

CONTRACT No.

2 / OSI 2017/15 AK ERAF / 1.1.1.4/17/I/007

Riga

11/12/2017

SPECIAL TERMS OF THE CONTRACT

The Latvian Institute of Organic Synthesis, represented by its **Director Osvalds Pugovičs**, hereinafter referred to as the Contracting Authority, on the one hand; and

Bruker Nordic AB, registration No. **556577-2364** represented by its **Managing Director Larus Einarsson**, hereinafter referred to as the Seller, on the other hand,

Both together and each separately referred to as the Party or the Parties, based on the results of the open competition „**Modernisation and Functional Amplification of the Existing Nuclear Magnetic Resonance Spectroscopy Equipment of the Latvian Institute of Organic Synthesis**”, id. No. **OSI 2017/15 AK ERAF** organised by the Latvian Institute of Organic Synthesis, hereinafter referred to as the Competition, and on the Tender submitted by the Seller, have entered into the following contract:

1. THE CONTRACT SUBJECT

- 1.1. The Seller shall produce (or deliver from the manufacturer) and sell to the Contracting Authority, and the Contracting Authority shall purchase from the Seller, the following goods, subject to the specifications and conditions contained in this Contract and its annexes and in the Seller's Tender submitted in the above-mentioned competition:
600 MHz NMR spectrometer to be used with existing OXFORD magnet system hereafter referred to as the Goods or Products,
and provide the following related services:
Product installation, Product inspection and Product performance testing, hereinafter referred to as Related Services.

2. THE CONTRACT DOCUMENTS

- 2.1. The Contract consists of the following documents which form an integral part thereof:
- 1) Special Terms of the Contract;
 - 2) General Terms of the Contract;
 - 3) Technical Specification (Annex 1 to the Contract);
 - 4) Technical Tender (Annex 2 to the Contract)
 - 5) Financial Tender (Annex 3 to the Contract);
 - 6) Time Schedule (Annex 4 to the Contract).
- 2.2. In the event of a conflict or contradiction between the aforementioned documents, the documents shall apply in the order in which they are listed in the above paragraph.

3. THE CONTRACT PRICE AND PAYMENT PROCEDURE

3.1. The price of Goods paid to the Supplier by the Contracting Authority, including all taxes, fees and other necessary expenses, excluding VAT, shall be **EUR 747 780,00** (seven hundred forty-seven thousand seven hundred eighty euro 00 cents), where VAT is not applicable and shall be **EUR 0,00** (0 euro 00 cents) and the price of goods, including applicable VAT, shall be **EUR 747 780,00** (seven hundred forty-seven thousand seven hundred eighty euro 00 cents), hereinafter referred to as the Contract Price.

3.2. The Contract Price shall be paid by the Contracting Authority to the Seller as follows:

- 1) The Contracting Authority shall pay an advance payment of **30% (thirty percent)** of the total Contract Price, i.e. **EUR 224 334,00** (two hundred twenty-four thousand three hundred thirty-four euro 00 cents), where VAT is not applicable and shall be **EUR 0,00** (0 euro 00 cents) and the advance payment for the goods, including applicable VAT shall be **EUR 224 334,00** (two hundred twenty-four thousand three hundred thirty-four euro 00 cents). The advance payment shall be paid after signature of the Contract, within thirty (30) days after the receipt of the Contractor's invoice. The Contractor is entitled to refuse to accept the advance payment.
- 2) The Contracting Authority shall make the final payment of **70 % (seventy percent)** of the total Contract Price, i.e. **EUR 523 446,00** (five hundred twenty-three thousand four hundred forty-six euro 00 cents), where VAT is not applicable and constitutes **EUR 0,00** (0 euro 00 cents) and the price of Goods, including applicable VAT, constitutes **EUR 523 446,00** (five hundred twenty-three thousand four hundred forty-six euro 00 cents), once the installation of the Goods is complete, the Product acceptance tests as approved by the Contracting Authority have been performed, the final transfer and acceptance form has been signed, and the delivery note/invoice has been received. The Contracting Authority shall make the payment within thirty (30) days, by transferring the funds to the bank account indicated in the Seller's invoice.

4. DELIVERY PLACE AND DEADLINE

4.1. The place of delivery of Goods and Related Services shall be **Aizkraukles iela 21, Riga, LV-1006, Latvia**. The delivery and handover of Goods to the Contracting Authority shall be performed and Related Services shall be provided by the Seller within the time limits specified in the Time Schedule attached to this Contract. The Contract shall be fully implemented by the Seller by **24/08/2017** (excluding warranty obligations).

4.2. The Supplier must ensure the transport of Goods to the address indicated by the Contracting Authority (in accordance with Clause 4.1) and shall cover the cost of shipping, transport, insurance and customs (if any).

5. DETAILS AND SIGNATURES OF THE PARTIES

5.1. The Contract has been drawn up in two copies, on 20 (twenty) pages each, with equal legal force, of which one copy is kept by the Contracting Authority and one by the Seller.

5.2. The Contracting Authority's contact person during the performance of the Contract: **Arturs Aksjonovs**, telephone +371-67014884, e-mail: arturs@osi.lv.

5.3. The Seller's contact person during the performance of the Contract: **Larus Einarsson**, telephone +4686552511, e-mail: Larus.Einarsson@bruker.com.

The Contracting Authority:
APP Latvian Institute of Organic Synthesis
Reg. No. 90002111653
VAT Reg. No. LV90002111653
Aizkraukles iela 21,
Riga, LV-1006, Latvia
The Treasury
Code: TREL LV2X
Account: LV42TREL9150211012000

The Supplier
Bruker Nordic AB
Reg. No. 556577-2364
VAT Reg. No. SE5565772364-01
Vallgatan 5
SE-170 67 Solna, Sweden
Deutsche Bank AG
Code: DEUTDESM660
Account: DE62660700040095005500

Director of
the Latvian Institute of Organic Synthesis:

Managing Director of
Bruker Nordic AB

Osvalds Pugovičs

Larus Einarsson

Riga
11/12/2017

Riga
11/12/2017

GENERAL TERMS OF THE CONTRACT

These General Terms of the Contract supplement the Special Terms of the Contract. Where there is a conflict or disagreement, the Special Terms of the Contract shall prevail.

1. THE CONTRACT SUBJECT

- 1.1. The Seller shall deliver and transfer to the Contracting Authority the Goods according to the description, quantity and specifications stated in the requirements of the Special Terms of the Contract and the Technical Specification attached to the Contract, as well as the Technical Tender, if such is attached to the Contract.
- 1.2. The Seller shall provide to the Contracting Authority Goods-related Services described in the Technical Specification attached to the Contract or the supplier's Technical Tender. Such additional services may include the installation of Goods, training of the Contracting Authority's personnel, regular technical inspection and maintenance of the Goods, or other services in accordance with the Technical Specification.

2. TRANSFER AND ACCEPTANCE OF THE GOODS

- 2.1. The Seller shall transfer the Goods to the Contracting Authority in accordance with the procedures and having the modification, parameters and supplementary devices specified in the Special Terms of the Contract and the Technical Specification. Simultaneously with the transfer of the Goods, the Seller shall submit the following documents to the Contracting Authority:
 - 2.1.1. Product manuals in Latvian and/or English;
 - 2.1.2. Technical passport of the Goods or an equivalent document describing the specific characteristics of the Goods;
 - 2.1.3. Guarantee certificate(s) of the manufacturer(s);
 - 2.1.4. Certificate of conformity;
 - 2.1.5. Invoice;
 - 2.1.6. As well as any other documents listed in the Technical Specification.
- 2.2. The final transfer and acceptance form shall be signed by the Parties when all of the following conditions are met:
 - 2.2.1. The Goods have been delivered to the Contracting Authority;
 - 2.2.2. The Goods have been installed;
 - 2.2.3. The test period (if provided for in the Technical Specification or the Technical Tender) has ended with satisfactory results;
 - 2.2.4. Final acceptance tests have been carried out;
 - 2.2.5. The Seller has handed over to the Contracting Authority the manufacturer's technical documentation, executive documentation in relation to the Goods, operating and maintenance manuals, etc.;
 - 2.2.6. Any defects discovered have been corrected;
 - 2.2.7. All other provisions (*except warranty obligations*) of the Contract have been fulfilled.
- 2.3. The day of transfer of the Goods shall be the day on which the Final Transfer and Acceptance Form is signed.

- 2.4. Ownership of the Goods shall pass from the Seller to the Contracting Authority at the later of the following dates: signature of the Final Transfer and Acceptance Form or the final payment under the Contract. Regardless of these events, the risks associated with the Goods will pass to the Contracting Authority after the delivery of the Goods (except for the cases referred to in Clause 5.1).
- 2.5. The delivery note/invoice and the transfer and acceptance certificate for the Goods shall be signed by the Contracting Authority within five working days of their receipt. The Contracting Authority shall be entitled to invite experts or other specialists during the acceptance of Goods and Related Services, or perform independent tests to verify the conformity of the Goods with the provisions of the Contract.
- 2.6. In the event that the examinations and tests provided for in the Contract are not successful, the Parties shall draw up a defect form indicating the deadline for the correction of defects and the Seller shall, after the correction of all defects, carry out repeated examinations and tests.
- 2.7. The examinations and tests of the Goods performed at the Seller's factory or to be carried out by the Seller under the Contract shall be carried out at Seller's risk and expense. The examinations and tests not specified in the Contract shall be carried out at the expense of the Contracting Authority. However, if during such examinations or tests the Goods are found to be incompatible with the Contract, any repeat examinations or tests shall be carried out at the Seller's risk and expense. In any case, the Parties shall each cover their own expenses related to the remuneration, business trips or transport of the Party's personnel.
- 2.8. The Contracting Authority shall be entitled not to accept the Goods or Related Services delivered by the Seller, if it finds that the Related Services have been performed in poor quality or insufficient volume, or that the Goods are of poor quality, damaged, not in working condition, contain other defects, are not complete (including missing documentation specified in the Agreement), or do not comply with the provisions of the Agreement. In this case, the Contracting Authority shall draw up an act indicating the defects found and the deadlines for their elimination and submit it to the Seller. The deadline referred to in this Clause shall not affect the Contracting Authority's right to charge a penalty for the late fulfilment of the Seller's obligations.
- 2.9. After receiving the Seller's notice that the defects pointed out by the Contracting Authority have been eliminated, the Contracting Authority shall re-accept the Goods or Related Services in accordance with the procedures specified in the Contract.
- 2.10. The Seller shall be responsible for the risk of total or partial loss of or damage to the Goods until handing them over to the Contracting Authority.

3. PRODUCT PACKAGING

- 3.1. The Seller must provide the packaging of the Goods as is necessary to protect them from damage during transport. The packaging must be sufficiently resistant to rapid movement, temperature fluctuations and precipitation during transport.
- 3.2. All packaging units must be properly marked so that their contents can be identified.

4. QUALITY AND WARRANTIES

- 4.1. The Seller warrants that the delivered Goods correspond to the models specified in the Contract or the Technical Specification, and conform to the parameters specified therein and other provisions of the Contract. The Seller also warrants that the Goods supplied under the Contract do not, and during their operation, will not incur any defects due to their construction, materials, manufacture or for any other reasons, except if the Contracting Authority operates the Goods in a way that is contrary to the operating instructions.
- 4.2. The Seller warrants that the delivered Goods will be of high quality and will comply with all requirements provided for in the applicable laws and regulations of the Republic of Latvia and/or the European Union.
- 4.3. The warranty contained in this Contract shall be valid for **12 (twelve) months** from the date of delivery of the Goods to the Contracting Authority, unless otherwise specified in the Special Terms of the Contract.
- 4.4. In the event that the Contracting Authority detects a defect, deficiency or other non-compliance of the Goods or any part thereof during the above-mentioned warranty period, the Contracting Authority shall draw up an act regarding this, inviting the Contracting Authority's specialists or other experts, if necessary. If a defect, deficiency or other non-compliance is found to be attributable to the warranty provided for in this Contract, the Contracting Authority shall send a written notice to the Seller.
- 4.5. The Seller undertakes to repair or replace the damaged or inappropriate Goods free of charge, if the defect is subject to warranty conditions. The Seller shall respond to the warranty request within two (2) business days from the receipt of a written notice from the Contracting Authority, in order to diagnose the cause of the damage. In the event of a defect, the Seller shall, within ten (10) business days, send a replacement of the damaged equipment. For custom-built equipment such as, for example, a probe, the repair period will depend on the time required for transport, repairs, testing, and, if applicable, the manufacture of a new device. Therefore, in the case of repairs of custom-made equipment, the Parties shall agree on the repair period in writing.
- 4.6. In the event that the Seller has not remedied the defects, deficiencies or non-compliances that are subject to warranty within the deadline specified in Clause 4.5 of the General Terms of the Contract or within another deadline agreed upon between the Parties in writing, the Seller shall pay a penalty of 0.05% (five hundredths of a percent) of the Contract Price for each day of delay, but not more than a total of 10% (ten percent) of the Contract Price. The penalty is not payable for the time period, during which the Seller, with the written consent of the Contracting Authority, has replaced the Product to be repaired with an equivalent product.

5. INSURANCE

- 5.1. The Seller shall be fully responsible for all risks of loss of or damage to the Goods during transport, storage, installation, inspection and testing until the Goods have been handed over to the Contracting Authority and a Transfer and Acceptance Form has been signed. The Seller shall be fully responsible for all risks associated with the Goods during the installation and inspection of the Goods carried out by the Seller's personnel at the Contracting Authority's premises.

- 5.2. The Seller undertakes to insure the Goods during delivery, installation, inspection and testing at his own expense. The insurance must cover 100% (one hundred percent) of the value of the Goods against all risks.

6. RIGHTS AND OBLIGATIONS OF THE PARTIES

6.1. Rights and obligations of the Seller:

- 6.1.1. The Seller shall be responsible for the compliance of the Goods with the requirements of the Contract and international standards.
- 6.1.2. The Seller shall be responsible for the use of suitably qualified and certified personnel in the provision of Related Services. All costs of accommodation, hotel, transport etc. of the Seller's representatives shall be included in the Contract Price.
- 6.1.3. The Seller shall be responsible for any breach of patent, trademark or industrial rights that may arise in connection with the delivery of the Goods or their continued use for intended purposes.
The Seller reserves the right to take over the defence in the event of such a claim.
- 6.1.4. The Seller undertakes to deliver the Goods, as well as the Related Services, during the working hours of the Contracting Authority's personnel.
- 6.1.5. The Seller undertakes to comply with applicable labour protection regulations, fire safety regulations, electrical safety regulations, environmental protection regulations and other laws and regulations in force in the Republic of Latvia, as well as the work safety rules of the Contracting Authority, during the delivery of Goods and the provision of related services, while working at the Customer's premises. The Contracting Authority undertakes to introduce the Seller with the work safety rules of the Contracting Authority's company.
- 6.1.6. The Seller undertakes to treat as confidential any documentation received from the Contracting Authority in connection with the execution of this Contract. The Seller undertakes to not publish such documentation without the prior written consent of the Contracting Authority and not disclose it to third parties, except when required to disclose such information to law enforcement or national regulatory authorities as set out in applicable laws and regulations.

6.2. Rights and obligations of the Contracting Authority:

- 6.2.1. The Contracting Authority undertakes to pay for the Goods in accordance with the terms and conditions specified in this Contract.
- 6.2.2. The Contracting Authority undertakes to sign the Transfer and Acceptance Form for the Goods or provide a reasoned written refusal to accept the Goods.
- 6.2.3. The Contracting Authority shall provide free access to the Seller's specialists to the place of delivery and installation of the Goods at the time mutually agreed upon between the Parties.

7. PAYMENT TERMS

- 7.1. The Contracting Authority shall pay the Seller for the Goods delivered and accepted in accordance with the procedures stipulated in the Contract in accordance with the terms and conditions set out in the Special Terms of the Contract.

8. CHANGES TO AND TERMINATION OF THE CONTRACT

- 8.1. The Contract may be supplemented, amended or terminated by mutual agreement of the Parties. Any amendments or additions to the Contract shall be made in writing and become an integral part thereof.
- 8.2. Any amendments to the Contract, if necessary, shall be made in accordance with the provisions of Article 61 of the PPL.
- 8.3. The price for the Goods and services included in the Technical Tender must not be changed and the unit prices must remain constant during the performance of the Contract.
- 8.4. The Contracting Authority shall be entitled to unilaterally terminate the Contract by sending a written notice to the Seller if any of the following conditions are met:
- 8.4.1. The Seller misses any of the delivery deadlines specified in the Contract or its annexes, including interim deadlines, and the Seller's delay has reached thirty (30) days;
 - 8.4.2. The Seller fails to fulfil any other obligations under the Contract and has failed to remedy the breaches within thirty (30) days from the receipt of a corresponding written notice from the Contracting Authority;
 - 8.4.3. Any condition set out in Article 64 Paragraph one of the PPL has been met.
- 8.5. Should the Parties terminate this Contract prior to its completion, the Parties shall draw up an act recording the list of Goods delivered by the Seller and accepted in accordance with the procedure set out in this Contract as at the time of termination of the Contract. The Contracting Authority shall pay the Seller for the Goods accepted in accordance with this act, in accordance with the prices specified in the Contract. The Contracting Authority shall be entitled to deduct the calculated penalty and/or damages from the amount payable to the Seller.
- 8.6. The Contracting Authority may terminate the Contract at any time by submitting a written notification to the Supplier, without paying any compensation to the Supplier, if the Supplier goes bankrupt or becomes insolvent, provided that the termination of the Contract does not affect or invalidate any right of action or compensation that may or will pertain to the Contracting Authority.

9. LIABILITY OF THE PARTIES

- 9.1. If the Seller fails to deliver the Goods or perform Related Services within the deadlines, including interim deadlines, stipulated in the Contract, the Seller shall pay to the Contracting Authority a penalty of 0.05% (five hundredths of a percent) of the value of the Goods or Related Services not delivered on time for each day of delay, but not more than 10% of Contract Price. Payment of the penalty shall not release the Seller from the fulfilment of obligations under this Contract.
- 9.2. If the Contracting Authority does not pay for the Goods within the time limits specified in the Contract, it shall pay to the Seller a penalty of 0.05% (five hundredths of a percent) of the amount due for each day of delay, but not more than 10% of the Contract Price. Payment of the penalty shall not release the Contracting Authority from the fulfilment of obligations under this Contract.

- 9.3. Should the Seller fail or refuse to comply with the Contract, or if the Contract is terminated due to the Seller's fault, including in accordance with Clause 8.4 of the General Terms of the Contract, the Seller shall refund the Contracting Authority all unused advance payments (if applicable) and pay an additional one-time penalty of 10% (ten percent) of the total Contract Price.
- 9.4. The Parties shall be responsible in accordance with Latvian laws and regulations for all losses incurred by the other Party or by third parties due to the failure of the Party to comply with or properly comply with this Contract.

10. SUBCONTRACTORS AND PERSONNEL

- 10.1. The Seller is not entitled, without the approval of the Contracting Authority, to replace the personnel and subcontractors indicated in the Tender or to involve additional subcontractors or personnel in the performance of the Procurement Contract.
- 10.2. If the Seller hires subcontractors for the performance of this Contract, their replacement and the recruitment of new subcontractors must be carried out in accordance with the provisions of Article 62 of the PPL.
- 10.3. Since the services included in this Procurement Contract are provided at the Contracting Authority's premises, after the award of the Procurement Contract and no later than upon commencement of the implementation of the Procurement Contract, the Seller shall submit a list of all subcontractors involved in the provision of services, if any, including the subcontractor's name, contact details and authorised representative, insofar as such information is known. The list should also include subcontractors of the supplier's subcontractors.
- 10.4. During the performance of the Procurement Contract, the Supplier shall notify the Contracting Authority of any changes in the information referred to in Clause 10.3 of the Regulations, and shall supplement the list of subcontractors by including any subcontractors hired for the provision of services at a later time (*if applicable*).
- 10.5. The Contracting Authority will not agree to the replacement of a subcontractor indicated in the Tender or to the recruitment of a new subcontractor in the cases stipulated in Article 62, Paragraphs three and four of the PPL.
- 10.6. The Contracting Authority will not agree to the replacement of personnel indicated in the Tender in the cases stipulated in the Procurement Contract and in Article 62, Paragraph two of the PPL.

11. SETTLEMENT OF DISPUTES

- 11.1. Any disputes, disagreements or claims between the Parties shall be resolved by the Parties through mutual negotiations or in court of the Republic of Latvia in accordance with Latvian legislation.

12. FORCE MAJEURE

- 12.1. The Parties shall be released from liability for full or partial non-fulfilment of the Contract, if such non-fulfilment is caused by *force majeure* or extraordinary circumstances which began after the conclusion of the Contract and which could not be predicted or prevented. *Force majeure* or extraordinary circumstances may include: natural disasters, accidents, catastrophes, epidemics, military actions, blockades, actions of authorities and governing bodies, adoption and entry into force of laws and regulations that significantly restrict or violate the rights of the Parties and affect the obligations assumed by them.
- 12.2. The Party referring to the operation of *force majeure* or extraordinary circumstances shall immediately notify the other Party thereof in writing. The report must indicate the timeframe during which the Party expects the fulfilment of its contractual obligations to become possible and foreseeable and, upon request, be accompanied by a statement issued by the competent institution, containing the confirmation of the operation of the extraordinary circumstances and their characteristics.
- 12.3. Each Party shall be entitled to unilaterally terminate the Contract by sending a written notice to the other Party at least thirty (30) days in advance if the *force majeure* conditions which restrict the performance of the Agreement continuously last for more than three months.

13. MISCELLANEOUS

- 13.1. In this Contract, 'a day' shall mean a calendar day and 'a month' shall mean a calendar month.
- 13.2. This Contract shall be binding on the Contracting Authority and the Seller, as well as any third parties who become their legal successors.
- 13.3. The Contract has been concluded and shall be interpreted and executed in accordance with the laws and regulations in force in the Republic of Latvia.
- 13.4. All correspondence, approvals, documentation and other information exchanged between the Parties in relation to the Contract must be in Latvian or English, drawn up in writing and must be submitted to the other Party personally against signature or sent by registered letter to the address specified in the Contract or the legal address of the respective Party.

Annex 1
Contract No. 2 / OSI 2017/15 AK ERAF / 1.1.1.4/17/I/007

TECHNICAL SPECIFICATIONS

Lot 2 Modernisation of 600 MHz NMR spectrometer

Technical specifications for a 600 MHz NMR spectrometer to be used with existing 51 mm bore size OXFORD magnet system for high resolution liquid state NMR spectroscopy.

To best achieve this goal the system has to meet the following technical requirements:

General description of the system	A 600 MHz NMR spectrometer system allowing the acquisition, processing and analysis of 1D, 2D, 3D and 4D NMR spectra of biological samples (metabolites, proteins, cells etc.) in solution when used together with existing OXFORD magnet system. The offered system must include at least the following parts: shim system, lock system, console, radio-frequency generators, amplifiers, field gradient generator, preamplifiers, digitizer (analog-to-digital converter), workstation for system control, temperature control system, two liquid state probes, sample changer, software for system control, data processing and analysis.
Compatibility	The successful tenderer must supply all above mentioned equipment. The compatibility of system components must be demonstrated during acceptance tests.

1. Existing system specifications

Magnet type (existing magnet)	Actively shielded superconducting magnet
Field strength (existing magnet)	14.09 T
Bore diameter (existing magnet)	51 mm
Cryoplatfom (existing)	Existing cryoplatfom cooling system comprising a water circulation unit and an outdoor air cooling unit can be used

2. Shim system requirements

Measurement of the helium level	Daily automatic measurement with an integrated calculation of the next refilling date and with an automatic warning if helium level is below a user defined level
Number of shim gradients	At least 36
Automatic sample shimming	Must provide fast and automatic sample shimming

3. Requirements for phase and frequency generation

Number of equivalent frequency channels	At least 4
Frequency generation range for each channel	At least 5 to 650 MHz
Phase and amplitude generation	Fully digital
Frequency increment step size	0.01 Hz or smaller

Phase increment step size	0.01 degrees or smaller
Monotony/accuracy of RF output signal phase	Max. deviation of 0.5 degrees in the range of 90 dB power change
Event time for individual and simultaneous phase, frequency and/or amplitude changes	25 ns or shorter, independently of the number of channels involved
Pulse and delay timing control	With a resolution of 12.5 ns or shorter
Connectivity between the frequency generators, the transmitters and probe	Fully software controlled and freely selectable

4. Requirements for RF amplitude control and amplifiers

Amplitude control range for each channel	At least 90 dB
Amplitude control step size	0.1 dB or smaller
Max. pulse power in the range ^1H to ^{19}F	Max. power of at least 100 W
Max. pulse power for two amplifiers in the range 6 to 365 MHz	Max. power of at least 500 W
Max. pulse power for deuterium channel amplifier	At least 150 W
Raise and fall times for all transmitters	100 ns or shorter

5. Requirements for field gradient generation

Gradient generation axis	Z
Gradient linearity	high
Max. gradient amplifier current	At least 10 A

6. Preamplifier requirements

Number of preamplifiers and their application	At least 4 preamplifiers: one selective ^1H preamp, two broad band preamps and one ^2H preamp. The ^1H , ^{13}C and ^2H preamplifiers must be cryogenically cooled.
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7. Receiver and digitizer requirements

Receiver system adjustable amplification range	At least 90 dB in 1dB steps
Receiver bandwidth	At least 5 MHz
Frequency filtering	Must be equipped with real time digital filters with practically rectangular filter characteristics
Artifact suppression	Must be equipped with oversampling technology for elimination of folding artifacts
Digitizer dynamic range	At least 22 bit < 6 kHz spectral width and at least 16 bit < 5 MHz spectral width

8. Lock system requirements

Application	Must be capable of working under pulsed field gradient conditions and to decouple and pulse at the ^2H frequency
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9. Requirements for system control workstation, software and included databases

Workstation type	PC
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Operating system type	Open-source operating system (e.g. Linux)
Hard disk space	At least 2 TB
Ethernet interfaces (to separate spectrometer communication and network communication)	At least 2
Display size	At least 24"
General requirements for spectrometer control, data processing and analysis software	The software must be capable to perform acquisition and processing of 1D, 2D, 3D and 4D data sets; must include software for automation control; must include NMR experiment simulation software; must have integrated pulse sequence programming; must contain module for relaxation and diffusion data analysis.
Software licenses for processing workstations	At least 20 perpetual processing licenses for other workstations must be included, with support and update period of at least 3 years
Software user manuals	Printed software user manuals must be included
NMR experiments library	The software for spectrometer control must include a library of single- and multidimensional NMR experiments and pulse sequences enabling standard or non-uniform sampling
Spectra acquisition and processing modules	Must include: a module for the calculation of relaxation and diffusion parameters (DOSY); a module for multiplet analysis; a module for quantification; a module for deconvolution and line shape analysis; a module for analysis of relaxation experiments for protein samples; a module for non-uniform sampling during data acquisition.
NMR experiment simulation software requirements	Simulation software must be capable to perform numerical simulations of one- to n-dimensional experiments and to produce datasets that can be read with the processing software

10. Variable temperature control requirements

Temperature control	Software controlled
Temperature range	At least -150°C to +200°C
Temperature control step size	0.1°C or smaller
Temperature stability in the range from 0 to 50°C	Fluctuations of max. 0.01°C per 1°C change in room temperature
Cooling unit min. outlet temperature	-40°C or lower

11. First liquids probe requirements

Probe type	5 mm triple resonance inverse probe, can be cryogen cooled
Incorporated gradients axes	Z
Inner coil tuned to	¹ H/ ¹⁹ F observe and ² H locking
Outer coil tuned to	simultaneous decoupling on ¹³ C and ¹⁵ N
¹⁹ F NMR	The probe must be capable of ¹⁹ F observation with ¹ H decoupling and vice versa, two-dimensional ¹³ C ¹⁹ F spectroscopy with ¹ H decoupling
Automatic tuning and matching	The probe must be capable of automatic tuning and matching for ¹ H/ ¹⁹ F, ¹³ C and ¹⁵ N channels
Signal/noise ratio (¹ H, 0.1% ethylbenzene)	At least 4000:1 over 200 Hz

Signal/noise ratio (^{13}C , ASTM)	At least 800:1
Variable temperature range	At least -40°C to $+80^{\circ}\text{C}$

12. Second liquids probe requirements

Probe type	5 mm triple resonance inverse probe
Incorporated gradients axes	Z
Inner coil tuned to	^1H observe
Outer coil tuned to	simultaneous decoupling on ^{13}C and ^{15}N
Automatic tuning and matching	The probe must be capable of automatic tuning and matching for ^1H , ^{13}C and ^{15}N channels
Signal/noise ratio (^1H , 0.1% ethylbenzene)	At least 1200:1 over 200 Hz
Variable temperature range	At least -150°C to $+150^{\circ}\text{C}$

13. Requirements for liquids probe automatic sample changer

Sample capacity	At least 24 (3-mm or 5-mm sample tubes)
Samples tube types	The sample changer must be capable of exchanging round and shaped sample tubes
Number and types of supplied spinners	At least 12 (3-mm spinners must be supplied)
Number and types of supplied sample tubes	At least 10 (5-mm shaped sample tubes must be supplied)

14. Additional requirements

Delivery	Within 12 months after signing of the contract
Installation	The price must include installation on LIOS premises
Documents to be supplied	Detailed documentation of the equipment with regard to its operation and maintenance shall be supplied
Installation tests	After installation, S/N ratio and line-shape specifications of liquids and solids probes must be achieved
Warranty	At least 12 months from the date of final acceptance; during the warranty period, the supplier shall provide warranty repair services free of charge, except for the costs of substances, reagents, solvents.
Warranty for spectrometer control workstation	At least 12 months
Training	LIOS personnel should be consulted about equipment operation during the system installation
Instrument service	Upon completion of the warranty period it must be possible to conclude an individual service/maintenance contract

Annex 2

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TECHNICAL TENDER

Annex 3

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FINANCIAL TENDER

Annex 4

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DELIVERY SCHEDULE