# *ANNEX II + III:* TECHNICAL SPECIFICATIONS + TECHNICAL OFFER

**Contract title: Supply of** Automated mobile air monitoring station **p 1 /…**

**Publication reference:** RORS00090/IPHPA/TD1

**Columns 1-2 should be completed by the contracting authority**

**Columns 3-4 should be completed by the tenderer**

**Column 5 is reserved for the evaluation committee**

Annex III - the contractor's technical offer

The tenderers are requested to complete the template on the next pages:

* Column 2 is completed by the contracting authority shows the required specifications (not to be modified by the tenderer),
* Column 3 is to be filled in by the tenderer and must detail what is offered (for example the words ‘compliant’ or ‘yes’ are not sufficient)
* Column 4 allows the tenderer to make comments onits proposed supply and to make eventual references to the documentation

The eventual documentation supplied should clearly indicate (highlight, mark) the models offered and the options included, if any, so that the evaluators can see the exact configuration. Offers that do not permit to identify precisely the models and the specifications may be rejected by the evaluation committee.

The offer must be clear enough to allow the evaluators to make an easy comparison between the requested specifications and the offeredspecifications.

| **1.**  **Item number** | **2.**  **Specifications required** | **3.**  **Specifications offered** | **4.**  **Notes, remarks,  ref to documentation** | **5.**  **Evaluation committee’s notes** |
| --- | --- | --- | --- | --- |
| 1. | **Mobile Air quality monitoring station(trailer) Quantity: 1** |  |  |  |
|  | Manufacturer’s name: |  |  |  |
|  | Product type, model: |  |  |  |
|  | **Specification** |  |  |  |
| 1.1. | **Mobile Air quality monitoring station:**  Hot-dip galvanized welded chassis;  Braked axle min1350 kg;  Overrun device min KF7,5;  Wheels 165R13C under the floor and spare wheel/tyre;  Support wheel;   1. support legs;   Floor made of waterproof board 12mm;  Sides and roof made of iso panels 30 mm, height of side 2200 mm, rear door 1000x2000 mm, roof covered with galvanized sheet (all dimensions ±10%)  On the floor and roof equipment mounting holes;  Complete 12V lighting system;  Fire extinguisher |  |  |  |
| 1.2 | **Manifold:**  Glass manifold unit for the gaseous measurement instruments with 8 outlets;  Sampling tube should be made of borosilicate glass. The sampling tube (inner tube) should be into an appropriate protecting and supporting housing (outer tube). The outer tube should be made of stainless steel;  Fan properly connected in line with the distribution tube to provide the appropriate flow in the sampling tube should be included;  The connecting points must have the possibility to accept Teflon tubes of 1/4 inch(6/4mm) diameter. |  |  |  |
| 1.3 | **Storage:**  Min three 19" rack cabinets with a heightofmin1500 mm |  |  |  |
| 1.4 | **Assurance of stable temperature inside the trailer:**  Air conditioner 12BTU, inverter |  |  |  |
| 1.5 | **Electrical installation:**  In accordance with the requirements of the installed equipment/connection 380V external with an internal electrical cabinet equipped with a protective switch and fuses |  |  |  |
| 1.6 | **UPS – uninterruptible power supply system:**  UPS for all analysers, meteo-sensor, sampling unit and data logging / communication devices operating at full power.  Separated outlets connected to the UPS.  UPS outlets for monitors and data equipment and non-UPS outlets for heating and cooling equipment need to be clearly labelled;  Output power 2400 W / 3000 VA  Nominal input voltage 230V (±10%)) |  |  |  |
| 1.7 | **Generator:**  power: min 7.5kW, monophase autonomy: min 11h under 50% of capacity  electrical start  dimensions: max 750mm x 600mm x 650mm  weight : max 120kg |  |  |  |
| 1.8 | **Documentation:**  Technical documentation for the registration of the trailer |  |  |  |
| 1.9 | **Additional services before the provisional acceptance:**  Unloading products at the place of delivery  When delivering equipment, it is required to install the equipment and verify performance of hardware and software |  |  |  |
| 2 | **Automatic analyzer for measuring of suspended particulate matter PM10, PM2.5,PM1**  **Quantity: 1** |  |  |  |
|  | Manufacturer’s name: |  |  |  |
|  | Product type, model: |  |  |  |
|  | **Specifications** |  |  |  |
| 2.1 | **Measuring Principle:**  Optical system for simultaneously measurements of PM10,PM2.5, PM1 |  |  |  |
| 2.2 | **Measurement:**  Simultaneously continuous measurement of PM10,PM2.5, PM1 |  |  |  |
| 2.3 | **Certificates:**  Certificates which show the conformity of the analyzer in accordance with the *Guidance to the Demonstration of Equivalence of Ambient Air monitoring Methods, version January 2010 (GDE)* or with the field test procedures of EN 16450 or equivalent. The test of equivalence needs to be carried out according to the GDE. Full Test Report is required and should be in offer. |  |  |  |
| 2.4 | **Range:**  User selectable in the range from 0 to 10000 µg/m3 for PM10 and 0 to 5000 µg/m3 for PM2,5 |  |  |  |
| 2.5 | **Measurement cycle:**  < 1 min |  |  |  |
| 2.6 | **Operating temperature:**  +5 to +40°C |  |  |  |
| 2.7 | **Signal inputs/outputs:**  Digital:  RS 232  Ethernet |  |  |  |
| 2.8 | **Internal memory:**  All data should be stored on a removable memory card or USB stick |  |  |  |
| 2.9 | **Sampling system:**  Length: 1 m above the roof including waterproof flange |  |  |  |
| 2.10 | **Dimensions:**  Standard 19” rack mountable, including mounting material for fixing to a 19” rack |  |  |  |
| 2.11 | **Others:**  Built-in temperature and humidity sensor; |  |  |  |
| 2.12 | **Power:**  220 -- 240 V AC, 50 Hz. |  |  |  |
| 2.13 | **Installation:**  Instrument must be installed at the existing monitoring station on 19" rack by the contractor;  Sampling probe of analyser must be installed by the bidder on the roof with flanges of non-corrosive material. |  |  |  |
| 2.14 | **Additional services before the provisional acceptance:**  Before delivery, the device must be calibrated for all optical channels and the mass concentration and also for the flow.  Unloading products at the place of delivery.  When delivering equipment, it is required to install the equipment and verify performance of hardware and software.  After installing the equipment and instruments, it is necessary to perform a test that shows that the data from all the instruments are received and that they can be processed and displayed using the ”Košava” software. Please see Annex 1: Compliance with existing “Košava” system.  Basic training of employees (up to 5 people) in Serbian language for use of the installed equipment and instruments during 5 days. Instructions manual must be provided. The original operating instructions for all system components can be in English. A brief instruction manual should be in Serbian. Instructions manual, original operating instructions and brief instruction manual should be in electronic form. |  |  |  |
| **3** | **Total Reduced Sulphur (TRS) and Sulphur dioxide (SO2) analyzer**  **Quantity: 1** |  |  |  |
|  | Manufacturer’s name: |  |  |  |
|  | Product type, model: |  |  |  |
| 3.1 | **Principle:**  UV Fluorescence |  |  |  |
| 3.2 | Measurement should be able to be switched from TRS to SO2 or to measure both in a selectable interval of min. 10 minutes |  |  |  |
| 3.3 | **Sample cleaning:**  5 µm PTFE filter 47-54 mm  Filter holder accessible from front side of the analyzer |  |  |  |
| 3.4 | **Ranges:**  Programmable 0 -- 50, 100, 200, 500, 1.000, 10.000 ppbfor SO2 |  |  |  |
| 3.5 | **Lower detectable limit:**  ≤ 0.5 ppb. |  |  |  |
| 3.6 | **Drifts:**  zero < 0.5 ppb/24h  span < 0.5% of full scale /24h |  |  |  |
| 3.7 | **Operating temperature:** +5 to +40°C |  |  |  |
| 3.8 | **Flow control:**  By critical orifice, internal Pump |  |  |  |
| 3.9 | **Linearity:**  ≤ 1% full scale |  |  |  |
| 3.10 | **Display:**  LCD color display with touch screen |  |  |  |
| 3.11 | **Calibration system:**  The device must be supplied with a zero scrubber, shut off valve for an external gas cylinder and critical orifice to control the flow from the gas cylinder. |  |  |  |
| 3.12 | **Signal inputs/outputs:**  Digital:  RS 232  Ethernet |  |  |  |
| 3.13 | **Instrument diagnostic:**  Remote: via RS 232 and Ethernet  Local: on instrument display |  |  |  |
| 3.14 | **Connection to data logger:**  Digitally (Ethernet or RS-232). |  |  |  |
| 3.15 | **User interface:**  Software controlled from multi line menu with keys. Adjustable display. |  |  |  |
| 3.16 | **Power:**  220 -- 240 V AC, 50 -- 60 Hz. |  |  |  |
| 3.17 | **Dimensions:**  Standard 19” rack mountable, max. 8height units including mounting material for fixing to a 19” rack including telescopic slides |  |  |  |
| 3.18 | **Additional services before the provisional acceptance:**  Before delivery, the device must be calibrated in a laboratory accredited according to the requirements of the EN ISO/IEC 17025 standard for the specific test procedures.  Unloading products at the place of delivery.  When delivering equipment, it is required to install the equipment and verify performance of hardware and software.  After installing the equipment and instruments, it is necessary to perform a test that shows that the data from all the instruments are received and that they can be processed and displayed using the ”Košava” software. Please see Annex 1: Compliance with existing “Košava” system.  Basic training of employees (up to 5 people) to use the installed equipment and instruments) in Serbian language for 5 days. Instructions manual must be provided. The original operating instructions for all system components can be in English. A brief instruction manual should be in Serbian. Instructions manual, original operating instructions and brief instruction manual should be in electronic form. |  |  |  |
| 4 | **Ammonia (NH3) and Nitrogen oxides analyser NOx (NO and NO2)**  **Quantity: 1** |  |  |  |
|  | Manufacturer’s name: |  |  |  |
|  | Product type, model: |  |  |  |
| 4.1 | **Principle:**  Chemiluminescence |  |  |  |
| 4.2 | Measurement must be possible for NH3, NOx, NO2 and NO (at the same time) |  |  |  |
| 4.3 | **Sample cleaning:**  1 µm PTFE filter 47 mm – 54mm |  |  |  |
| 4.4 | **Ranges:**  Programmable 0 -- 50, 100, 200, 500, 1.000and 2.000 ppb. |  |  |  |
| 4.5 | **Lower detectable limit:**  ≤ 1,5 ppb. |  |  |  |
| 4.6 | **Drifts:**  zero < 0,5 ppb/24h  span <1% full scale/24h |  |  |  |
| 4.7 | **Operating temperature:** +5 to +40°C |  |  |  |
| 4.8 | **Flow control:**  By critical orifice. Internal or external |  |  |  |
| 4.9 | **Linearity:**  ≤ 1% full scale |  |  |  |
| 4.10 | **Display:**  LCD color display with touch screen |  |  |  |
| 4.11 | **Converters:**  Molybdenum converter, converter efficiency >95% Heated to > 300°C; NH3 converter heated to >800°C with efficiency of min. 95% |  |  |  |
| 4.12 | **Calibration system:**  The device must be supplied with a zero scrubber, shut off valve for an external gas cylinder and critical orifice to control the flow from the gas cylinder. |  |  |  |
| 4.13 | **Signal inputs/outputs:**  Digital:  RS 232  Ethernet |  |  |  |
| 4.14 | **Instrument diagnostic:**  Remote: via RS 232 and Ethernet  Local: on instrument display |  |  |  |
| 4.15 | **Connection to data logger:**  Digitally (Ethernet or RS-232). |  |  |  |
| 4.16 | **User interface:**  Software controlled from multi line menu with keys. Adjustable display. |  |  |  |
| 4.17 | **Power:**  220 -- 240 V AC, 50 -- 60 Hz. |  |  |  |
| 4.18 | **Dimensions:**  Standard 19” rack mountable, max. 8 height units including mounting material for fixing to a 19” rack including telescopic slides |  |  |  |
| 4.19 | **Additional services before the provisional acceptance:**  Before delivery, the device must be calibrated in a laboratory accredited according to the requirements of the EN ISO/IEC 17025 standard for the specific test procedures.  Unloading products at the place of delivery.  When delivering equipment, it is required to install the equipment and verify performance of hardware and software.  After installing the equipment and instruments, it is necessary to perform a test that shows that the data from all the instruments are received and that they can be processed and displayed using the ”Košava” software.Please see Annex 1: Compliance with existing “Košava” system.  Basic training of employees (up to 5 people) to use of the installed equipment and instruments in Serbian language for 5 days. Instructions manual must be provided. The original operating instructions for all system components can be in English. A brief instruction manual should be in Serbian. Instructions manual, original operating instructions and brief instruction manual should be in electronic form. |  |  |  |
| 5 | **Carbon monoxide analyzer (CO)**  **Quantity: 1** |  |  |  |
|  | Manufacturer’s name: |  |  |  |
|  | Product type, model: |  |  |  |
| 5.1 | **Principle:**  Gas Filter correlation, Non-dispersive infrared spectrometry according to EN14626:2012 |  |  |  |
| 5.2 | **Certification:**  Certificate which shows the conformity of the analyser in accordance with EN14626:2012 is required and should be in the offer. Full Type Approval Test Report shall demonstrate that the tested analyser meets all the performance requirements of the reference method according to the EN 14626:2012. Full Type Approval Test Report is required and should be in offer. |  |  |  |
| 5.3 | **Sample cleaning:**  5 µm PTFE filter 47-54 mm  Filter holder accessible from front side of the analyzer |  |  |  |
| 5.4 | **Ranges:**  Programmable from 0 to 100 ppm |  |  |  |
| 5.5 | **Lower detectable limit:**  ≤ 0.05 ppm. |  |  |  |
| 5.6 | **Drifts:**  zero < 0,1ppm/24h  span < 0,5% of reading /24h |  |  |  |
| 5.7 | **Operating temperature:** +5 to +40°C |  |  |  |
| 5.8 | **Flow control:**  By critical orifice. Internal pump |  |  |  |
| 5.9 | **Linearity:**  ≤ 1% full scale |  |  |  |
| 5.10 | **Display:**  LCD color display with touch screen |  |  |  |
| 5.11 | **Calibration system:**  The device must be supplied with a zero scrubber, shut off valve for an external gas cylinder and critical orifice to control the flow from the gas cylinder. |  |  |  |
| 5.12 | **Signal inputs/outputs:**  Digital:  RS 232  Ethernet |  |  |  |
| 5.13 | **Instrument diagnostic:**  Remote: via RS 232 and Ethernet  Local: on instrument display |  |  |  |
| 5.14 | **Connection to data logger:**  Digitally (Ethernet or RS-232). |  |  |  |
| 5.15 | **User interface:**  Software controlled from multi line menu with keys. Adjustable display. |  |  |  |
| 5.16 | **Power:**  220 -- 240 V AC, 50 -- 60 Hz. |  |  |  |
| 5.17 | **Dimensions:**  Standard 19” rack mountable, max. 4 height units including mounting material for fixing to a 19” rack including telescopic slides |  |  |  |
| 5.18 | **Additional services before the provisional acceptance:**  Before delivery, the device must be calibrated in a laboratory accredited according to the requirements of the EN ISO/IEC 17025 standard for the specific test procedures.  Unloading products at the place of delivery  When delivering equipment, it is required to install the equipment and verify performance of hardware and software  After installing the equipment and instruments, it is necessary to perform a test that shows that the data from all the instruments are received and that they can be processed and displayed using the ”Košava” software. Please see Annex 1: Compliance with existing “Košava” system.  Basic training of employees (up to 5 people) to use the installed equipment and instruments in Serbian language during 5 days. Instructions manual must be provided. The original operating instructions for all system components can be in English. A brief instruction manual should be in Serbian. Instructions manual, original operating instructions and brief instruction manual should be in electronic form. |  |  |  |
| 6 | **Ozone analyzer (O3)**  **Quantity: 1** |  |  |  |
|  | Manufacturer’s name: |  |  |  |
|  | Product type, model: |  |  |  |
| 6.1 | **Principle:**  UV photometry according to EN14625:2012 |  |  |  |
| 6.2 | **Certification:**  Certificate which shows the conformity of the analyser in accordance with EN14625:2012 is required and should be in the offer. Full Type Approval Test Report shall demonstrate that the tested analyser meets all the performance requirements of the reference method according to the EN 14625:2012. Full Type Approval Test Report is required and should be in offer. |  |  |  |
| 6.3 | **Sample cleaning:**  5 µm PTFE filter 47 mm – 54mm  Filter holder accessible from front side of the analyzer |  |  |  |
| 6.4 | **Ranges:**  Programmable from 0 to 10 ppm |  |  |  |
| 6.5 | **Lower detectable limit:**  ≤ 0.5 ppb. |  |  |  |
| 6.6 | **Drifts:**  zero <1ppb/24h  span < 1%of reading /24h |  |  |  |
| 6.7 | **Operating temperature:** +5 to +40°C |  |  |  |
| 6.8 | **Flow control:**  By critical orifice. Internal pump |  |  |  |
| 6.9 | **Linearity:**  ≤ 1% full scale |  |  |  |
| 6.10 | **Switching to sample/span/zero inlet:**  By internal electro valves |  |  |  |
| 6.11 | **Display:**  LCD color display with touch screen |  |  |  |
| 6.12 | **Calibration system:**  The device must be supplied with a zero scrubber and an O3 –generator, requested O3 level must be programmable between two levels of ozone, but in range from 50 ppb to 1000 ppb |  |  |  |
| 6.13 | **Signal inputs/outputs:**  Digital:  RS 232  Ethernet |  |  |  |
| 6.14 | **Instrument diagnostic:**  Remote: via RS 232 and Ethernet  Local: on instrument display |  |  |  |
| 6.15 | **Connection to data logger:**  Digitally (Ethernet or RS-232). |  |  |  |
| 6.16 | **User interface:**  Software controlled from multi line menu with keys. Adjustable display. |  |  |  |
| 6.17 | **Power:**  220 -- 240 V AC, 50 -- 60 Hz. |  |  |  |
| 6.18 | **Dimensions:**  Standard 19” rack mountable, max. 4 height units including mounting material for fixing to a 19” rack including telescopic slides |  |  |  |
| 6.19 | **Additional services before the provisional acceptance:**  Before delivery, the device must be calibrated in a laboratory accredited according to the requirements of the EN ISO/IEC 17025 standard for the specific test procedures.  Unloading products at the place of delivery.  When delivering equipment, it is required to install the equipment and verify performance of hardware and software.  After installing the equipment and instruments, it is necessary to perform a test that shows that the data from all the instruments are received and that they can be processed and displayed using the ”Košava” software. Please see Annex 1: Compliance with existing “Košava” system.  Basic training of employees (up to 5 people) to use of the installed equipment and instruments on Serbian language during 5 days. Instructions manual must be provided. The original operating instructions for all system components can be in English. A brief instruction manual should be in Serbian. Instructions manual, original operating instructions and brief instruction manual should be in electronic form. |  |  |  |
| 7 | **Meteorological equipment –Air Quality Monitoring Station**  **Quantity: 1** |  |  |  |
|  | Manufacturer’s name: |  |  |  |
|  | Product type, model: |  |  |  |
| 7.1 | Data transfer: from the sensor directly to the data receiving system  Power Supply: direct current, 12–24 VDC  Working environment temperature: –50°C to +60°C |  |  |  |
| 7.2 | **Pole for mounting meteorological device**:  Height: 10 m above ground  Material: aluminium or stainless steel |  |  |  |
| 7.3 | **Wind speed sensor:**  Method: ultrasonic  Measuring area: 0–75 m/s,  Accuracy: ±0.3 m/s or ±3% (0 to 35 m/s)  ±5% (>35 m/s) RMS  Resolution: 0.1 m/sec |  |  |  |
| 7.4 | **Wind direction sensor:**  Method: ultrasonic  Measuring area:0 – 359.9°  Accuracy: < 3 ° RMSE > 1.0 m/sec |  |  |  |
| 7.5 | **Temperature sensor:**  Principle Method: NTC  Measuring area: –50°C to +60°C  Accuracy: 0.2°C ( -20°C – 50°C) |  |  |  |
| 7.6 | **Relative Humidity sensor**  Principle Method: Capacitive  Measuring area: 0 – 100%  Accuracy: ± 2% |  |  |  |
| 7.7 | **Barometric pressure sensor**  Principle Method: MEMScapacitive  Measuring area: 300 – 1200 hPa  Accuracy: 0.5 hPa |  |  |  |
| 7.8 | **Installation:**  Meteorological equipment shall be installed on monitoring station. |  |  |  |
| 7.9 | **Additional services before the provisional acceptance**  Unloading products at the place of delivery.  When delivering equipment, it is required to install the equipment and verify performance of hardware and software.  After installing the equipment and instruments, it is necessary to perform a test that shows that the data from all the instruments are received and that they can be processed and displayed using the ”Košava” software. Please see Annex 1: Compliance with existing “Košava” system.  Basic training of employees (up to 5 people) to use of the installed equipment and instruments on Serbian language during 5 days. Instructions manual must be provided. The original operating instructions for all system components can be in English. A brief instruction manual should be in Serbian. Instructions manual, original operating instructions and brief instruction manual should be in electronic form. |  |  |  |
| 8 | **BTEX analyzer**  **Quantity: 1** |  |  |  |
|  | Manufacturer’s name: |  |  |  |
|  | Product type, model: |  |  |  |
| 8.1 | **Principle:**  Gas chromatography associated with a PID detector according EN 14662-3:2016 |  |  |  |
| 8.2 | **Certification:**  Certificate which shows the conformity of the analyser in accordance with EN14662-3:2016 is required and should be in the offer. Full Type Approval Test Report shall demonstrate that the tested analyser meets all the performance requirements of the reference method according to the EN EN14662-3:2016. Full Type Approval Test Report is required and should be in offer. |  |  |  |
| 8.3 | **Measurement method:**  Permanent with measurement cycle 15/30 minutes |  |  |  |
| 8.4 | **Measured compounds:**  Benzene, Toluene, o-Xylene, m-Xylene, p-Xylene, Ethylbenzene |  |  |  |
| 8.5 | **Sample cleaning:**  5 µm PTFE filter 25 mm in filter holder or DFU filter |  |  |  |
| 8.6 | **Ranges:**  Up to 300ppb/ Programmable 0-1000 µg/m3 |  |  |  |
| 8.7 | **Memorisation of measured values:**  Minimum 3 years – 15 minute average concentrations for at least four (4) compounds. |  |  |  |
| 8.8 | **Lower detectable limit:**  ≤ 0,2 µg/m3 (15 min cycle) |  |  |  |
| 8.9 | **Operating temperature:** +5 to +40°C |  |  |  |
| 8.10 | **Chromatograms:**  Internal computer and touch screen display.  Graphic presentation of actual run at monitor display.  Stored chromatograms to be displayed for further evaluation.  Possibility of evaluation of stored chromatograms during operation. |  |  |  |
| 8.11 | **Chromatographic column:**  Capillary column |  |  |  |
| 8.12 | **Switching to sample/span/zero inlet:**  By internal valves |  |  |  |
| 8.13 | **Calibration system:**  Integrated calibration valve for external span gas cylinder |  |  |  |
| 8.14 | **Signal inputs/outputs:**  Digital:  RS 232 or  Ethernet |  |  |  |
| 8.15 | **Instrument diagnostic:**  Remote: via RS 232 and Ethernet  Local: on instrument display |  |  |  |
| 8.16 | **Connection to data logger:**  Digitally (Ethernet or RS-232). |  |  |  |
| 8.17 | **Power:**  220 -- 240 V AC, 50 -- 60 Hz. |  |  |  |
| 8.18 | **Dimensions:**  Standard 19” rack mountable, max. 5 height units, including mounting material for fixing to a 19” rack including telescopic slides |  |  |  |
| 8.19 | **Additional services before the provisional acceptance**  Before delivery, the device must be calibrated in a laboratory accredited according to the requirements of the EN ISO/IEC 17025 standard for the specific test procedures.  Unloading products at the place of delivery.  When delivering equipment, it is required to install the equipment and verify performance of hardware and software.  After installing the equipment and instruments, it is necessary to perform a test that shows that the data from all the instruments are received and that they can be processed and displayed using the ”Košava” software. Please see Annex 1: Compliance with existing “Košava” system.  Basic training of employees (up to 5 people) to use of the installed equipment and instruments on Serbian language during 5 days. Instructions manual must be provided. The original operating instructions for all system components can be in English. A brief instruction manual should be in Serbian. Instructions manual, original operating instructions and brief instruction manual should be in electronic form. |  |  |  |
| 9 | **Data acquisition system (Data logger, 4G GSM router and software)**  **Quantity: 1** |  |  |  |
|  | Manufacturer’s name: |  |  |  |
|  | Product type, model: |  |  |  |
|  | **Specifications** |  |  |  |
| 9.1 | The Supplier shall enable the central acquisition system to communicate with the monitoring stations via 4G GSM router. |  |  |  |
| 9.2 | 1 (one) 4G GSM router should be included in the offer. |  |  |  |
| 9.3 | 1 (one) Data logger should be included in the offer. |  |  |  |
| 9.4 | Data logger should archive the data from the measuring instruments. |  |  |  |
| 9.5 | Data logger should communicate with the PC. |  |  |  |
| 9.6 | Data logger should communicate and control environmental analyzers, meteorological equipment/sensors |  |  |  |
| 9.7 | Data logger should have open protocol for communication with existing CAS (Central Acquisition System) via internet access (LTE / 3G / 2G, ADSL / VDSL, DSL, Ethernet) through WAN port |  |  |  |
| 9.8 | 5 x RS232 communication ports for communication with the equipment |  |  |  |
| 9.9 | 1 x RS485 communication ports for communication with the equipment |  |  |  |
| 9.10 | 4 x USB ports for communication with the equipment |  |  |  |
| 9.11 | 2 x 100/1000 Ethernet for transfer of the data to the central software and access to the equipment. Separated ports for connection of equipment for communication to internet (WAN port) and port for communication with measuring equipment from the station (LAN port). |  |  |  |
| 9.12 | Internal memory that allows data storage for a period of 10 years for a total of 50 different measuring components (SO2, NO, NO2, NOx, CO) |  |  |  |
| 9.13 | Should be able to start automatically after the power loss |  |  |  |
| 9.14 | Possibility of cascading two dataloggers in master-slave mode, where slave datalogger is used as an extension for connecting more than 6 analyzers/sensors |  |  |  |
| 9.15 | Housing adopted in a 19” rack |  |  |  |
| 9.16 | Connection of analyzers/sensors using the RS232 / 485 interface or through the LAN port using the IP protocol |  |  |  |
| 9.17 | **Software:**  Operating system that provides reliable operation and data processing in real time;  Web application for configuring DataLogger that allows easy management of DataLogger;  Placing raw and processed data on the datalogger itself with the possibility of re-sending to CAS or exporting data in Excel format;  Data consistency in case of power failure and re-arrival;  Acquisition of measured minute values on devices with parameters:  Time measurement – timestamp, Code of the measuring component,  Device type,  Device serial number,  Measurement status - measurement, span-zero calibration, service/maintenance  Errors-alarms on the devices.  Processing of measured data, aggregation and storage in a database,  Generating a backup of the measured data to the external memory,  Processing of error signals (alarms) received from measuring devices and generation of error reports.  Monitoring of measuring devices and remote access and control;  Web configuration of the complete monitoring station;  Security control of access to DataLogger, in the station and over the Internet;  Control of establishing and maintaining a VPN connection to the central system;  Automatic "update" with changes in software and configuration;  E-mail warning about exceeding the limit values ​​or the alarm conditions of the equipment;  Complete user interface in Serbian or English language.  Connection to the central data acquisition system KOŠAVA v5; Please see Annex 1: Compliance with existing “Košava” system.  Providing real-time data transfer to the CAS central data acquisition system with all device and station status parameters;  Possibility of creating and automatically sending to CAS an electronic work order during regular and extraordinary work on the station and equipment  Ability to monitor and control who is entering the station via sensors or video surveillance with direct input on data logger and transferring info to CAS. |  |  |  |
| 9.18 | **Additional services before the provisional acceptance**  Unloading products at the place of delivery.  When delivering equipment, it is required to install the equipment and verify performance of hardware and software.  After installing the equipment and instruments, it is necessary to perform a test that shows that the data from all the instruments are received and that they can be processed and displayed using the ”Košava” software. Please see Annex 1: Compliance with existing ”Košava” system.  Basic training of employees (up to 5 people) for use of the installed equipment and instruments on Serbian language during 5 days. Instructions manual must be provided. The original operating instructions for all system components can be in English. A brief instruction manual should be in Serbian.Instructions manual, original operating instructions and brief instruction manual should be in electronic form. |  |  |  |

**Important Notes:**

* The eventual documentation supplied should clearly indicate (highlight, mark) the models offered and the options included, if any, so that the evaluators can see the exact configuration. Offers that do not permit to identify precisely the models and the specifications may be rejected by the evaluation committee.
* The offer must be clear enough to allow the evaluators to make an easy comparison between the requested specifications and the offered specifications.
* **Unless otherwise specified, the requirements in these Technical Specifications are presented as a minimum standard which the offered goods must meet.**
* **For all required standards required in technical specification tenderer may offer equipment with equivalent standard compliance if applicable.**

**Warranty:**

Tenderers must provide local reliable warranty service agent providing maintenance and the rapid supply of equipment spare parts and consumables for the Warranty duration of one year.

Offer must include warranty service description including:

• Service organisation contact data including name, postal address, telephone number, fax number and e-mail address;

• Help Desk (phone) support, which must be available during working hours, 8AM – 4PM;

• Guaranteed maximum response time to submitted maintenance support request (fax or e-mail) of 1 (one) working day;

• Guaranteed that any requests for services will be attended to within 24 hours;

• Guarantee that all items can be repaired or alternatively replaced within a maximum of 72 hours;

**Annex 1. - Compliance with existing “Košava” system**

Data logger receives files/data from the analyzers that are part of the station. Data loggers from the monitoring stations send data to central acquisition system through VPN communication (it is necessary to have internet connection - cable, lte/3/4g router into station). Moreover there is API protocol (essential part of existing CAS) for sending files to existing central acquisition system from different dataloggers/users/systems if necessary. All the files sent via API protocol (either to or from CAS) should be in JASON format.

Main features of existing ”Košava“ system:

* Fully web-based application
* Total independence from operating system
* Total independence from relational database
* Integrated VPN hub for communication with remote data loggers
* Multilingual system (defined via language file), as well as online Help
* System operates with all known analyzer manufacturers, with option to expand for new devices.
* System collects all measurement parameters defined according to AQUI / DEM standard (pollutants, metadata), as well as all other parameters defined by the equipment manufacturer.
* Alarm and warning notifications via E-mail service.
* Option to create up to 100 networks.
* Option to connect over 1000 measurement stations (data loggers), with each station capable of sending over 100 measurement parameters.
* Dynamic display of current measurements, as well as measurements for a specified period.
* Georeferencing of measurement stations and display of data and station locations on Google Maps
* Automatic backup on local data archive system, as well as remote data storage systems.
* Overview of the complete system inventory, overview of functional and dysfunctional equipment per station, as well as equipment performance logs.
* Record keeping for equipment servicing, service and maintenance costs, failures and replacement of spare parts.
* System has no limitations regarding number of users or time of use.