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Road lighting technology
LED lighting systems

Solar energy use

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MULTI-PURPOSE SOLAR POWER PLANTS

Multi-purpose solar power plant (SEU) comprises:

- *solar cell (SC);*
- *battery (BAT);*
- *controller;*
- *container and fastenings.*

SEU is available in two design versions **SEU-1** and **SEU-2.**

SEU-1

SEU-2

SEU design depends on site geographical coordinates (number of sunshine days and their duration) and SEU loads.

Arbitrary combinations of solar power, battery capacity and its type are possible in below indicated range depending on system operating requirements:

- **SEU-1** - SC peak power from 40 to 160 W, battery capacity from 45 to 200 A * h;
- **SEU-2** - SC peak power from 180 to 300 W, battery capacity from 100 to 350 A * h;

Designation structure

SEU-X-X/X/X-X

- SEU design version
- Solar panel power,W
- Battery capacity,A * h
- Output voltage, 12V, 24V (for SEU-1 - 12V only)
- With radio channel (R), without radio channel- no letter.

Designation example of multi-purpose solar power plant design version 2, solar panels power 240W, battery capacity 200 Ah with output voltage 12V without radio channel:

SEU-2-240/200/12

SEU can be equipped with different types of controllers, including PWM, MPPT, single or two-timer controllers to control lighting, battery charge\discharge, presence detectors, speed, radio modem with appropriate software for remote interaction between SEU consumers; inverters of various power, low power gasoline or diesel generator, wind generator.

Several SEUs can be integrated into a system with a purpose of simple increase in power to extend their functions at one installation point, or they may be installed apart from each other with shared control by radio channel.

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Solar power plants with batteries are ideally suited for production and storage of electric power.

Ability to produce, accumulate and store electric power makes such solar power plants a reliable source of energy at all times regardless of weather conditions and time of day. Such system has a long service life and does not depend on power outage in stormy weather; power setbacks, instability and poor quality of existing electric networks. SEU installation does not require trenching, cabling, time-consuming and expensive connection to power supply network.

Solar power plants charge the batteries at day time, and then the stored energy is supplied to input as required. The controller built into SEU provides for battery charging with temperature compensation by manufacturer specified algorithms, protects it from excessive discharge and provides other functions at consumer choice out of available combinations.

The convenience of solar power plants consists in their light weight, compactness and ease of installation. SEU can be mounted on billboards, poles and pillars.

SEU is designed for autonomous power supply of various consumers within its power capabilities:

- street, landscape, architectural lighting;
- fountains, ventilation and cooling systems, weather stations, pumping stations;
- security systems, emergency lighting and power supply;
- power supply of houses, summer cottages, sports, tourism and agricultural facilities of various kinds;
- power supply for mobile traffic lights, road signs, unregulated pedestrian crossings, autonomous sensors, photofixation systems, unguarded railway crossings;
- charging of stand-alone tools, laptops, batteries;
- and many others.

LLC "Elintel" own products for use in SEU:

- pedestrian crossing display panel
- pedestrian crossing displays in traffic light section housing Ø 100, 200, 300 mm
- different purpose outdoor LED lamps
- LED spotlights
- household and housing LED lamps
- simple low-cost controller with one timer
- 2- timers controller, used mainly for lighting systems, but not only
- battery charge-discharge controller with broad load and radio modem control functions

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SEU specifications

Specifications	Value
Degree of protection against external factors	IP54 (IEC 60529)
Operating temperature range*:	– 30°C - +55ºC
Relative humidity at 25 º C	100%
Solar panel canting angle (elevation angle) variation, degrees	
SEU-1	from 45 to 80 with 5 degrees increment
SEU-2	from 5 to 85 with 10 degrees increment
Wind load	up to 160 km / h
Mounting pipe diameter (for pole mounting), mm	76
Max. SEU weight (for largest SC dimension and maximum battery capacity for the given design), kg, not more	
SEU-1	100
SEU-2	200
Warranty period, years	3
Average life - at least	10 years

** Temperature range towards negative values is limited by temperature condition of guaranteed battery operation parameters*

We may help you to choose SEU configuration based on your initial data as below, if required:

- ***solar radiation and climate for your geographical coordinates;***
- ***consumer types;***
- ***consumer operation timing diagram.***

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SELF-POWERED PEDESTRIAN CROSSING PANEL DATA SET KTPPA-1

Self-powered pedestrian crossing panel data set KTPPA-1 is designed to improve safety of pedestrians in unregulated road crossings areas.

Set composition on each side of pedestrian crossing:

1. Solar Power Plant SEU-1 *(Solar cell (SC) Battery (BAT), Controller, Radio Modem with antenna, Container, Fastening)*

2. 2-sided pedestrian LED crossing panel

"Pedestrian crossing" panel display visually corresponds to road sign 5.19.1, 5.19.2 by GOST R 52290-2004. The pedestrian crossing panel is housed in undismountable sealed metal body to impede unauthorized access. Facial protective glass of high impact strength resistant to external climatic conditions is used. LEDs of high specific luminous efficiency are used in panel assembly.

The panel turns on by pedestrians with the use of call button (human contour - red LEDs, track - yellow LEDs, panel outline - white LEDs).

Light indication is directed towards vehicle traffic, approaching the crossing, drawing additional attention of drivers to this part of the road.

KTPPA-1 is not a traffic control device and is intended only to raise awareness of drivers approaching and crossing designated unregulated pedestrian crossing.

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SEU supplies crossing panel and controls with electrical energy collected from the sun and accumulated in the battery.

All consumers are powered from batteries at dark hours. The controller, built into SEU provides battery charging with temperature compensation by manufacturer specified algorithms and protects it from excessive discharge. Pedestrian panel turn on time (1 to 255sec). and the pause between switchings (1 to 255 seconds) are also programmed to save battery power. Two KTPPA-1 are interconnected by radio channel in authorized frequency range (from 433.1-434.7 MHz) and 1 to 10mW power.

The set installation does not require trenching, cabling, time-consuming and expensive connection to power supply network.

KTPPA-1 specifications

Solar panels power, battery capacity and KTPPA-1 weight depend on SEU configuration based on daily average solar insolation at installation site. The selected parameters shall provide consumers with enough energy for positive balance at any time of year.

Specifications	Value
Degree of protection against external factors	IP54 (IEC 60529)
Operating temperature range*	– 30°C - +55ºC
Relative humidity at 25 º C	100%
Power consumed by one two-sided panel, W, not more than	30
Self-powered operation (at very cloudy weather) for 120 1-min. daily operations	8 days
Wind load	up to 160 km / h
Mounting pipe diameter, mm	76
Overall panel size, mm	900x900x50
Warranty period, years	3
Average life - at least	10

**Температурный диапазон в сторону отрицательных значений ограничен температурным режимом гарантированных параметров работы АКБ*

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SELF-POWERED KSUSA STREET LIGHT SET

KSUSA-1

KSUSA-2

Self-powered KSUSA street light set is designed for lighting of streets, roads and squares with the use of solar energy.

LED light turns on only at night time after sunset. Turn on/off time is flexibly programmed from all-night operating mode (sunset to dawn) to selected sunset to sunrise time intervals.

Composition: 1. Solar Power Plant SEU
(Solar cell (SC), Battery (BAT), Controller, Container, Fastening)
2. SUS lamp

The set is equipped with **SEU-1** or **SEU-2** and one of below lamps depending on mounting location and required lighting conditions:

- SUS-90-12 (luminous flux - 7700 lm, power - 90W) (SEU-2 only)
- SUS-70-12 (luminous flux - 6,000 lm, power - 70W) (SEU-2 only)
- SUS-50-12 (luminous flux - 4,250 lm, power - 50W)
- SUS-30-12 (luminous flux - 3000 lm, power - 30W)

Freezeproof battery provides for extended deep discharge without significant degradation for this class of systems and maintains large capacity reserve even at low temperatures.

SEU is equipped with solar panels of 14-15% solar energy conversion efficiency. Solar panel parameters are specified for international standard testing conditions (STC).

SEU supplies LED lamp with electrical energy, emitted by sun and accumulated in battery. All consumers are powered from batteries at dark hours. SEU built-in controller provides battery charging with temperature compensation

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The set installation does not require trenching, cabling, time-consuming and expensive connection to power supply network.

PU controller monitors battery condition and adjusts current supply to consumers. It prevents battery damage from overcharge or deep discharge at low solar energy periods. It is also protected against over-voltage, short-circuit and reverse polarity

KSUSA specifications

The power of solar panels, battery capacity and KSUSA weight depend on SEU configuration based on daily average solar insolation at product installation site. The selected parameters shall provide consumers with enough energy for positive balance at any time of year.

Specifications	Value
PU protection degree against external factors	IP54 (IEC 60529)
Operating temperature range*	– 30°C - +55ºC
Relative humidity at 25 º C	100%
Self-powered operation (at very cloudy weather) in continuous operating mode at night time.	8 days
Wind load	up to 160 km / h
Warranty period, years	3
Average life - at least	10

** Temperature range towards negative values is limited by temperature condition of guaranteed battery operation parameters*

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SELF-POWERED PEDESTRIAN CROSSING LED SET KIPPA

KIPPA-1 set is used as an option for unregulated pedestrian crossings to alert drivers and to enhance traffic safety.

Pulse LED indication provides for early identification of pedestrian crossing or intersection to facilitate safe driving conditions especially at dusk and night hours.

The product is supplied from self-sufficient solar power plant.

Composition:

1. Solar Power Plant SEU *(Solar cell (SC) Battery (BAT), Controller, Container, Fastening)*

2. Pedestrian crossing LED display IPP

KIPPA-1 set can be fitted with radio controller to interconnect several KIPPA-1 for synchronous operation in authorized frequency band.

IPP display is structurally fitted into traffic light housing section Ø 100, 200, 300 mm.

High-performance yellow glow LEDs are used as display light source.

SEU supplies IPP and controls with electrical energy, emitted by sun and accumulated in the battery.

Freezeproof battery provides for extended deep discharge without significant degradation for this class of systems and maintains large capacity reserve even at low temperatures.

SEU is equipped with solar panels of 14-15% solar energy conversion efficiency. Solar panel parameters are specified for international standard testing conditions (STC).

The central controller provides lead-acid battery charge/discharge control function from photovoltaic module

SEU installation does not require trenching, cabling, time-consuming and expensive connection to power supply network.

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KIPPA-1 specifications

The power of solar panels, battery capacity and KIPPA weight depend on SEU configuration based on daily average solar insolation at product installation site. The selected parameters shall provide consumers with enough energy for positive balance at any time of year.

Specifications	Value
PU protection degree against external factors	IP54 (IEC 60529)
Operating temperature range*	– 30°C - +55ºC
Relative humidity at 25 º C	100%
LED flashing frequency in Hz	1 ± 10%
Consumption power, at rated voltage, W, not more	
IPP-100	1.4
IPP-200, IPP-300	2
Axial light intensity, Cd, not less	
IPP-100	120
IPP-200, IPP-300	150
Wind load	up to 160 km / h
Self-powered operation (at very cloudy weather) in continuous operating mode with fully charged battery.	3-5 days
Mounting pipe diameter, mm	76
Warranty period, years	3
Average life - at least	10

** Temperature range towards negative values is limited by temperature condition of guaranteed battery operation parameters*

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PWM KBS-10-12/24V CONTROLLER

KBS-10-12/24V - is designed to control lead-acid batteries charge and discharge, as well as lighting conditions, depending on time of day. It is ideal for self-powered low power (no more than 120W) lighting systems, based on photovoltaic solar panels. Load control (light source) is provided by one of 40 programs, depending on time of day.

Key features:

- Charging rate pulse-width modulation
- Charge voltage regulation
- 4 charging modes: forced, PWM, rectifying, supporting
- Automatic load connection after protecting cutout
- Temperature compensation
- Programmable mode
- Electronic fuse
- Low level of electromagnetic radiation
- Battery discharge prevention by solar cell (SC) at night hours
- Load shedding at unacceptably low battery voltage
- SC cut off after battery full charge voltage is attained
- Protection against battery open circuit
- Lightning protection varistor
- Load protection against input overvoltage
- Overheat protection
- Load short circuit protection
- SC,BAT and load reversed polarity protection
- Ease of use
- Low cost

KBS-10-12/24V Controller Specifications

Specifications	*Value*
Degree of protection against external factors	IP22 (IEC 60529)
Maximum output current, A	10
Maximum load current,A	10
Maximum internal consumption, mA	7
Recharge voltage, V	13.7
Forced charge voltage, V	14%
Load reconnection voltage (automatic), V	13,1/26,2
Load reconnection voltage (manual), V	12,5/25
Safety cutout point at discharge, V	11,1/22.2
Operating temperature	-45°C - +40ºC
Maximum cross section of connecting wires, mm^2	2.5
Mass, kg, not more	0.3
Dimensions without mounting parts (L * W * H), mm	105x80x20
Warranty period, years	3