**Section 7. Technical Specifications**

**Procurement of 230KV & 132 KV Polymer Surge Arrester for Sub-Station Division of APSCL**.

**1. For Polymer Type 230 kV Metal-oxide Gapless Surge Arrester:**

| **Item No** | **Name of the Items & Details Technical Specification** | **Unit of Measurement**  | **Quantity** |
| --- | --- | --- | --- |
| **1** | **2** | **3** | **5** | **6** |
|  |  | **Minimum Requirement of APSCL** |  |
| **Unit** | **Data** | **pcs** | **12** |
| **1** | **230 kV Polymer Surge arresters-** **General Data** |  |  |
| 1.1 | Manufacturer |  | Siemens/Tri-delta/ ABB/Equivalent |
| 1.2 | Type |  | Polymer type metal oxide gapless |
| 1.3 | Model designation |  | To be filled |
| 1.4 | Country of origin |  | EU/ G-7 |
| 1.5 | Standards |  | IEC 60099-4 |
| 1.6 | Design |  | Metal oxide gapless, Outdoor |
| 1.7 | Rated short circuit current | kA | ≥ 40 |
| 1.8 | Short circuit testing  |  | Tests shall be conducted by Internationally Recognized Testing Laboratory and Test report shall be certified from the authority of the Laboratory. |
| 1.9 | Manufacturer of ZnO block |  | Siemens/Tri-delta/ ABB |
| 1.10 | Country of origin of ZnO block  |  | EU/ G-7 |
| **2** | **Surge Arrester- Characteristics**  |  |  |
| 2.1 | Nominal system voltage | kVrms | 230 |
| 2.2 | Highest voltage of equipment | kVrms | 245 |
| 2.3 | Rated voltage of surge arrester, Ur | kVrms | 192-210 |
| 2.4 | Maximum continuous operating voltage (MCOV) | kVrms | 154-160 |
| 2.5 | Rated frequency | Hz | 50 |
| 2.6 | Nominal discharge current in (8/20 µs) | kApeak | 10 |
| 2.7 | High current impulse of an arrester (4/10 µs) | kApeak | 100 |
| **3** | **Surge arresters- Design and construction** |  |  |
| 3.1 | Line discharge class | Class | 3 |
| 3.2 | Thermal Energy dissipation capacity (per kV of rated voltage) | kJ/kV | ≥ 6.5 |
| 3.3 | Long duration current impulse (2000 µs) | A | ≥ 850 |
| **3.4** | **Maximum residual voltage, Ures** |  |  |
| 3.4.1 | For switching impulse current 30/60 µs at 0.5 kA | kVpeak | 375-406 |
| 3.4.2 | For switching impulse current 30/60 µs at 1 kA | kVpeak | 385-416 |
| 3.4.3 | For switching impulse current 30/60 µs at 2 kA | kVpeak | 405-416 |
| 3.4.4 | For lightning impulse current 8/20 µs at 5 kA | kVpeak | 435-477 |
| 3.4.5 | For lightning impulse current 8/20 µs at 10 kA | kVpeak | 465-508 |
| 3.4.6 | For lightning impulse current 8/20 µs at 20 kA | kVpeak | 515-564 |
| **3.5** | **Dielectric endurance of arrester housing**  |  |  |
| 3.5.1 | Lightning impulse withstand voltage of arrester housing up (1.2/50 µs) | kV | ≥925 |
| 3.5.2 | Power frequency withstand voltage of arrester housing (1 min wet) | kV | ≥425 |
| **3.6** | **Mechanical requirements** |  |  |
| 3.6.1 | Specified short term load (SSL) (Fdyn) | N | To be filled |
| 3.6.2 | Specified long term load SLL(Fstat) | N | To be filled |
| 3.7 | Minimum creepage distance | mm/kv | ≥25 mm/kV |
| 3.8 | Housing insulating material |  | Composite /Silicon |
| 3.9 | Insulating basement |  | Yes |
| 3.10 | Surge arrester height | mm | To be filled |
| 3.11 | Surge arrester weight | kg | To be filled |
| 3.12 | Voltage distribution ring present/ring diameter | Yes/No (mm) | To be filled  |
| **3.13** | **HV terminal** |  |  |
| 3.13.1 | Shape  |  | Flat |
| 3.13.2 | Dimension | mm ×mm | To be filled |
| 3.13.3 | Number of holes |  | Min 4 |
| 3.13.4 | Distance between holes |  | To be filled |
| 3.13.5 | Material suitable for |  | Al terminal |
| **3.14** | **Test requirements** |  |  |
| 3.14.1 | Design test and report must be submitted  |  | To be provided |
| 3.14.2 | Routine test report |  | To be provided |
| 3.14.3 | Type test report |  | To be provided |
| **3.15** | **Drawings and other technical information**  |  | To be provided |
| 3.15.1 | Manufacturers authorization letter |  | To be provided |
| 3.15.2 | Manufacturers quality assurance certificates |  | To be provided |
| 3.15.3 | Guaranteed technical data sheet duly signed by the manufacturer |  | To be provided  |
| 3.15.4 | Drawings of installation and dimension |  | To be provided |
| 3.15.5 | List of Type tests to be performed: 1. Power frequency voltage withstands and lightning impulse voltage withstand tests on complete arrester housing,2. Operating duty test3. Long duration current impulse withstand tests4. Residual voltage test5. Pressure relief test6. Artificial pollution test  |  | Test certificates must be provided by an internationally recognized testing laboratory in manner as mentioned in their guidelines.  |
| 3.15.6 | Descriptive catalogues with maintenance manual  |  | To be provided |
| 3.15.7 | Special tools and necessary equipment’s for installation  |  | Should be supplied by the tenderer (if necessary) |

1. **For Polymer Type 132 kV Metal-oxide Gapless Surge Arrester:**

| **Item No** | **Name of the Items & Details Technical Specification** | **Unit of Measurement** | **Quantity** |
| --- | --- | --- | --- |
| **1** | **2** | **3** | **5** | **6** |
|  | **Minimum Requirement of APSCL** |
| **Unit** | **Data** |
| **1** | **132 kV Polymer Surge arresters-** **General Data** |  |  |  **Pcs** | **12** |
| 1.1 | Manufacturer |  | Siemens/ Tri-delta/ ABB/ Equivalent |
| 1.2 | Type |  | Polymer type metal oxide gapless |
| 1.3 | Model designation |  | To be filled |
| 1.4 | Country of origin |  | EU/G-7 |
| 1.5 | Standards |  | IEC 60099-4 |
| 1.6 | Design |  | Metal oxide gapless, Outdoor Polymer |
| 1.7 | Rated Short circuit current | kA | ≥ 40 |
| 1.8 | Short circuit testing authority |  | Tests shall be conducted by Internationally Recognized Testing Laboratory and Test report shall be certified from the authority of the Laboratory. |
| 1.9 | Manufacturer of ZnO block |  | Siemens/Tri-delta/ ABB |
| 1.10 | Country of origin of ZnO block  |  | EU/ G-7 |
| **2** | **Surge Arrester- Characteristics**  |  |  |
| 2.1 | Nominal system voltage | kVrms | 132 |
| 2.2 | Highest voltage of equipment | kVrms | 145 |
| 2.3 | Rated voltage of surge arrester | kVrms | 120-132 |
| 2.4 | Maximum continuous operating voltage | kVrms | 96-102 |
| 2.5 | Rated frequency | Hz | 50 |
| 2.6 | Nominal discharge current in (8/20 µs) | kApeak | 10 |
| 2.7 | High current impulse of an arrester (4/10 µs) | kApeak | 100 |
| **3** | **Surge arresters- Design and construction** |  |  |
| 3.1 | Line discharge class | Class | 3 |
| 3.2 | Thermal Energy dissipation capacity (per kV of rated voltage) | kJ/kV | ≥ 6.5 |
| 3.3 | Long duration current impulse (2 ms) | A | ≥ 850 |
| **3.4** | **Maximum residual voltage, Ures** |  |  |
| 3.4.1 | For switching impulse current 30/60 µs at 1 kA | kVpeak | 237-261 |
| 3.4.3 | For switching impulse current 30/60 µs at 2 kA | kVpeak | 231-271 |
| 3.4.4 | For lightning impulse current 8/20 µs at 5 kA | kVpeak | 265-295 |
| 3.4.5 | For lightning impulse current 8/20 µs at 10 kA | kVpeak | 282-311 |
| 3.4.6 | For lightning impulse current 8/20 µs at 20 kA | kVpeak | 305-342 |
| **3.5** | **Dielectric endurance of arrester housing**  |  |  |
| 3.5.1 | Lightning impulse withstand voltage of arrester housing up (1.2/50 µs) | kV | ≥550 |
| 3.5.2 | Power frequency withstand voltage of arrester housing (1 min wet) | kV | ≥250 |
| **3.6** | **Mechanical requirements** |  |  |
| 3.6.1 | Specified short term load (SSL) (Fdyn) | N | To be filled |
| 3.6.2 | Specified long term load SLL(Fstat) | N | To be filled |
| 3.7 | Minimum creepage distance | mm/kv | ≥25 mm/kv |
| 3.8 | Housing insulating material |  | Composite /Silicon |
| 3.9 | Insulating basement |  | Yes |
| 3.10 | Surge arrester height | mm | To be filled |
| 3.11 | Surge arrester weight | kg | To be filled |
| 3.12 | Voltage distribution ring present/ring diameter | Yes/No (mm) | To be filled  |
| **3.13** | **HV terminal** |  |  |
| 3.13.1 | Shape  |  | Flat |
| 3.13.2 | Dimension | mm ×mm | To be filled |
| 3.13.3 | Number of holes |  | Min 4 |
| 3.13.4 | Distance between holes |  | To be filled |
| 3.13.5 | Material suitable for |  | Al terminal |
| **3.14** | **Test requirements** |  |  |
| 3.14.1 | Design test and report must be submitted  |  | To be provided |
| 3.14.2 | Routine test report |  | To be provided |
| 3.14.3 | Type test report |  | To be provided |
| **3.15** | **Drawings and other technical information**  |  | To be provided |
| 3.15.1 | Manufacturers authorization letter |  | To be provided |
| 3.15.2 | Manufacturers quality assurance certificates |  | To be provided |
| 3.15.3 | Guaranteed technical data sheet duly signed by the manufacturer |  | To be provided  |
| 3.15.4 | Drawings of installation and dimension |  | To be provided |
| 3.15.5 | List of Type tests to be performed: -1. Power frequency voltage withstands and lightning impulse voltage withstand tests on complete arrester housing,2. Operating duty test3. Long duration current impulse withstand tests4. Residual voltage test5. Pressure relief test6. Artificial pollution test  |  | Test certificates must be provided by an internationally recognized testing laboratory in manner as mentioned in their guidelines. |
| 3.15.6 | Descriptive catalogues with maintenance manual  |  | To be provided |
| 3.15.7 | Special tools and necessary equipment’s for installation  |  | Should be supplied by the tenderer (if necessary) |

**Note:**

1. The Supplier must supply mandatory spare parts.