

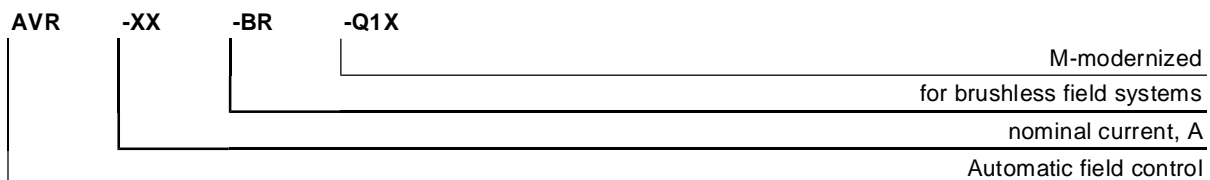


AVR AUTOMATIC FIELD CONTROL FOR CAGE SYNCHRONOUS BRUSHLESS GENERATORS

APPLICATION

AVR-XX-BR-Q1X microprocessor automatic excitation control produced by CC "Energocomplekt" is designed for power supply by automatically adjustable current of field winding of brushless exciter of type GSB, GSD cage synchronous generator for diesel motors up to 3 MW in all its operational modes. The control also carries out functions of control, protection and signaling about the field system condition. AVR controls can also be used for a completing field systems of generators of other series and types, and also for reconstruction of electric machine, high-frequency and brushless field systems of generators incorporating control and regulation equipment realized on the basis of EPA panels, RBA-62 controls, SDE-76 control stations, ARV-R devices, etc.

STRUCTURE OF SYMBOLS



The control is produced in UHL climatic modification, accommodation category 4 in accordance with GOST 15150 and GOST 15543 with the following influencing factors:

- ambient temperature from +1 up to +40 °C;
- height above sea level up to 3000 m;
- 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.

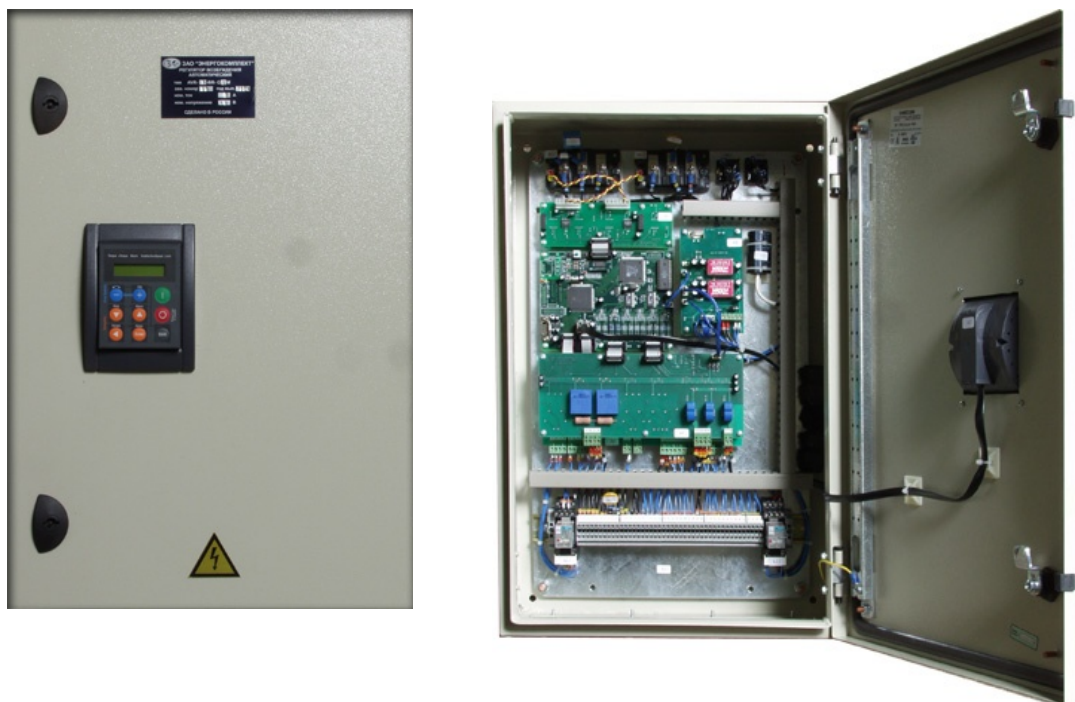


Fig. 1. AVR-8-BR-Q1D automatic field control for cage synchronous motors.

OPERATING MODES

Automatic field control provides:

- I local or remote change of voltage setting with the speed of 0.5 % per second in the range from 80 up to 110% with relation to the generator nominal voltage;
- I maintenance of voltage set by the device on the generator outputs with accuracy not worse than 1% with relation to the established static characteristic. Thereby static regulation value on the reactive current can be established in the range from 0 to 10%;
- I independence of voltage on the generator outputs in the idling mode in case of frequency change from 47 to 52 Hz;
- I forcing field current up to the preset values on the frequency rate at reduction of voltage on the generator outputs by 10-20% and more;
- I limiting field current on the double value of the generator rotor current;
- I limiting the duration of the generator field forcing depending on its frequency rate;
- I clearing (unexciting) the generator field by clearing the brushless exciter field;
- I program initial field;
- I steady regulation of the generator field current at fast alternating loadings, up to single load surges, caused by simultaneous switch-on of cage synchronous motors with total capacity up to 30% of the nominal generator power;
- I limiting the minimal field current to the value not allowing the generator switch to the mode of reactive capacity deep consumption;
- I steady distribution of reactive capacity without use of group regulation or cross leveling connections between several generators of comparable capacity, switched on in parallel on the generating voltage level;

There is also a possibility of outputting through dry isolated contacts the following signals about the condition of the control and the activator:

- I automatic mode of the control operation;
- I manual mode of the control operation;
- I field system failure (breakdown of the rotating rectifier diode, breakdown of the control power transistor, field loss, increased voltage on the stator outputs).
- I failure signal is also output to the power station circuit.

Note: Permissible current through the relay contacts is 0.7 A at the direct current voltage 250 V.

BASIC SPECIFICATIONS

Name of the parameter	Value
Nominal rectified current, A	6.3 - 8
Nominal rectified voltage, V	75
Maximum rectified voltage, V	180
Forcing ratio on field current and voltage, r.u., not less than	2.4
Overload duration by two-times current, sec	60
Nominal voltage of alternating current circuits (from additional winding), V	190
Permissible variation range for voltage of alternating current circuits, V	85...265
Permissible variation range for voltage frequency of alternating current circuits, Hz	25 - 440
Nominal power supply voltage of alternating current circuits (from a storage battery), V	24
Permissible variation range for voltage of direct current circuits, V	18...36
Permissible voltage ripple level for direct current circuits, %	20
Power consumption on alternating current circuits, W, not more than in nominal mode in forcing mode	450 3000
Power consumption on direct current circuits, W, not more than	30
Nominal voltage on circuits of the stator voltage measurement, V	105
Nominal current on circuits of the stator current measurement, A	5
Power consumption from current and voltage measuring transformers, per phase, VA, not more than	1

The company carries out installation supervision, adjustment and testing of field systems, warranty and post-warranty service, modernization and repair of motor field systems in operation, maintenance personnel training and technical advisory services on equipment selection. Field systems equipment is delivered within 3 months from the date of contract execution and prepayment.