



DEALERS & IMPORTERS OF POWER PLANTS & ALLIED MACHINERY

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## **12 MW UNUSED KALUGA MAKE STEAM TURBINE GENERATOR SET**

**1 No. 12 MW Unused New Kaluga (Russia) Fully Condensing Steam Turbine Generator having the following technical specifications :**

- **STEAM TURBINE:**

Rating	: 12 MW
RPM	: 3000
Inlet Steam Pressure	: 42 KG /CM <sup>2</sup>
Inlet Steam Temp.	: 435±5 <sup>0</sup> C
Flow Rate of Cooling Water including that for Air Coolers of Generator and Oil Cooler	: 3400 T/H

- **ALTERNATOR:**

Nominal Rating	: 12 MW
Max Rating	: 12.8 MW
RPM	: 3000
System	: AC 3 Phase
Frequency	: 50 Hz
Voltage	: 11 Kw
Power Factor	: 0.8
Insulation	: Class 'F'
Excitation	: Brushless
Excitation Current	: 268 Amps
Excitation Volts	: 299 Volts
Efficiency	: 97.6 %

- **AUXILIARIES:**

Condensing System  
Governing System  
Ejectors  
Oil Cooler  
Filters  
Stop Valve  
Oil Pump Block  
Oil Tank  
Instrumentation  
Control Station  
Spare for Turbine & Generator  
Special Tools & Tackles  
Drawings & Documents etc.

**NITIN CORPORATION,  
MUMBAI, INDIA.**

**12 MW UNUSED KALUGA (RUSSIA)  
STEAM TURBO GENERATOR**

## TECHNICAL CHARACTERISTIC OF TG SET

- 1. PRINCIPAL PARAMETERS AND CHARACTERISTICS OF TURBINE TYPE II-12-4, 2T**
  - 1.1 CAPACITY : 12 MW
  - 1.2 REGULATION RANGE OF AUTOMATIC CHANGE OF CAPACITY : FROM 30 TO 100%
  - 1.3 NOMINAL FREQUENCY OF ROTATION OF ROTOR : 50 HZ (3000 RPM)
  - 1.4 NOMINAL PARAMETERS OF MAIN STEAM:  
ABSOLUTE PRESSURE : 42KGF/CM<sup>2</sup>  
TEMPERATURE : 435±5<sup>0</sup>C
  - 1.5 NOMINAL TEMPERATURE OF COOLING WATER : 32<sup>0</sup>C  
FLOW OF COOLING WATER  
(INCLUDING THAT FOR AIR COOLERS OF GENERATOR AND FOR OIL COOLERS) : 3400 T/H  
WATER : SWEET
  - 1.6 PRINCIPLE CHARACTERISTIC OF TURBINE : SEE ANNEXURE 1A
  - 1.7 VOLTAGE OF NETS OF AC USED IN THE TURBINES EQUIPMENT : 415/220 V  
THAT OF DC : 48 V AND 220 V
  - 1.8 ALL HOT SURFACE OF THE TURBINE SHALL BE INSULATED IN ACCORDANCE WITH TECHNICAL DOCUMENTATION OF THE MANUFACTURER. TEMPERATURE ON THE INSULATION OUTER SURFACE AT AMBIENT TEMPERATURE NO MORE THAN 30<sup>0</sup>C SHALL NOT EXCEED 50<sup>0</sup>C.
  - 1.9 AT ACCEPTANCE OF THE TURBOSET FROM THE ERECTION, THE AVERAGE QUADRATIC VALUE OF VIBROSPEED OF THE TURBINES BEARINGS UNDER ALL OPERATION LOADS AT NOMINAL FREQUENCY OF ROTATION IN VERTICAL AND TRANSVERSAL DIRECTIONS SHALL NOT EXCEED 2,8 MM/SEC, AND IN AXIAL DIRECTION –NO MORE THAN 4,5 MM/SEC.
  - 1.10 TURBINE IS INTENDED FOR THE TOTAL, NUMBER OF STARTS FOR THE ENTIRE PERIOD OF OPERATION NO LESS THAN 3800 FROM VARIOUS THERMAL STATES, INCLUDING 100 STARTS FROM COLD STATE.
  - 1.11 QUALITY OF STEAM AND FEED WATER SHALL BE IN CORRESPONDENCE WITH THE REQUIREMENTS OF GOST 20995-75 (SEE AN EXTRACT FROM THE STANDARD, THIRD COLUMN)
  - 1.12 CLIMATIC VERSION : TROPICAL

## **2. PRINCIPAL PARAMETERS AND CHARACTERISTICS OF TURBOGENERATOR**

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**12 MW UNUSED KALUGA (RUSSIA)  
STEAM TURBO GENERATOR**

**T-12-2Y3**

NOMINAL ACTIVE CAPACITY, MW	: 12
MAXIMUM CONTINUOUS ACTIVE CAPACITY, MW	: 12, 8
VOLTAGE OF STATOR WINDING, KV	: 11
FREQUENCY OF CURRENT, HZ	: 50
FREQUENCY OF ROTATION, RPM	: 3000
NOMINAL POWER FACTOR (OVEREXCITATION)	: 0, 8
POWER FACTOR AT MAXIMUM CONTINUOUS LOAD (OVEREXCITATION)	: 0, 85

**DIRECTION OF ROTATION                      UPON CLIENTS REQUIREMENT**

CLASS OF HEAT RESISTANCE OF INSULATION OF WINDINGS "F"	
VALUE OF SHORT CIRCUIT RATIO (AT NOMINAL LOAD), RELATIVE UNITS	: 0, 51
Xd (RESISTANCE, NOT SATURATED) %, (ALLOWANCE $\pm 15\%$ )	: 219
Xd, (NOT SATURATED) %, (ALLOWANCE $\pm 15\%$ )	: 24
Xd, (SATURATED) %, (ALLOWANCE $\pm 30\%$ )	: 10
Jt, c	: 30

**PERMISSIBLE VALUE OF TOTAL DEVIATION**

IN VOLTAGE AND FREQUENCY, %	: 6
EFFICIENCY (AT P=Pn And COS f=0, 8), % (WITH ALLOWANCE AS PER IEC PUBLICATION 34-1)	: 97, 6

**TEMPERATURE OF SWEET COOLING WATER**

AT INLET TO AIR COOLERS, °C, NO MORE THAN	: +40
CURRENT OF EXCITATION (RATED VALUE), A	: 268
VOLTAGE OF EXCITATION (RATED VALUE), V	: 229
EXCITATION SYSTEM	: BRUSHLESS

**RATIO OF FORCING EXCITATION ON CURRENT OF EXCITATION**

OF TURBO GENERATOR, RELATIVE UNITS (R.U.), NO LESS THAN	: 2
DURATION OF FORCING ON THE CURRENT OF ROTOR OF TURBO GENERATOR, SEC, NO LESS THAN	: 50
VOLTAGE BUILD-UP SPEED AT THE WINDING OF ROTOR OF TURBOGENERATOR DURING FORCING R. U. NO LESS THAN	: 2, 5 SEC