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INVITATION AND PROCUREMENT DOCUMENTATION

Name of public contract: 099_Ve_ERDF_ Úloha pro pokusy s měřením a řízením základních procesních veličin a Plovák na vzdušném proudu / System for experiments with measurement and control of fundamental process variables and Float in air stream levitation / FM_026, FM_027

Int. no. of public contract: 20/9615/099

Name of program: Operational Program Research, Development and Education
Project title: The Educational Infrastructure of the TUL to Raise the Relevance, Quality and Advancement of Education in the Age of Industry 4.0

Registration number: CZ.02.2.67/0.0/0.0/16_016/0002553

Contracting authority: Technická univerzita v Liberci/Technical university of Liberec

Address: Studentská 1402/2, 461 17 Liberec I-Staré Město

Reg. no.: 46747885; DIČ: CZ46747885

Represented by: doc. RNDr. Miroslav Brzezina, CSc., rector

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Profile of the contracting authority E-ZAK: <https://zakazky.tul.cz/>

Technical university of Liberec (hereinafter „Contracting authority“), hereby invites economic operators to submit a tender in the following simplified below-threshold procedure pursuant to Section 3 a) and Section 53 of Act No. 134/2016 Coll., on Public Procurement, as amended (hereinafter referred to as the "ZZVZ"). The public contract is not awarded in according ZZVZ, pursuant to Section 31 ZZVZ.

The invitation contains the procurement documentation.

Type of public contract: Public supply contract.



1 Subject of the public contract

CPV code: 38424000-3

Subject of the Public Contract: Laboratory Tasks for Basic Industrial Process Control Demonstration

FM 026 System for experiments with measurement and control of fundamental process variables **... 1 piece**

- The system must be designed in such a way as to provide the students with an opportunity to get hands-on-experience with all aspects of process automation: i.e. both with automatic control methods and with actuators (valves, pumps), sensors and automation hardware.
- The system must allow implementing at least the following feedback control loops: water level control, temperature control, pressure control flow rate control and mixing control.
- Structure of the system should be as follows: Closed loop flow circuit with centrifugal pump, fluid tank(s) and transducers to measure flow rate, pump inlet and exit pressure, process and tank temperatures and tank level. The possibility of controlling centrifugal pump flow, tank level, temperatures and analyzing the effects of pump performance curves.
- The centrifugal pump with changeable impeller profiles, clear-view pump.
- The maximal fluid pump flow rate ca 150 l/min, pump speed controlled by frequency controlled drive with shaft power ca. 2 kW. The tank capacity about 75 l.
- Compact all-in-one design with PLC, HMI (minimal 15" Touchscreen) and all other hardware and software that is necessary for control experiments
- It must be possible for the students to create their visualization and control application completely freely from the beginning. However a software application must also be prepared for the basic courses that will include complete control and visualization of the whole system and where it will be sufficient for the students just to change controller tuning and other similar parameters like setpoints etc.
- PLC must enable the implementation of PID controllers, ladder logic, function block diagram and structured text programming.
- Network Enabled with Ethernet/Wi-Fi Connectivity enabling remote control
- Power voltage 220-240 V/50 Hz.

Other requirements:

- Warranty: 24 months
- Transport to the Purchaser's seat
- The laboratory system must be accompanied by a detailed curriculum in Czech or English language. This curriculum will explain all aspects of the laboratory system and it will enable its immediate use in teaching. In particular, this curriculum should contain a detailed description of the laboratory system structure and of the control experiments that can be performed, further the functional principles and properties of the actuators and sensors used in the laboratory system as well as a tutorial on programming the PLC and HMI devices used to control the system. Expected minimal length of the curriculum is 300 pages with standard font size
- A part of the offer must be at least a sample of this curriculum including complete content pages and samples of the text from individual chapters covering at least 15% of the full text. If



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this curriculum or its sample is available at the supplier's web or similar, it is sufficient to provide a link.

FM 027 Float in air stream levitation 2 pieces

- The system must be designed in such a way as to provide the students with an opportunity to get hands-on-experience with all aspects of process automation: i.e. both with automatic control methods and with actuators (valves, pumps), sensors and automation hardware.
- Structure of the system should be as follows Device realizes controlled air blower to control positioning of a float in a clear-view tube. The float position is real time measured using an appropriate sensor. The air flow can be controlled by changing the speed of a motor driving the blower (variable frequency drive, it is the manipulated variable) and it can be disrupted with controllable air-louvers (actuated using e.g. solenoids or similar actuators, it is the disturbance variable).
- The fan nominal parameters: ca. 3000 rpm, maximum air flow ca 100 m³/h.
- Compact all-in-one design with PLC, HMI (minimal 19" Touchscreen) and all other hardware and software that is necessary for control experiments
- It must be possible for the students to create their visualization and control application completely freely from the beginning. However a software application must also be prepared for the basic courses that will include complete control and visualization of the whole system and where it will be sufficient for the students just to change controller tuning and other similar parameters like setpoints etc
- PLC must enable the implementation of PID controllers, ladder logic, function block diagram and structured text programming.
- Network Enabled with Ethernet/Wi-Fi Connectivity enabling remote control
- Power voltage 220-240 V/50 Hz.

Other requirements:

- Warranty: 24 months
- Transport to the Purchaser's seat
- The laboratory system must be accompanied by a detailed curriculum in Czech or English language. This curriculum will explain all aspects of the laboratory system and it will enable its immediate use in teaching. In particular, this curriculum should contain a detailed description of the laboratory system structure and of the control experiments that can be performed, further the functional principles and properties of the actuators and sensors used in the laboratory system as well as a tutorial on programming the PLC and HMI devices used to control the system. Expected minimal length of the curriculum is 300 pages with standard font size
- A part of the offer must be at least a sample of this curriculum including complete content pages and samples of the text from individual chapters covering at least 15% of the full text. If this curriculum or its sample is available at the supplier's web or similar, it is sufficient to provide a link.

The supplier must be able to prove that the both systems offered are really designed and tuned for the purposes of



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university education i.e. it must be a turnkey solution that can be immediately used in laboratory classes without further preparatory works like system identification, writing materials for students using the system etc. In particular it must be evident that the systems allows performing non-trivial laboratory experiments within the time of standard teaching unit (1,5 hours) and the time constants are neither too long (settling times over 10 minutes) or entirely trivial {e.g. first order responses with time constants of several seconds). It must also be clear that parameters of the pumps, valves and other actuators are well designed to work together with the used dimensions of pipes, tanks etc. and it does not happen that just a small fractions of the ranges of actuators or sensors would be used during experiments. This can be proved by one of the following ways:

- a) video showing experiments with the system (link is sufficient if available at the suppliers web or youtube or similar website)
- b) Reference to universities or similar establishments that are already using the system and willing to report their experience
- c) Schematic diagram of the system with parameters of the individual components and derived mathematical model in form of a system of differential equations with numerical values of parameters corresponding to the used components. The purpose of the model is to allow the purchaser to perform simulation and decide whether the system is designed correctly. In this case the supplier guarantees that the system supplied will really behave according to this diagram.

At least one of these methods of demonstrating the required characteristics must be part of the offer.

2 Estimated value

Maximum allowed value of the public contract (excluding VAT):

FM_026

System for experiments with measurement and control of fundamental process variables

1 piece **1 990 000,00 CZK**

FM_027

Float in air stream levitation

2 pieces **1 360 000,00 CZK**

The offer exceeding the maximum allowed value of individual items of the public contract do not meet the award criteria and the contracting authority will exclude a participant from a procurement procedure according to § 48 (2) a) of ZZVZ.

3 The method of defining the tender price

The participant is obliged to include the tender price in the tender and in the following structure:

- price excluding VAT,
- VAT (optional),
- price including VAT (optional),.

Tender price must include **all costs of performance of the public contract** and **must be set as maximal and must not be exceeded**.

Tender price must also be determined with taking into account the development of prices in the relevant market, including the development of the exchange rate of the Czech currency to the foreign



currencies until the fulfillment of the subject of the public contract.

If the tender price should be in a foreign currency (i. e. other than CZK) the tender price shall be converted in CZK for the purposes of tender assessment and evaluation. The exchange rate determined by the Czech National Bank (Česká národní banka) as of the commencement date of the simplified below-threshold procedure, i.e. on the date of publication of the invitation to tender on the profile of the contracting authority E-ZAK. The date of commencement of the procurement procedure is indicated on the contracting authority's E-ZAK profile.

4 Time limit and address for receipt of tenders

Time limit for receipt of tenders:

A tender can be submitted until 23rd June 2020 to 10:00.

Tenders must be submitted:

In electronic form via electronic tool E-ZAK (website <https://zakazky.tul.cz/>) only

5 Time and place of performance of the public contract

Delivery term: 120 days from the date on which the Contract enters into force.

Place of delivery: Technická univerzita v Liberci/Technical university of Liberec, FM, Studentská 1402/2, 461 17 Liberec, Czech Republic.

6 Qualification criteria and evidence of their fulfillment

In accordance with the ZZVZ, the contracting authority shall establish the following qualification requirements:

- a) Basic qualification in respect of Section 74 ZZVZ
- b) Professional qualification in respect of Section 77 (1) ZZVZ

The participant shall prove its basic and professional qualification by **the Affirmation of the fulfillment of the basic and professional qualification (Annex P1)**. The participant submits this affirmation in a simple copy or in an electronic original.

The affirmation must be signed by the statutory body of the subscriber; in the case of signing by another person, the proper authorization of the person for the relevant legal action must be documented at the same time.

The Contracting Authority reserves the right to request the submission of documents proving the fulfillment of the qualification, on which the Affirmation has been made, at any time during the procurement procedure.

When conducting the procurement procedure, the contracting authority may request the submission of the originals or certified copies of the qualification documents.

The selected economic operator shall prove the fulfillment of the basic and professional qualification **by submitting an electronic original of an affirmation (see Annex 1)**, if it has not already been submitted in the procurement procedure, or an extract from the List of Approved Economic Operators or a Certificate issued under an approved System of Certified Economic Operators.



A. Basic qualification

(1) An economic operator shall not be qualified if it

- a) was convicted by final judgement in the country of its registered seat of a crime specified in Annex No. 3 to ZZVZ or another similar crime pursuant to the law of the country of its registered office in the past five years preceding the commencement of the procurement procedure; expunged convictions are disregarded,
- b) has outstanding tax arrears registered in tax records in the Czech Republic or in the country of its registered office,
- c) has outstanding arrears in respect of payments and penalties of public health insurance in the Czech Republic or in the country of its registered office,
- d) has outstanding arrears in respect of payments and penalties of social security contributions and contribution to the national employment policy in the Czech Republic or in the country of its registered office,
- e) is in liquidation, has been declared insolvent, in respect of whom the receivership has been imposed under another legal regulation or it is in a similar situation pursuant to the law of the country of its registered office.

(2) If the economic operator is a legal person, both this legal person and every member of its governing body shall meet the condition specified in paragraph a) of subsection (1). Where a legal person is a member of the governing body of the economic operator, the condition specified in paragraph a) of subsection (1) shall be met by

- a) this legal person,
- b) every member of the governing body of this legal person, and
- c) the person representing this legal person in the governing body of the economic operator.

(3) If a participant in the procurement procedure is a branch of a business of

- a) a foreign legal person, the condition specified in paragraph a) of subsection (1) shall be met by this legal person as well as the head of the branch,
- b) a Czech legal person, the condition specified in paragraph a) of subsection (1) shall be met by the persons referred to in subsection (2) as well as the head of the branch.

B. Professional qualification

The economic operator shall prove its professional qualification in relation to the Czech Republic by submitting a copy of an entry in the Commercial Register or other similar records provided that registration in such records is required pursuant to another legal regulation.

C. Common provisions governing qualification

Where **qualification has been obtained abroad**, it shall be proved by documents issued under the law of the country in which it has been obtained. This document shall be submitted along with its translation into Czech language. A document in Slovak language and a certificate of education in Latin language shall be submitted without a translation. Where pursuant to the relevant legal order the required document is not issued, it may be substituted by an affirmation.

This affirmation must declare the absence of the required document in accordance with the relevant legislation and its own declaration of fulfillment of the requirements that would otherwise have been proved by the relevant document (e.g. a declaration of absence of a criminal record Register and the fact that the economic operator was not punished).

7 Other requirements for the tender, Tender language

1. **Tenders must be submitted only in electronic form** via electronic tool E-ZAK (website <https://zakazky.tul.cz/>)



2. Tender language

The tender must be submitted in **English or in Czech language**.

Annex P1 - affirmation is bilingual (Czech and English)

Annex P2 – contract is bilingual (Czech and English), contractor has to fill in the text boxes in **both languages**.

3. Required structure of tender

- A. **Affirmation of the fulfillment of qualification criteria (annex no. 1)** or the documents demonstrating fulfillment of basic qualification under Section 74 ZZVZ and professional qualification under Section 77 ZZVZ,
- B. **Contract (annex no. 2)**
- C. **Description of the subject** of the public contract (technical specification demonstrating compliance with the requirements of the contracting authority) including the tender price.
- D. **A sample of the curriculum** including complete content pages and samples of the text from individual chapters covering at least 15% of the full text. If this curriculum or its sample is available at the supplier's web or similar, it is sufficient to provide a link.
- E. Demonstration of the required properties of the equipment according to Article 1 Subject of the contract item a), b) or c)
 - a) video showing experiments with the system (link is sufficient if available at the suppliers web or youtube or similar website)
 - b) Reference to universities or similar establishments that are already using the system and willing to report their experience
 - c) Schematic diagram of the system with parameters of the individual components and derived mathematical model in form of a system of differential equations with numerical values of parameters corresponding to the used components. The purpose of the model is to allow the purchaser to perform simulation and decide whether the system is designed correctly.

Variants will be not accepted.

The economic operator may submit in the procurement procedure only one tender. The economic operator which has submitted a tender in the procurement procedure shall not be at the same time a person through which another economic operator proves qualification in the same procurement procedure. The contracting authority shall exclude a participant which has submitted several tenders either separately or together with other economic operators or a participant which has submitted a tender and is at the same time a person through which another economic operator proves qualification in the same procurement procedure.

8 Technical specification

Technical specification means requirements for the properties of the subject of the public contract. The technical specification is listed above in the specification of the subject of the public contract.

9 Business and payment conditions

Business and payment conditions:

Business and payment conditions are included in contract proposal (annex P2).



Contract proposal:

The participant has to fill in the text boxes in **both languages** in accordance with his tender and shall attach to the tender. The participant is not entitled to change any of the contract's provisions.

10 Evaluation criteria

Tenders will be evaluated on the basis of their economic advantageousness.

The contracting authority shall evaluate the economic advantageousness of tenders **on the basis of the lowest tender price** (excluding VAT).

In order to conclude a contract, the contracting authority will select the participant whose tender has been evaluated as the most economically advantageous on the basis of the lowest tender price (excluding VAT).

11 Explanation of tender documentation

Requests for an explanation of tender documentation must be received in writing to the address: via e-mail zakazky@tul.cz or via electronic tool E-ZAK (<https://zakazky.tul.cz/>) or.

The request must be received by the contracting authority no later than **7 labour days** before the deadline for submission of tenders. If the contracting authority provides an explanation upon a request that has not been delivered in time, it is not obliged to observe the time limits under subsection 98 (1) ZZVZ.

The contracting authority may explain the tender documentation without an economic operator's request.

12 Award period

The contracting authority does not set an **award period**.

13 Opening of tenders

Opening tenders in electronic form – granting access to the content - shall be launched without undue delay after the expiry of the time limit for the submission of tenders. As only electronic tenders will be submitted in the procedure, there is no public opening of tenders.

14 Other conditions and reserved rights

- The contracting authority reserves the right according to Section 53 (5) ZZVZ to publish the notice of exclusion of a participant from the procurement procedure or the notice of selection of an economic operator on the contracting authority profile. In that case, the notices shall be considered to be delivered to all participants at the moment of their publication.
- The contracting authority is entitled to set aside the award procedure before signing the contract in cases defined in Section 127 ZZVZ.
- The contracting authority points out that according to Section 122 (5) of the ZZVZ the selected economic operator is obliged (if it is a legal entity and if it is not possible to find data on the beneficial owner from the Evidence of Beneficial Owners according to Section 122 (4) ZZVZ) as a condition for the conclusion of the contract to:
 - provide identification data of all persons that are its beneficial owners pursuant to the



Act on Selected Measures against Money Laundering and Financing of Terrorism,

- provide documents that demonstrate the relation of all persons under paragraph a) to the economic operator; such documents include, but are not limited to,
 - a copy of an entry in the Commercial Register or other similar records,
- a list of shareholders,
- a decision made by the governing body regarding payment of a share in profit,
- a memorandum of association, charter or code of rules.
- **The selected economic operator understands and expressly agrees that the Agreement, including any amendments and additions thereto, and the amount of the price actually paid for the performance of the public contract will be published on the profile of the Contracting Authority in accordance with Section 219 of Act No. 134/2016 Coll., provided that there are legitimate reasons for such disclosure. If the contract fulfills the conditions for publication in the Register of Contracts, it will be published by the Technical University of Liberec pursuant to Act No. 340/2015 Coll. in the Register of Contracts maintained by the Ministry of the Interior of the Czech Republic. In this context, the parties are obliged to indicate data in the contract which are subject to business secret and will not be disclosed in the sense of the Act On Register of Contracts. TUL does not bear any responsibility for publishing such unindicated data.**
- Costs of drawing-up a tender will not be reimbursed by the contracting authority. Submitted tenders will not be returned.

In Liberec 1st June 2020

On behalf of the contracting authority: RNDr. Ivana Večeřová

Annex P1 - Affirmation on basic and professional qualification criteria

Annex P2 – Contract proposal



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