

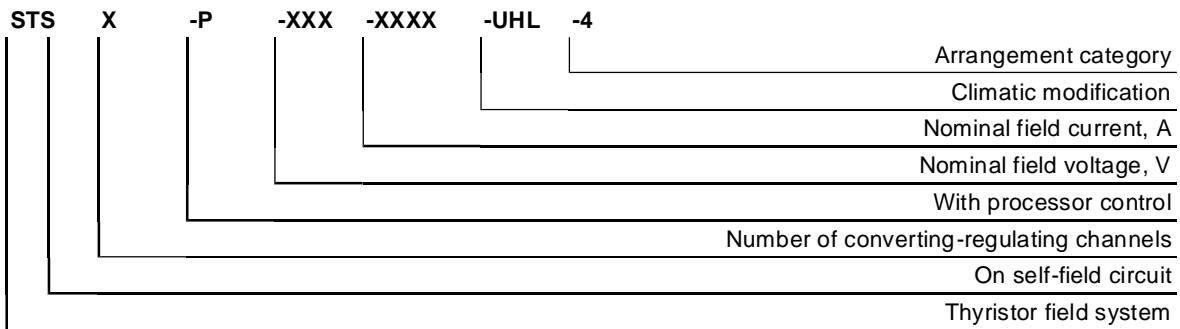


STS STATIC THYRISTOR FIELD SYSTEMS FOR AVERAGE CAPACITY TURBO- AND HYDROGENERATORS

APPLICATION

STS static thyristor field systems are designed for power supply by automatically adjustable rectified current of field winding of average capacity turbo- and hydrogenerators. The field systems can be applied for completing newly developed and modernized turbo- and hydrogenerators of capacity up to 220 MW.

STRUCTURE OF LEGEND



The field system is designed for operation in the following conditions:

- height above sea level not more than 1000 m;
- normal value of ambient temperature from +1 °C to +40 °C;
- relative humidity not more than 80% at temperature +25 °C.

Environment – non-explosive, not containing current-conducting dust in concentration reducing insulation level to impermissible limits.





Fig. 1. STS-2P-160-1050 UHL static field system with 100% reserve

SPECIFICATIONS

Name of the parameter	Value
Ceiling limit for field voltage, not less than, r.u.	2.5
Ceiling limit for field current, not less than, r.u.	2.0
Duration of forcing current flow, not less than, sec	50
Field system response time, sec	0.03
Power supply voltage frequency, Hz	50
Nominal voltage on circuits of the stator voltage measurement, V	105
Nominal current on circuits of the stator current measurement, A	5

OPERATIONAL MODES AND FIELD PARAMETERS

- I field should be provided from 380 V station of auxiliary network or from 220 V operative DC power supply source (storage battery). Switching-on to the direct current network should be realized automatically in case of failure of AC power supply;
- I idling;
- I switching-on to the network by exact (automatic and manual) synchronization method;
- I switching-on to the network by self-synchronization method (at sliding not more than 5%);
- I operation in integrated and self-contained power systems with loadings from idling up to the nominal and with overloads according to GOST 183-74 and GOST 533-85;
- I steady field control at fast alternating loads, up to single load surges, caused by simultaneous switch-on of asynchronous engines with square-cage rotor of total capacity up to 30% of the nominal generator power;
- I the unit stop in normal and emergency modes;
- I field forcing with preset frequency rate and adjustable forcing setting and field killing in case of failures in power system causing accordingly voltage decrease or increase on the station or turbogenerator trunks in relation to the preset static characteristic;
- I field killing (field discharge) at the generator normal stop by switching the thyristor converter (hereafter converter) to the inverter mode;
- I field discharge in emergency modes at the action of protection systems by switching the converter to the inverter mode and switching-off the field discharge protection;
- I proportional-integral control of the stator voltage on its deviation from the preset value with blending by the turbogenerator reactive current. For expanding the areas of stability by operation in the network under loading and increasing quality parameters of transient processes, stabilization by derivatives of the stator voltage and the turbogenerator rotor current is carried out;
- I voltage maintenance on the generator outputs according to the preset setting with 1% accuracy in relation to the preset static characteristic. Thereby the value of control constant-error response can be selected within the limits from 0 to 10% in the modes of reactive power delivery and from 0 to 10% in the modes of reactive power consumption;
- I steady reactive capacity distribution between the generators of commensurable capacity incorporated on the generating voltage level, without use of group control or cross leveling connections;
- I unloading the generator on its reactive capacity with accuracy $\pm 5\%$ from the nominal value by its switching-off;
- I program initial field up to $95 \pm 5\%$ of the nominal generator voltage and field killing by its scheduled stop;
- I local and remote change of voltage control setting in the range from 80 up to 110% with relation to the generator nominal voltage;
- I limiting field current on the double value in relation to the nominal generator field current without time delay, and limiting the rotor overload on time-dependent characteristic according to the generator data;

- I limiting the minimal field current to the value not allowing the generator switch to the mode of reactive capacity deep consumption;
- I operation with group voltage control devices;
- I independence of voltage on the generator outputs from frequency in the range from 45 Hz and over, with proportional voltage reduction at frequency decrease lower than 45 Hz.

The company carries out installation supervision, adjustment and testing of field systems, warranty and post-warranty service, modernization and repair of engine field systems in operation, maintenance personnel training and technical advisory services on equipment selection.

Field systems equipment is delivered within 3 to 5 months from prepayment.
