

# LLC “Center of energy saving and innovations technologies”

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## Normalizers



**Energy saving normalizers of alternating current “Normel” industrial batch ESSV are used for:**

- power supply of different electric equipments, settings and gears by stable three-phase sine wave voltage in case of mismatch of conditions of the feed voltage network to Russian National State Standard (ГОСТ) 13109-97.
- automotive regulation of voltage of electric networks of 380/220 V, 50 hz.
- energy saving.

– Improvement of the quality of the electric energy according with conditions of Russian National State Standard (ГОСТ) 13109-97.

### **The normalize NORMEL works under following principals:**

1. Universality of usage: Normalizers NORMEL batch ESSV can be in all spheres of economics. Load capacity can vary from 0 to 100%, that affect the quality of stabilized voltage. It has easy adaptability to existing power grids.
2. Energy saving and energy efficiency. Normalizer NORMAL allows to save consumed electricity and free up additional power.
3. Stabilization of supply. The normalize NORMEL is highly effective stabilizer and it has efficiency of 99.7% (in contrast to conventional stabilizers that have 96%).
4. Increase the lifetime of electrical equipment: As a result of work of the equipment (load) under stable conditions and power quality the lifetime of both domestic and technological equipment increases by 2.5-3 times.
5. Filtering. The device NORMEL is a qualitative inductive filter, it prevents the penetration of the load pulse radio frequency interference from the network. Normalizers NORMEL are not the source of the higher harmonics (noise) since they don't contain semiconductor elements in their pattern. They are filters for reducing harmonic currents.
6. Security: Automatic control of each component of the device. The functions of this device is to protect your equipment from overcurrent and short circuits.
7. Easy installation. It's sufficient to establish the normalize NORMEL between device of commercial metering of voltage and controlled load.
8. Philosophy NORMEL is in the unity of solutions on energy saving, good power supply and protection of equipment that is expressed in the usage of innovative technologies, the technical specifications and the use of high quality components and advanced circuit design.

### **Economic efficiency**

As a result of the normalization of electricity by using devices NORMEL achieved following economic effects:

- Saving money by reducing energy consumption;
- Saving money by eliminating defective goods in industries made because of poor power;
- Saving money by increasing of the lifetime of electroreceivers;
- Saving money by protecting electroreceivers from possible deviations from the norm in the supply networks.

**Principles and technology incorporated in our products have been tested for a long period of different business and technical laboratories. NORMEL technology showed excellent results as an effective means to solve the problems of energy supply and energy efficiency.**

**Modern innovative device NORMEL is created to solve problems of efficient usage of electric energy in every sphere of activities.**

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## Outdoor lighting control cabinet "Shuno-Reastat-SKP-05"



Distance control complex built as an outdoor lighting control cabinet SHUNO «RESTAT xxx / XX- 05 SKP " intended for use as a basic unit of the automated control system and accounting of the electricity of outdoor lighting networks (ASKEU NO), that plays the role of an interface between the electrical distribution panel (EDP) transmitting electricity to lighting feeders and urban traffic control server. Cabinet also serves as a power conditioner providing EDP by stabilized voltage and the ability to automatically or arbitrarily by Manager smoothly and synchronously reduce the voltage on all three phases in the outdoor lighting networks , that consist of high-pressure discharge lamps with electromagnetic control gear thereby achieving reduction of energy consumption in the hours when the traffic declines, while maintaining visual comfort , and hence road safety due to the lack of contrast of light stripes on the road surface that takes place at night in the disconnected parts of luminaires ASKEU NO networks but without voltage regulation .

SHUNO «RESTAT xxx / XX- SKP 05 represents a complex device that consist of:

- Stabilizer - reducing regulator of phase voltage of network, designed to work in three-phase 380 V (400V) with a common neutral conductor

and independent control of each phase, which includes three independent phase voltage regulation module using an autotransformer - motors (AT) with the output outlets that are switchable by powerful multilayer semiconductor switch keys;

- Distance control systems of stabilizer. voltage regulator via a server based dispatching system controller with built-in module for GPRS - connection to the server and modules of discrete input- output port through which the output line contactor comprising the controller in the evening and at night his device dimming output voltages phase modules served by control order, and with the checkpoint regulator integrated circuits switching devices and all external connections (EDP) are taken on the status of these signals and control circuits , as well as the indication is displayed on the display controller input - output voltage of the regulator, as well as the output currents and active power output of each phase . In addition, complex remote control transmits information to the server with a three-phase digital power meter type "Mercury" , located in SHUNO «RESTAT xxx / XX-CRG 05 " for its archiving in the control , and also operates the security, fire and emergency alarms in the cabinet and in EDP and sends their messages to the server.

HUNO «RESTAT xxx / XX-SKP 05 " saves up to 40% per year due to operational distant controlled or programmed by star almanac dimming of luminous flux of lamps at night and stabilization of line voltage. It also eliminates overruns electricity that occurs when there is overvoltage in unstabilized network. Unlike existing ASKEU NO, that save electricity at night due to the deviation of one or two phase supply of EDP complex SHUNO «RESTAT xxx / XX-SKP 05 " dimes all lights at the same level without creating contrast lighting from road pavement that is unsafe for night driving.

