**TECHNICAL SPECIFICATION No TS 1506.001 v1**

**Cable Test Van, 70 kV**

Procurement of automated cable test van for testing, fault location of underground power cables from 0.4 kV to 20 kV based on vehicle, commercial motor transport up to 3.5t. Weight information: cable test van total weight could be ≤ 3500 kg.

| **No** | **Description** | **Minimal technical requirement** | **The offer with technical specification** | **The exact source[[1]](#footnote-1)** | **Remarks** |
| --- | --- | --- | --- | --- | --- |
| **Priority “A” requirements** | | | | | |
|  | **GENERAL REQUIREMENTS** |  |  |  |  |
|  | Manufacturer (name and factory location) | Specify |  |  |  |
|  | 1506.001 Cable Test Van, 70 kV [[2]](#footnote-2) | Specify type reference |  |  |  |
|  | User manual | LV or EN or RU |  |  |  |
|  | Cable Test Van photo | available |  |  |  |
|  | Complies with European directives | confirm |  |  |  |
|  | Before delivery all the offered equipment must be carried out by type of metrology and production tests. Checks must comply with the IEC / CENELEC standards, according to each type of equipment. | confirm |  |  |  |
|  | The offeror must offer all the necessary hardware and computer software for all of the specific (display) functions, including all the necessary protection, accessories and connecting parts, the operating and maintenance documentation in Latvian or English or Russian languages | confirm |  |  |  |
|  | **FUNCTIONAL REQUIREMENTS** |  |  |  |  |
|  | Cable testing with >70 kV DC; | available |  |  |  |
|  | Cable testing with >38 kV AC (VLF sine and cos wave) according IEEE 400.2-2013 standard; | available |  |  |  |
|  | Advanced TDR pre-location methods including  [1] high flash over faults up to >70 kV,  [2] long cables,  [3] intermittent faults; | available |  |  |  |
|  | Arc Reflection Technology (ART) cable fault pre-location in MV/HV network with >32 kV and > 2500 Joules (for 8, 16 and 32 kV) | available |  |  |  |
|  | Arc Reflection Technology (ART) cable fault pre-location in LV networks with 4 kV and >1500 Joules; | available |  |  |  |
|  | Cable fault conversion based on infinitely variable (0- >15 kV) resonance burning with >30 A output at >15 kV and live TDR monitoring; | available |  |  |  |
|  | Cable fault pinpointing based on acoustic-magnetic method with fast (min. 3s) impulse charging across all voltage levels; | available |  |  |  |
|  | Integrated audio frequency generator for cable line tracing, depth indication and line identification with min. 2 powerful operating frequency ranges <2000Hz and <10kHz. Transmitter output power at 2000Hz and 10kHz frequencies >200W | available |  |  |  |
|  | Integrated DC cable oversheath testing with >10 kV and fault pinpointing with >10 kV pulsesin combination with precise step voltage probe for soft and hard ground application; | available |  |  |  |
|  | **DESIGN REQUIREMENTS** |  |  |  |  |
|  | Integrated modular design of system based on separate functioning measurement units for high system performance, redundancy and high safety standards. | available |  |  |  |
|  | Full automation of system with multilayer safety controls (module vs. overall system). | available |  |  |  |
|  | User Friendly Human Machine Interface (HMI) with step-by-step help for Cable Van operator is preferred.  - Data transfer requirements: data transfer via flash memory card  ~~-~~ The system should create inspection reports  - Cable Van software update and upgrade must be supported 5 years. The software upgrade can be provided only by manufacturer or authorized representative. Software diagnostics and its upgrade must be provided at least once per year.  - Office productivity software for Inspection reports with possibility to create .pdf format files. | available |  |  |  |
|  | Automated one-phase high voltage system (HVS) switch rated >70 kV completely encapsulated and capable of switching all measurement modes. Systems that require any manual plug-over of test cables are not accepted. | available |  |  |  |
|  | HV pre-location technology based on inductive type Arc Reflection Technology (ART). Systems that provide only resistive type Arc Reflection methods are not accepted. | available |  |  |  |
|  | HV fault conversion based on resonance burning with automated intelligent power matching. System with manual power matching, finite steps and non-effective power conversion requiring power input above 6 kVA are not accepted. | available |  |  |  |
|  | HV DC/VLF test unit with short duty cycle (<1hr) are not accepted. | available |  |  |  |
|  | Automated line impedance matching of TDR | available |  |  |  |
|  | Advanced safety system. The faulty ground conditions monitor should also monitor fast ramp voltage.  -Safety standard in accordance with EN 50191 and EN 61010-1  -Safety monitoring Protective earthing, operational earthing, auxiliary earthing, potential monitoring, HV connections, rear doors, emergency stop button.  -Monitoring of the supply voltage Overvoltage protection, undervoltage protection | available |  |  |  |
|  | Overall measurement system power rating <6 kVA for all measurement modes including burning. | available |  |  |  |
|  | **DETAILED SPECIFICATION** |  |  |  |  |
|  | **Control Panel and System Controls** |  |  |  |  |
|  | **Display Unit**  - LCD monitors for high productivity and greater clarity during the test results evaluation. |  |  |  |  |
|  | **Control Unit**  -Operation of system via central unified control unit with embedded operating system user interface. | available |  |  |  |
|  | **Control System**  ~~-~~Fully automated control system with a possibility to connect external portable computer with the control program for that cases when the main operating module (that is integrated in side of van) will fail. (Software must be included in offer)  - Cable test van should have a modular system that will enable proper van functioning through any HV module would be removed | available |  |  |  |
|  | **Safety**  -Safety and power distribution unit incl. separation transformer;  -Low energy consumption of system; | available |  |  |  |
|  | **Automatic HV Switch** - 1ph  -Completely automated switch for switching all HV and LV modes.  -Rapid switching of modes without need to change connections to device under test. | available |  |  |  |
|  | **Automatic LV Switch** – 1ph  -Automatic switch for distributing LV signals (e.g. TDR/ISO/ect.) | available |  |  |  |
|  | **Sockets**  -Socket bar with two power sockets 230V and external system connection socket | available |  |  |  |
|  | **Cable Fault Analytics and HV Testing** |  |  |  |  |
|  | **Insulation resistance measuring device:**  Integrated and detachable measurement device  -Max. Voltage DC: 1000 V;  -Riso: >1GΩ | available |  |  |  |
|  | **HV DC**  Integrated HV- DC testing mode;  Including leakage current measurement  -Max. output voltage DC: 0 - >70 kV;  -Resolution: 0,1kV  -Max. output current at 70kV: 10mA  -Resolution: 10µA  -Accuracy: ±3% | available |  |  |  |
|  | **HV VLF**  Integrated HV-VLF (VLF sine and cos wave) according IEEE 400.2-2013 standard testing mode;  Continuous duty cycle without thermal limitations.  -Max. Output Voltage: 0- >38 kV COS;  -Max. Output Voltage: 0- >38 kV (rms) SIN;  -Output Frequency: 0,1 Hz/SIN and COS;  -Max. Output Load at >3 µF @ 0.1 Hz at 38 kVrms  -Accuracy: ±3% | available |  |  |  |
|  | **HV Sheath**  Integrated precision sheath testing and pinpointing mode - Output voltage adjustment: 0 ->10 kV,  - Output current: 0 - 90mA  - Resolution: 10µA | available |  |  |  |
|  | **Pre-Location** |  |  |  |  |
|  | **TDR 1 Phase**  Integrated TDR for reflection measurement and additional modes.  -Measuring Range: min 20m-50 km;  -Max. Pulse Amplitude: >160V;  -Pulse width: 20ns – 0.01ms  -Velocity of Propagation: 40 m/µs – 149.9 m/µs;  -Direct TDR 1 Phase measurement over HV cable | available |  |  |  |
|  | -SIM/MIM, ARM, ARC or equivalent  -DC SIM/MIM, ARM burning, ARC burning or equivalent  -Impulse current  -Decay | available |  |  |  |
|  | **Inductive Arc Reflection Technology**  -Max. Voltage: 0-32 kV (inductive) | available |  |  |  |
|  | **Surge Current Coupling**  -Max. Voltage: 0->32 kV | available |  |  |  |
|  | **Decay Voltage Coupling**  -Max. Voltage: >70kV | available |  |  |  |
|  | **Intermittent Fault Scanning** | available |  |  |  |
|  | **Burn Module**  -Integrated AC/DC voltage Burn Module  -Max. Output Voltage: >15kV DC~~/ >2,5kV AC~~  -Max. Output Current: >40A;  -Resonance Burning:  -Max. power consumption: <4 kVA. | available |  |  |  |
|  | **Monitored Fault Converting**  In combination with burn module  -Live TDR measurement during fault conversion on process;  -Max Output Voltage: >8kV DC;  -Max. Output Current: >0.3A | available |  |  |  |
|  | **Fault Pinpointing** |  |  |  |  |
|  | **Surge Generator MV/HV**  Increased surge energy  -Surge Voltage: 0-4/8/16/32 kV;  -Max. Surge Power: >2500 Joules (each step);  -Surge Sequence: 3-10 s (each step);  -Single shot mode | available |  |  |  |
|  | **Surge Generator LV**  Integrated surge unit for LV fault location | available |  |  |  |
|  | **Cable Line Locating** |  |  |  |  |
|  | **Locator Set**  Integrated powerful audio frequency generator with high precision locator:  -Output frequency: 0 - 10kHz ( two frequency ranges: 0- 2 kHz and 0 - 10kHz are preferred);  -Preferred output power at 10kHz: > 200W @10kHz;  -Automatic or manual impedance matching;  -Automatic or manual depth measurement | available |  |  |  |
|  | **Connecting Cables and Drums** |  |  |  |  |
|  | **HV (1ph)**  **-**HV Cable drum length >50M;  **-**HV Rating: >100kV;  Manual operation | available |  |  |  |
|  | **LV-Unit**  -Rack with LV connection cables  -Mains Cable – >50m;  -Protective Earth – >50m;  -Earth Potential (FU/EP) – >10m | available |  |  |  |
|  | **Mounting** |  |  |  |  |
|  | Ergonomic Operator’s Desk for mounting Control Unit | available |  |  |  |
|  | **Furniture** |  |  |  |  |
|  | Swivel Chair with Transport Fixation | available |  |  |  |
|  | **VEHICLE CONVERSION** |  |  |  |  |
|  | Internal Coachwork | available |  |  |  |
|  | External Coachwork | available |  |  |  |
|  | **AFTER- SALE SERVICE** |  |  |  |  |
|  | Calibration, Maintenance and repair services in Baltic States | available |  |  |  |
|  | Warehouse for most commonly used spare parts, located in Baltic States | available |  |  |  |
|  | 5 year warranty period for Cable van equipment | available |  |  |  |
| **Priority “B” requirements** | | | | | |
|  | **ADDITIONAL EQUIPMENT** |  |  |  |  |
|  | **TDR 3 Phase**  Integrated TDR for reflection measurement and additional modes.  -Measuring Range: min 20 m -50 km;  -Max. Pulse Amplitude: >160V;  -Velocity of Propagation: 40 m/µs – 149.9 m/µs; | available |  |  |  |
|  | **Insulation resistance measurement**  3-phase measurement L-N, L-L via LV connection with TDR connection cable, 50 m | available |  |  |  |
|  | Remote app via smartphone or tablet  – Switching the surge voltage generator on and off  – Setting the surge voltage and the surge sequence | available |  |  |  |
|  | VLF connection set - 3-phase VLF test set for busbars or terminations | available |  |  |  |
|  | VLF connection set - 3-phase PD free test set for connection terminals with M12 connector | available |  |  |  |
|  | VLF connection set -3-phase PD free test set for connection terminals with M16 connector | available |  |  |  |
|  | **STAFF TRAINING** |  |  |  |  |
|  | The offeror takes responsibility to provide staff training according to consumer’s requirements: |  |  |  |  |
|  | 3 days (3 x 8 hours) staff training at manufacturer’s facilities (exc. flights, transfer, accommodation costs) | available |  |  |  |
|  | 1 day (8 hours) staff training about specific technologies at consumer’s facilities (inc. flights, transfer, accommodation costs for manufacturer or offeror staff) | available |  |  |  |

1. An accurate source presenting the technical information (title and page of the instruction) [↑](#footnote-ref-1)
2. Name and number of material category of AS “Sadales tīkls” [↑](#footnote-ref-2)