

ANNEX II + III: TECHNICAL SPECIFICATIONS + TECHNICAL OFFER

Contract title: Strengthen capacities in air quality monitoring

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Publication reference: NEAR/BEG/2023/EA-OP/0121

Annex 1 to Corrigendum no.1 replaces version published on 8 September 2023

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 on its 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 offered specifications.

Unless otherwise specified, the requirements in these Technical Specifications are presented as a minimum standard which the offered goods must meet.

1. Item Number	2. Specifications Required		3. Specifications Offered	4. Notes, remarks, ref to documentation	5. Evaluation Committee's notes
1.	Air quality monitoring container (Includes air conditioning and calibration gases)	Quantity: 20			
	Manufacturer's name:				
	Product type, model:				
	Specification				
1.1.	<p>The container must be designed in a way to enable installation and operation of all components listed under items 2 – 9.</p> <p>The Air quality monitoring station needs to fulfil the following requirements:</p> <p>The Air Quality Monitoring Stations must be designed and constructed to work as an integrated system and equipped with the monitoring; analysis, sensor, sampling and data logging / communication devices identified as sub-items;</p> <p>All equipment and parts should be accessible for operation and maintenance.</p> <p>The shelter for the Ambient Air Quality Monitoring Stations must fulfil the requirements described under: 1.2, 1.3, 1.4, 1.5, 1.6, 1.7, 1.8, 1.9, 1.10, 1.11, 1.12 and 1.13.</p>				

1.2	<ul style="list-style-type: none"> • Design and dimensions: 3000 * 2500 * 2500 mm (L * W * H) +/- 5%; <p>Construction enabling fixing of meteorological mast for anemometer and one sealed sampling probe (PM10 and PM2.5 and PM1) must be inserted on the roof with flanges of non-corrosive material;</p> <p>Meteorological mast should be fixed on the container;</p> <p>Ability for transportation by crane via top four corners eye-bolt;</p> <p>Protection against electrical/magnetic interference – inside and external of shelter;</p> <p>Sampling heads, meteorological mast with sensors must be secured and tightened with tightrope cable.</p>			
1.3	<ul style="list-style-type: none"> • Materials: The container shall consist of, white color container constructed and equipped with all the necessary instruments for the specified measurements. All materials, which are used for the construction of the shelter, shall be with resistance to humidity, dust and corrosive environment. The construction shall be of water proof, leak proof, and dust proof construction; The insulation factor should be 0.6 W/m² K. 			
1.4	<ul style="list-style-type: none"> • Doors: The shelter should have one door. Door (doors) should be with staircase and equipped with a doubled security lock (3 point steel stick inside the door) and alarm for intruders. 			

	<ul style="list-style-type: none"> • Alarm system for unallowed opening of the door: The alarm should notify the user when it is triggered, by data logger via email. The email will be sent to a person defined by SEPA. 			
1.5	<ul style="list-style-type: none"> • Roof: The roof should be flat enabling fixing of sampling systems. The roof should be covered with anti-slip and non-corrosive material and properly fenced (minimal height of 80 cm, non-corrosive material) against fall of persons working on it. There should be sufficient drainage or gradient to prevent of water of staying. Roof construction should be capable of 250 kg loading. 			
1.6	<ul style="list-style-type: none"> • Floor: The floor should be made of a water-resistant and anti-static material. 			
1.7	<ul style="list-style-type: none"> • Interior: A desk plus drawers' bench with storage space should be placed in the shelter. A chair made out of antistatic material should be provided; The installed lighting should be in accordance to the valid lighting standards in EC for operation and maintenance of the equipment; One fire extinguisher; Three-cylinder holders for calibration gases 50 L bottles; 1 (one) ladder shall be included in the offer, with height of 3 m. 			

1.8	<ul style="list-style-type: none"> • Installation analysers and devices: <p>2 pieces 19" racks suitable for offered instruments. The rack cabinets shall be shock and vibration proofed.</p>			
1.9	<ul style="list-style-type: none"> • Assurance of stable temperature inside the container: <p>Temperature inside the container shall be kept at 20 ± 2 °C by means of a suitable air condition system inverter 3.5 KW with option of self-restart after possible losing of power, controlled by internal thermostats during summer conditions and a heater during winter conditions.</p>			
1.10	<ul style="list-style-type: none"> • Electric installation: <p>Power line 3 * 230 V / 400 V;</p> <p>All electrical and/or analytical equipment to run on 230 VAC power supply;</p> <p>Electric protections, power plugs and sockets;</p> <p>There shall be a function for cutting off the analyzers when the temperature reaches outside a preset temperature range (15 ± 2 °C, 40 ± 2 °C);</p> <p>1.10.5. There shall be separate groundings for power and signal (instrument);</p>			

1.11	<ul style="list-style-type: none"> Additional requirements: <p>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.</p>			
1.12	<ul style="list-style-type: none"> Calibration gases: <p>1 set of 3 gas cylinders 50 liters (NO, SO₂ and CO) shall be installed in air quality monitoring station container</p> <p>Cylinder size: 50 L.</p> <p>Cylinders: Aluminium cylinder 50 L with valve Number 14 according to DIN 477;</p> <p>Full pressure: 150 bar;</p> <p>Stability period: 12 months;</p> <p>Accuracy: ± 10 % for ppb range and ± 2 % for ppm range.</p> <p>1 (one) Span gas cylinder NO with certificate from reference laboratory: 50 L gas cylinder for NO -- 400 ppb ± 10% in N₂ (purity 5.0). The delivery must include cylinder with two stage stainless steel pressure regulators;</p>			

	<p>1 (one) Span gas cylinder SO₂ with certificate from reference laboratory: 50 L gas cylinder for SO₂ -- 400 ppb ± 10% in N₂ (purity 5.0). The delivery must include cylinder with two stage stainless steel pressure regulators;</p> <p>1 (one) Span gas cylinder CO with certificate from reference laboratory: 50 L gas cylinder for CO -- 8 ppm ± 2% in N₂ (purity 5.0). The delivery must include cylinder with two stage brass or similar pressure regulators.</p>			
1.13	<p>Additional services before the provisional acceptance Unloading products at the place of delivery. When delivering equipment, it is required to install the equipment.</p>			

1. Item Number	2. Specifications Required		3. Specifications Offered	4. Notes, remarks, ref to documentation	5. Evaluation Committee's notes
2	Automatic analyzer for measuring of suspended particulate matter PM10, PM2.5 and PM1	Quantity: 29			
	Manufacturer's name:				
	Product type, model:				
	Specifications				
2.1	Measuring Principle: Optical system for simultaneously measurements of PM10, PM2.5 and PM1				
2.2	Measurement: Simultaneously continuous measurement of PM10, PM2.5 and PM1				
2.3	Range: User selectable in the range from 0 to 5000 µg/m ³				
2.4	<ul style="list-style-type: none"> • Measurement cycle: < 1 min 				
2.5	<ul style="list-style-type: none"> • Operating temperature: +5 to +40°C 				
2.6	<ul style="list-style-type: none"> • Signal inputs/outputs: <u>Digital:</u> 				

	Bi-directional RS 232 and/or Ethernet (using TCP/IP protocol) for measuring data, internal parameters and configuration.			
2.7	<ul style="list-style-type: none"> Internal memory: All data should be stored on a removable memory card or USB stick 			
2.8	<ul style="list-style-type: none"> Sampling system: length: 1 m above the roof including waterproof flange 			
2.9	<ul style="list-style-type: none"> Certificates: Certificates which show the conformity of the analyzer in accordance with the <i>Guidance to the Demonstration of Equivalence of Ambient Air monitoring Methods, version January 2010 (GDE)</i> 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. The laboratory performing the tests of the analyser must be accredited according to EN ISO/IEC 17025 for the specific test procedures. 			
2.10	<ul style="list-style-type: none"> dimensions Standard 19" rack mountable, including mounting material for fixing to a 19" rack 			
2.11	<ul style="list-style-type: none"> others: Built-in temperature and humidity sensor; . Real calibration possibility of all optical channels and the mass concentration in Serbia. 			

2.12	<ul style="list-style-type: none"> • Power: 220 -- 240 V AC, 50 Hz. 			
2.13	<ul style="list-style-type: none"> • Installation: Instrument must be installed at the existing monitoring station on 19" rack by the contractor; Sampling probe of analyzer must be installed by the bidder on the roof with flanges of non-corrosive material. 			
2.14	<p>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 2: Compliance with existing 'Košava' system.</p> <p>Basic training of SEPA 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.</p>			

1. Item Number	2. Specifications Required		3. Specifications Offered	4. Notes, remarks, ref to documentation	5. Evaluation Committee's notes
3	Sulphur dioxide (SO ₂) analyzer	Quantity: 10			
	Manufacturer's name:				
	Product type, model:				
3.1	Principle: UV Fluorescence according to EN14212:2012				
3.2	Certification: Certificate which shows the conformity of the analyser in accordance with EN14212:2012 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 14212:2012. Full Type Approval Test Report is required and should be in offer. The laboratory performing the tests of the analyser must be accredited according to EN ISO/IEC 17025 for the specific test procedures.				
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 ppb			
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: <u>Digital:</u> Bi-directional RS 232 Ethernet using TCP/IP protocol			

	Control outputs for external calibration units: potential-free contacts or open collector (zero/span signal)			
3.13	Instrument diagnostic: <u>Remote:</u> via RS 232 and Ethernet <u>Local:</u> 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. 4 height units including mounting material for fixing to a 19" rack including telescopic slides			
3.18	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 2: Compliance with existing 'Košava' system.			

	<p>Basic training of SEPA 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.</p>			
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1. Item Number	2. Specifications Required		3. Specifications Offered	4. Notes, remarks, ref to documentation	5. Evaluation Committee's notes
4	Nitrogen oxides analyser NO_x (NO and NO₂)	Quantity: 16			
	Manufacturer's name:				
	Product type, model:				
4.1	Principle: Chemiluminescence method according to EN14211:2012				
4.2	Certification: Certificate which shows the conformity of the analyser in accordance with EN14211:2012 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 14211:2012. Full Type Approval Test Report is required and should be in offer. The laboratory performing the tests of the analyser must be accredited according to EN ISO/IEC 17025 for the specific test procedures.				
4.3	Sample cleaning: 5 µm PTFE filter 47 - 54 mm Filter holder accessible from front side of the analyzer.				

	NH3 response at the level of the limits prescribed by EN 14211			
4.4	Ranges: Programmable 0 -- 50, 100, 200, 500, 1.000, 10.000 and 20.000 ppb.			
4.5	Lower detectable limit: ≤ 0.3 ppb.			
4.6	Drifts: zero < 0,5 ppb/24h span < 0,5% full scale/24h			
4.7	Operating temperature: +5 to +40°C			
4.8	Flow control: By critical orifice, internal pump			
4.9	Linearity: ≤ 1% full scale			
4.10	Display: LCD color display with touch screen			
4.11	Converter: Molybdenum converter, converter efficiency >95% Heated to > 300°C			
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:			

	<u>Digital:</u> Bi-directional RS 232 Ethernet using TCP/IP protocol Control outputs for external calibration units: potential-free contacts or open collector (zero/span signal)			
4.14	Instrument diagnostic: <u>Remote:</u> via RS 232 and Ethernet <u>Local:</u> 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. 4 height units including mounting material for fixing to a 19" rack including telescopic slides			
4.19	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.			

	<p>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 2: Compliance with existing 'Košava' system.</p> <p>Basic training of SEPA 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.</p>			
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1. Item Number	2. Specifications Required		3. Specifications Offered	4. Notes, remarks, ref to documentation	5. Evaluation Committee's notes
5	Ozone analyzer (O3)	Quantity: 9			
	Manufacturer's name:				
	Product type, model:				
5.1	Principle: UV photometry according to EN14625:2012				
5.2	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. The laboratory performing the tests of the analyser must be accredited according to EN ISO/IEC 17025 for the specific test procedures.				
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 10 ppm				

5.5	Lower detectable limit: ≤ 0.5 ppb.			
5.6	Drifts: - zero <1ppb/24h - span < 1% 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	Switching to sample/span/zero inlet: By internal electro valves			
5.11	Display: LCD color display with touch screen			
5.12	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 50ppb to 1000ppb.			
5.13	Signal inputs/outputs: <u>Digital:</u> Bi-directional RS 232 Ethernet using TCP/IP protocol			

	Control outputs for external calibration units: potential-free contacts or open collector (zero/span signal)			
5.14	Instrument diagnostic: <u>Remote:</u> via RS 232 and Ethernet <u>Local:</u> on instrument display			
5.15	Connection to data logger: Digitally (Ethernet or RS-232).			
5.16	User interface: Software controlled from multi line menu with keys. Adjustable display.			
5.17	Power: 220 -- 240 V AC, 50 -- 60 Hz.			
5.18	Dimensions: Standard 19" rack mountable, max. 4 height units including mounting material for fixing to a 19" rack including telescopic slides			
5.19	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			

	<p>KOŠAVA software. Please see Annex 2: Compliance with existing 'Košava' system.</p> <p>Basic training of SEPA 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.</p>			
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1. Item Number	2. Specifications Required		3. Specifications Offered	4. Notes, remarks, ref to documentation	5. Evaluation Committee's notes
6	Meteorological equipment –Air Quality Monitoring Station	Quantity: 18			
	Manufacturer's name:				
	Product type, model:				
6.1	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				
6.2	Pole for mounting meteorological device: Height: 10 m above ground Material: aluminium or stainless steel				
6.3	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				

6.4	<p>Wind direction sensor:</p> <p>Method: ultrasonic</p> <p>Measuring area: 0 – 359.9°</p> <p>Accuracy: < 3 ° RMSE > 1.0 m/sec</p>			
6.5	<p>Temperature sensor:</p> <p>Principle Method: NTC</p> <p>Measuring area: –50°C to +60°C</p> <p>Accuracy: 0.2°C (-20°C – 50°C)</p>			
6.6	<p>Relative Humidity sensor</p> <p>Principle Method: Capacitive</p> <p>Measuring area: 0 – 100%</p> <p>Accuracy: ± 2%</p>			
6.7	<p>Global radiation sensor</p> <p>Measurement method: Silicon photo diode or thermopile;</p> <p>Response time (95%): < 1 s;</p> <p>Non-stability (change/year): +/- 1%;</p> <p>Non-linearity (0 to 1000 W/m²): +/- 1%;</p> <p>Directional error: < 30 W/m²;</p> <p>Temperature dependence of sensitivity: +/- 5%;</p> <p>Spectral range: 300 to 1100 nm;</p> <p>Measuring range: 1400 W/m².</p>			

6.8	<p>Barometric pressure sensor</p> <p>Principle Method: MEMS capacitive</p> <p>Measuring area: 400 – 1200 hPa</p> <p>Accuracy: 0.5 hPa</p>			
6.9	<p>Installation:</p> <p>Meteorological equipment shall be installed on monitoring station.</p>			
6.10	<p>Additional services before the provisional acceptance</p> <p>Unloading products at the place of delivery.</p> <p>When delivering equipment, it is required to install the equipment and verify performance of hardware and software.</p> <p>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 2: Compliance with existing 'Košava' system.</p> <p>Basic training of SEPA 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.</p>			

1. Item Number	2. Specifications Required		3. Specifications Offered	4. Notes, remarks, ref to documentation	5. Evaluation Committee's notes
7	PM10, PM2.5 sequential standard reference sampler	Quantity: 22			
	Manufacturer's name:				
	Product type, model:				
7.1	Flow rate Variable from 1.0 m ³ /h up to 2.3 m ³ /h				
7.2	Pump: Vacuum pump with maximum flow rate of 6 m ³ /h (no blower type). Controlled flow rates: 1.0 – 2.3 – 3.0 m ³ /h Converted to ambient temperature (T) and ambient air pressure (P), built-in P and T sensors.				
7.3	Sampling time 1 h – maximum 168 h per filter.				

7.4	<p>Magazines for filters:</p> <p>4 (four) magazine boxes in total: (two) magazine boxes: 1 (one) magazine box for the blank filters and 1 (one) magazine box for sampled filters; 1 additional set of 2 (two) magazines (for sampled and clean filters) with transportation box should be included in the offer</p> <p>Magazine boxes should be able to load 16 filter holders, each;</p> <p>Sampled filters must be covered within their magazine.</p>			
7.5	<p>Filter Holders:</p> <p>The filter holders must be made of POM.</p> <p>The filter holders must be able to take in filters of 47 mm or 50 mm diameter.</p> <p>The height of the filter holders must be 12 mm and the outer diameter 71.5 mm. The free filter area must be 37.5 – 40.0 mm.</p> <p>16 filter holders must be delivered with each sampler.</p>			
7.6	<p>Deviation from the set point of flow rates according to CEN EN 12341:2014:</p> <p>< 2% over the sampling period</p> <p>< 5% instantaneous value</p>			

7.7	Power supply 230 V, 50/60 Hz.			
7.8	Interface RS232; USB 2.0. or SD card			
7.9	Consumption ≤ 450 VA.			
7.10	Temperature Range - 30°C up to more than 50°C			
7.11	<p>Housing, sampling system</p> <p>The housing must be made of stainless steel sheet metal of 1.2 mm thickness. Stainless steel have to be for outdoor use.</p> <p><u>Dimensions:</u> Width max. 600 mm Depth max. 400 mm Height with inlet max 170 cm Weight max 80 kg</p> <p>The housing must be equipped with casters.</p> <p>The sampling system must be equipped with sheath air. The sampling tube must be made of stainless steel. Temperature measurement directly downstream the filter.</p>			

7.12	<p>Noise level according to DIN 2058</p> <p>in a distance of 8 m << 35 dBA</p>			
7.13	<p>Inlets</p> <p>Impactor inlets with exchangeable jets (1 set 8 pieces, each):</p> <p>PM10 (according to CEN EN 12341:2014)</p> <p>PM2.5 (according to CEN EN 12341:2014)</p> <p>designed for the flow rate of 2.3 m³/h, each.</p>			
7.14	<p>Data output</p> <p>All measuring data and results such as sampling time, sampled volume in operating-m³ and standard-m³ (Nm³), mean temperature etc. must be recorded and stored on a USB stick / SD card. Further, all current measuring data and signals per currently sampled filter must be logged on the USB stick / SD card every minute or every 5 minutes (data logger function) such as elapsed sampling time, current flow rate, ambient temperature and pressure, current pressure drop across the currently sampled filter etc.</p> <p>A real-time data transmission to a central data acquisition system must be also possible (Bavaria-Hessian protocol).</p>			

7.15	<p>Leak test</p> <p>The sampler must be equipped with an internal leak check, which complies with the requirements as laid down in the CEN EN 12341:2014. This leak check must include the complete pipe work between pump and sampling head and the filter holder at the sampling position (without inlet).</p>			
7.16	<p>Installation:</p> <p>PM10, PM2.5 sequential standard reference sampler shall be installed next to monitoring station.</p>			
7.17	<p>Remote Support</p> <p>The sampler must be equipped with an additional interface in order to connect a mobile phone for data transfer.</p> <p>This application allows to check and control all functions of the sampler remotely by customer or supplier in case of trouble-shooting.</p>			

7.18	<p>Additional services before the provisional acceptance</p> <p>Unloading products at the place of delivery.</p> <p>When delivering equipment, it is required to install the equipment and verify performance of hardware and software.</p> <p>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 2: Compliance with existing 'Košava' system.</p> <p>Basic training of SEPA 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.</p>			
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1. Item Number	2. Specifications Required		3. Specifications Offered	4. Notes, remarks, ref to documentation	5. Evaluation Committee's notes
8	Data acquisition system (Data logger, 4G GSM router and software)	Quantity: 9			
	Manufacturer's name:				
	Product type, model:				
	Specifications				
8.1	The Supplier shall enable the central acquisition system to communicate with the monitoring stations via 4G GSM router.				
8.2	1 (one) 4G GSM router should be included in the offer.				
8.3	1 (one) Data logger should be included in the offer.				
8.4	Data logger should archive the data from the measuring instruments.				
8.5	Data logger should communicate with the PC.				
8.6	Data logger should communicate and control environmental analyzers, meteorological equipment/sensors				
8.7	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				
8.8	5 x RS232 communication ports for communication with the equipment				
8.9	1 x RS485 communication ports for communication with the equipment				
8.10	4 x USB ports for communication with the equipment				

8.11	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).			
8.12	Internal memory that allows data storage for a period of 10 years for a total of 50 different measuring components (SO ₂ , NO, NO ₂ , NO _x , CO)			
8.13	Should be able to start automatically after the power loss			
8.14	Possibility of cascading two dataloggers in master-slave mode, where slave datalogger is used as an extension for connecting more than 6 analyzers/sensors			
8.15	Housing adopted in a 19" rack			
8.16	Connection of analyzers/sensors using the RS232 / 485 interface or through the LAN port using the IP protocol			

8.17	<p>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;</p>			
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	<p>Complete user interface in Serbian or English language. Connection to the central data acquisition system KOŠAVA; Please see Annex 2: Compliance with existing 'Košava' system.</p> <p>Providing real-time data transfer to the CAS central data acquisition system with all device and station status parameters;</p> <p>Possibility of creating and automatically sending to CAS an electronic work order during regular and extraordinary work on the station and equipment</p> <p>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</p>			
8.18	<p>Additional services before the provisional acceptance Unloading products at the place of delivery.</p> <p>When delivering equipment, it is required to install the equipment and verify performance of hardware and software.</p> <p>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 2: Compliance with existing 'Košava' system.</p> <p>Basic training of SEPA 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.</p>			

1. Item Number	2. Specifications Required		3. Specifications Offered	4. Notes, remarks, ref to documentation	5. Evaluation Committee's notes
9	UPS – uninterruptible power supply system	Quantity: 18			
	Manufacturer's name:				
	Product type, model:				
9.1	<p>UPS (30 minutes) for all analysers, meteo-sensor, sampling unit and data logging / communication devices operating at full power.</p> <p>Separated outlets connected to the UPS.</p> <p>UPS outlets for monitors and data equipment and non-UPS outlets for heating and cooling equipment need to be clearly labelled;</p> <p>Output power 2400 W / 3000 VA</p> <p>Nominal input voltage 230V</p> <p>Frequency range 50/60 Hz +/- 5 Hz</p> <p>Automatic internal bypass</p> <p>LED display</p> <p>Possibility of cold start</p>				

	Working environment conditions: temp. 0 - 40 °C, RH (RH) 0 - 95%			
9.2	<p>Additional services before the provisional acceptance</p> <p>Unloading products at the place of delivery.</p> <p>When delivering equipment, it is required to install the equipment and verify performance of hardware and software.</p> <p>Basic training of SEPA employees (up to 5 people) to use of the installed equipment and instruments on Serbian language.</p> <p>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..</p>			

Support & maintenance requirements during warranty and commercial warranty period for all items				
Commercial warranty	<p>1 additional year (after the end of 1 year standard warranty) in accordance with the conditions laid down in Article 32 of the General Conditions and Article 32 of the Special Conditions</p> <p>Tenderer must provide a detailed description of the organisation of the proposed service (e.g. name of the authorised service provider)</p>			
Response time	<p>On-site response time within 48 hours during 2 years after provisional acceptance</p> <p>Tenderer must provide a detailed description of the organisation of the proposed service (e.g. name of the authorised service provider)</p>			
Repair time	<p>72 hours repair time during 2 years after provisional acceptance</p> <p>Tenderer must provide a detailed description of the organisation of the proposed service (e.g. name of the authorised service provider)</p>			

Part II – Place of delivery/Acceptance

In the excel table (Annex 1 -Distribution list) attached.

Annex 2. - 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 JSON 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.