test a measurable parameter. The protocol of the measurement shall be made and approved. The list of accomplished requirements with the note of measured value and the list of unaccomplished and incomplete requirement shall be made.

1.5.5. Functional Demonstration

Verification via functional demonstration shall be to test the system's response to a subject of requirement and check if its response is within the limits of the requirement. The protocol of functional demonstration shall be made and approved. The list of accomplished requirements and the list of unaccomplished and incomplete requirements shall be made.

1.6. System Configuration

One possible schematic configuration of the ELIps instrument is shown in figure 1.



1.6.1. One possible schematic configuration of the ELIps instrument (Figure 1).

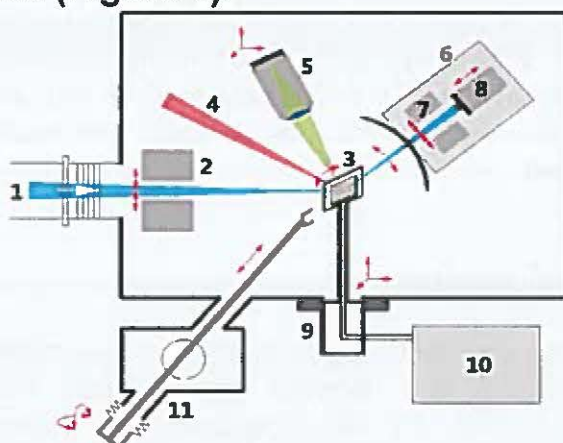


Figure 1: One possible schematic configuration of the ELIps instrument. Main components are: 1: Input beam from beamline or auxiliary light source, 2: Polarizers, 3: sample stage, 4: Pump beam, 5: microscope/periscope with illumination, 6: Detector mount, 7: Analyzers, 8: Detector, 9 translation stage, 10: Temperature control and magnetic field generator, 11: Load-lock system.

1.7. Input for system level: IR to UV and VUV

The system shall be designed to perform time-resolved magneto-optical ellipsometry in the range between 1 and 40 eV together with the ELI Beamlines HHG source. The HHG source at ELI Beamlines is expected to reach parameters summarized in table 1, column 3 and the design of the ELIps system shall be optimized for the values given for the 50 mJ drive in table 1. The ELI HHG source will not be available at the time of acceptance of the VUV ellipsometer. As a consequence, the instrument acceptance shall be based on:

-Tests and verification of the functional requirements in the IR to UV range (1 to 6.5 eV) using:

- a. The light source included in the instrument.
- b. The 1 kHz Ti:Sapphire alignment laser of E1 (at 800 nm or some other wavelength in the IR to UV).

-Tests and verification of the mechanical functions required for VUV operation and the switching between set ups for IR to UV and VUV operation.

-Tests and characterization of the parts necessary for VUV operation in the range between 6.5 and 40 eV (mirrors, polarizers and VUV detector) at an external light source if the ELI HHG source is not available at the time. If no other source is available the VUV polarizers can be tested in Prague at the PALS facility HHG source.

1.7.1. Output parameters of the HHG system (Table 1).

Wavelength range	5 mJ driver 1	50 mJ driver 2	100mJ driver 3
50-125 nm (photons per pulse)	1e6	5e8	1e10
20-50nm (photons per pulse)	10e5	5e7	1e9

10-20nm (photons per pulse)	1e3	5e5	1e7
<10nm (photons per pulse)	1e2	5e3	1e5
polarization	linear	linear	linear
Pulse duration	10 fs	10 fs	10 fs
Harmonic width (eV)	0.25	0.25	0.25
Harmonic separations (eV)	3	3	3

Table 1: Output parameters of the HHG system. With two colour operation the harmonic spacing will be 1.5 eV and elliptical/circular polarization will be possible.

1.8. External interfaces

External interfaces of the VUV/Soft X-ray materials science endstation (of which the ELIps is the main instrument) are schematically shown in Figure 2. Interfaces with the HHG source in E1 are shown.

1.8.1. Block diagram of the interfaces between the VUV/Soft X-ray materials science endstation and E1 (Figure 2).

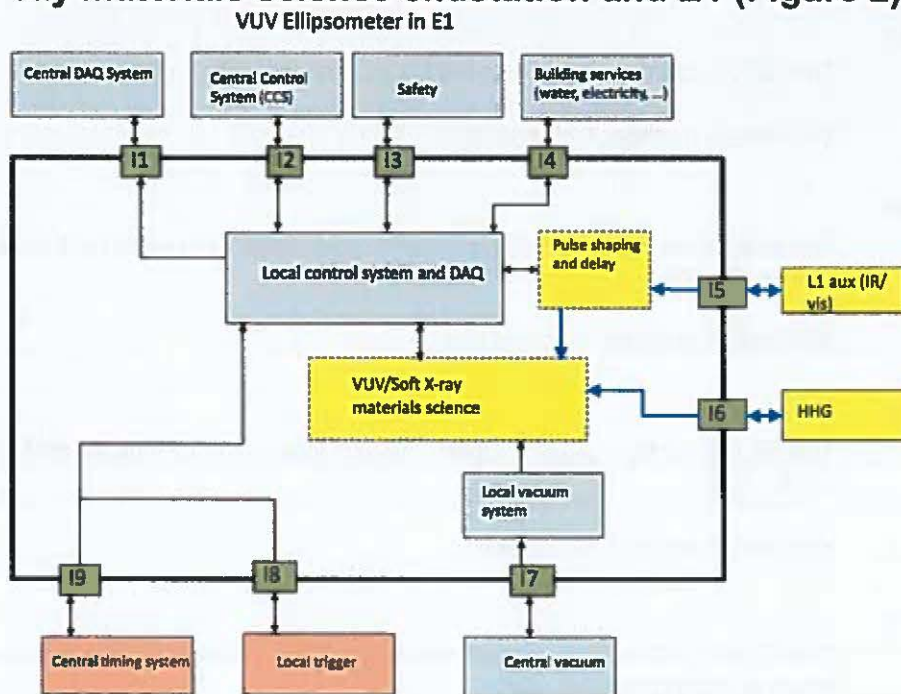


Figure 2: Block diagram of the interfaces between the VUV/Soft X-ray materials science endstation (of which the ELIps is the main instrument) and E1. I5 and I6 shall serve for input into the experimental system (pump and probe beams), not for exchange of signals.

The main location of the ELIps instrument is at the HHG source in E1 (fig. 3). It shall be possible to locate the instrument at both of the C1 and C2 instrument stations. The maximum footprint of the ELIps shall be (3x2 m²).