The equipment necessary for the installation

1. Three-phase asynchronous Motor with cage rotor
2. Auto Alternator
3. Load relay (Rectifier)
4. 12V car battery
5. Car DC to AC Inverter

1. Three-phase asynchronous motor with cage rotor

The car is the most asynchronous widespread electric car. It is found widely in electrical actuators make in all industrial sectors, particularly in social and arrangement of three-phase motor, machine tools, for the operation of pumps, compressors, ball Mills, electric cranes, bridges, medical apparatus, appliance etc.

Asynchronous engines are built for a wide range of powers (from ordinal W units up to tens of MW), for low voltages (below 500V) and medium voltage (3

kV, 6 kV and 10 kV) and synchronous speed the frequency f = 50 Hz commonly with equal to n = 500, 600, 750, 1000, 1500 or 3000 rpm, depending on the number of pairs of poles.
The main advantages of induction motors over other types of electric motors are:

- *constructive simplicity;*
- *low cost price;*
- *high safety of operation;*
- *high technical performance (high torque, high efficiency);*
- *stability in the functioning, operation, handling and simple maintenance;*
- *directly from the mains power supply three-phase grid by 2003;*
- *can supply motors with power less than 5KW of monophase A.C. network using a capacitor phase.*

Engine power

Connect the three-phase motor to 400V network directly connecting the engine to the heater power supply. To reduce the current absorbed at start up the engines over 5kW is connection terminals connecting triangle star/U1-V1-V2, W2, W1-U2.

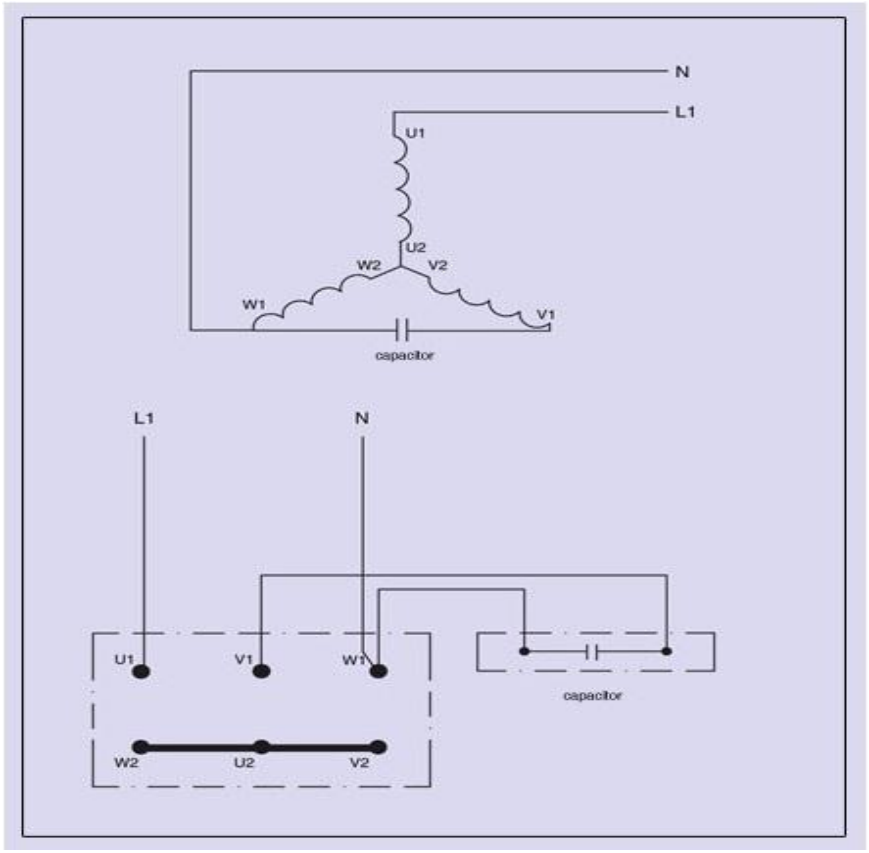
Connecting a three-phase motor to a power supply of 230V A.C. is as follows:

- first create a connection to the terminals of the motor star short circuit between terminals U2-V2-W2.

- Connect neutral (null) to the positive terminal W1;
- Connect the positive terminal U1 phase;
- The capacitor is connected to the positive terminal at the entrance and exit to W1, V1 landmark;

The direction of rotation of the motor can be reversed by changing the phase and neutral between them.

Capacitor choice phase is done depending on the engine power, its value must be 70 µF/kW.



The basic operation of asynchronous motor

Three-phase asynchronous engine receives electricity from the AC network by connecting the statorului, which converts energy into mechanical energy supplied to the rotor shaft.

Trifazaţi currents in lower system absorbed by the stator produces a magnetic field that învârtitor for the fundamental harmonic is in the form:

This field produces the report with a rotorică (which at the time of startup is fixed) a magnetic flux of the form:

This in turn induces the flow phase has înfăşurarii rotorice the same pulsation t.e.m.. As a rotorică is closed (in short circuit or a balanced consumer) t.e.m. will give rise to a current through the rotorică phase. Symmetrical three-phase system of currents in a three-rotorică interacting with three phase feed system 2 Y giving rise a couple of forces which will trigger the rotor. The rotor increases its speed and thus finally is set to the value of $\Omega_2\Omega_1 < (_1\ \Omega$ is the angular velocity of sincronism of the învârtitor inductor).

2. Car alternator

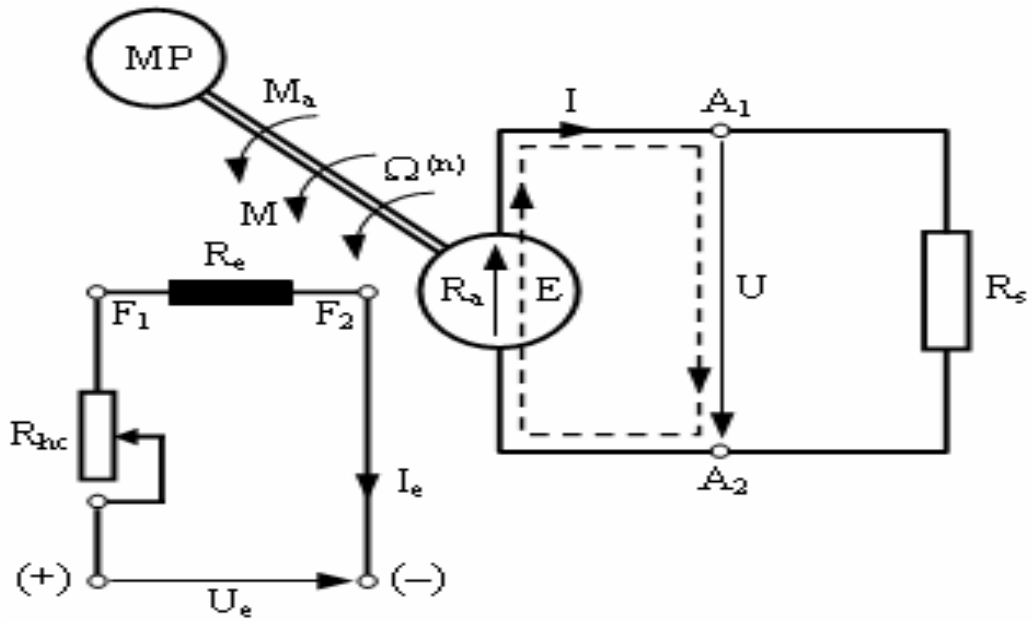
The alternator is an electromechanical device that converts mechanical energy from the engine

electricity in the form of direct current with a voltage of 12V.

The generator is a DC machine that operates by the generator, being trained by the engine.

The engine (electric motor) develops for this active couple me with the same respect as the speed of rotation. The alternator excitation winding is provided by a current of the DC source, which may be a rectifier, a battery, a DC generator or even electric car considered (autoexcitation).

The principle of the car altenator



$I_{(e)}$ -inrush current in winding excitation

$_E$ U-voltage at battery terminals

R_{ho} -rheostat

R_e -excitation winding resistance

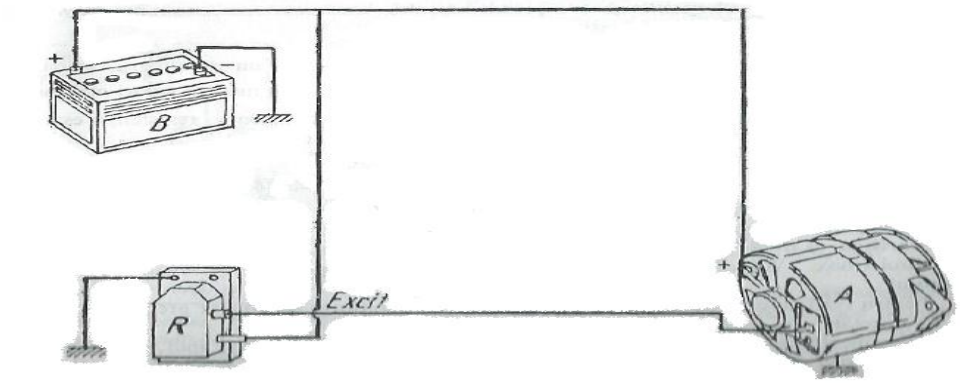
I-current in the rotor winding

E-electromotive inside the alternator

U-voltage at the alternator output

MP-primary propulsion engine

Wiring diagram - alternator connection in the circuit



3. Relay (rectifier)

The Rectifier is designed to charge the battery with a voltage coming from the alternator. It stabilizes the charging voltage at 12V DC.

Load relay connections

- The positive terminal of the rectifier is connected to the DF to DF the alternator terminal after the Excitation circuit (2);
- The positive terminal + B is connected to battery (+);
- The positive terminal + of the meal.

4. Car Battery 12V D.C.

The battery is a source of reversible chemical consisting of an element which puts electricity and store it in the form. Its operation is based on the occurrence of an explosion-proof electric voltages kind, obtained by associating various materials in electrochemical point of view. The battery of accumulation can be acidic or alkaline (for motorcycles).

Battery lead acid.

It contains three elements:

1. liquid (called the electrolyte)
2. the positive electrode consists of PbO_2
3. the negative electrode composed of Pb

The operation is performed on the basis of reversible chemical reactions.

(+) $PbO_2 + 2h + H_2SO_4 \rightarrow \leftarrow PbSO_4 + 2H_2O$

(-) $Pb + H_2SO_4 + A \rightarrow \leftarrow PbSO_4 + H_2O$

Reaction between solids like Pb and PbO_2 and liquid substances such as H_2SO_4 and H_2O results lead sulfate ($PbSO_4$) to spend in the form of fine crystals of white on the electrodes. The resulting substance is water. It is observed that is consumed and the resulting H_2O, H_2SO_4 therefore electrolyte is added to increase the concentration of H_2SO_4.

5. Car inverter Dc-2003

The inverter is an electrical device that allows the conversion of direct current into alternating current. Alternating current obtained can have different voltages and frequencies. May have different modes of operation (electromechanically or semiconductor devices).

Voltage inverters with a pure sinusoid are electronic devices that convert direct current into alternating current needed many electrical appliances used by people. Alternating current produced form pure sine current quality, being the same or better with the current from the mains (the usual current of the socket).

Alternative energy systems, power inverters are an important link between the energy in a direct current to the battery and AC power that requires electrical equipment. An inverter/power supply fed from a group of batteries can be a continuous source of energy in the event of a fall of voltage or blackout.

The batteries provide energy in the form of direct current (DC-direct current) which can be used at very low voltages, but cannot be used to fuel most modern household appliances. The national network of electric current and power generators produce AC with sinusoidal waveform (AC-alternating current) that is used by the most common electrical appliances today. Voltage inverters take direct current provided by a group of traction batteries and transforms it electronically in alternating current.

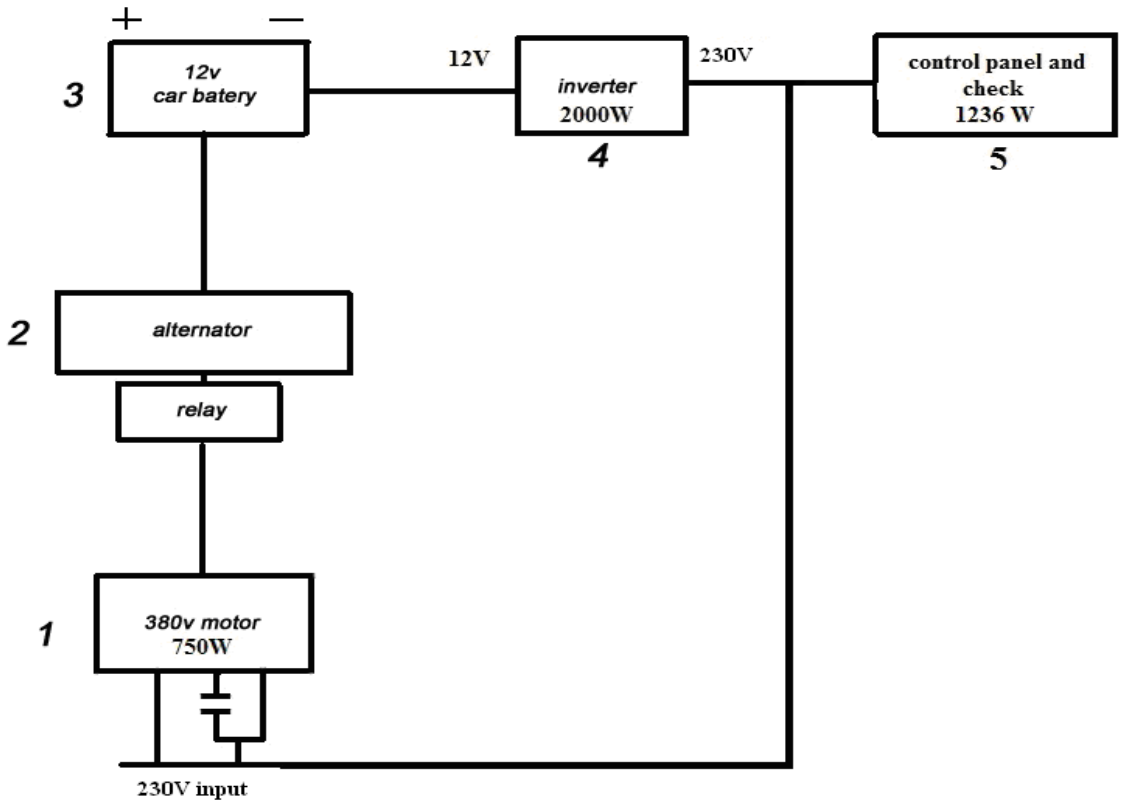
A power inverter used as energy reserve in urgent cases in a housing connected to the network will use the energy from the grid in order to keep the batteries charged and when the mains fails, it will automatically switch to absorb current from batteries and power the electrical system of the home. In a stand-alone renewable energy system, whether for a home, car, or in the inverter allows AC electrical appliances to work with energy drawn from the accumulator battery group.

Alternating electric current supplied to the national grid or motor generators has a sine wave with a pure sinusoid. This is the safest in operation for household appliances. The alternating with pure sine passes from the maximum value of the voltage to the minimum value and vice versa through a curved wave shape smoothly as opposed to jumping into the current stage alternative with modified sine. Voltage inverters with a pure sinusoid will produce alternating current of the same quality or better with the current from the mains (the usual plug), ensuring that even the most sensitive electronic equipment will function properly.

With pure sine inverters are more expensive than inverters with modified sine, but their shape quality of output waveform can be a definite advantage.

For buildings with offices, a power inverter used for energy supply in case of emergency, an inverter with pure sine will allow correct operation for all Office equipment and fluorescent lighting. For anyone who uses, battery chargers, electric drill machines, radios with digital clock or sensitive electronics will have to choose an inverter with a pure sinusoid in order to ensure the correct operation of all household appliances.

The operation of the entire circuit



The inverter is connected to the 12V car battery transforms continuous-continuous charging current of 230V AC. Three-phase motor (380V, is seas, 0.75 KW) is connected to the inverter output (outlet) (230V) using a phase capacitor (50 μF). Train engine using a car alternator drive belts. It produces a current with a voltage of 12V DC and using the load output is stored in the battery.

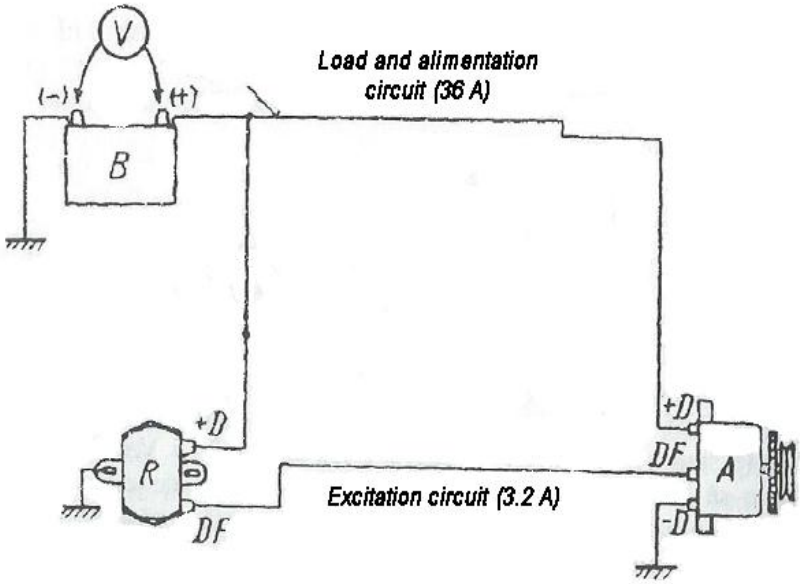
The inverter is related to both three phase motor 750W and lighting fixtures with a total power of 936 W (12 75Wşi bulbs 2 fluorescent lamps) but also an outlet with a voltage of 220 v and an output of about 300W.

Lighting and grip on the Panel are connected in parallel in order to avoid system downtimes at the failure of one of them.

Connecting the alternator to the circuit is performed according to the scheme below:

- The positive terminal "+" battery to the positive terminal of the car "+ D" of the alternator;
- The "-" Terminal of the generator to the ground;
- The terminal "DF" alternator "DF" to the positive terminal of the relay load;
- The positive terminal "+ D" load relay to the positive terminal "+" battery;

- The "-" Terminal of the car battery to ground.



All system produces a stream of 2000W 750W of which are consumed by the three-phase asynchronous engine, and what follows after powering the engine, a current of the power supply are you using 1250W lighting fixtures and electrical outlets.