

CONTRACT No: INV-2018-00039-6011

BETWEEN CZECH METROLOGY INSTITUTE AND SUPRACON AG

Supracon AG based in: An der Lehmgrube 11, 07751 Jena, Germany is an incorporated company (Court District register no. HRB 208970) in accordance with the legislation of Germany (value added tax ID DE 216111685) and Matthias Meyer, Managing Director legally represents Supracon AG, hereinafter referred to as **Contractor**.

Czech Metrology Institute based in Okružní 31, 63800 Brno, IČO 00177016 Czech Republic is hereafter referred to as **Contracting Authority**. The person authorized to act for the contracting authority is BBA, MSc. Ondřej Kebrle.

Both parties agree upon the following:

1. Subject of the Contract

The subject of the contract is the delivery, installation and commissioning of a Programmable quantum standard of AC voltage as defined in Annex 1 "Technical Specifications" by the Contractor to the Contracting Authority. The contractor is obliged to perform the subject of the contract with the due and professional diligence.

2. Legal Regulations

Legal Regulation of the Czech Republic apply.

3. Total Price of the Contract

The price of the equipment is fixed in EURO and is to be understood CIP Brno (Czech Republic), packaging, marking, insurance and delivery at the temporary storage of the Contracting Authority are included.

The Total Price of the contract is 431.938 EURO (four hundred and thirty one thousand nine hundred and thirty eight Euro) exclusive of VAT. The prices are not subject for alterations during the period of execution of the present contract.

The Total price is itemized in Annex 2 "Itemisation of Price".

4. Payment terms

Contracting Authority shall transfer the payment for the equipment into Contractor' account by two installments:

1. The first installment upon advance invoice for 30% of the Total Price. 129.581 EURO shall be transferred to the account of the Contractor immediately after signing of the Contract by both Parties.
2. The second installment upon the final invoice for 70% of the Total Price. 302.357 EURO shall be done by bank transfer onto Contractor' account after installation and commissioning of the subject of the contract not later than 30 calendar days from the date of signature of the handover protocol.

5. Delivery terms

The delivery time is twelve months from signing the contract.

The Contractor sells and the Contracting Authority buys on CIP Brno, delivery conditions (in accordance with INCOTERMS 2000).

6. Address of delivery

The delivery address is:

Czech Metrology Institute
Okruzni 31,
63800 Brno,
Czech Republic

The person authorized to sign the handover protocol for the contracting authority:.....

7. Packaging

The packing should protect the equipment from any damages during transportation. The Contractor shall be responsible for any damage of the equipment caused by improper packing.

8. License Provisions

The software for the subject of contract can be installed on as many computers as the Contracting Authority wishes. It is not allowed to sell, license or sublicense the software outside of the Contracting Authority.

9. Warranty

The Contractor warrants that the product will be free from defects in materials and workmanship for a period of two years from the date of signing the handover protocol. If any product proves defective during this warranty period, the Contractor, at its option, either will repair the defective product without charge for parts and labour, or will provide a replacement in exchange for the defective product.

In order to obtain service under this warranty, the Contracting Authority must notify the Contractor of the defect before the expiration of the warranty period and make suitable arrangements for the performance of service. The Contracting Authority shall be responsible for packaging and shipping the defective product to the Contractor.

This warranty shall not apply to any defect, failure or damage caused by improper use or improper or inadequate maintenance and care. The Contractor shall not be obliged to furnish service under this warranty:

- a) to repair damage resulting from attempts by personnel other than the Contractor representatives to repair or service the product,
- b) to repair damage resulting from improper use or connecting to incompatible equipment, or
- c) to service a product that has been modified or integrated with other product when effect of such modification or integration increases the time or difficulty of servicing the product.

The Contractor reserves the right to make changes in design, specification at any time without incurring any obligation to install the same on the units previously purchased.

10. Penalty provisions

In case of delivery delay in the responsibility of the Contractor the Contracting Authority can demand from the Contractor payment of a penalty at rate of 0,1 % of the total price for each commenced day of delay. However the sum of the penalty cannot exceed 5 (five) % of the total price.

In case of delay in the payment by the Contracting Authority as specified in paragraph 4 of the present Contract, the Contractor can demand from the Contracting Authority the payment of the penalty at a rate of 0,1 % from the sum for each commenced day of delay. However the sum of the penalty cannot exceed 5 (five) % from the total price of delayed payment.

The delay penalty payment to not applicable in case of Force major.

11. Insurance

The Contractor at his expense provides insurance for the equipment until the signature of the handover protocol.

12. Arbitration

All disputes and differences, which may arise out of or in connection with the present Contract, will be settled as far as possible by means of negotiations between the Parties.

If the Parties do not come to an agreement within 30 days. The disputed matter shall be settled by court determined by the rules of EU International private law.

13. Withdrawal

a) The Contracting Authority may withdraw from the Contract if the prices stated by the Contractor in an invoice are different from those in the Contract and the Contractor fails to correct an incorrect invoice despite Contracting Authority's request. The Contracting Authority may withdraw from the Contract if the Contractor is in delay with the performance for more than 3 months. The Contracting Authority may withdraw from the Contract if the performance delivered by the Contractor does not satisfy all the requirements defined by the Contracting Authority in the specifications to this public contract, including in particular the technical conditions.

b) A bidder has the right to withdraw from the Contract in the event that the Contracting Authority is in delay with the payment of an invoice for more than 3 months.

14. Force major

Should any circumstances arise which prevent complete or partial fulfillment by any of the Parties of their respective obligations under the present Contract, namely: fire, war, military operations of any kind, blockade, prohibition of export or import, walkout or any other circumstances beyond the control of Parties, the time stipulated for fulfillment of such obligations shall be extended for the period equal to that during which such circumstances will remain in force.

Should the above circumstances continue to be in force for more than three months, each Party shall have the right to refuse any farther fulfillment of the obligations under the Contract and in such case neither of the Parties shall have the right to make a demand upon. The Party for whom it becomes impossible to meet their obligations under the present Contract, shall immediately advise the other Party as regards the beginning and cessation of the circumstances preventing the fulfillment of their obligations.

15. Other

Both the parties must agree with the publishing of the Contract, their identifications and other information stated in the Contract, including the price of the work. Should any part of the Contract contain a business secret (the total price of the work may not be a business secret), the affected party shall mark such part and such part shall be made illegible prior to the publishing of the Contract.

The Contract comes into force on date of signing the contract by both Parties.

16. Addresses and phone numbers of the Parties

Contracting Authority:

Czech Metrology Institute

Okružní 31,

63800 Brno,

Czech Republic

Contact Person of Contracting Authority: Ing.

Tel.

Email:

Contractor:

Supracon AG, An der Lehmgube 11, 07751 Jena, Germany

Contact Person of Contractor: Matthias Meyer

Tel.:

Fax:

Email:

17. Bank account of the Contractor

Beneficiary's Bank: Sparkasse Jena

SWIFT: HELADEF1JEN

Account No.: 2038

IBAN: DE 23 8305 3030 0000 0020 38

18. Signatures

Contracting Authority: Czech Metrology Institute

Director for Economy

MSc., BBA Ondrej Kebrle

Date: 28. 5. 2018

Contractor Supracon AG

Managing Director,

Matthias Meyer

Date: 7. 6. 2018

ANNEX 1: TECHNICAL SPECIFICATIONS

Programmable quantum standard of AC voltage

1. PURPOSE OF EQUIPMENT

Programmable quantum standard of AC voltage is the most versatile implementation of the Josephson effect for calibration of DC and AC sources. The standard, which is the subject of this contract, will serve as a device for calibration of AC and DC sources and as a future basis for traceability of the standard of electrical power.

2. REQUIRED QUANTITY

One “programmable quantum standard of AC voltage” with operating software, commission at CMI Brno Czech Republic, and training of two operators in CMI, Brno, Czech Republic.

3. TECHNICAL SPECIFICATIONS AND PARAMETERS

The required specifications of the product mentioned above are described in more detail in this section.

Standard consists at least of:

1. one programmable Josephson array,
2. microwave synthesizer,
3. bias source for driving programmable Josephson array,
4. nanovoltmeter as null detector for DC measurements,
5. control electronics,
6. digitizer as null detector for AC measurements,
7. waveform generator,
8. pulse tube cryocooler,
9. air-cooled compressor,
10. vacuum pump,
11. computer with licensed operating system,
12. control software.

CMI Brno will provide 10 MHz reference frequency standard supplied by coaxial cable. CMI Brno will provide a calibrator and a Zener standards for demonstration purpose.

Operating abilities of the standard:

1. automatic calibration of Zener references,
2. automatic calibration of DC voltmeters,
3. automatic calibration of calibrators, DC function up to 10 V and AC function up to 7 V RMS and 2 kHz,
4. automatic calibration of voltmeter linearity,
5. automatic calibration of current (calibrator and reference resistor required for the measurements are not included in the items to be delivered).

Properties of the standard:

1. Standard have to be able to operate with power supply of 230 V, 50 Hz.
2. Properties of the Josephson voltage array when operated in the standard:
 - output voltage range at least ± 10 V,
 - zero and first order Shapiro step width at least 1.2 mA at optimal conditions (measured in liquid helium),
 - zero and first order Shapiro step width at least 1 mA for operating temperature of 2nd stage of the cryocooler,
 - zero and first order Shapiro step width at least 0.8 mA at 10 V.
3. Pulse tube cryocooler have to be able to cool down the chip to temperature lower than 4 K when chip is operating at 10 V.
4. Standard have to be able to lock microwave synthesizer to 10 MHz reference frequency standard and maintain traceability of DC and AC voltage to this reference standard.
5. The uncertainty of the calibration of a Zener reference standard has to reach 100 nV at level of 10 V ($k=1$).
6. The uncertainty of the calibration of a calibrator has to reach 0.5 $\mu\text{V/V}$ ($k=1$) at level of 7 V RMS and frequency 1 kHz in time less than 30 s.
7. Additional request:
8. The standard will be delivered to CMI OI Brno (Czech Metrology Institute, Okružní 31, 638 00, Brno).
9. The supplier will commission the standard into operation.
10. The supplier will demonstrate calibration of a Zener reference at 10 V and calibration of AC voltage of a calibrator at amplitude of 7 V RMS and frequency of 1 kHz.
11. The supplier will provide training of at least two operators.
12. Installation files of the control software will be delivered on individual data media.
13. Bugs of the control software will be fixed no later than 4 months after reporting them. In the case this service will be terminated by supplier anytime in the future, the supplier will offer the source code for sale for a reasonable price.
14. The control software will be updated to be compatible with the future updates of the supplied operating system and depending software. In the case this service will be terminated by supplier anytime in future, the supplier will offer the source code for sale for an equivalent price.
15. Part of the control software will be an application programming interface (driver) so the standard can be controlled from an external application.
16. Operating system of the controlling computer must be Windows, at least professional edition.
17. The warranty on the whole system must be two years.
18. The supplier will deliver documentation to all components of standard, if available.
19. The supplier will deliver documentation to control software.

ANNEX 2: ITEMISATION OF PRICE

1. price of 10V Programmable Quantum Standard and control software	
1	<i>a turn-key PJVS system, useable for automated AC and DC calibrations of voltmeters, voltage standards, Zener references and calibrators up to 2 kHz frequencies; including the components</i> xxx
1.1	10 V Programmable Josephson voltage standard (PJVS) array
1.2	Pulse-tube cooler
1.3	Compressor 4 kW (air-cooled)
1.4	LeCroy AWG1104 Bias source, 20-channel, 5 ns transition time, optical isolated
1.5	Ground-free power supply (+12V +5V)
1.6	Keithley 2182A nanovoltmeter
1.7	70 GHz microwave synthesizer, 150 mW power
1.8	Multiplexer, 3-channels, including polarity reversal scanner
1.9	Control electronic unit for Multiplexer, heater, sensors
1.10	Fast Digitizer up to 15 Mbit/s sample rate, optical communication cards
1.11	Keithley waveform generator
1.12	Synchronisation units for optical trigger/clock signals
1.13	Software AC Quantum Voltmeter (Basic mode, DC mode, AC mode, cryocooler)
1.14	Computer with Monitor
1.15	Rack mounted
1.16	Sensors for environment (pressure, temperature, humidity)
1.17	Accessories: USB-IEEE converter, optical USB hub, cables
2	Vacuum pump and vacuum pressure sensor xxx
3	Accessories for maintenance cryocooler: pump-and purge unit, filter cartridge, He5.0 bottle, pressure reducer xxx
4	<i>Software Package for automated DC and AC calibrations of Current</i> xxx
	(calibrator and reference resistance required)
5	<i>Warranty extension to two years</i> xxx
6	<i>Programming of driver for Contractor electronics for control by external applications</i> xxx
2. price of transportation, installation, assembly and commissioning	
5	On-site installation and training (4 days) xxx
3. price of training of operators	
4.	
6	Packaging, shipping costs to CMI Brno, Czech Republic, insurance xxx