| Technical data sheet for dry type transformer (THICKENER AREA) | | |
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| **INDIVIDUAL SITE CONDITIONS** | | |
| 1.1 | Project Name: | Auramine concentrate plant |
| 1.2 | Country of destination: | Georgia |
| 1.3 | Main specification Doc. No.: | DISTRIBUTION TRANSFORMERS |
| 1.4 | Related list of attachment | - |
| 1.5 | Atmosphere | Indoor |
| 1.6 | Installation | Indoor |
| 1.7 | Design air temperature indoor | Max. 55°C, min. -10 °C |
| 1.8 | Inside Design Relative Humidity | 85 |
| 1.9 | Altitude above mean sea level | < 1000 m |
| 1.10 | Seismic Load | 9 |
| 1.11 | Snow load | Not applicable |
| 1.12 | Wind load | Not applicable |
| 1.13 | Sand load | Not applicable |
| **INDIVIDUAL POWER SUPPLY AND DISTRIBUTION SYSTEM** | | |
| 2.1 | Tag No. | to be discussed |
| 2.2 | System rated voltage (no-load voltage) | 400V (secondary side) |
| 2.3 | Service voltage | 400V, 3AC + PEN |
| 2.4 | Static voltage variation | ±5% |
| 2.5 | Dynamic voltage variation | ±10% |
| 2.6 | Harmonic content on primary side | class 1 according EN 61000-2-4 |
| 2.7 | Harmonic content on secondary side | class 2 according EN 61000-2-4 |
| 2.8 | Rated frequency | 50 Hz |
| 2.9 | Static frequency variation | ± 0.2 % |
| 2.10 | Dynamic frequency variation | ± 0.4 % |
| 2.11 | Combination of voltage and frequency variation | Within limits for Zone – A of IEC 60034-1 |
| 2.12 | Short-circuit current on primary side (including plant contribution) | 15kA for 1 sec |
| 2.13 | Factor for peak current | 2.5 |
| 2.14 | System neutral | Solidly grounded |
| **TRANSFORMER** | | |
| 3.1 | Number of pieces | 1 |
| 3.2 | Manufacturer | Hittachi (ABB) |
| 3.3 | Type / Number | as per manufacturer |
| 3.4 | Transformer typeTransformer type | Dry type distribution transformer |
| 3.5 | Rated voltage Ur | Primary 10 kV, secondary 0.4 kV |
| 3.6 | Vector group | Dyn 11 |
| 3.7 | Rated frequency fr | 50 Hz |
| 3.8 | Duty | Continuous |
| 3.9 | No. of windings | Two |
| 3.10 | Rated current Ir | Primary . ..... A, secondary ..... A |
| 3.11 | Rated power Sr | **1600 kVA** |
| 3.12 | Impedance voltage uKr | 6.5 % without negative tolerance |
| 3.13 | Cooling | AN |
| 3.14 | No load current I0 | ..... A prim. at 100% Voltage &<br>..... A prim. at 110% Voltage |
| 3.15 | No load losses P0 | ..... kW at 100% Voltage &<br>..... kW at 110% Voltage |
| 3.16 | Full load losses Pfl | ..... kW |
| 3.17 | Short circuit losses Pkr | ..... kW |

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| 3.18 | Reactance at rated current & frequency | |
| 3.19 | Resistance voltage drop uR<br>cos □ = 1<br>cos □ = 0,8 | <br>%<br>% |
| 3.20 | X1 / R1 - ratio | |
| 3.21 | X0 / R0 - ratio | |
| 3.22 | Zero Sequence Impedance Z0 | |
| 3.23 | Efficiency η at<br>cos φ = 1 and 4 / 4 load<br>3 / 4 load<br>2 / 4 load<br>cos φ = 0,8 and 4 / 4 load<br>3 / 4 load<br>2 / 4 load | |
| 3.24 | Maximum Efficiency η max | (at 40 % load) |
| 3.25 | Magnitude of Inrush current & duration | A sec |
| 3.26 | Short-circuit duration for design | 2 sec |
| 3.27 | Insulation class | F |
| 3.28 | Corrosion class | C5I |
| 3.29 | Fire class | F1 |
| 3.30 | Operating mode | DB |
| 3.31 | Pre-load and additional load at motor start | |
| 3.32 | Temperature rise of windings | K (max. 100 K) |
| 3.33 | Thermal time constant | min |
| 3.34 | Thermal withstand | x Ir / sec |
| 3.35 | Mechanical short circuit withstand | kA prim. |
| 3.36 | Rated Insulation Voltage | 12 kV primary<br>1.1 kV sec |
| 3.37 | Dielectric Test Voltage | 28 kV primary<br>3 kV sec |
| 3.38 | Rated Impulse Withstand Voltage | 60 kV primary |
| 3.39 | MV / LV phase sequence | L1 L2 L3 / To suit switchgear (TPN) |
| 3.40 | Heat to be dissipated | kW |
| 3.41 | Sound pressure level in 1 m distance | max. 65 dB |
| 3.42 | Dimensions L x W x H | |
| 3.43 | Weight<br>Core & winding weight<br>total weight<br>max. shipping weight<br>weight of removable parts | |
| 3.44 | Erection | On rails with flat wheels |
| 3.45 | Installation | On wheels with locking system |
| 3.46 | Type of enclosure | Min. IP 31 & main terminal box min. IP 55 |
| 3.47 | Painting | RAL 7035 |
| 3.48 | Tagging & Lettering | Stainless steel rating-plate placed on the long side, indelibly engraved with data like Item Number<br>and Service Title as well as prescribed by IEC 60726 |

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| 3.49 | Accessories | Lifting lugs for complete transformer and accessories<br>Vibration Isolation Frame<br>Temperature Control relay for alarm / trip and remote<br>indication on LV switchgear / DCS.<br>Neutral CTs |
| **OFF-LOAD TAPS** | | |
| 4.1 | Mounting | On primary & operable from ground level |
| 4.2 | Lettering | Every position of the taps |
| 4.3 | Steps | -5,0 % / -2,5 % / 0 / +2,5 % / +5,0 %<br>( = 5 steps on Primary Side ) |
| **POWER CONNECTION** | | |
| 5.1 | Primary side | Cable from bottom of transformer front<br>Connection screwed |
| 5.2 | Secondary side | cable connection (to be discussed possible busbar connection) |
| 5.3 | Star point | Bus Duct |
| 5.4 | Accessories | Isolated cable shield busbar |
| **ADDITIONAL TERMINAL BOX** | | |
| 6.1 | Control voltage for signals | 220 V AC, isolated for protection relay |
| 6.2 | Protection class | Min. IP 55 |
| 6.3 | Accessories | cable glands<br>earthed PE busbar<br>isolated cable shield busbar<br>earthed cable armour clamp |
| **MEASURING AND PROTECTION DEVICES** | | |
| 9.1 | Temperature (number, type, place, function, lettering) | per phase 1 x resistance thermometer double PT100<br>(3-wire-system from terminal box)<br>per phase 2 x PTC; all three phases shall be in series<br>for alarm at 110 °C and trip at 120 °C |
| **TYPE TEST CERTIFICATES** | | |
| 10.1 | Temperature test | Yes / No Certificate No. |
| 10.2 | Impulse test | Yes / No Certificate No. |
| SPECIAL TEST CERTIFICATES | | |
| 11.1 | Short Circuit test | Yes / No Certificate No. |