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

**Supply of Equipment for measurement, monitoring, and remote control in the water supply system**

**11-404-94/25**

**Columns 1-2 should be completed by the Project partner**

**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 Project partner 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 offeredspecifications.

The requirements set out in the technical specifications represent the minimum technical characteristics which offered goods must satisfy, unless stated otherwise, and tenderers are not allowed to modify technical specification in any way.

For each item for which it is not explicitly stated that it is allowed to offer goods of the equal characteristics, i.e. for each item where it is not stated “or equivalent”, for the purposes of this tender documentation it is assumed that words “or equivalent” are stated, and tenderer is allowed to offer equivalent goods / goods of equivalent characteristics.

| **1.**  **Item no.** | **2.**  **Specifications Required** | **3.**  **Specifications Offered** | **4.**  **Notes, remarks,  ref to documentation** | **5.**  **Evaluation Committee’s decision (Y/N)** |
| --- | --- | --- | --- | --- |
| **1** | **Portable ultrasonic flow meter – 2 pieces**  -Measurement range (possible) and flow direction from 0.01 to 25 m/s, with the capability of bidirectional measurement  -Device protection class: IP67, according to EN60529  -Sensor protection class: IP68  -Operating temperature: from minimum -10ºC to +50ºC  -Display: 2 lines with 16 characters each, with backlight  -Power supply options (energy consumption): 12V DC, built-in battery power (<3W); 220V/12V adapter for mains supply  -2 MHz sensors for measurement on pipes of all materials and sizes from DN40 to DN1100  -Sensor operating temperature: from -40ºC to +100ºC  -Output signals: 4 to 20 mA; pulse (reed contact)  -Memory capacity: more than 100,000 records  -Communication with computer via RS232 port  -Additional equipment: computer software for data transfer and analysis, transport case, cable for PC connection |  |  |  |
| **2** | **Pressure meter – with the option for hydrant attachment (loggers) – 8 pieces**  -Measurement range: 0 – 20 bar  -Protection class: IP68  -Operating temperature: -20 to +60°C  -Power supply: internal battery  -Operating time: minimum 5 years or 100,000 measurements  -Memory: minimum 500,000 readings  -User interface: bidirectional wireless communication  -Pressure sensor error: max 1%  -Measurement interval for pressure surges: 0.1 second  The set should also include:  -A compatible device for wireless remote data reading, compatible with a PC  -Hydrant adapter and 2.0 hose (quick coupling – threaded) for pressure gauge installation |  |  |  |
| **3** | **Multi-jet water meters for measuring sanitary (drinking) water consumption – 170 pieces**  DN 20 (3/4”), Q4 = 5 m³/h, Installation length L = 190 mm. The water meter must comply with the requirements prescribed by the Rulebook and the metrological conditions for water meters, as well as the accuracy requirements according to ISO 4064/93, at minimum accuracy class “C” (R=160), with a minimum nominal pressure of 16 bar (NP 16). All water meters must be accompanied by appropriate documentation from the Republic Institute for Standardization and Metrology of RS or the State Institute of Metrology of BiH and must be sealed with a valid metrological seal. The serial number of the water meter, along with other markings and labels, must be clearly visible. Water meters must be prepared for remote RF LoRaWAN or GPRS reading (or equivalent), with the capability of on-site RF-LoRa 8or equivalent) module installation without removing the seal or the water meter itself.  RF-LoRa (or equivalent) modules can be from any manufacturer but must be fully compatible with the hardware and software currently used by Vodovod Trebinje for radio-based meter reading.  The water meters should be of the **horizontal type with a semi-dry mechanism**, multi-jet, equipped with a protected dial and mechanical transmission. The dial must be fully protected against water and dirt ingress (installed within a sealed casing filled with lubricant and gel).  The housing of new household/individual/main water meters must be made of **brass according to CC754S standard** for copper and copper alloys, compliant with the European standard EN1982, both internally and externally protected with an epoxy powder coating no thinner than 120 microns, safe for human health. Installation length: L = 190 mm. A non-return valve must be installed on the outlet side, and a dirt filter on the inlet side. Brass unions must be supplied with the water meters. Accuracy class “C” according to MID Directive, R ≤ 160 (horizontal installation). Water meters must be **new and ready for remote reading**. |  |  |  |
| **4** | **Remote reading module RF / RF (LoRaWAN or equivalent) – 1.000 pieces**   * LoRaWAN (or equivalent) protocol: Class A * Operating frequency: 868 MHz * Battery capacity: minimum 8000 mAh * Communication range: minimum 3000 meters * Protection class: minimum IP68 * Battery life: minimum 5 years   The modules must include protection against external magnetic fields via an inductive sensor, electronic leak detection, and bidirectional communication capability.  The module is to be installed on BAYLAN water meters of types TK, TY, VK, and SD, which are already installed in the Vodovod a.d. Trebinje system.  Communication with base stations must comply with the "long-range" WAN 1.0 standard already in use by Vodovod a.d. Trebinje.  Additionally, full compatibility must be ensured with the existing LoRaWAN gateways and the ChirpStack LoRaWAN server used by Vodovod a.d. Trebinje. |  |  |  |
| **5** | **Base Station for Remote Reading (LoRaWAN KL Gateway Outdoor or equivalent) – 2 pieces**  Communication: in accordance with LoRaWAN 1.0 or equivalent Operating temperature: -40°C to +60°C External LoRa antenna (or equivalent) Compliance: EU EN 300220 and EN 55022 Class B, EN 55024 or equivalent The base station must support data transmission via GPRS communication   * Connectivity: 2G/3G/4G, Ethernet * Capacity (number of messages): 700,000 messages per day * Installation type: Outdoor * Transmission power: 27 dBm * Sensitivity: -141 dBm * Number of channels: 8 * Real-time analysis capability: Yes * Power supply: PoE (Power over Ethernet) * Backup battery: 1 minute * Protection level: IP67 * Secure operating system |  |  |  |
| **6** | **Handheld Terminal for Remote Reading – WiFi / RF Modem – 1 piece**  A device for collecting data from the remote water meter reading system, with pre-installed software.   * Operating frequency: 868 MHz * Memory capacity: minimum 1000 read units |  |  |  |
| **7** | **Software for Data Collection and Processing – AMR/AMI (Automated Meter Reading / Advanced Metering Infrastructure) – 1 piece**  Software for collecting and processing data from the remote water meter reading system, primarily based on bidirectional communication. The system must include an interface for collecting, processing, and generating data, which is stored in a centralized database and collected via LoRaWAN gateways, LoRaWAN radio modules, and a LoRaWAN server. |  |  |  |
| **8** | **Turbidimeter – Laser Turbidity Sensor – 1 piece**   * Measurement range: 0–100 NTU (Model OLTU600 for drinking water) * Turbidity detection range: 0.001 to 100 NTU * Resolution: 0.001 NTU * Accuracy:   + For range 0.001–40 NTU: ±2% of reading or ±0.015 NTU   + For range 40–100 NTU: ±5% of reading * Operating temperature range: 0–45 °C * Communication: RS485 with MODBUS-RTU protocol * Power supply: 9–18 V DC * Power consumption: 2.5 W * Housing material: POM, nylon, ABS, and stainless steel * Dimensions: 140 × 140 × 330 mm * Weight: 2.1 kg * Protection rating: IP65 * Sample flow rate: 100–700 mL/min (ideally 200–300 mL/min) |  |  |  |
|  | The bidder is required to submit samples along with the offer for the following items:  a. Domestic "semi-dry" water meter DN 20 (3/4") b. Remote reading module compatible with the installed domestic water meters  All offered equipment must fully comply with the above-mentioned technical requirements. Additionally, the entire equipment must be compatible with the hardware and software systems used by "VODOVOD" a.d. Trebinje. If it is determined that the proposed equipment does not meet these requirements, the Contracting Authority reserves the right to reject such an offer as technically unacceptable.  Provide instructions for use in the local language and, if necessary, provide a half-day training for the installation and use of the procured equipment  Warranty – minimum 1 year | | | |