|  |  |  |  |
| --- | --- | --- | --- |
| 1) | Manufacturer’s name and type designation |  | LEEEC SFZ-40000/132 |
| 2)  | Type test certificates a) Issuing Laboratoryb) No. & Date  |  | short circuit test will be done in CTQC Lab only for one unit transformer and will be witness by Veikei, other tests for the above mentioned transformer will be done in factory Lab and witness by Veikei |
| 3) | Vector group |  | Dyn11 |
| 4)  | Rate power of the transformer (temperature-rise measured by resistance)  |  |  |
|  | a) With 55 deg C temperature rise of winding;1. ONAN Cooling,
2. ONAF Cooling ,
 | KVAKVA | 3150040000 |
|  | b) With 60 deg C temperature rise of winding;1. ONAN Cooling,
2. ONAF Cooling ,
 | KVAKVA | 3400044000 |
|  | c) With 65 deg C temperature rise of winding;1. ONAN Cooling,
2. ONAF Cooling ,
 | KVAKVA | 3700047000 |
| 5) | Temperature rise of oil corresponding to the KVA and temperature rise values given in ; |  |  |
|  | a) i. Item 4a(1) ii. Item 4a(2)  | Deg CDeg C | 5050 |
|  | b) i. Item 4b(1) ii. Item 4b(2)  | Deg CDeg C | 5555 |
|  | c) i. Item 4c(1) ii. Item 4c(2)  | Deg CDeg C | 6060 |
| 6) | Hottest spot winding temperature rise corresponding to KVA and temperature rise rating given in  |  |  |
|  | a) i. Item 4a(1) ii. Item 4a(2)  | Deg CDeg C | 6868 |
|  | b) i. Item 4b(1) ii. Item 4b(2)  | Deg CDeg C | 7373 |
|  | c) i. Item 4c(1) ii. Item 4c(2)  | Deg CDeg C | 7878 |
| 7) | Tertiary winding rating, corresponding to 55 Deg C temperature-rise of winding (measured by resistance) where applicablea) ONAN coolingb) ONAF cooling |  | NANA |
| 8) | Rated voltage of windings 1. H.V. Winding
2. L.V. Windings
3. Tertiary winding(if applicable)
 | kVkVkV | 13211.5NA |
| 9) | Tapping voltages at all plus and minus tapings, Volts |  |  |
| 10) | Highest operating voltage for which tappings are designed for continuous overvoltage operation, percent of tapping voltage  | percent | Tapping 1145.2kV+110% |
| 11) | Overvoltage Operation |  |  |
| **HV Tapings** | Applied voltage | Operating time for rated tapping current Hrs | Current for continuous operation A | Temp Flux Density Tesla | Temp Rise of core Deg C  | Temp Rise of winding Deg C  |
| **132kV Winding** |
| 145200 | 152,000 | Continous | 152 | 1.62 | 68 | 55 |
| 132000 | 152,000 | Continous | 152 | 1.78 | 68 | 55 |
| 132000 | 145,000 | Continous | 159 | 1.7 | 68 | 55 |
| 118800 | 145,000 | Continous | 159 | 1.89 | 68 | 55 |
| 118800 | 132,000 | Continous | 175 | 1.72 | 68 | 55 |
| 12) | Maximum Flux density and operating conditions at which occurs: FrequencyVoltage HVVoltage LVLoad Current | TeslaHzVoltsVoltsAmps | 1.895014520011500159/2008 |
| 13) | Design Flux density at rated voltage, rated current and frequency | Tesla | 1.55 |
| 14) | Impedance voltage (Principal tap ) on 31.5 MVA base;1. High voltage-low voltage

b) Low voltage-tertiary c) High voltage-tertiary  | PercentPercentPercent | 10NANA |
| 15) | Resistance voltage (principal tap) on 31.5 MVA base;1. High voltage-low voltage

b) Low voltage-tertiary c) High voltage-tertiary  | PercentPercentPercent | 0.291NANA |
| 16) | Reactance voltage (principal tap) on 31.5 MVA base;1. High voltage-low voltage

b) Low voltage-tertiary c) High voltage-tertiary  | PercentPercentPercent | 9.996NANA |
| 17) | Short Circuit impedance referred to the first winding in the following pairs; |  |  |
|  | a) At Principal tapi) High voltage-low voltage (ohms per phase)ii) Low voltage-tertiary (ohms per phase)iii) High voltage-tertiary (ohms per phase) |  | 55.3NANA |
|  | 2) At extreme plus tapi) High voltage-low voltage (ohms per phase)ii) Low voltage-tertiary (ohms per phase)iii) High voltage-tertiary (ohms per phase) |  | 68.9NANA |
|  | 3) At extreme minus tapi) High voltage-low voltage (ohms per phase)ii) Low voltage-tertiary (ohms per phase)iii) High voltage-tertiary (ohms per phase) |  | 43.4NANA |
| 18) | Zero sequence impedance (principal tap) on 31.5 MVA base;a) High voltage-low voltage b) Low voltage-tertiary c) High voltage-tertiary  | PercentPercentPercent | 9NANA |
| 19) | Regulation (Principal tap) on 31.5 MVA base1. 100% power factor
2. 80% power factor
3. 70 % power factor
 | PercentPercentPercent | 0.96.57.8 |
| 20) | Exciting current on 31.5 MVA base1. 90% voltage
2. 100% voltage
3. 105% voltage
4. 110% voltage
5. 120% voltage
 | PercentPercentPercentPercentPercent | 0.250.30.360.54.3 |
| 21) | Impulse test voltage;1. HV Winding
2. LV Winding
3. Tertiary Winding
 | KV PeakKV PeakKV Peak | 650110NA |
| 22) | Separate source power frequency test voltage;1. HV Winding
2. LV Winding
3. Tertiary Winding
 | KV rmsKV rmsKV rms | 27538NA |
| 23) | Induced over voltage withstand test  | KV rms | 275 |
| 24) | Short circuit characteristics at rated voltage; |  |  |
|  | a) Maximum asymmetrical short circuit current for which the mechanical bracings are designed andconstructed to withstand without damage frequent short-circuit faultsi) HV Windingii) LV Windingiii) Tertiary Winding | KA PeakKA PeakKA Peak | 3.940.3NA |
|  | b) Maximum symmetrical short circuit current for which transformer windings are designed andconstructed to thermally withstand without injury;i) HV Winding 1 Sec.2 Sec.3 Sec.4 Sec.5 Sec.ii) LV Winding 1 Sec.2 Sec.3 Sec.4 Sec.5 Sec.  | ampsampsampsampsampsampsampsampsampsamps | 2916.62062.41683.91458.31304.330130.421305.417395.815065.213474.7 |
|  | iii) Tertiary winding1 Sec.2 Sec.3 Sec.4 Sec.5 Sec. | ampsampsampsampsamps | NANANANANA |
|  | 1. short circuit duration (Sec)
 |  | 3 |
| 25) | Guaranteed no load losses at rated frequency;1. 100% voltage
2. 105% voltage
3. 110 % voltage
4. 120 % voltage
 | KWKWKWKW | 22283240 |
| 26) | Guarantee Load losses for reference temperature of 75 ºC including correspondingconsumption of fan motors |  |  |
|  | a) At Principal tapi) 100% ONAN rating ii) 75% ONAN rating iii) 50% ONAN rating iv) 100% ONAF rating v) 75% ONAF ratingvi) 50% ONAF rating  | KWKWKWKWKWKW | 9556251509141 |
|  | b) At extreme plus tapi) 100% ONAN rating ii) 75% ONAN ratingiii) 50% ONAN rating iv) 100% ONAF rating v) 75% ONAF rating vi) 50% ONAF rating  | KWKWKWKWKWKW | 9056251509040 |
|  | c) At extreme minus tapi) 100% ONAN rating ii) 75% ONAN rating iii) 50% ONAN rating iv) 100% ONAF rating v) 75% ONAF rating vi) 50% ONAF rating | KWKWKWKWKWKW | 110673017010848 |
| 27) | Tolerance applicable fora) Guaranteed no-load losses at 100% voltage b) Guaranteed load losses at 100% ONAF rating at principal tap  | PercentPercent | 00 |
| 28) | High Voltage Bushings  |  |  |
|  | a) Rating;1. Voltage
2. Current
3. Impulse withstand voltage
4. Power Frequency Withstand voltage
 | KVAmpsKV PeakKV rms | 145800650275 |
|  | b) Type |  | BRDLW-145 |
|  | c) Manufacturers |  | CHINA |
|  | d) Catalogue number (catalogue to be attached with bid) |  |  |
|  | e) Creepage Distance  | mm | 4500 |
| 29) | Low Voltage Bushings |  |  |
|  | a) Rating;1. Voltage 2. Current 3. Impulse withstand voltage 4. Power Frequency Withstand voltage  | KVAmpsKV PeakKV rms | 20315012555 |
|  | b) Type |  | BDW-20 |
|  | c) Manufacturers |  | CHINA |
|  | d) Catalogue number (catalogue to be attached with bid) |  |  |
|  | e) Creepage Distance  | mm | 480 |
| 30) | HV NEUTRAL BUSHINGS  |  |  |
|  | a) Rating;1. Voltage
2. Current
3. Impulse withstand voltage
4. Power Frequency Withstand voltage
 | KVAmpsKV PeakKV rms | NA |
|  | b) Type |  | NA |
|  | c) Manufacturers |  | NA |
|  | d) Catalogue number (catalogue to be attached with bid) |  | NA |
|  | e) Creepage Distance  | mm | NA |
| 31) | LV neutral bushing  |  |  |
|  | a) Rating;1. Voltage
2. Current
3. Impulse withstand voltage
4. Power Frequency Withstand voltage
 | KVAmpsKV PeakKV rms | 20315012555 |
|  | b) Type |  | BDW-20 |
|  | c) Manufacturers |  | CHINA |
|  | d) Catalogue number (catalogue to be attached with bid) |  |  |
|  | e) Creepage Distance | mm | 480 |
| 32) | Tertiary bushing  |  | NA |
|  | a) Number |  | NA |
|  | b) Rating;1. Voltage
2. Current
3. Impulse withstand voltage
4. Power Frequency Withstand voltage
 | KVAmpsKV PeakKV rms | NA |
|  | c) Type |  | NA |
|  | d) Manufacturers |  | NA |
|  | e) Catalogue number (catalogue to be attached with bid) |  | NA |
|  | f) Creepage Distance  | mm | NA |
| 33) | High voltage bushing current transformers(catalogue to be attached with the bid)a) numberb) ratioc) accuracy classd) accuracy limit factore) rated burden f) short-time thermal current g) continuous thermal current h) Dynamic current i) Resistance of the secondary winding j) No. of cores in each bushing CT | VAkAkAkAOhms | 1200/15P101050.250.271 |
| 34) | Low voltage bushing current transformers(catalogue to be attached with the bid)a) numberb) ratioc) accuracy classd) accuracy limit factore) rated burden VAf) short-time thermal current kAg) continuous thermal current kAh) Dynamic current kAi) Resistance of the secondary winding Ohmsj) No. of cores in each bushing CT | VAkAkAkAOhms | 13000/15P1010303752.781 |
| 35) | Type of on-load tap changer (catalogue and data to be supplied with bid) |  |  |
| a. Manufacturers |  | MR |
| b. type |  | 250D/145 |
| c. Rated current  | amps | 250 |
| d. Step voltage  | Volts | 1200 |
| e. No. of steps |  | 23 |
| f. Motor Drive i) Type ii) Supply voltage (Volts)iii) H.P iv) Insulation level(voltage to earth) | VoltskV rms | ED415/24012 |
| g) Tap changer protective relay(catalogue to be attached with the bid)i) Typeii) Makeiii) Contact rating |  | RS2001MRDC110 |
| h) Insulation levelsi) voltage to earth ii) Impulse test voltage iii) One minute power frequencytest voltage(50Hz)  | kV rmskV peakkV rms | 145650275 |
| i) Internal insulation levels Impulse/one minute power frequency test voltagei. Between selected and preselected taps(KV peak/KV rms)ii. Across fine tap windings(KV peak/KV rms)iii. Between phase of fine tap windings(KV peak/KV rms) iv. Across coarse and fine tap winding, if applicable(KV peak/KV rms)v. Across coarse tape windings, if applicable(KV peak/KV rms)vi. Between phases of coarse tap winding(KV peak/KV rms) |  | 130/30250/65650/275 |
| j. Remote tap position indicatori. Type designationii. Manufactureriii. Method of remote indications |  | MR |
| k) Temperature-rise of contacts at 1.2 times maximum rated through current |  | NA |
| l) Permissible number of operations at rates step voltage |  | 23 |
| m) Permissible number of operations atreduced step voltage |  | 23 |
| n) Permissible number of operations forselector switch |  | 2 |
| o) Temperature-rise of transition resistors at1.5 times max. rate through current |  | NA |
| p) Mechanical endurance.i. No. of operations without requiring overhauling.ii. Total No. of permissible operations in life time. |  | 300000600000 |
| 36) | Liquid Type Oil Thermometer (catalogue to beattached withbid**)** |  |  |
| a. Type designation |  | BWY |
| b. Manufacturer |  | CHINA |
| c. Catalogue No. |  |  |
| d. Contact rating between 110V&250V DC and 250V AC | Amps | 5 |
| 37) | Resistance Type Oil Thermometer (catalogues to be attached with bid) |  |  |
| a. Type designation |  | BWY |
| b. Manufacturer |  | CHINA |
| c. Catalogue No. |  |  |
| d. Contact rating between 110V&250V DC and 250V AC | Amps | 5 |
| 38) | Oil Level Indicator (catalogues to be attached with bid) |  |  |
| a. Type designation |  | YZF |
| b. Manufacturers |  | CHINA |
| c. Catalogue No. |  |  |
| d. Contact rating between 110V&250V DC and 250V AC | Amps | 2 |
| 39 | Winding Temperature Indicator  (catalogue to be attached with bid)  |  |  |
| 1. Local
 |  |  |
| i). Type |  | BWR |
| ii). Manufacturer |  | CHINA |
|  iii). Contract rating between 110V&250V DC and 250V AC | Amps | 5 |
| 1. Remote
 |  |  |
|
| i). Type |  | XMZ |
| ii). Manufacturer |  | CHINA |
|  iii). Contract rating between 110V&250V DC and 250V AC | Amps | 5 |
| 40) | Buchholz Relay (catalogue to be attached with bid)  |  |  |
| a) Type  |  | QJ4 |
| b) Manufacturer |  | CHINA |
| c) Catalogue No. |  |  |
| d)Contact rating between110V&250V DC and 250V AC | Amps | 5 |
| 41) | Pressure relief device (catalogues to be attached with the bid)  |  |  |
| a) Type  |  | YSF |
| b) Manufacturer |  | CHINA |
| c) Catalogue No. |  |  |
| d) Pressure range for operation  | kg/cm² | 55kpa |
| e) Contact rating if applicable  |  | 0.3A |
| f)Number |  |  |
| 42) | Automatic voltage regulator, if required |  |  |
| a) Type Designation |  | TAPCON |
| b) Manufacturer |  | MR |
| c) catalogue No. |  |  |
| d)Input P.T. supply voltage  | Volts | 110 |
| e) Input C.T. supply current | Amps | 5 |
| f)voltage adjustment range, percent of the voltage to be regulated.  | Percent | ±10 |
| g) Sensitivity range percent of the voltage top be regulated  | Percent | ±0.5-±0.9 |
| h) Under voltage blocking percent of the voltage to be regulated.  | Percent | 70-95% |
| i)Overcurrent blocking percent of normal current  | Percent |  |
| 43) | Forced air cooling equipment |  |  |
|  | a) type(whether plate or tube) of radiators |  | PLATE |
|  | b) No. of radiators |  | 14 |
|  | c) No. of tubes/plates in one radiator |  | 20 |
|  | d) Radiator dimensionsLength(L)\*Width(W)\*Height(H) |  | 985\*536\*2255 |
|  | e) Total No. of fans |  | 14 |
|  | f) No. of fans required for full upper rating output under specified conditions |  | 10 |
|  | g) No. of spare fans |  | 4 |
|  | h) Motor ratingi) H.P.ii) Supply voltage | V | 0.25kW415v |
| i)Total fan consumption at full load | kW | 3.5 |
| 44) | Breather (catalogues to be attached with bid) a) Typeb) Makec) Number  |  | XS-5kgCHINA2 |
| 45) | Valves (catalogues to be attached with bid) a) Typeb) Makec) Sizei) Drain valveii) Filter valveiii) Sampling valve |  | GLOBECHINADN80DN8020 |
| 46) | Guarantee noise level a)At lower rating (ONAN)b)At upper rating (ONAF) | dbdb | 6873 |
| 47) | Type of construction, core or shell |  | CORE |
| 48) | Weight of core and coils  | kg | 28000 |
| 49) | Weight of case and fittings  | kg | 8000 |
| 50) | Weight of core  | kg | 19000 |
| 51) | Weight of coil  | kg | 9000 |
| 52) | Weight of copper | kg | 8000 |
| 53) | Weight of oil  | kg | 18000 |
| 54) | Total weight  | kg | 65000 |
| 55) | Shipping weight of heaviest piece  | kg | 58000 |
| 56) | Weight of heaviest piece for untanking  | kg | 35000 |
| 57) | Total volume of oil a) Main tank b) Conservator c) Radiators  | LitresLitresLitres | 1750010002050 |
| 58) | Tank dimensionsLength(L)Width(W)Height(H) | mmmmmm | 459015702880 |
| 59) | Overall dimensionsLength(L)Width(W)Height(H) | mmmmmm | 695041505880 |
| 60) | Thickness of platesa) Tank cover b) Tank sides c)Tank bottom d) Radiator e) Conservator  | mmmmmmmmmm | 2081618 |