

LIGHTING WITH SOLAR ENERGY

The cost of energy has risen dramatically in recent years. As this trend is expected to continue, local authorities – which are already feeling the strain of tight budgets – are under increasing pressure to reduce energy consumption.

One of the cost pools for local authorities is street lighting, and in this field solar lighting systems can be a cost-effective alternative to conventional lighting. Having reached technical maturity, solar light installations are today available in a wide range of designs for various requirements.

Photovoltaic exterior lights were initially developed as mains-independent street lighting and for isolated locations in which either no mains power is available or in which a connection to the power grid would be too complex and costly.

They can be employed wherever the use of conventional, grid-powered lights is not possible or desirable for whatever reason:

- Prohibitive costs of laying feed lines to remote locations*
- Impairment of road traffic through feed line installation work*
- Uneconomic use of mains power*

In addition to generating their own energy, solar-powered lighting systems do not need feed lines, which can help reduce installation costs and makes them environment-friendlier than conventional lighting in two respects.

They are ideally suited for lighting car parks, bus stops, playgrounds, public market and exhibition areas, sports and school facilities, driveways to industrial parks and leisure centres, monuments, promenades and foot- and cycle paths in both rural and urban areas.

Which model is best suited for a particular application depends not least on the required operating times and light yield and the environmental and site conditions.

German power and switchgear specialist ESGO has many years' experience in the development and supply of photovoltaic lighting and offer a comprehensive range of solar-powered light systems covering a wide range of applications and requirements.

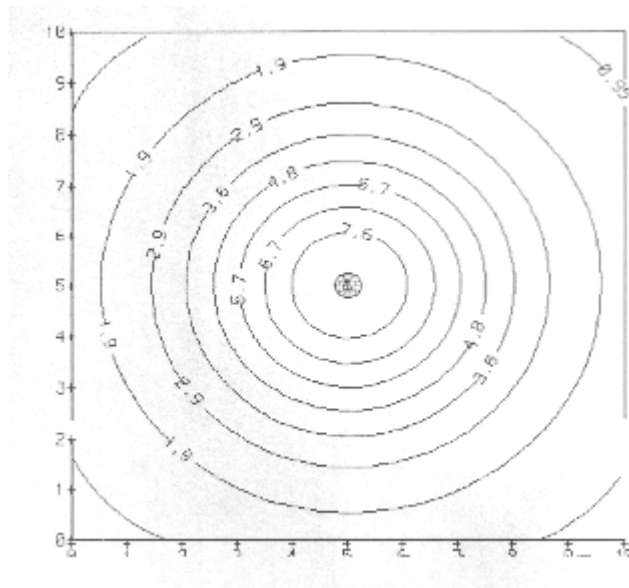
SOLAR-POWERED EXTERIOR LIGHT SAL 18/240 Trendline

SAL 18/240 Trendline on 4.0 m LSH pole

Luminous intensity distribution (lx) within a 10 x 10 m area

x [m]-> y [m]	.50	1.50	2.50	3.50	4.50	5.50	6.50	7.50	8.50	9.50
9.50	.86	1.11	1.41	1.68	1.85	1.86	1.70	1.44	1.15	.90
8.50	1.11	1.53	2.03	2.53	2.88	2.89	2.58	2.09	1.58	1.16
7.50	1.40	2.02	2.85	3.83	4.55	4.57	3.90	2.94	2.10	1.47
6.50	1.66	2.51	3.82	5.40	6.58	6.61	5.50	3.93	2.61	1.74
5.50	1.81	2.84	4.50	6.52	8.11	8.15	6.64	4.62	2.95	1.90
4.50	1.81	2.83	4.49	6.50	8.08	8.11	6.61	4.60	2.93	1.89
3.50	1.64	2.49	3.79	5.35	6.50	6.54	5.42	3.88	2.57	1.71
2.50	1.38	1.99	2.81	3.78	4.48	4.50	3.83	2.87	2.05	1.43
1.50	1.09	1.49	1.99	2.48	2.81	2.83	2.51	2.03	1.54	1.13
.50	.83	1.08	1.37	1.63	1.80	1.81	1.65	1.40	1.12	.86

Mean 3.03
 Minimum .83 at x= .50m y= .50m
 Maximum 8.15 at x= 5.50m y= 5.50m



TECHNICAL DATA AND QUALITY PARAMETERS

Mean roadway illumination intensity 3.03 lx
 Min. illumination intensity .93 lx at x= .50m y= .50m
 Max. illumination intensity 8.15 lx at x= 5.50m y= 5.50m
 Uniformity .28
 Uniformity .10

SOLAR-POWERED OUTDOOR LAMP SAL 18/240 Trendline

General description:

The solar-powered exterior light SAL18/240 Trendline has been designed specially for areas in which a local connection to grid power is not possible or would be too expensive. It is ideal for pedestrian zones, cycle paths, breakdown lanes and other road areas outside the actual roadway as well as streets, pedestrian crossings, park lanes, school yards and any areas in which lighting is used to reduce crime and enhance a sense of security.

In addition to a reliable supply of solar power, the lamp features an appealing design and a solid build quality.

The 18 W energy-saving lamp is controlled by an intelligent charge controller and supplied from a 200 Ah storage battery. Both battery and charge controller are contained in a galvanised underground enclosure. The storage battery provides up to 14 hours of night-time lamp operation, which can optionally be split over two periods with a timer, for example

from 4 p.m. to 1 a.m. and from 4 to 8 a.m. The battery is recharged through a total of 240 Wp PV modules, which are mounted on a revolving module support that can be aligned to face due south.

To obtain a sufficient and evenly distributed luminous intensity for the intended lighting application (see overleaf), we recommend poles with

a height of between 3 and 4 metres. Alternatively exterior lights can be supplied with an 11 W lamp.

The system is available in a range of RAL colours, is maintenance-free and works fully independently of any external power source.



Advantages:

- The system does not need an external power source.
- Reliable energy supply throughout the lamp operating time.
- No need to lay power cables
- The light has an appealing design.

Basic system:

- Two 12 V/120 Wp solar modules
- Steel pole, height 4 m above ground
- Storage battery, 12 V/200 Ah, maintenance-free
- Charge controller with photoelectric lighting controller
- Module support bracket
- Galvanised underground enclosure
- Lamp, 12 V/18 W, with electronic ballast unit

SOLAR-POWERED OUTDOOR LAMP SAL 11/150 Basicline

General description:

The solar-powered outdoor lamp SAL11/150 Basicline in the design of Trendline has been designed specially for areas in which a local connection to mains power is not possible or would be too expensive.

It is ideal for pedestrian zones, cycle paths, breakdown lanes and other road areas outside the actual roadway as well as streets, pedestrian crossings, park lanes, school yards and any areas in which lighting is used to reduce crime and enhance a sense of security.

In addition to a reliable supply of solar power, the lamp features an appealing design and a solid build quality.

The 11 W energy-saving lamp is controlled by an intelligent charge controller and supplied from a 140 Ah storage battery. Both battery and charge controller are contained in a galvanised underground enclosure.

The storage battery provides up to 8 hours of night-time lamp operation, which can optionally be split over two periods with a timer, for example from 5 p.m. to 11 p.m. and from 5 to 7 a.m.

The battery is recharged through a total of 150 Wp PV modules, which are mounted on a revolving module support that can be aligned to face due south.

To obtain a sufficient and evenly distributed luminous intensity for the intended

lighting application (see overleaf), we recommend poles with a height of between 3 and 4 metres.

The system is available in a range of RAL colours, is maintenance-free and works fully independently of any external power source.



Advantages:

- The system does not need an external power source.
- Reliable energy supply throughout the lamp operating time.
- No need to lay power cables
- The light has an appealing design.

Basic system:

- Two 12 V/75 Wp solar modules
- Steel pole, height 4 m above ground
- Storage battery, 12 V/140 Ah, maintenance-free
- Charge controller with photoelectric lighting controller
- Module support bracket
- Galvanised underground enclosure
- Lamp, 12 V/11 W, with electronic ballast unit

SOLAR-POWERED OUTDOOR LIGHTING SYSTEM SAL 11/150

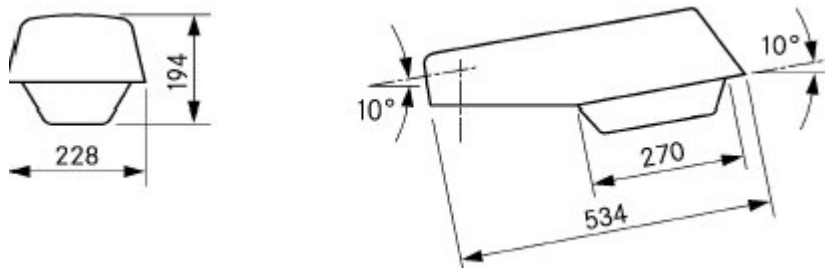
The SAL 11/150 is a high-quality street light with the following characteristics:

Luminaire for post-top and side-entry mounting
for compact fluorescent lamp
1 × PL-S 11 W = 900 lm
Structured polymethyl methacrylate bowl
Aspherical reflector
Degree of protection: light IP54, terminal chamber IP23
Pole connection dimensions:
Luminaire for side-entry mounting: $d_2 \times l_2 = 42/48 \times 100$ mm
Glass-fibre reinforced
polyester resin enclosure (SMC) from 20% recycled materials
Polyester colour similar to RAL 7035 throughout
(for other RAL colours please enquire)
Cast aluminium spigot adapter for post-top and side-entry installation

Stainless steel pole fixing screw
Detachable mains connector with
strain relief, cable protection and plug contacts
Electrical components and lamp socket are incorporated in
a removable gear tray
Ultra-pure aluminium reflector
Lamp enclosure with felt seal
Bowl or glass with aluminium frame is hinged and has a corrosion-resistant-
resistant turnlock fastener for opening or removal without tools.

Dimensions: luminaire for side-entry mounting
Subject to technical changes

Dimensions: luminaire for side-entry mounting



SOLAR-POWERED OUTDOOR LAMP SAL 18/150

Our SAL 18/150 is designed for lighting exterior spaces, such as walk ways, bicycle paths, public grounds and areas.

It is also ideal for car park, playing fields, outdoor swimming pools and campsites.

Suitably sited, it can be used all year round.



Operating principle

A lamp controller with a built-in photoelectric lighting controller switches the lamp on at nightfall and off again at dawn.

At a depth of discharge of 70 percent, a fully charged storage battery provides an operating time of up to 50 hours. With a timer the luminaire can be configured for continuous or timed operation.

The optional motion sensor switches the lamp on for 80 seconds at a time (other on-times are possible).

The chosen solar panels and lamp ensure a sufficient storage battery charge for a dependable lamp operation.

Standard equipment

Two 75 Wp solar modules

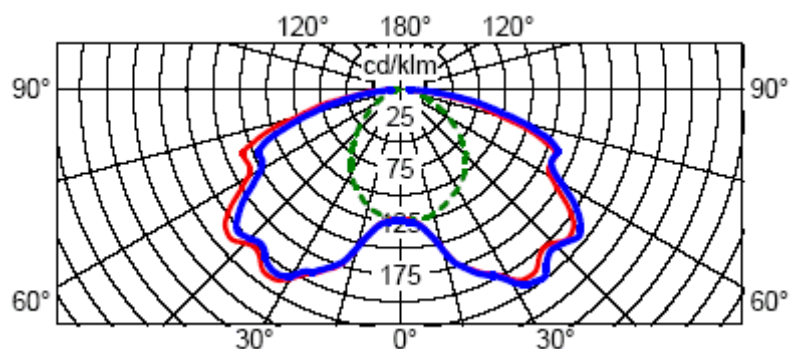
Energy-saving 18 W lamp

Maintenance-free 12 V/135 Ah storage battery

Charge controller, photoelectric lighting controller, motion detector, timer

Corrosion-protected underground battery enclosure

Light intensity distribution



SOLAR ADVERTISING AND INFORMATION BOARD LIGHTING SYSTEM WBL5 21/24

Cost-effective through LED technology

The solar advertising and information board luminaire has been designed specially for lighting advertising boards and signs that are sited remote from the electric mains grid. The use of LED technology cuts

power consumption by up to 90 percent and the LEDs have a service life of up to 100,000 operating hours. With these benefits and the complete elimination of electricity charges this type of lighting is enjoying increasing popularity even in locations where a mains connection would be possible.



Operating principle

A lamp controller with a built-in photoelectric lighting controller switches the LED lamp on at nightfall and off again at dawn.

At an operating duty of 13 hours per day the storage battery has a guaranteed power reserve of twelve days.

The solar modules with battery enclosure and the luminaire are designed for pole-mounting.

Alternatively they can be fitted directly to the object to be lit.

Complete system

Two 12 V/12 Wp solar modules

Steel pole, height 3 m above ground

LED luminaire incl. pole-mounting fixtures

Storage battery, maintenance-free, 12 V/24 Ah

Battery enclosure

Charge controller with photoelectric lighting controller

Advantages:

No complicated laying of power cables; can be used immediately

No energy costs!

Luminaire:

12 V DC

Current consumption:

20° : 132 mA

70° : 146 mA

IP64

Selection table

Object size and luminaire type	recommend distance in cm					
	50	100	150	200	250	300
Object size Width: Height: (= max. width)						
Distance of object from luminaire Angle of radiation: 20°	140	280	425	550		
Distance of object from luminaire Angle of radiation: 70°	35	70	110	150	180	215

20° for spotlight type



70° for flood light

SOLAR-POWERED OUTDOOR LIGHT SALX 18/24

The cost-effective alternative for many applications.

The SALX 18/24 is the ideal solution for lighting outdoor areas and paths in both private and public spaces. A modified version of the luminaire is available for remote bus stops without access to mains power and at which lighting is required only for short times.

The light can be sited in any location in which the solar modules receive **direct sunlight all year round without** prolonged shading. As shade dramatically reduces the solar modules' energy yield and accidental activation through the motion sensor should be prevented, careful positioning of the installation is important.

Operating principle

The **18 W energy-saving lamp** with electronic ballast unit receives its power from a **maintenance-free 12 V** storage battery with 7.2 Ah, which is built into the lamp enclosure. The battery, which is suited for **cyclic operation**, is charged during the day by two **12 Wp amorphous silicon thin-film solar modules**. An electronic charge controller with deep discharge protection protects the storage battery. The **motion sensor**, which switches the light on when it detects movement, features a built-in **photoelectric lighting controller** with adjustable twilight threshold. After an infinitely adjustable on duration of between 5 seconds and 15 minutes, the lamp is switched off again. The fully-laden storage battery has a capacity of about 120 cycles of 90 seconds each per night, which includes a **reserve capacity for days with little sunshine**, especially in winter. The range of the passive infrared motion sensor with a coverage angle of about 120 degrees can be adjusted up to about ten metres.



Basic system:

Two 12V / 12 Wp solar modules,
Storage battery, 12V / 7,5 Ah maintenance-free
Charge controller with photoelectric lighting controller
Infrared motion detector 120°

SOLAR-POWERED OUTDOOR LIGHTING SYSTEM SAL 20/240 LED

LED lamps are an innovation that makes a significant contribution to saving energy and therefore to environmental protection.

The innovative lighting systems SAL 20/240 and SAL 10/150 excel through their environment-friendly production and low energy consumption as well as a long lifespan.

Thanks to their durability, the LEDs never have to be replaced, lasting for the entire lifespan of the light installation.

Both LED luminaires are designed to operate for ten hours per night at all times of the year.

The built-in, intelligent charge controller switches on the LED panel at nightfall and off again at dawn.

The storage battery provides up to ten hours of night-time lamp operation, which can optionally be split over two periods with a timer, for example from 5 p.m. to midnight and from 4.30 a.m. to 7.30 a.m.

The lamp must be installed so that solar panels face due south and are exposed to direct sunlight.



BASIC SYSTEM

Two high-performance modules with 12 V/120 Wp or 12 V/75 Wp

Steel pole, height 4 m above ground

Two maintenance-free rechargeable batteries, 12 V/140 Ah

Corrosion-protected underground enclosure

Intelligent electronics

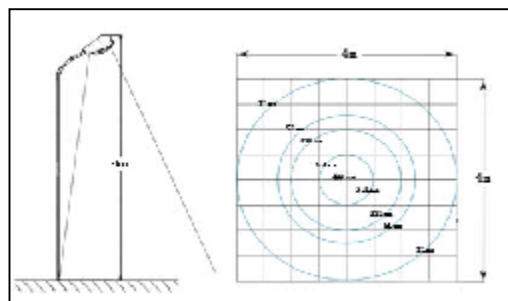
LED array with 200 or 400 LEDs

Luminaire for side-entry mounting



Model	SAL 10/150	SAL 20/240
Ambient temperature	-40 to +70 °C	-40 to +70 °C
Light colour temp.	6400k white	6400k white
Output	10 W	20 W
Service life of LEDs	50,000 h	50,000 h
Number of LEDs	200	400

Light spread of SAL 10/150 at 4 m light spot height (LSH)



Over the next five to ten years, conventional light sources, such as filament, halogen, fluorescent and high-pressure discharge lamps, will be increasingly replaced with LED lamps. This paves the way for new developments in the use of solar power for lighting applications.

POLES AND ACCESSORIES FOR OUR SOLAR LAMPS

LAMP POLES

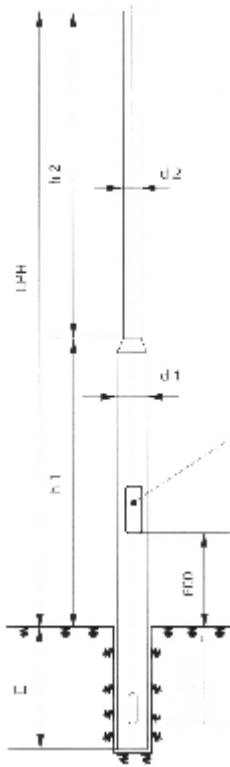
For our Trendline and Basicline versions, a special pole-bracket module combination is available (lamp height above ground 3.5 m for Basicline, 4 m for Trendline), which has been designed specially for these lamps.

For all other models we recommend cylindrical two-diameter top-mounting poles.

These poles are galvanised as standard and optionally available painted or powder-coated in any RAL shade at a small additional cost.

Depending on the lamp design, poles with a light spot height (LSH) of 3.0 to 4.5 m should be used.

A foundation plan is supplied for installing the lamps.



Information for ordering standard poles

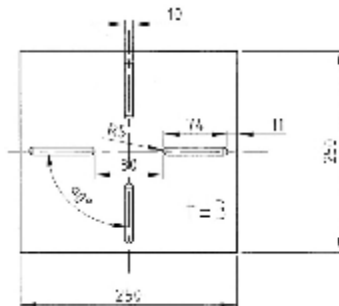
Model	LSH m	E m	h1 m	h2 m	d1 mm	d2 mm	Weight kg
AZ 760302	3,0	0,7	1,3	1,7	114	76	28,0
AZ 760352	3,5	0,7	1,3	2,2	114	76	30,5
AZ 760402	4,0	0,7	1,3	2,7	114	76	33,5
AZ 760452	4,5	0,8	1,5	3,0	114	76	37,5
AZ 760502	5,0	0,8	2,0	3,0	114	76	40,0

A = top-mounting pole
 Z 76 = spigot diameter 76 mm = d2
 040 = LSH = 4.0 m
 2 = two-part

For other dimensions and styles please enquire

ACCESSORIES

Base plates



Size depending on lower pole diameter, welded on or loose for mounting later

Corrosion protection sleeves

Protect steel poles at ground surface area;

Inside coated with non-setting sealing compound, which evenly coats the steel surface on shrinkage to provide effective protection.